VALUE FOR MONEY?:

THE EFFICIENCY OF PRIMARY HEALTH UNITS
IN TANZANIA

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ABSTRACT

This thesis reports on a multi-disciplinary evaluation of primary level health units, undertaken in Tanzania. The research objectives were to evaluate the provision of primary level health care in order to develop recommendations for its improvement and appropriate methods for such assessment at district level. The evaluation used the technique of cost analysis together with specific review of structural and process quality and of the community's satisfaction with the available care, in order to assess production efficiency.

An initial group of 58 health units, including both dispensaries and health centres, and government and voluntary agency units, were evaluated in the cost and structural assessments. Process quality was assessed in a sub-sample of twenty units, and community satisfaction in relation to a further sub-sample of ten units. The range of unit types was maintained at each stage of the study.

This study's analysis indicates that these units were inefficient, characterized by poor productivity, limited structural, and weak process, quality. They were also poorly perceived by the community. Health centres were relatively expensive but of poor quality. Voluntary agency units performed no better than government units, and sometimes worse.

The study's conclusions point to the need for better management of available resources to bring about more efficient, better quality care. The inadequacy of currently available resources was found to underlie some performance failures but an equally important problem was the weakness of the organizational structure of the health system. The research findings indicate the potential for efficiency savings, as well as considering the additional resources that might be generated through the introduction of user fees at the primary level. However, this potential will only be tapped if structures that encourage flexible and effective management are developed. The methods of this research could be used to strengthen managerial practices, either being adapted for use in other research studies or for monitoring at the district level. Similar research is required to support the development of management structures and systems.

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GLOSSARY

ANC/CW	ante-natal/child-welfare
BP	blood pressure
CCM	Chama Cha Mapinduzi
DAO	district administrative officer
DED	district executive director
DHMT	district health management team
DMO	district medical officer
EDP	essential drugs programme
EPI	expanded programme of immunization
FGD	focus group discussion
FP	family planning
FTSE	full time staff equivalent
Hb	haemoglobin
HHQ	household questionnaire
IC	informal conversation
ID	in-depth interview
IMR	infant mortality rate
IUCD	intra-uterine contraceptive device
MA	medical assistant
MCH	maternal and child health
MCHA	maternal and child health aide
MOH	ministry of health
PHC	primary health care
PNG	Papua New Guinea
PT	participant research
RDD	regional development director
RDF	revolving drug fund
RMA	rural medical aide
RMO	regional medical officer
TB	tuberculosis
Tsh	Tanzanian shilling
TT	tetanus toxoid
TWSA	time without specific activity
WHO	World Health Organization

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PREFACE

Origins of the research

Since the 1980s the sustainability of health care in developing countries has become a major concern of international health policy. Although particularly linked to consideration of how to sustain activities initiated through overseas donor support (OECD 1989), the phrase has also been associated with discussion of the need for additional resources to ensure the maintenance and expansion of health systems. Review of community financing experience, however, led Stinson (1987) to conclude that sustainability is a complex problem which is not only dependent on increased resource generation. More effective planning, to respond to and shape demand is also important, as is improving the quality of services and strengthening the use of available resources.

This interpretation of the requirements for developing sustainable health care reflects the author's own experience of health planning in the mid-1980s in Swaziland, Southern Africa. Although a relatively wealthy country, small and with good infrastructure, a 1984 nationwide clinic survey revealed that the country had significant problems in providing reasonable levels of care from its health units (Government of Swaziland 1984). Consequently, despite pressure from the community and politicians to expand the health infrastructure, the Ministry of Health adopted policies to discourage additional clinic construction whilst encouraging management action to improve the services provided from existing buildings. Such action revolved around strengthening district health management - working with district health officials to identify and plan for their priority health needs. As past failures in identifying the recurrent budget requirements of capital investment had contributed to weaknesses in the care provided, emphasis was placed on realistic budgeting as a vital element of district health management. In an environment where real decentralization of power to the district level was not possible without government-wide approval, health sector actions emphasized the development of district management skills and annual planning and budgeting systems based on consultation between centre and periphery. Such improvements strengthened the health ministry's hand in budget negotiations with central finance and planning departments and in one year led to small, additional allocations for the health recurrent budget - a previously unimaginable event.

Broadly, this experience illustrates that ensuring sustainability is not simply a question of raising additional funds for the health sector, but is also, and crucially, based on improving the use of currently available funds through better management. The research reported here, undertaken in a different sub-Saharan Africa with similar problems, is rooted in that lesson. It sought to explore ways of improving the performance of health units, and to develop methods that will allow district managers to monitor and

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support the units under their responsibility.

Outline of thesis

Section 1 sets the context of the research. Its objectives are presented and justified in Chapter 1 and the evaluation framework, rooted in assessment of efficiency, is also outlined. Discussion of this framework is complemented by literature reviews of cost analyses (Chapter 2) and quality of care/satisfaction assessments (Chapter 3), which focus on definitional and methodological issues. Finally, in Chapter 4 the study site, sampling procedures and evaluation methods are described.

Section 2 of the thesis presents the findings of the study. Chapter 5 focuses on resource use and cost analysis, presenting results and exploring explanations of them. Chapters 6-8 look in detail at the findings of the sub-studies concerning structure, process and satisfaction. Each chapter includes consideration of the link between costs and quality, initial conclusions and methods used.

Section 3 of the thesis draws together the different sub-studies' findings in full consideration of the overall implications of the research. Chapter 9 discusses the policy implications in detail and Chapter 10 highlights the key methodological, policy and research recommendations arising from the study.

CHAPTER ONE:
FRAMEWORK OF ANALYSIS

This chapter first introduces this research and its objectives by reference to the situation of health care in developing countries in the late 1980s. The framework of analysis used in the research and in the presentation of findings is then outlined; its brief description anticipates the fuller cost and quality of care literature reviews of Chapters 2 and 3.

1.1   Research background and objectives

Following their independence in the 1960s many sub-Saharan African countries initiated considerable expansion of their health care infrastructure. In Botswana, for example, the number of clinics doubled between 1969 and 1984 allowing 85% of the widely dispersed Botswana population to live within 15km of a health unit (Walt 1990). However, infrastructural expansion was usually not accompanied by concurrent increases in the recurrent budgets of health ministries. The resulting recurrent cost problem (Heller 1979, UNICEF 1988, Waddington and Thomas 1988) can be seen in its symptoms: shortages of drugs, dressings and other medical supplies, poorly equipped facilities with no staff to run them, poorly maintained buildings and equipment, immobile vehicles caused by lack of spares and/or fuel, unfilled staff posts, and primary level staff working without supervision due to transport difficulties (Attah 1986, Gesler 1979, Government of Swaziland 1984, Kloos *et al.* 1987, Lasker 1981). This range of difficulties leads to *"reduced efficiency, reduced service quality, reduced service quantity, reduced confidence in public sector facilities, with consequent low utilization; a shortened lifespan for capital investments; and low morale among staff with consequent absenteeism and high turnover"* (Abel-Smith and Creese 1989 p.19).

Reaction to the recurrent cost problems has tended to focus on the health sector's resource constraints, which were exacerbated by international recession in the 1980s. The average per capita GDP growth rate for developing countries between 1981 and 1985 was -1.1% compared with 2.7% in 1976-1980 (Cornia *et al.* 1987). As a result, the proportion of national budgets spent on health declined - for example, from 10.4% to 5.8% between 1979 and 1984 in Swaziland (Abel-Smith 1986). Such resource crises led to calls for alternative financing and cost recovery in the 1980s. The World Bank's 1987 publication Financing Health Services in Developing Countries: An Agenda for Reform, in particular, called for review of current financing mechanisms, promoting the introduction of user fees for health care - combined with insurance schemes where possible - in order to generate the resources required to sustain and improve the quality of available health care. World Bank and International Monetary Fund lending policies have pushed countries further towards this goal by the policy conditions accepted as

part of loans and structural readjustment packages (Dahlgren 1990, Kanji 1989).

However, sustainable health care requires not only more resources but more effective planning and management (Gilson 1990a, Stinson 1987). The World Bank (1987), for example, identified the effective use of non-government resources and the decentralization of government health services as part of its strategy to address existing health system problems. Decentralization has, in particular, been seen as a way of tackling the past management failures associated with centralized management (Amonoo-Lartson et al 1984, WHO 1983) by developing a better organizational framework for the implementation of primary health care (Mills *et al.* 1990). Experience of decentralization has emphasized the need for improved information and management systems (Bossert *et al.* 1991, Mills *et al.* 1990), for management training (Amonoo-Lartson *et al.* 1984, Cassels and Janovsky 1991, Newbrander *et al.* 1988) and for recognition of the political influences that underlie health sector decision-making (Collins 1990, Mills *et al.* 1990).

The importance of these management issues to cost recovery debates can be seen in the history of UNICEF's Bamako Initiative (UNICEF 1988). At its introduction in 1987 the Initiative sought to promote the creation of small-scale cost-recovery schemes, such as revolving drug funds (RDFs), and the selective package of mother and child health (MCH) services identified by the organization as being most cost-effective. However, *"the Bamako Initiative view is naive if it believes that improved management is almost inevitably a result of decentralization and autonomy...Without providing appropriate training, establishing improved accounting and management systems and frequent quality supervision, it is doubtful whether RDFs will be sustainable"* (Kanji 1989 p.9-10). Experience of the Initiative's implementation has further emphasized the importance of strengthening management at the same time as changing financing patterns (McPake *et al.* 1992) and *"by giving due attention to service quality through staff training and the rehabilitation of infrastructure, the Initiative has, in fact, already begun to site indication of increased service utilization [despite fees increases]"* (Jarrett and Ofosu-Amaah 1992 p.167). Wouters (1991) has also stressed that *"policy makers should understand the role of quality in the supply and demand of health, not only to assess the efficiency of the health sector, but also to determine its affordability"* (p.269).

Research studies have an important role to play in supporting decentralized management and in developing management improvements (Amonoo-Lartson *et al.* 1984, Bossert *et al.* 1991, Cassels and Janovsky 1991, Jarrett and Ofosu-Amaah 1992). Through evaluation of current performance and identification of the key factors influencing it, research can generate improved monitoring systems, key information needs and identify steps to improve future performance. A few large-scale studies, as undertaken in Ghana (IDS 1978a, 1978b) and Afghanistan (O'Connor 1978), have, for example, looked at the factors influencing the performance of the whole health care system. Micro-level studies have

also begun to explore aspects of performance such as the costs of service provision (Chapter 2), the quality of care offered within health units and the influence of community perceptions of care on utilization (Chapter 3). However, few evaluation studies have so far been undertaken with a specific focus on the primary level, integrating evaluation approaches and using methods that might be replicated by health managers at the district level.

Three fundamental questions have been proposed in relation to health care performance: is the service reaching the people it should serve? has the service been effective in meeting people's needs? how should resources be allocated in such a way as to serve as many people as possible? (Tanahashi 1976). These questions could be looked at from different perspectives, but the importance of resource-related issues points to the particular relevance of economic approaches: *"...the health sector has a duty to satisfy the public that it is achieving a tolerable level of efficiency in the use of resources - that resources are only used in the provision of services when they can be effective and that effective services are provided at the lowest cost consistent with acceptable standards of care"* (Abel-Smith 1976 p.221).

In order to address these concerns the research presented in this thesis had the following objectives:

1.   to develop research methods for evaluating the efficiency of primary health care units and monitoring approaches for sustaining efficiency improvements;

2.   to evaluate the performance of primary level health units with respect to:

    2.1   costs,

    2.2   quality, and

    2.3   community satisfaction with available care;

3.   given this evaluation, to consider the actions required to improve the efficiency of primary level units and the potential for managers to influence the units' performance.

1.2   Efficiency as a basis for evaluation

1.2.1 Efficiency concepts

The economic concept of efficiency has two central concerns:

* *allocative efficiency*, concerning the allocation of resources to achieve socially defined objectives and

* *production efficiency*, concerning the use of available resources in production of goods and services.

In both concerns it is assumed that society places sufficient value on the achievement of efficiency to make it a key objective of production. Given that this thesis is primarily concerned with the management of health care and the production process of the health sector, its analysis is based on issues of production, not allocative, efficiency. Newbrander *et al.* (1992) identify three types of production efficiencies: technical efficiency, which focuses on the mix of inputs which will produce a given output; economic efficiency, which is concerned with the least-cost combination of inputs which will produce the desired output, given various possible combinations of inputs; and scale efficiency which deals with whether the system as a whole is producing services at least cost and is based on economies of scale. The three are inter-linked. *"As a rule, when the term 'efficiency' is used it is economic efficiency (the least cost solution to achieve a given output) to which reference is being made"* (Newbrander *et al.* 1992 p.16), but Berman (1986) suggests that operating efficiency is a key issue for health managers. This concept of efficiency is similar to technical efficiency, based on assessment of productivity and the causes of variation in cost per unit of output. In any case, cost analysis can be used to assess efficiency by exploring the relationship between costs and output, and the factors that influence this relationship (Chapter 2).

1.2.2 Translating efficiency concepts to the health sector

Two main problems arise in translating the concept of efficiency to the health sector: defining output, and the nature of the managerial process and its underlying imperatives. Both are interlinked.

In the health sector, output is fundamentally concerned with 'good health' - that is the ultimate goal. However, proposing a measurable definition of good health and establishing a link between it and the production process of health care are, in practice, very difficult. For example, health output includes elements such as reduction of pain and an increased sense of well-being that have no clear unit of measurement, and health outputs may vary considerably between health units because of differences in case mix, or severity of illness.

In this research no attempt was made to measure or value health status outcomes on three grounds: first, because of the considerable difficulties of establishing a definitive link between the multiple outputs of a health unit and changes in the health status of users; second, the key focus of production efficiency is whether the least cost combination of inputs has been used in achieving a given output; third, district managers are primarily charged with ensuring that existing services are provided as effectively as possible within available resources and national guidelines concerning service provision. Concern with district management requires a primary focus on process not outcome, accepting as given that the health services available represent the best use of available resources. National planners, on the other hand, should be more concerned with assessing the cost-effectiveness of alternative mixes of health

services in establishing national guidelines.

A more practical, if limited, definition of health output was therefore chosen for use in this study i.e. patients or attenders seen, complemented by investigation of the process of providing care. Adopting this definition requires that, at the minimum, the outputs of different health units are assessed for their similarity before comparing efficiency, as differences in the type and nature of output (such as case mix and severity) may be a better explanation of cost differences between health units than differences in, say, productivity or utilization levels (Chapter 2).

The second difficulty of translating efficiency concepts to the health sector, the nature of the managerial process, requires consideration of the economic management imperative. It is sometimes incorrectly characterized as, simply, 'seeing as many patients as possible' (in order to reduce costs); thus, conflicting with the medical imperative of 'seeing as many patients as possible giving due attention to their problems and applying appropriate medical techniques in order to secure their best chances of improvement'. However, the economic management imperative is not simply to reduce costs, but rather to obtain maximum output with the available resources; and assessment of efficiency requires consideration of whether the health sector is getting value for money from the resources available to it. The special needs of the health sector and the nature of health output, perhaps more clearly than in some sectors, indicates that both the quantity and quality of output should, therefore, be considered in efficiency evaluations. Within a focus on the process of providing health care, a full efficiency evaluation requires both a review of costs, in order to explore if and why cost differences between health units exist, and, at the same time, a more purposeful examination of aspects of the quality of care provided - factors which together with cost will allow judgements about value for money to be made. As the quality assurance debate over efficiency (Chapter 3) emphasizes, efficiency should not replace health management concerns, particularly regarding the quality of health care, but should complement them.

1.3 An integrated evaluation of health care performance

Assessment of the links between the concepts of efficiency and quality allows identification of the key issues to be considered when undertaking an evaluation that integrates economic and quality approaches. A first step in establishing the links is to consider the factors that influence efficiency, as assessed through cost analysis (Figure 1.1).

Three related areas are identified as important influences on efficiency: resources available, the way resources are used and utilization patterns. As the figure indicates, in the language of quality assurance (Chapter 3) these can be interpreted as: resources available = structure; the way resources are used

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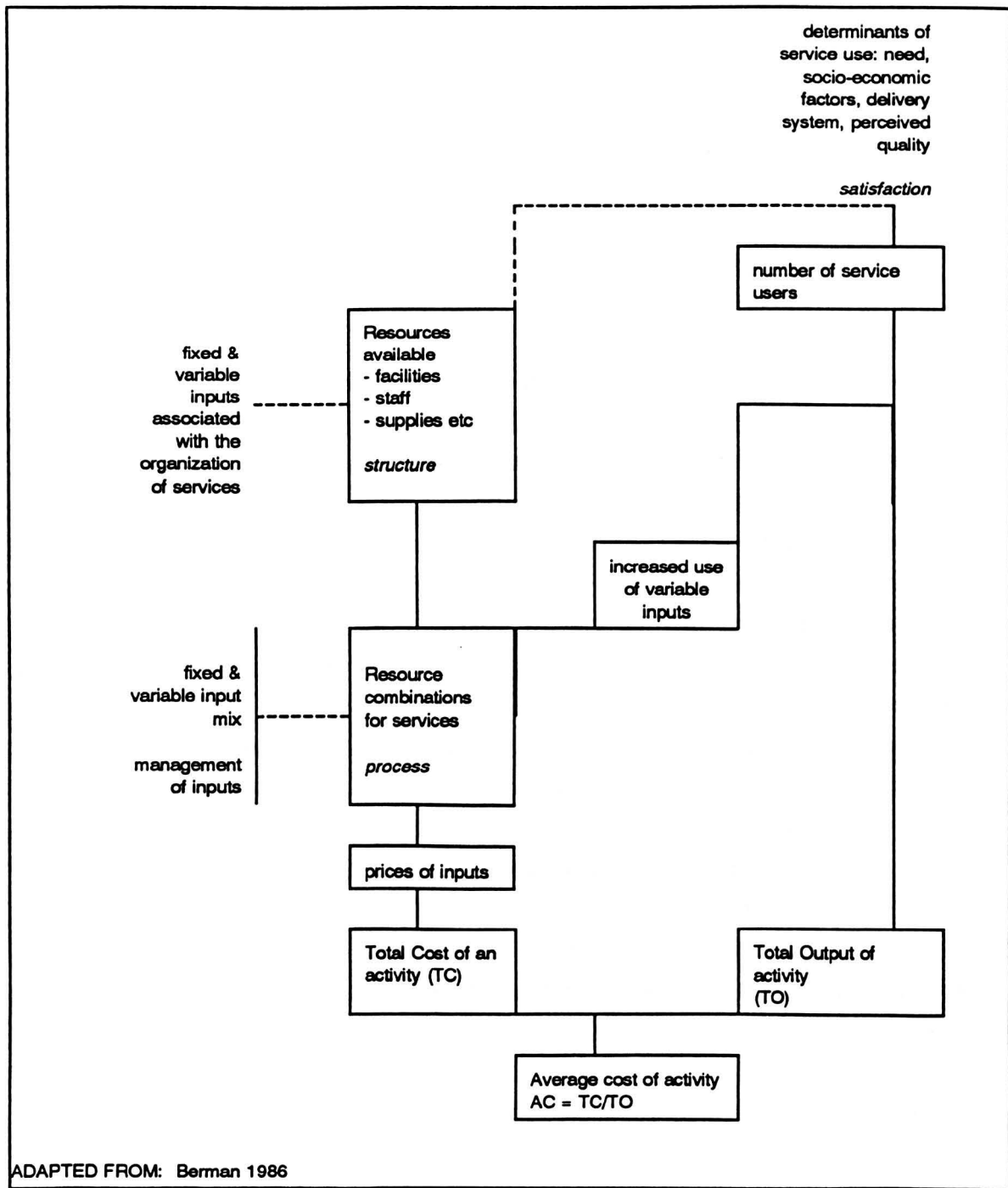
Figure 1.1: Factors affecting costs

= process ; utilization/perceived quality = satisfaction (= process and outcome).

Considering the relationships between efficiency and quality algebraically:

COSTS (C) are influenced by the resources available (x), the way resources are used (q1), the prices of inputs (p), and utilization levels (U), i.e.

$$C = fn(x, q1, p, U)$$

QUALITY (Q) is influenced by the resources available (x), technical skills (q2), inter-personal skills (q3), i.e. $Q = fn(x, q2, q3)$

UTILIZATION (U) is influenced by the resources available (x), the way resources are used (q1), technical skills (q2), inter-personal skills (q3) and other factors (M) (e.g. perceived cause of illness, relationship with provider), i.e.

$$U = fn(x, q1, q2, q3, M).$$

The frequency of occurrence of four variables - resources available, the way resources are used, technical skills, and inter-personal skills - suggests that they tie efficiency and quality together. The way resources are used is likely itself to be linked to technical and inter-personal skills, given that process quality is based on the combination of these skills (Chapter 3). These variables are, therefore, of particular importance to assess in conjunction with costs in undertaking a full efficiency evaluation. Their assessment is complemented by consideration of perceived quality, based on satisfaction and reflected in utilization. Figure 1.2 and Table 1.1 suggest, from intuitive assessment, how these different issues affect costs and quality and so influence efficiency.
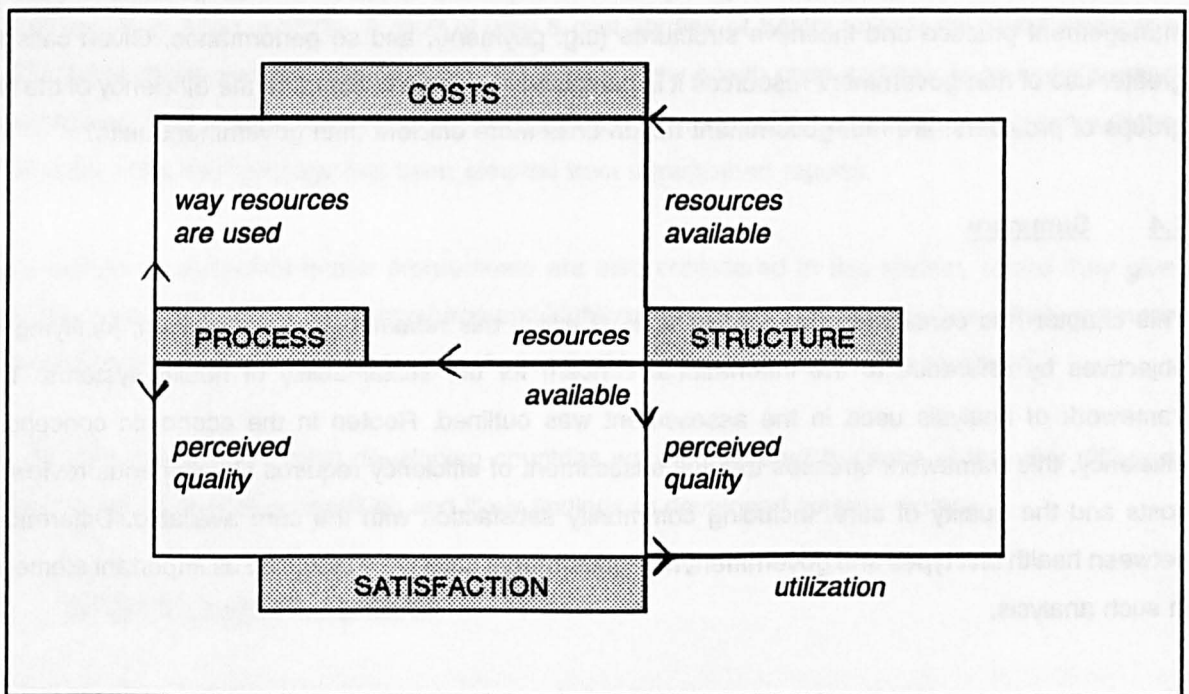
Figure 1.2: Health care production, the links between costs and elements of quality

Chapter 2 highlights two further issues that should be considered in evaluating efficiency. The type of health unit is important because higher level units (such as health centres), with greater technology and skills, are assumed to produce a different output from primary care: how efficient are health centres?

Table 1.1: The links between costs and quality of care

ISSUE	COST IMPACT[1]	QUALITY OF CARE IMPACT[2]
RESOURCES AVAILABLE	direct impact on total, average and marginal costs; also influence the way resources can be used (e.g. prescribing practices)	can influence: health care practice (ways resources are combined) e.g. types of examinations undertaken, drugs prescribed; and perceived quality (utilization) e.g. availability of drugs, privacy
WAY RESOURCES ARE USED	combination of inputs have impact on total, average and marginal costs: e.g. ratio of trained to untrained staff; e.g. proportions of more expensive drugs (such as anti-biotics) used	combinations may reflect technical skills (as in prescribing) or inter-personal skills (perhaps reflected in time given to patients); may have consequences for utilization via impact on perceived quality
UTILIZATION	direct impact on average and variable costs (increased utilization requiring increased variable inputs)	likely to reflect perceived quality of care

NOTES: 1. See Figure 1.1
2. Drawn from Chapter 3.

Ownership differences (public/private) may also be important because of their possible impact on management practice and incentive structures (e.g. payment), and so performance. Given calls for greater use of non-government resources it is particularly valuable to compare the efficiency of the two groups of providers: are non-government health units more efficient than government units?

1.4   Summary

This chapter has considered the context against which this research was undertaken, justifying its objectives by reference to the international concern for the sustainability of health systems. The framework of analysis used in the assessment was outlined. Rooted in the economic concept of efficiency, this framework stresses that full assessment of efficiency requires simultaneous review of costs and the quality of care, including community satisfaction with the care available. Differences between health unit types and government/non-government units were identified as important elements in such analysis.

CHAPTER TWO:
COST LITERATURE REVIEW

The evaluation framework of this study (Chapter 1) is rooted in the economic concept of efficiency, which can be assessed using the techniques of cost analysis. This review of relevant literature seeks to clarify issues important to efficiency assessment and to provide a basis for developing this study's methodology. Key conceptual issues are first discussed before considering the purposes for which cost analysis has been undertaken and the specific issues considered in assessment of production efficiency; then, against this background of theory and objectives, the methodology of cost analysis is discussed.

Assessment of recommended practice from costing manuals and texts is combined with detailed review of cost studies focused on lower-level health units - units with, at the most, some in-patient capacity. Robertson's 1985 review of developing country cost analyses within the English literature identified only one large-scale study of such health units (Heller 1975) and by 1991, although the overall number of cost studies had increased *"most limit themselves to a single programme or one type of service"* (Robertson *et al.* 1991 p.1328). A total of only 8 cost studies of health units were found within the English literature: four small-scale, focusing on one or a few health units and four large-scale studies of a sample of health units. Not all the studies are available in the published literature, and some of the detail concerning methodology has been gleaned from unpublished reports.

Some studies of individual health programmes are also considered in this review, where they give adequate details of their costing procedures and highlight elements of costing practice which are more rarely discussed in studies of health units. Appendix 2A summarizes all studies reviewed.

Only studies undertaken within developing countries were considered because of the very different settings, methodological possibilities and likely findings of developed country studies.

2.1   Efficiency and cost concepts

Review of economic cost and production theory helps identify cost categories to calculate and cost behaviour to explore, in assessment of efficiency. Economic evaluation approaches, for example, identify the cost of any activity as the economic value of all resources that are used in it, including money expenditure, voluntary labour and user's time: together equalling the full cost of the activity (Levin 1983).

Cost categories important to efficiency assessment include: total, average (cost per unit of output) and marginal costs (the additional cost associated with expanding output by one unit); and fixed and variable costs (the former cannot be altered in the short-term in response to output changes, but the latter can). Economic cost theory suggests that average and marginal costs are linked to utilization and that their short-term relationship is non-linear (Figure 2.1).

Efficiency is maximized when the average cost curve is at its minimum point: available resources are employed as productively as possible and the production point of least cost per unit of output is achieved. Interpretation of the relationship between the two cost curves relies on production theory and, in particular, the law of diminishing marginal productivity. It suggests that in the short-run, in any setting, the marginal productivity of variable inputs can be increased at low levels of output by, for example, concentration and specialization, so causing falls in marginal and average costs. However, because such gains are limited as long as resources remain fixed, marginal productivity is likely to fall as output continues to rise - leading to increases in marginal and average costs.
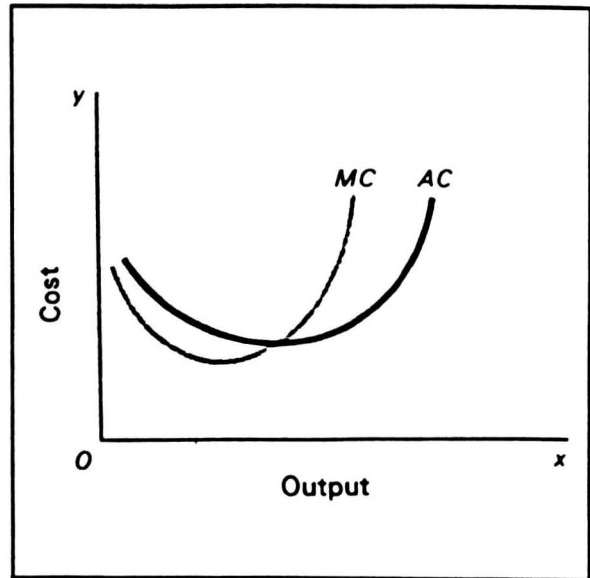
Figure 2.1: Average and marginal cost curves

Examination of both fixed/variable and average/marginal costs is, therefore, important in assessing efficiency. Marginal cost assessment is helpful for planning purposes because it indicates the cost of output expansion or contraction - based solely on variable cost changes. Average costs are, rather, based on the past experience of undertaking the activity and the productivity with which it was undertaken, considering both variable and fixed cost inputs. Average and marginal costs can be compared between firms producing the same type of output in order to explore differences in efficiency. For example, economies of scope, lower average costs associated with a wider range of output, may be evident.

In the long-term all inputs are variable, and economies of scale may be possible as a result of capacity expansion which, whilst causing total costs to rise, also generates greater output at lower average costs than at the short-term point of efficiency. Cost curve analysis of the long-term possibilities (Figure 2.2) emphasizes that short-run average cost curves all lie within the envelope of a similarly-shaped long run average cost curve. Each short run curve is constrained by the capacity of the fixed cost items, which impose limits on how far output can be increased (for example, because only a limited number of

workers can work in a limited space). It is only in the long-term that the fixed variables, such as space, can be increased to allow expansion of output. Assessment of efficiency should, therefore, not only consider productivity differences between health units but also whether productivity increases are anywhere constrained by capacity limits.

The theoretical relationship between utilization, productivity and costs in health care production is predicated on the assumption that during production (health care provision) there is no change in case mix or quality of care, and that managerial action seeks to maximize output. It is assumed that any change in these conditions is likely to cause the cost curves to shift upwards or downwards, depending, respectively, on whether the change leads to greater, or less, cost for any level of output. For example, if better quality care implies more thorough examination or more personal care then more resources are likely to be required for each level of output (Jacobs 1980).
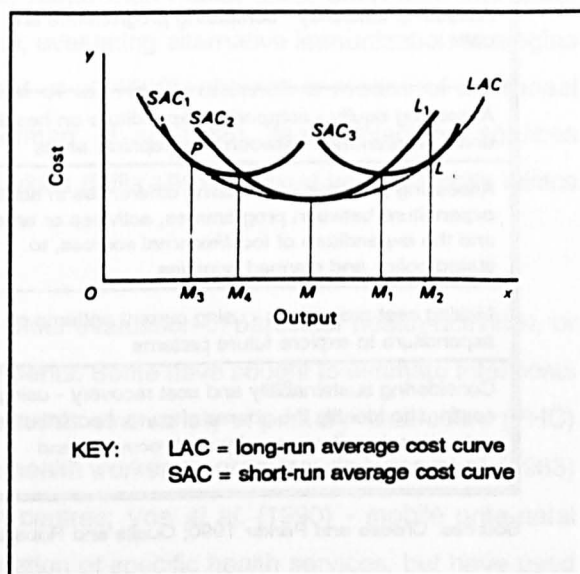
Figure 2.2: Long-run average cost curve

KEY: LAC = long-run average cost curve
        SAC = short-run average cost curve

Comparison of efficiency between health units of different quality is, therefore, difficult - apparently lower productivity may be associated with better quality output rather than lower intensity of resource use. Productivity is, anyway, a more limited concept than efficiency as it is based on the possibility of producing more output with the same inputs rather than of producing more output by utilizing inputs more effectively (Shone 1981). Greater efficiency may require productivity increases but those increases may also be encouraged by, for example, changes in the resource mix.

2.2   Cost analysis in practice

2.2.1 The uses of cost analysis

Of the issues identified in Table 2.1 as potential foci of cost analysis, the health unit studies reviewed generally sought to assess efficiency. Comparison of cost profiles and average costs between areas in Indonesia led to the conclusion that *"there is great potential in Indonesia for increasing cost-efficiency within the existing administrative and management structure. Some sub-districts are considerably more efficient than others, and the total output of the rural health system could be dramatically increased with relatively small additional costs. Potential areas where improvements could be made include use of drugs and supplies, work assignments of personnel"* (Berman *et al.* 1989a

Table 2.1: Uses and analyses of cost data

USE	DATA ANALYSES
Accountability - monitoring the use of financial resources relative to budgets and plans	Total, capital and recurrent expenditure of units, programmes and areas
Assessing efficiency - comparing programmes and units	Cost profiles (input and activity); average costs; fixed versus variable costs; exploring the factors influencing costs
Assessing equity - comparing expenditure on health units/ programmes between geographical areas	Total costs and cost per capita (inhabitant/target population)
Assessing priorities - by relating differences in actual expenditure between programmes, activities or areas, and the expenditure of local/external sources, to stated policy and planned priorities	Total costs and cost per capita (inhabitant/target population); costs by contributor; costs by level of health system
Making cost projections - using current patterns of expenditure to explore future patterns	Planning ratios, marginal costs
Considering sustainability and cost recovery - using costings to identify the shares of current contributors, potential rates of community cost recovery, and potential pricing levels	Total costs, cost profiles (by inputs)

Sources: Creese and Parker 1990; Qualls and Robertson 1989

p.692). In Papua New Guinea (PNG) cost analysis was used to develop *proposals for the improvement of rural health services without cost increases* (Mitchell *et al.* 1988 p.15); as high service costs were found to be associated with low levels of attendance, *a focus of future efforts to improve efficiency should therefore be on increasing the use of existing services* (Mitchell *et al.* 1988 p.53). In Ecuador it was concluded that *in order to increase delivery efficiency, the costs of RSSP [social security] primary health care facilities in general..should be examined closely* (Robertson *et al.* 1991 p.1334).

Cost profiles indicating the continuing emphasis of curative care at the primary level of the health system, despite the stated priority usually given to preventive care, may have important policy implications. Berman *et al.* (1989a) suggest for Indonesia that *official staff assignments and the actual use of staff need to be reviewed to determine how to accelerate the shift of resources to priority programmes* (p.692). The broad objective of informing policy debate is also shown by a South African study, which aimed to remedy the gap in current knowledge of health service costs in South Africa as *this information is crucial in informing current debates on the setting and organization of primary health care in [the country]* (Broomberg and Rees 1991 p.4).

Some health unit studies have also been carried out at least partly to demonstrate the methods involved in cost analysis (Alexander *et al.* 1972, Heller 1975). In the PNG study, cost analysis was also

the foundation for the development of a model for planning health facilities and a variety of management tools (manpower distribution indicators, drug use, ration use, travel and transportation use, maintenance requirements, bed requirements, weekly output figures) (Mitchell *et al.* 1988).

Cost studies looking at particular health programmes, rather than health units, often feed into wider consideration of costs and consequences. For example, evaluating alternative immunization strategies (Berman *et al.* 1991, Robertson *et al.* 1984, Shepherd *et al.* 1989), alternative modes of diarrhoeal treatment provision (Horton and Claquin 1983, Lerman *et al.* 1985), family planning services (Tangcharoensathien *et al.* 1990), malaria control activities (Mills 1991) or fixed versus mobile clinics (Gish and Walker 1977).

Several studies attempt sketchy costings as part of a wider evaluation of particular health activities, or in order to validate or complement other, broader arguments. Some have sought to estimate total costs in discussion of the potential role and financial requirements of a variety of primary health care (PHC) programmes: Chabot and Waddington (1987) - village health worker programme; de Vries *et al.* (1983) and the Kasongo team (1984) - primary level health centres; Vos *et al.* (1990) - mobile ante-natal clinics. Other studies have introduced costs into evaluation of specific health services, but have used only the limited data easily available to them to consider the cost implications of particular health activities. Parkinson *et al.* (1983) look at outpatient care at clinic and hospital level, Rees *et al.* (1978) focus on aspects of hospital costs, Vogel *et al.* (1976) look at an hospital out-patient department. Such assessments show how even simple cost analyses can generate useful discussion of management and policy issues.

2.2.2 Issues in assessing efficiency

Creese and Parker (1990) identify six factors to consider in assessing efficiency: the prices paid for inputs, staffing ratios, staff productivity, intensity of use of a unit (volume of care in relation to capacity), economies of scale and economies of scope. Newbrander *et al.* (1992), more theoretically, point to the importance of technical, economic and scale efficiency.

In Ecuador, analysts concluded that three factors - productivity differences, the particular mix of services offered and economies of scope - were important in determining that ministry of health (MOH) units, and units offering dental care, had lower average costs than other units (Robertson *et al.* 1991). The South African study also drew on detailed comparisons of productivity differences between doctors and PHC nurses in considering whether staff use efficiency could be improved (Broomberg and Rees 1991). No study has identified staffing ratios as an explanation of average cost differences, although the ratio of trained to untrained staff might, because of different salary rates, have an influence. The Indonesian

study included specific assessment of staff and drug use in both real and monetary terms (e.g. patient contacts per full time staff equivalent and personnel cost per contact) (Berman and Sakai 1992). Low productivity in some units resulted in relatively high average costs; however, variation in productivity between sub-districts indicated that efficiency improvements were possible within the existing system and might be generated through re-assessing staff allocations and task assignments, and improving prescribing practices. *"Rough estimates of the potential financing gains from increasing productivity showed this to be a potentially important source of health care financing at the margin"* (Berman and Sakai 1992 p.416)

Assessment of the relationship between average costs and level of output can generate important policy implications concerning operating efficiency. Bennett and Modisaotsile (1991), for example, showed that the number of children seen at a facility was the most significant factor affecting the cost of child survival programmes. Given the scattered nature of population settlement *"there is an inherent conflict between the objectives of minimizing costs and maximizing accessibility. Botswana has perhaps reached the stage where very careful consideration should be given to the construction of new facilities"* (p.ix). Focusing specifically on the impact of volume on average cost in an immunization programme, Robertson et al. (1984) also show *"a clear inverse relationship between the average cost per dose and service volume...[however] it seems that the optimum service volume has not yet been reached in the field units because the average cost curve showed no trough throughout the range of service volumes considered"* (p.732). The analysts, therefore, suggested that the efficiency of immunization sessions could be raised by reducing their frequency and/or by redistributing catchment areas, leading to more intensive use of staff and other resources. Although using only a sketchy costing, Ugalde (1984) reviewed costs in relation to low staff productivity, low utilization and low perceived quality, in an assessment that concluded that high costs were caused by low utilization and productivity due to *"poor managerial practices, shortages of medicine, dispersion of the population and the compulsory one-year rural social service required from all graduating physicians"* (p.441).

Although some evidence of economies of scope has been found (Robertson et al. 1991), there is little firm evidence of increasing returns to scale. Rather, exploration of differences in unit costs between units at different levels of the health system in Indonesia and PNG led to the conclusion that sub-centres may provide a more cost-efficient way of organizing health care than health centres (Berman 1989, Mitchell et al. 1991); development of sub-centres has anyway been promoted on the grounds that they are more equitable than health centres (Berman et al. 1989b). Such conclusions have relevance for the future development of rural health services. Comparison of costs between different health care providers is also useful given the growing importance being given to non-government health care (World Bank 1987). In Ecuador, government health units had lower average costs than social security health units but also fewer drugs, suggesting poorer quality; the analysts concluded that *"the MOH*

would profit from a review of its policies for providing drugs as an input into PHC service delivery, subject to financial constraints. A comparative examination of RSSP [social security] policies and practices should be undertaken" (Robertson *et al.* 1991 p.1334). In PNG, comparison of mission and government units showed that mission units were characterized both by higher average costs and better quality care than government units (Garner *et al.* 1990).

In only these latter two studies have data on quality as well as costs been collected. In combination with theoretical considerations they suggest that *"comparative average costs should not be considered alone as indicators of relative subsectorial efficiency. Costs must be adjusted for quality differences, which are worthy of future study. This observation is particularly important in view of the virtual absence of cost comparisons among sub-sectors in the literature of international health, and the scarcity of research dealing with cost and quality together"* (Robertson *et al.* 1991 p.1334).

2.3   Cost studies: methodology

Costing manuals and texts generally recommend an ingredients approach to costing within developing countries, based on identifying, measuring and valuing the resources (ingredients) used in the activity of assessment (Levin 1983). The alternative approach, more often used in developed countries, uses the expenditure data of accounting systems but it is difficult to apply in developing countries because accounts data are unreliable and hide too much of the information required for cost analysis (Levin 1983; Bloom 1988). In practice, most studies primarily adopt the ingredients approach, drawing on reliable expenditure data where possible or necessary.

2.3.1 Cost identification

The first step of cost analysis requires identification of relevant costs, based on study objectives. Three groups of costs should theoretically be considered in full economic evaluation: organizing and operating costs within the health sector, costs borne by patients and their families, and costs borne externally to the health sector, patients and their families (Drummond and Stoddart 1985).

In practice, given their focus on managerial issues, health unit studies usually adopt the perspective of the providing agency and ignore user costs; only the Indian study considered the user's perspective (Alexander *et al.* 1972). Single programme studies, however, often discuss user costs. Bennett and Modisaotsile (1991), for example, did not include travel time and fares within the costs of child survival services provided from a sample of health units, but did obtain some information on these issues from interviews with women attending clinics. They suggest that *"the private costs to the women appear to be low, especially when compared to the costs of providing services"* (p.31), although noting limits to

the data collected. In contrast, inclusion of private drug expenditures in Lerman *et al.*'s (1985) analysis of diarrhoea treatment led them to conclude that, at 46% of total treatment expenditure, these costs demonstrated community capacity and willingness to pay for their perceived health needs. Horton and Claquin (1983) suggest that private costs for diarrhoeal treatment in Bangladesh *"although possibly small in relation to the reported costs of services, are nevertheless large enough to provide a deterrent to the use of a service by some individuals"* (p.722-3). Finally, the Thai study of intra-uterine contraceptive device (IUCD) services more systematically included private costs and showed that *"the lower average cost per acceptor at the health centre was due mainly to the fact that the client's costs there were ten times less than at the hospital"* (Tangcharoroensathien *et al.* 1990 p.180).

Although ignoring user costs, health unit studies at least partially adopt a societal view by considering donated inputs and valuing capital inputs by consideration of their opportunity cost.

2.3.2 Sample size

Where the activity of focus is provided through many health units or where there are many relevant health units within a particular geographical area, it is recommended that a representative sample be selected to generate cost estimates representative of the wider population of units such as district, region or country (Fielden 1991). In the large-scale Indonesian study, for example, data was drawn from a sample of sub-districts (health centre work areas), allowing coverage of the government's three development regions, national topographical differences and differences in distance from a major population centre (Berman *et al.* 1989a). It appears that the sub-districts were selected by purposive sampling of regencies (an administrative unit above the level of sub-district) within 5 pre-selected provinces but it is not clear whether every sub-district within each sampled regency was included in the study. In PNG a stratified random sample was drawn from a sample frame allowing for two different types of health unit, two different degrees of access and four different administrative regions (Mitchell *et al.* 1988).

However, within small-scale health unit studies costs have, rather, been assessed in purposively chosen geographical areas/health units. A similar approach was undertaken in the larger Ecuador study which included health units located in two provinces: one rural, low-income and the other urban and more affluent (Gomez 1987). The units were selected purposively to ensure topographical balance, similar service provision, a high proportion of low socio-economic users, an acceptable level of data and the approval of the parent organization (Robertson *et al.* 1991).

2.3.3 Costing period and cost items considered

Manuals generally recommend that the costing period should be one full year so that it is consistent with records on key inputs such as personnel and distortions that may be caused by seasonality are avoided (Creese and Parker 1990). Most studies have followed this recommendation; however, the large-scale Indonesian study extrapolated annual costs from monthly costs and the South African study considered only monthly costs.

Cost items to be considered include: capital items (buildings, furniture, equipment and vehicles) and recurrent items (personnel, drugs, operating and maintenance, other supplies) (Levin 1983). However, the costs of training and supervision are often ignored in practice (Alexander *et al.* 1972, Heller 1975, Mitchell *et al.* 1988) perhaps because of information problems (Hussain 1983). Heller (1975) excluded basic personnel training after determining that its opportunity cost would be negligible. The South African and Ecuador studies were unusual in their inclusion of the indirect costs of the parent organization's administration. For example, in the Ecuador study both the relevant administrative costs, at the national and provincial level, and the costs of indirect services (such as laboratory tests, maintenance, transportation, training) were assessed (Gomez 1987). By contrast, as elsewhere, the PNG study focused specifically on the costs associated with the activities undertaken by the units themselves, ignoring the wider support provided to them (even supervision) (Mitchell *et al.* 1988). Some internal administration costs (including training and supervision given to lower level units) have, however, sometimes been considered (Broomberg and Rees 1991, Hussain 1983, Mitchell *et al.* 1988). The rule-of-thumb appears to be to ignore the administrative costs that would be both difficult to estimate and roughly similar for all units reviewed, on grounds of both feasibility and their limited influence over efficiency within units. In contrast, single-programme studies have often directly included adminstration costs from all levels of the health system (immunization studies for example being undertaken for vertical programmes).

2.3.4 Measuring costs

Cost study findings clearly show that the two key resources in health care are personnel and drugs: personnel captured between 40-60% of total costs in over half the health unit studies and drugs, 10-20% in one third of them. Estimation of their costs is, thus, particularly important.

The most reliable time use data may appear to be that of observations, but this approach is often rejected on cost grounds (Heller 1975, Robertson *et al.* 1991). In India, for example, detailed work sampling was undertaken over an entire year in four health centres and the study authors comment, *"...such prolonged studies would not be necessary for deriving simple estimates of time spent per*

activity. However, it would be difficult to obtain reliable information, especially of non-productive time, other than by direct observation" (Alexander *et al.* 1972 p.1851).

A more feasible alternative might be the approach of the Indonesian study, in which health staff were asked to complete time logs during a special survey (Berman *et al.* 1989a). This approach benefits from the lower costs associated with asking people to, in effect, observe themselves; but may also suffer from the potential for inaccuracy and bias inherent in it. It may also be a costly method - considerable training was given to participating staff before data collection and all were provided with a watch to assist in correct completion of time logs (Department of Health/University of Indonesia/Johns Hopkins University 1987). Perhaps the crudest method is the use of estimated average times needed to produce different services, undertaken in Ecuador because alternative methods were regarded as less feasible (Robertson *et al.* 1991). Interviews, for example, may suffer from poor recall, *"influenced by the best judgement or biases of the personnel involved. The actual flow of services received by a patient are overestimated, since it is effectively assumed that the entire period devoted to such an activity is devoted to patient care"* (Heller 1975 p.39). In the PNG study, in which interviews were used, the problems associated with recalling activities in the previous year led analysts to combine staff allocation and time use data from different periods (Mitchell *et al.* 1988). However, careful comparison of the interview and observation methods, led to the conclusion that *"no clear findings exist measuring the magnitude of recall error...no obvious alternative data source is apparent since observations... cannot be made unobtrusively"* (Valadez *et al.* 1990 p.121; also Desai and McCaw 1987). The balance of costs and accuracy, therefore, suggests that interviews and self-completed work logs are the most appropriate methods for collecting time use data.

Drug costs can also be estimated using a variety of methods, reflecting the drug, and related information, system of the study location. Fielden (1990) recommends that vaccine costing procedures should be based on supplies delivered to health units, in order to allow for wastage, and the same procedures are important for curative drugs. The Indonesian study's methods are, therefore, open to criticism: vaccine costs were sometimes estimated from output levels and a special survey of patient records was used in determining drug cost per patient for each sub-district (Department of Health/University of Indonesia/Johns Hopkins University 1987). These methods were used because monthly stock reports were deemed to be inaccurate, but they suffer particularly from the possible under-estimation of wastage costs. In Malaysia, even cruder methods were used: outpatient drug costs were based on average drug costs for a set of commonly diagnosed illnesses; and costs for MCH services were primarily based on consideration of dispensers' estimates of the proportion of the total drug budget allocated to MCH activities (Heller 1975). In PNG, however, costs were carefully calculated by looking at the drugs delivered to each unit; but each unit's costs were then more crudely allocated between inpatient and outpatient programmes based on inpatient/outpatient days as a proportion of

total inpatient and outpatient days (Mitchell *et al.* 1988). As for personnel costs, drug cost estimation methods should be as accurate as possible without incurring considerable costs; specific attention should be given to allowance for the full costs of drug wastage.

Other costs were determined from expenditure records and/or estimates of likely use. Buildings, for example, were costed in the PNG study by applying a standard square metre cost to the area actually used by each programme. An unusual feature of this study was the use of different square metre costs for different degrees of accessibility (the poorer the access the more expensive the building cost) (Mitchell *et al.* 1988). Equipment costing can be more difficult - in Indonesia it was based on the cost of a standard kit. The proportion of this standard actually present in a unit was assessed by observation and an appropriate proportion of the total cost determined. Items of large value (over US$60) were costed separately and then added to the sub-district total cost (Department of Health/University of Indonesia/Johns Hopkins University 1987). Similarly, in PNG, total equipment costs were estimated through consideration of a standard inventory and its current replacement cost plus the replacement costs of additional, available items of equipment (Mitchell *et al.* 1988).

Data limitations sometimes necessitate cost estimations: thus in PNG, where actual expenditure on salaries and records of the number of months each staff member worked during the year were not available, personnel cost estimates were based on the average fortnightly salary of the relevant category of health worker (Mitchell *et al.* 1988). Other estimation procedures include basing maintenance costs on capital costs (Alexander *et al.* 1972) and supervision costs on budget data (Department of Health/University of Indonesia/Johns Hopkins University 1987). By contrast, the South African study (Broomberg and Rees 1991) was able to use a rich data base of accounts and supply use records. Water and light costs were determined from expenditure data, for example, and even the costs of small consumable items could be derived from available consumption records. It seems likely that the Ecuador study (Robertson *et al.* 1991) could also draw on better than average expenditure data.

2.3.5 Cost allocation procedures

Measurement procedures must first allocate discrete inputs to activities: for example, particular rooms, personnel, items of equipment or drugs used in them. Inputs shared by more than one activity should then be allocated between them on the basis of an appropriate dimension - such as distance travelled for vehicles, space used for buildings, volume used for supplies, time used for people (Creese and Parker 1990). In practice, joint cost allocation usually takes place after input use has been valued.

Procedures for allocating joint costs differ between studies, depending on the complexity of the health

units assessed, the setting of service provision and the objectives of the study. The Indian health unit study (Alexander *et al.* 1972) pioneered the functional costing approach - based on identification of the major health functions (activities) of the primary health centres and field activities under review, and the allocation of costs across them using the following criteria:

- proportion of floor space (buildings, furniture and equipment capital and recurrent maintenance costs);
- proportion of mileage (vehicle capital and recurrent costs);
- actual use, as identified by scrutiny of records (drug and other supplies');
- time use information (salary costs and as proxy for other costs when relevant data unavailable).

For each function the proportion of costs related to direct delivery of services, administrative/support activities and non-productive activities was also determined, as was the split between field extension activities and the health unit. The extent of cost allocation, however, should be limited to the detail required for policy and planning decisions.

The Indonesian studies also relied on time-use data but adopted simpler procedures. Wherever possible, costs were first allocated directly to individual activities or shared across activities according to reported use of items (for buildings, equipment); drug costs were allocated between illness care and MCH/family planning (FP) on the basis of an average cost determined from a sample of prescriptions; finally, time use data was used to allocate both shared personnel, and other shared resources otherwise unallocated. *"Non-productive staff time and resources were assigned to service categories in direct proportion to the allocation of productive or direct service time"* (Berman *et al.* 1991a p.687).

A rule-of-thumb approach (based on assumptions about actual use) was adopted in the PNG study for the distribution of resources other than time, drugs or buildings not otherwise allocated. For example, maintenance: 25% to in-patient, 25% to outpatient and 50% to administration (housing); standard equipment: 50% to inpatient, 25% to outpatient and 25% to maternal care. The in-centre overhead costs (e.g. administration) were not allocated between patient care activities (Mitchell *et al.* 1988). In contrast, the wealth of information available in the South African study even allowed drug costs to be traced to individual areas within the clinic; although personnel and supervision/administration (within unit) costs were allocated on the basis of personal estimates of time use (Broomberg and Rees 1991). Cost allocation in the Bangladesh study relied on different criteria for different inputs and did not use personnel time at any stage - primarily because only total costs were considered and there was no attempt to cost individual activities within the health units (Hussain 1983).

The indirect costs associated with parent body administration in the South African study were allocated to the clinic using separate criteria for each component of total indirect cost (e.g. nursing personnel costs on the basis of the proportion of total nurses employed by the clinic; other departments on the

basis of information concerning the proportion of total workloads attributable to the clinic). The total clinic adminstration cost was then allocated between activities within it using similar criteria for each type of cost (Broomberg and Rees 1991). However, the inclusion of overhead costs can require more detailed allocation procedures to distribute internal and external overhead costs to final service activities; such as the step-down approach of hospital costing studies (Drummond *et al.* 1987). For example, in the Ecuador study, overhead costs were first divided between each level of service delivery (on an unclear basis) and the cost identified with health centres was then divided by the number of these facilities in each province. Second, all services were classified as final (the sum of all actions undertaken in response to a single health concern), intermediate (a preliminary activity such as diagnostic x-ray or a complementary one such as injection as part of the treatment), or general (support activity) (Gomez 1987, Robertson *et al.* 1991). The total cost of general and (presumably, though not clearly stated) intermediate services were then allocated across final activities on the basis of proportional time allocations between the final services, except where an input was wholly allocated to a specific service (e.g. vaccinations). Similar procedures were also implicitly used in all studies where unproductive resources were treated as, in effect, overheads and often distributed between final service activities by time use factors (as in the Indonesian study, Berman *et al.* 1991a).

Costing overheads in single-programme studies has the additional problem of identifying, at every level, what proportion of administration costs are fairly allocated not just to a unit but to one programme within it. Although, as in health unit-focused studies, time allocations may be used (Horton and Claquin 1983), costs have also been split relative to a programme's share of total health unit visits (Lerman *et al.* 1985), or by each service's proportion of directly assigned costs (Shepherd *et al.* 1989). In the Thai study a two-step allocation method assigned, first, the costs of the family planning clinic on the basis of the proportion of total health unit working days attributable to this clinic and, second, the costs of the IUCD service on the basis of the proportion of total staff time spent in family planning clinics in promoting this method. Other studies give too few details to judge allocation procedures. However, single-programme studies can also over-allocate costs; Robertson *et al.* (1984), for example, calculated the cost of each element of the combined DPT (diphtheria-polio-tetanus) vaccine although the information is not helpful for planning. The degree of joint cost allocation should be determined by the purpose of the study.

Overall, allocation procedures emphasize the importance of time use data in costing studies; it may be that a single programme focus leads to over estimation of time use, but this issue has not been studied.

2.3.6 Cost valuation

Financial valuation procedures appear straightforward for some inputs: personnel, for example, are

usually valued at their current gross salary, including both employer and employee contributions to pension or social insurance systems. Levin (1983) recommends that any special allowances and the value of non-monetary benefits such as housing should also be included in personnel costs. The value of supplies is the sum of the cost of the supplies used in the activity, their transportation costs (including insurance) and the value of resources lost or wasted in transport/during use (Creese and Parker 1990).

Valuing capital items, of which buildings are usually the most important, is more difficult. It is generally agreed that costs should be calculated from their current replacement price (not that at the time of construction/purchase); but various alternative approaches may be used in determining annual capital costs (Drummond *et al.* 1987, Levin 1983):

- straight-line depreciation, dividing the capital replacement cost by the useful life of the input and ignoring interest foregone (Broomberg and Rees 1991, Mitchell *et al.* 1988, Robertson *et al.* 1991);
- calculation of annual depreciation plus an allowance for the opportunity cost of investment (Alexander *et al.* 1972, Department of Health/University of Indonesia/Johns Hopkins University 1987, Heller 1975, Hussain 1983);
- building rental price (Robertson *et al.* 1991);
- annuitization of the initial capital outlay over the useful life of the asset, automatically incorporating both the depreciation and the opportunity cost aspects (Drummond *et al. 1987*).

Straight-line depreciation is generally criticized in costing manuals because it ignores the opportunity cost of the investment i.e. the interest foregone (Drummond *et al.* 1987). Fielden (1991) suggests that as capital items are often imported, straight-line depreciation could underestimate replacement costs (e.g. due to inflation in manufacturer's economy and depreciation of local currency). For example, Heller (1975) estimated that the inclusion of the opportunity cost of capital almost doubled the cost of providing services in Malaysia.

Possible sources of an appropriate discount rate include: the economic planning office or finance ministry, the rate of interest that could be obtained by depositing money in the bank minus the rate of inflation (real rate), and a rule-of-thumb rate of 10% (Creese and Parker 1990). Recommended lifetimes vary by input and according to manual: for example, 25 years for buildings, 5-15 years for equipment, 5 years for vehicles (Fielden 1991), 25-30 years for buildings, 2 years for equipment, 7 years for vehicles (Reynolds and Gaspari 1985). In practice, use-lives and interest rates vary considerably between studies suggesting that no fixed rules apply for the estimation of such parameters. The only conclusion possible is that they should reflect the real circumstances of the study country; for example, the PNG analysts used several lifetimes for buildings based on the materials used, and for equipment, based on its value.

Capital cost considerations highlight the importance of assessing whether financial prices fully reflect the economic (opportunity) cost of resource use; costing manuals suggest that shadow pricing may be necessary for some inputs. The market prices of labour and foreign exchange are, in particular, highlighted as being potentially incorrect estimations of true opportunity costs because of distortions within their respective markets. The theory of project appraisal argues that market distortions often overvalue labour, as judged by its marginal productivity, and that a lower shadow wage rate should be used in costing (Squire and van der Tak 1975). Similarly, it is argued that official exchange rates mis-value the cost of imported items in developing countries. Two alternative approaches are available: calculating a shadow foreign exchange rate and using it to adjust the value of imported items (ODA 1972) or using world (border) prices for imported items and applying conversion factors to non-traded items (Squire and van der Tak 1975).

Determining appropriate shadow rates is fraught with difficulties, but current project appraisal practice requires either that they be used or that deviation from such practice be justified. Fielden (1991) comments that *"choosing the right shadow wage introduces an extra layer of assumptions into the analysis, and reduces the clarity of the calculations. Staff paid very low wages often seem to have adjusted their level of effort, or hours of work, accordingly, so increasing the value of their time might be quite inappropriate*" (p.12-3). However, such issues are rarely discussed in health unit costing studies. Although the PNG study states that donated inputs and voluntary labour have been costed, it is not clear whether shadow prices should have been used for labour and foreign exchange nor, if they had been used, what impact they would have had on cost estimations. Only the Ecuador study picks up the possible need for shadow pricing foreign exchange, commenting that converting costs to US dollars using the official exchange rate would not be advisable for international comparisons because it would not reflect the cost of health services relative to other goods and services, or the costs of health care between countries (Robertson *et al.* 1991).

Similar problems are encountered in assessing single-programme studies against these issues. Some studies give too few details to judge the methods used (e.g. Robertson *et al.* 1984) but shadow pricing is, at least sometimes, discussed. For example, Horton and Claquin (1983) conclude that *"using a shadow exchange rate [in costing the diarrhoeal services provided by different types of health facility] does not alter the rankings of the services, but increases the cost levels*" (p.723). More comprehensive assessment of these issues and, uniquely, the use of both world prices and standard conversion factors was undertaken in an economic evaluation of malaria control programmes in Nepal (Mills 1991).

From a societal perspective, such as that assumed to be held by national planners allocating scarce national resources between sectors or across health programmes full assessment of the opportunity costs of resources is required. However, because such costs do not accrue to district managers, they

are likely to be of less interest to these managers (or even the health ministry) (Creese and Parker 1990). District managers work within an existing budget constraint and seek to use the available resources to best effect, rather than determining future investment patterns for the health sector. From their perspective, valuation through financial rather than economic prices is adequate.

2.3.7 Data analysis

Table 2.1 indicates the range of findings presented within cost studies. In all health unit studies total costs, cost profiles (percent of total cost by input item and/or activity) and some average (per contact) costs are considered. Marginal costs have never been determined and fixed/variable costs only rarely. In single programme studies the presentation of cost results more often considers the fixed versus variable cost split (Berman *et al.* 1991a, Horton and Claquin 1983, Robertson *et al.* 1984).

The cost/output relationship, important to assessment of efficiency, can be considered using the techniques of scatterplots (Berman and Sakai 1992), ordinary least squares regression analysis (Berman *et al.* 1989a) or multiple regression analysis (Mitchell *et al.* 1988).

Finally, sensitivity analysis should be undertaken to test the cost results' sensitivity to changes in the assumptions used in their calculation (Fielden 1991, Levin 1983). Issues to test include:
- the effect of sampling procedures on district or national estimates;
- different ways of allocating shared costs (either different allocations or sources of information);
- different ways of valuing inputs, particularly capital inputs;
- the effect of using shadow wage and exchange rates.

Such analysis is not included in any health unit study. However, Shepherd *et al.* (1989) tested factors such as: sampling bias, the impact of costs originally excluded, and the costing of time use; and Horton and Claquin (1983) consider the impact of a shadow exchange rate on costs.

2.4   Cost functions and their estimation

Statistical cost studies undertaken in developed countries often seek to use their data to estimate and test a cost function, which *"summarizes the cost of production and can be used to determine the cost of both an additional unit of output (marginal cost) and of an average unit, as well as to describe the possibilities of economies or diseconomies of scale"* (Barnum and Kutzin 1992 p.23-29). Estimation of a cost function is, thus, an additional analysis that can assist in efficiency assessment.

It requires, first, consideration of the likely behaviour of managers in running health units. Normal

assumptions include: that managers seek to minimize costs, can change their factor mix fairly easily and do not set prices (Vitaliano 1987). Although these particular assumptions may not always hold, the literature generally agrees that costs are related to output levels (McGuire *et al.* 1988). Second, the cost function is outlined; average or preferably total costs are linked to output and equations may also include variables (such as quality) thought to influence the cost-output relationship (McGuire *et al.* 1988). Initially estimated as a linear relationship, more recent estimations use quadratic equations and so allow for the influence of economies of scale by assuming a non-linear relationship between costs and output (e.g. Barer 1982). The output variable in these functions may be defined by an index of services provided, of cases treated, of the number of successful treatments or of measures of the community's health (Feldstein 1967). Third, multiple regression techniques are used to test the proposed function with the available data.

Cost function estimation has primarily been undertaken for hospitals in developed countries. In developing countries, only six such studies have been identified in a recent review of the literature (Barnum and Kutzin 1992). The PNG primary health unit study reported here also partially estimates a cost function. Its results suggested that only bed capacity was important in influencing costs and marginal costs could not be determined for any specific activity. The analysts conclude that this failure was a result of health units functioning within their capacity limits so that marginal costs were very low; and that staffing patterns, the main determinant of cost, were not based on output levels (Mitchell *et al.* 1988).

2.5   Conclusions

By comparing cost profiles and, in particular, average costs between health units and exploring the explanations of any noted differences, cost analysis can be used to identify the management action required to improve efficiency. However, only few large-scale studies of primary health unit costs have been undertaken in developing countries and only one such study has sought to estimate a cost function with which to determine the marginal costs of health care. Cost functions in studies undertaken in developed countries generally seek to include a quality variable, because changes in quality are likely to influence the relationship between costs and output underlying the function. Therefore, the usual practice of comparing average costs without consideration of quality allows only partial assessment of efficiency. Only two developing country cost analyses of primary health units have jointly reviewed costs and quality.

Costing practice and consideration of experience emphasizes the key areas for careful consideration in costing. Setting objectives and determining the study's perspective is important in identifying which costs to assess, and appropriate sampling procedures; annual costs should normally be calculated.

Personnel and drug costs must be estimated especially carefully, because of their likely importance within total costs. Both the feasibility and the limitations of the associated data should be assessed when selecting methods for their estimation. Staff interviews are likely to be the most practical alternative for collecting time use information, but the data generated could be validated by alternative procedures. Drug use should include 'unproductive use' or wastage, as recommended for vaccine costing, rather than simply use reflected in prescriptions. Joint cost allocation requires careful consideration of objectives, appropriate criteria and the circumstances of the particular country/health unit. Where other information is not available, time-use data may determine appropriate allocations - particularly for relatively small costs.

Economic costing requires full consideration of the opportunity cost of resources and so careful valuation of donated inputs, capital costs, labour and imported goods. For buildings (generally the most important capital cost component) it may be easier to estimate rental values, assuming that these include an appropriate social time preference rate, rather than using other procedures for annualizing costs. Adopting a focus on production efficiency and district management justifies valuation at financial prices, as assessment requires comparison of resource use financed through budgets rather than calculation of the opportunity cost of that resource use. Assessment of technical efficiency could even be undertaken by reviewing physical resource use only (e.g. staff productivity), but costing approaches allow the simultaneous assessment of all resources used. However, even if valuation at financial prices is unavoidable or deemed acceptable, the opportunity cost of each input should at least be discussed.

Finally, the experience of the studies reviewed emphasizes the extent to which costing practice can be tailored to particular circumstances (e.g. PNG capital costing based on access factors and building materials' differences). Accurate cost estimation requires such adaptation. For example, to assume that input prices are the same in all parts of a country may be unrealistic (Over 1986). Consideration of the local conditions likely to influence costs increases confidence in study results and their management/policy implications. It does not, however, undermine the need for sensitivity analyses to assess the impact of key assumptions on cost results. Such analysis helps to test the validity of management and policy conclusions and to clarify the importance of methodological concerns.

2.6   Summary

This chapter has reviewed the literature concerning cost analysis, identifying central elements in costing methodology and issues to consider when analyzing efficiency. The productivity of resource use and the existence of economies of scale are particularly important concerns. Staff and drugs usually capture the greatest proportion of health care total costs. Cost analysis methods should, therefore, be most

careful in determination of staff and drug costs. Although economic costs should be used in a full economic evaluation, financial costs are adequate in an assessment of production efficiency.

CHAPTER THREE:
QUALITY OF CARE LITERATURE REVIEW

The evaluation framework of this study (Chapter 1) brings together economic approaches to assessment of efficiency with specific assessment of the quality of health care. This chapter reviews the literature related to quality initially by reference to definitions of quality, and then by focusing on the methodological and analytical approaches of quality assessment. The review aims to assess existing experience in order to identify the aspects of quality that might be considered in this study, and appropriate procedures for their evaluation.

Limited quality assessment work, both in terms of quantity and range, has been undertaken in developing countries. This review therefore draws on developed country literature in discussing conceptual issues, but only reviews the experience of quality assurance undertaken in developing countries because of the very different context and possibilities in developed countries.

3.1   Defining quality of care

3.1.1 Concepts and attributes

The concept of quality is difficult to pin down. In traditional use it conveys excellence or prestige (COD 1982), and in health care this excellence is ultimately understood with reference to improvements in health status (Donabedian 1988a; Palmer 1976). However, it is technically difficult both to measure changes in health status and to link those changes to health care interventions. If outcomes cannot be linked to processes, they *offer no particular guidance to quality assurers as to how to improve the quality of care delivered, even if they may suggest quality needs improving*" (Lohr 1988 p.45; also Donabedian 1988a, Palmer 1976). Yet such improvements are the core purpose in defining quality (Black 1990, Donabedian 1988a, Williamson *et al.* 1982). Definitions of quality have, thus, become entangled with approaches to its assessment and *"all assessments of quality are based...on hypotheses concerning the inter-relationship among structure, process and outcome*" (Donabedian 1988a p.177). Of these three commonly-accepted facets of quality, pre-eminence has been given to process - because it is easier than outcome to assess but is also more likely to be validated in terms of outcomes than structure. Operational definitions of quality thus assume that there is quality to the extent that medical practice conforms to generally accepted standards, previously proven to bring about positive outcomes (Shortbridge 1974).

Focus on the link between outcome and process also points to the distinction between efficacy and

effectiveness. Proof of efficacy usually comes from the special conditions of a clinical trial, but effectiveness is based on the benefits achieved when an intervention is used in real-life situations (Williamson *et al.* 1982) and affirms *"that providers of health care must concern themselves with finding treatments which are acceptable to those in need, and must include in their responsibilities attempts to secure compliance"* (Palmer 1976 p.16). As the bridge between efficacious and effective health care, therefore, good process quality requires not only technical skills, *"how well the activities undertaken comply with the relevant technological prescriptions aimed at effectiveness and safety"* (Roemer and Montoya-Aguilar 1988 p.11), but also inter-personal skills - *"the humanistic dimensions of personal, social and cultural acceptability and of compliance with ethical norms"* (Roemer and Montoya-Aguilar 1988 p.11; also Donabedian 1988a, Lohr 1988, Palmer 1976). In so far as unacceptable care is likely to be unused and, consequently, ineffective, a pre-requisite of good process quality is the level of patient satisfaction that generates compliance (Roemer and Montoya-Aguilar 1988, Tanahashi 1976).

These process-based definitions of quality are criticized for giving undue weight to health professionals' views (Shortbridge 1974, Palmer 1976). Black (1990) suggests that the emphasis on the scientific-technical ability of health workers and on the humanity with which care is delivered is a function of the US health care system. In contrast, a broader definition of quality embodied in the UK public health approach seeks to balance the concerns of the individual with those of a population perspective. A quality service is then *"one that provides effective care, that meets everyone's needs and that is delivered equitably, humanely and efficiently"* (Black 1990 p.97). Differences between US and UK perspectives are also suggested by Donabedian who notes that *"when the health care practitioner is 'a doctor to the collective' rather than to the individual, it is not surprising if the welfare of the collectivity becomes the measure of performance in health care"* (1988b p.98). Rather than being simply *"a set of variables that can be easily defined, measured, assessed and improved"*, quality is the *"merit or excellence of the system in all its aspects"* (Roemer and Montoya-Aguilar 1988 p.4).

Emphasizing the population perspective may also lead to a vision of quality that includes a broader approach to satisfaction and a stronger role for patient judgements in defining quality. A broader vision of quality *"affirms patient judgements as valued in themselves, rather than as surrogate measures of other dimensions of quality"* (Palmer 1976 p.17; also Baker 1990, Lohr 1988, Martin 1986). From this perspective, the process of care should not simply aim at ensuring patient compliance but should be based on *"the provider aiding patients to make informed choices, according to their own priorities"* (Palmer 1976 p.17). Affirmation of patient judgements may, thus, be an important part of the *"the process of democratising health services and counteracting the powerful interests of professions and state, or [may be] in pursuit of consumer sovereignty"* (Calnan 1988 p.927). Satisfaction is determined not only by experience of a particular source or provider or episode of care, but also by the health service in general and by outcomes (Starfield 1973, 1974).

The population perspective of quality also suggests that there are links between quality and efficiency; these are most fully discussed by Donabedian, the leading US quality analyst. Although initially excluding economic efficiency as a measurable dimension of quality of care, the growing need for cost containment led Donabedian to suggest that quality assessments should ask *"how any given level of effectiveness is to be achieved at lowest cost, and what level of effectiveness we should aim to attain for each patient and for society as a whole"* (1988b p.91). A detailed analysis in 1982 identified two aspects of efficiency - clinical efficiency, concerning the efficiency of strategies of care, perceived as a fundamental component of quality; and production efficiency, linked to the way that services are produced but excluded from the definition of quality because not involving the use of clinical judgement. *"Improvements in production efficiency will allow us to achieve current levels of quality at lower cost. Alternatively, we could produce larger quantities of care in which the mix of quality remains as it is now...[however]...to improve quality beyond that would require a change in the strategies of care. Therefore, while production efficiency is a component of the quality of the system that produces care, it is not a component of the quality of care itself"* (Donabedian et al. 1982 p.985-6).

Building on this distinction within the concept of efficiency, Donabedian noted that the difference between the individualistic and public health approach is that in the former, poor quality can be separated from inefficiency - *"even when the care includes wasteful elements, if everything needful is also done so that one can expect the greatest achievable improvements in health to be attained, there is inefficiency without impairment of effectiveness. There could also be ineffectiveness without inefficiency if care stops short of attaining achievable improvements in health, but without having included inappropriate or wasteful care"* (Donabedian 1988b p.91). In the public health view, in contrast, there are three links between quality and cost: *"1)bad care that can harm patients is also wasteful, 2) wasteful care often has the potential to harm patients, and 3) waste in any form depletes resources that could be used to treat more patients better"* (Donabedian 1989b p.93). But as cost reductions may *"masquerade as improvements in efficiency until it is discovered that the product has, in fact, deteriorated"*, the pursuit of efficiency should be cautious (Donabedian 1988b p.92).

3.1.2 Primary care in developing countries

In summary, definitions of quality can be identified through the measurable attributes of health care associated with good quality - such as process, effectiveness, efficiency and equity (Vuori 1982) and accessibility and acceptability (Palmer 1976). However, these attributes vary with the level of assessment. For example at the level of individual providers, quality has two components, technical and inter-personal, but for institutions quality includes amenities of care. If the focus of assessment is population groups, access, performance of practitioners and performance of patients in participating in care must also be considered (Donabedian 1988a). In other words, definitions of quality must reflect

the object of assessment.

Primary health care in developing countries is largely based on curative and preventive interventions already proven to be efficacious, such as the child survival programmes of UNICEF (Bryce *et al.* 1992, Nicholas *et al.* 1991). Therefore, health care quality, requires the *"proper performance (according to standards) of interventions that are known to be safe, that are affordable by the society in question, and that have the ability to produce an impact on mortality, morbidity, disability, and malnutrition. Such interventions exist and the most common problem is that they are not made available to all those in need or - if they are - they are not properly executed"* (Roemer and Montoya-Aguilar 1988 p.54-5). Even in developed countries, system failures resulting from poor coordination and poor communication are significant determinants of poor quality of care at the primary level (Palmer 1976). The greater severity of such failures in African and other developing countries ensures that the performance of isolated primary workers is dependent on circumstances at the intermediate and national levels and on the wider health system environment (the social, economic, political and cultural situation). The quality of PHC systems in developing countries is an inherent characteristic of the health system infrastructure (Roemer and Montoya-Aguilar 1988). For example, Ghanaian quality problems included resource inadequacy, poor organization of the PHC system and dis-integration of services (IDS 1978a, 1978b). Stressing personnel, organizational and environmental (e.g. personal economic difficulties, tradition) constraints, an Afghanistan study also concluded that field programmes that provide direct services to the public on a national basis can be implemented only to the extent than the necessary support services are provided (O'Connor 1980). All processes take place within, and so may be influenced by, structural constraints concerning manpower, finance and equipment (Vuori 1982); these constraints are especially critical for primary health care.

In this context, Donabedian's justification for excluding production efficiency from quality appears inappropriate. Although not requiring clinical judgements, production efficiency does shape the clinical judgements that can be made. In other words, like the economic concept of efficiency (Chapter 1), the resources available (structure) and the way they are used (process) together determine levels of quality.

However, *"..the concept of quality itself is in large measure a social construct... Without a personal commitment to quality in our work and a prideful joy in accomplishing it, no amount of organizational artifice will suffice to safeguard it"* (Donabedian 1988a p.190).

3.2   Quality assessment experience

Various practical factors will, ultimately, influence the choice of assessment method, such as: what are the study objectives? what data can be collected/afforded? what resources are available to give care?

Table 3.1: A typology of quality assessments in developing countries

BROAD TYPE	SPECIFIC TYPE	EXAMPLES
1. Structure	1.1 Whole system structure - organizational and financing data, and/or coverage, health unit structure, process, and maybe outcome	1.1.1 national focus, downwards: World Bank sector reviews, WHO PHC reviews 1.1.2 health unit focus, upwards: Centre for Health Policy 1991, MOH/WHO 1989
	1.2 Health unit structure - assessment of whether available structure is adequate for good process	1.2.1 alone: Garner et al 1990 1.2.2 combined with process assessments: AFYA/UNICEF/AMREF 1985, Fadhil 1987 1.2.3 combined with whole system review: Centre for Health Policy 1991, MOH/WHO 1989
	1.3 Support structure - assessment of supporting aspects of structure	1.3.1 specific aspects: Nicholas et al 1991, Valadez et al 1990 1.3.2 organizational issues: Centre for Health Policy 1991, MOH/WHO 1989 1.3.3 impact on motivation: Robinson and Larsen 1990
2. Process	2.1 Explicit - using standardized criteria	2.1.1 record review e.g. Malone 1980a, 1980b, Peters and Becker 1991, Pust and Burrell 1986 2.1.2 observation: curative - Amonoo-Lartson and de Vries 1981, Nicholas et al 1991; MCH care - MOH/WHO 1989
	2.2 Prescribing practices - observation/record review using standardised criteria	Gilson et al 1992 Kanji et al 1990
	2.3 Implicit - professional judgements	2.3.1 record audit: e.g. Malone 1980a, 1980b 2.3.2 observation: Centre for Health Policy 1991, Kanji et al 1990
	2.4 Health worker knowledge & practice - assessment of knowledge as an indicator of process success	Centre for Health Policy 1991, Gomez 1987, MOH/WHO 1989
3. Outcome	3.1 System success/outcome[1] - using coverage as indicator	Borgdorff and Walker 1986, Lerberghe and Pangu 1987, Lerberghe et al 1986
	3.2 Health status outcomes - assessment of impact of health care intervention on community health status	never reported in quality assessment of health units
	3.3 Satisfaction/perceived quality[2] - assessment of community attitudes towards available services	3.3.1 Quantitative assessments: e.g. Abu-Zeid and Dann 1985, Akin et al 1986 3.3.2 Qualitative assessments: e.g. Annis 1981, Attah 1986, Ugalde 1984

NOTE: 1. Coverage is seen as an indicator of system quality although providing no evidence of the impact of the system on medical outcomes (Roemer and Montoya-Aguilar 1988)
2. Studies identified under this item are a combination of studies of satisfaction, utilisation patterns and perceived quality: in all community views about available health services have been sought.

what do planners expect providers to do? which dimensions of quality are to be included? who is to make judgements? when is assessment to be done (concurrent, retrospective or prospective)? which health services are to be assessed? (Palmer 1976). The range and type of quality assessments undertaken in developing countries are outlined in Table 3.1.

Some assessments might more properly be called systems' analyses because of their wide-ranging scope, such as the 1989 study of the Botswana MCH/FP programme using WHO-developed rapid evaluation guidelines for MCH services. At the district level, this study looked at management and administration issues. Within health units, standard instruments were used for review of personnel, equipment and supplies, record-assessment and staff observation and interview. Focus group discussions explored community views of available care, and knowledge and practices regarding pregnancy and delivery care. Household interviews allowed quantification of patterns of resource use and perceptions of care available within modern health units. Finally, national-level interviews with key policy makers clarified national organizational and administrative issues. Such assessment covered structure, process and outcome.

Other studies which have also adopted a wide-ranging approach to quality assessment include: Nicholas *et al.* (1991), reporting international experience of assessing the structure, process and supporting management of a variety of child survival programmes; Bryce *et al.* (1992) reporting slightly narrower assessment procedures focused on health units (facility-based assessment); the Centre for Health Policy (1991), reporting a comprehensive structure, process and supporting management evaluation of first level clinics; and Fadhil (1987), reporting an MCH care evaluation from both the professional (structure and process) and user (satisfaction) perspectives. Such assessments illustrate the *"general rule, [that] it is best to include elements of each [structure, process and outcome]. That helps us to understand why outcomes depart from expectations so we can take steps to improve the situation. The concurrent use of the three approaches also allows the weaknesses of one to be supplemented by the strengths of another"* (Donabedian 1988a p.179).

The outcome evaluation counterpart to systems analyses uses coverage levels to evaluate system performance. For example, Roemer and Montoya-Aguilar (1988) promote the use of indicators like the ratio of staff to population or percent pregnant mothers receiving ante-natal care and curative care visits per head. Studies in Zaire (Lerberghe and Pangu 1987, Lerberghe *et al.* 1988) and Ghana (Zwart and Voorhoeve 1990) used utilization data to compare hospitalization rates and distance decay patterns between areas covered by health services and those not covered. In Zimbabwe review of health unit catchment areas in one district led to coverage estimates for outpatient, ante-natal and vaccination services (Borgdorff and Walker 1988). Such assessments look at structure from the viewpoint of utilization, using routinely available data to assess health system coverage patterns and the implications

effective, efficient and equitable provision of care.

The following review of experience will, however, focus only on structure, process and satisfaction assessments, as most relevant to the evaluation undertaken in this study. Few outcome evaluations have anyway been undertaken in developing countries (e.g. Figueroa undated).

3.3   Assessment of structure and process

3.3.1 Standards and criteria

The initial step in any quality assessment is to translate *"the more general concepts and definitions of quality...into specific criteria, norms and standards that specify and calibrate the relevant attributes"* (Donabedian 1988a p.181). The criteria selected for assessment should ideally be derived from scientific research showing the link between them and outcomes, should be relevant to the setting in which they are to be used and should be subject to periodic review (Black 1990, Roemer and Montoya-Aguilar 1988, Donabedian 1988a). The standards usually represent what is deemed to be an acceptable level of compliance with each criterion, and may be set by reference to common performance levels, the ideal (best practice), or minimum acceptable performance patterns (Black 1990, Donabedian 1966). However, it can be difficult to get consensus on normative standards, what constitutes the ideal, whilst assessment against them may discourage performance improvements where considerable shortfalls are evident; on the other hand, use of empirically-based standards (i.e. common practice) may only re-enforce current performance levels (Black 1990, Palmer 1976).

Most structural assessments have used *"...the availability, level and range of services...as a broad measure of [service] quality...[the method gives] a broad measure of the range and level of sophistication of the service, or an indication of the potential quality of the health centre"* (Garner et al. 1990 p.58). Structural aspects assessed include: the condition, cleanliness and adequacy of buildings, the availability of drugs, the availability and adequacy of equipment, staff working, support provided, services available, clinical organization, record-keeping and activity data (to assess coverage patterns). Standards appear to have been set either on the basis of evaluators' experience or using national guidelines. Relevant studies include country-specific evaluations in South Africa (Centre for Health Policy 1991), Ghana (Institute of Development Studies 1978a,b), Tanzania (AFYA/UNICEF/AMREF 1985), Iraq (Fadhil 1987) and PNG (Garner et al. 1990, Thomason and Edwards 1991); supervisor's checklists and personnel training manuals (e.g. AMREF 1983).

Garner et al.'s (1990) study perhaps best indicates both the potential and the drawbacks of this approach. The criteria used in the assessment were few in number, simple and depended only on

quick, visual inspection of the health units (and so could be included within supervision activities). Through the assessment it was possible to consider the adequacy of physical structure generally and with respect to three common conditions: immunization, obstetric emergency and febrile convulsions in children. For these conditions certain structural requirements were deemed essential to the provision of good quality care and without them poor outcomes were judged to be likely. However, "as each assessment had to be quick... This inevitably led to a bias towards the curative care carried out in the centre, and the primary preventive health care work at clinics tended to be under-represented" (p.58).

Assessments of process quality (Appendix 3A) have also set standards by reference to evaluator judgement, local expert consensus and available guidelines. For example, the studies reported in Nicholas et al. (1991) established standards based on WHO guidelines; consensus among in-country experts was used to develop a list of essential activities for the effective delivery of care and to define indicators "for each task in quantifiable terms that allowed measurement of a change in performance" (p.149). In effect the criteria were practice parameters against which to assess service quality: "child survival services are well suited to explicit evaluation criteria, since procedures generally follow WHO guidelines and thus should be implemented uniformly, even internationally. PRICOR experience has shown that this consistency in treatment protocols allows for the use of standard observation instruments by observers with modest technical knowledge" (p.163). However, the specific standards developed from internationally-set criteria must reflect local circumstances and, finally, be determined by local health professionals (Black 1990, Figueroa undated).

3.3.2 Data collection

Having established criteria and standards, the next step in quality assessment is to obtain appropriate data; Table 3.2 summarizes the strengths and weaknesses of different data sources for different types of assessment.

Structural assessment is perhaps the easiest form of quality assessment and the relevant data, the least expensive to collect (Palmer 1976). Physical structure is usually assessed through observation, using a checklist embodying the established standards. Wider structural assessments of system performance or supporting management structure, may use observations (Nicholas et al. 1991/supervision, Robinson and Larsen 1990/motivation) but may also draw on interviews (MOH/WHO 1989/district support, Centre for Health Policy 1991/personnel, supplies' management, Robinson and Larsen 1990/motivation, Thomason and Edwards 1991/hospital structure) or records (Valadez 1990/supervision, MOH/WHO 1989/system performance).

For process quality, the ultimate source of assessment data is "the provider-patient interaction. In

Table 3.2: Data sources for quality assessment

ASSESSMENT/ DATA SOURCE	POTENTIAL	PROBLEMS
Structural assessment: organizational reports & records	summarize relevant information; available, easy & cheap to use; allow calculation of indicators like staff to population ratios	reliability and accuracy not always clear, sufficient detail may not be given
Structural assessment: informal, in-depth interviews	allow cross-checking of available data and probing for detail/opinions by local experts	interviewing skill important, information may be biased
Structural assessment: observation	quick and simple, standardization possible	may be biased against issues cannot quickly observe
Process assessment: patient records	wide range of records may be available, easy and cheap to use	gives no information about the interpersonal skills of the provider[1]; vary greatly in quality and may, by default, become the focus of the assessment; most suspect for primary care, most useful for surgical interventions
Process assessment: direct observation	particularly important when reviewing the history-taking and examination components of medical practice	judgements may be biased by observer presence/ perceptions; difficult to standardize; in primary care provider actions may be determined by prior knowledge of patient
Process/outcome assessment: patient interviews	can generate information about patient perceived outcomes, satisfaction with the process of care, perceptions of access, accounts of compliance	may be expensive, may be difficult to get satisfactory response rate and reliable data; difficulties of measurement for, e.g. attitudes, satisfaction, social restoration, physical disability and rehabilitation
Process/outcome assessment: health service utilization data	easy and cheap to use, allows calculation of summary system success measures like coverage statistics	reliability and validity may be questionable, excludes non-users of health care, only limited indicator of process and outcome 'success'
Outcome assessment: community surveys	address both users and non-users of health care, allows clinical validation of health status outcomes	expensive, may be low response rates; difficulties of measuring outcomes like attitudes, satisfaction, social restoration, physical disability, rehabilitation; problems of confounding factors and validity[2]

SOURCES: Donabedian 1966, Garner *et al.* 1990, Palmer 1976, Roemer and Montoya-Aguilar 1988,

NOTE: 1. The predominant use of this type of data in developed country quality assessments is one reason for under-emphasizing the patient's views
2. It may be possible to use circumstantial evidence to judge effect of service (link between time trend of effect and intervention, effect observed in place of intervention but not elsewhere, size of effect proportional to magnitude of intervention etc) (Roemer and Montoya-Aguilar 1988).

general, the more remote from this interaction the point of data collection is, and the more transcribing and condensing the data have undergone, the greater the possibilities for misinformation about that event" (Palmer 1976 p.44). Data collection in process assessments (Appendix 3A) is, therefore, usually through observation using checklists. However, some assessments have also included interviews with attenders and households to validate observation assessments in relation to user/caretaker's knowledge and practice (e.g. Centre for Health Policy 1991, Cutts *et al.* 1988, Nicholas *et al.* 1991) and others have made some assessment of health related knowledge and behaviour in the community (e.g. Fadhil 1987, Nicholas *et al.* 1991). Interviews of health workers have been used to gather data on knowledge, attitudes and practice concerning illnesses and their treatment (MOH/WHO 1989, Nicholas *et al.* 1991) and short questionnaires completed by health staff were used as the basis for assessing health worker knowledge and practice against commonly accepted norms in Ecuador (Gomez 1987). A more complete review of staff knowledge undertaken in South Africa used an objective structured clinical evaluation, a clinical examination in which a series of real and simulated problems were presented to candidates: *"there were 13 stations of five minutes each [consisting of] patients to be assessed, diagnoses to be made from photographs, management scenarios, and records to comment on...Each station had a checklist against which the participant was scored"* (Centre for Health Policy 1991 p.12-3). In the Philippines, health providers were presented with clinical case summaries and asked to indicate how they would manage the case (Peters and Becker 1991).

Record-assessment was, in contrast, the focus of the PNG study of Pust and Burrell (1976). After referral to the provincial hospital, the correctness of health centre diagnosis was judged using pre-established criteria and therapy was reviewed, against the health centre diagnosis, using standard therapy manuals approved for use in PNG. In addition, the projected health consequences of incorrect diagnosis or therapy were considered. Malone (1980a, 1980b) also used patient records in assessing quality, judged against an independent evaluation of the same patients and Peters and Becker (1991) supplemented observations with record reviews in assessing case management of diarrhoea. Prescribing practice reviews (Kanji *et al.* 1990), undertaken by themselves or as part of wider process assessment, are also usually based on record review, although they may use information collected during consultation observations. Gilson *et al.* (1992) report a study which illustrates the use of standard drug use assessment criteria (INRUD 1991), covering prescribing, elements of patient care and patient knowledge. However, quality assessment of primary health care programmes in developing countries through record review is not easy because of poor recording practice (Peters and Becker 1991), *"it is seldom feasible to obtain the sort of refined measurements that can be made in the orderly conditions of wards in a large hospital. The objectives of quality assessment and the methods used to measure it must be realistic"* (Roemer and Montoya-Aguilar 1988 p.3).

3.3.3 Nature of assessment method

Quality assessment can use either explicit or implicit methods (Donabedian 1966, Palmer 1976). Explicit assessments are based on detailed criteria, embodied in checklists and reflecting the pre-set standards of good performance; there is little need for observer judgement. Assessments of physical structure have predominantly used explicit methods (e.g. Garner *et al.* 1990) but wider structural assessment may use more flexible methods, such as interviews (e.g. Centre for Health Policy 1991/personnel, supplies' management, MOH/WHO 1989/district support, Robinson and Larsen 1990/motivation, Valadez 1990/ supervision). Some assessments may use explicit criteria although combining observations and interviews (e.g. Thomason and Edwards 1991).

Explicit procedures have more commonly been used in developing country process assessments to evaluate, in particular, the technical skills of curative care providers. Criteria checklists have been used during observation (e.g. Amonoo-Lartson & de Vries 1988, Cutts *et al.* 1988, Fadhil 1987, Figueroa undated, Habicht 1979, Nicholas *et al.* 1991, Srinivasa *et al.* 1982), record review (e.g. Malone 1980a, 1980b, Peters and Becker 1991) or special examination (e.g. Centre for Health Policy 1991, Gomez 1987). The criteria used have generally covered each element of the procedure assessed: such as history, examination, diagnosis, treatment, and patient education for curative care (e.g. Nicholas *et al.* 1991) or history, examination, laboratory investigation and management for ante-natal care (e.g. Fadhil 1987, Srinivasa *et al.* 1982). Preventive services have been less frequently assessed and inter-personal skills have rarely been considered in process quality assessments.

Curative care assessments have sometimes been based on a specific diagnosis of interest (e.g. diarrhoea, Cutts *et al.* 1988; respiratory infections, diarrhoea and malaria, Nicholas *et al.* 1991) or have focused on overall case management practice ignoring the differences between diagnoses (e.g. Habicht 1979, Malone 1980a). They may also use tracer conditions (Kessner *et al.* 1977) to review general curative care practice i.e. *"specific health problems that allow health care evaluators to pinpoint the strengths and weaknesses of a particular medical practice setting or an entire health service network by examining the interaction between providers, patients and their environment"* (Amonoo-Lartson and de Vries 1981 p.735). In their study, Amonoo-Lartson and de Vries selected tracers on the basis of six criteria: significant functional impact, relative ease of diagnosis, high prevalence, substantial impact of care, consensus on its management, a relatively well understood epidemiology. In addition, each tracer was relevant to different age groups: 0-10 year olds (cough), 0-5 years olds (diarrhoea) and all ages (cough).

Explicit assessment allows little scope for flexibility in response to the peculiarities of each patient observed. Attempts to address this last problem in developed country quality assessments have led to

the formulation of criteria lists which branch into different paths, depending on the nature of the patient's complaint. However, such branching may undermine assessment of individual providers where small numbers in each diagnostic category make it difficult to generalize about quality of care; broad criteria, on the other hand, apply in all cases (Palmer 1976).

The facility-based assessment procedures reported by Bryce *et al.* (1992) combine explicit assessment of most elements of a curative consultation with implicit assessment of the correctness of diagnosis. Implicit assessment (e.g. AFYA/UNICEF/ AMREF 1985, Centre for Health Policy 1991, Kanji *et al.* 1990) is usually undertaken by experienced judges who, on the basis of their experience and against pre-set broad criteria, make their own judgements about the adequacy of performance in relation to the particular diagnosis seen. Implicit assessment can, therefore, be more flexible in response to the peculiarities of each patient - *"the health workers were assessed only in performing what was termed 'an appropriate physical examination'. It was felt that examination of the relevant system [assessed by observer] was a fairer and more objective measure than expecting the health worker to examine every patient from top to toe whatever the complaint"* (AFYA/UNICEF/AMREF 1985 p.10).

The differences between explicit and implicit assessments are exemplified by Malone's studies (1980a, 1980b). In each case, the assessments were based on comparison of patient records with the evaluator's notes of her independent consultations with the patient/mother. These notes were then submitted both for explicit audit and for implicit assessment by three, local experts - each of whom determined for each case whether or not care was adequate; their overall conclusions were based on a majority decision. This rather complex procedure was made possible by the focus on one health unit, the availability of an independent evaluator, reasonable patient records and three expert judges. Malone judged that both the explicit and implicit judgements were broadly similar (1980a); the circumstances required for such assessment are anyway not very likely in most developing country settings, given data availability and other problems.

Within the studies reviewed, the reliability and validity of methods were considered to different degrees (Appendix 3A). In assessing reliability, efforts varied from pilot studies (e.g. Srinivasa *et al.* 1982) to widespread use (Nicholas *et al.* 1991); and, in assessing validity, from acceptance of possible biases (Cutts *et al.* 1988) to comparison of explicit and implicit assessments (e.g. Malone 1980a, 1980b) to comparison with outcome data (Figueroa undated). One implicit assessment concluded that although *"repeatability was not strictly tested ...the common findings in different clinics and by the different teams, and the process of validation during feedback sessions with nurses, have strengthened our confidence in the accuracy and repeatability of the survey instruments"* (Centre for Health Policy 1991 p.11-2). However, the potential subjectivity of such assessments was noted in a second study: *"the observers adopted a very optimistic attitude, characterized by a high level of understanding of the problems of*

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working at the primary level, within the present Angolan situation" (Kanji *et al.* 1990 p.28).

Overall, it seems likely that greater reliability results from detailed specification of the criteria, standards and procedures used in assessing care; but because flexibility in judging individual cases is undermined, this greater reliability may be at the expense of some validity. However, as many of these structural and process assessments tacitly accept, *"conformity of practice to accepted standards has a kind of conditional or interim validity which may be more relevant to the purposes of the assessment in specific instances"* (Donabedian 1988a p.186).

3.3.4 Measurement scales and results presentation

Measurement scales are an important methodological feature of quality assessment. Assessment of criteria can be based on a small number of divisions (e.g. poor, adequate, good) or can use numerical scoring approaches. The former tend to be used in implicit assessments (e.g. AFYA/UNICEF/AMREF 1985, Centre for Health Policy 1991, Kanji *et al.* 1990), and the latter have more place in explicit assessments of process and structure (e.g. Amonoo-Lartson and de Vries 1981, Cutts *et al.* 1988 , Fadhil 1987, Garner *et al.* 1990, Srinivasa *et al.* 1982, Thomason and Edwards 1991).

Scoring systems allow the calculation of a mean score (across observations and/or health units), based on weights reflecting the differing contribution of each criterion to good outcome (Donabedian 1988a. However, such procedures do not necessarily lead to greater precision; evaluation of an early American study concluded that scores were a crude index serving best to delineate those providing medical care of an unacceptable level of quality, but not so efficient at separating the average from the good or excellent (Shortbridge 1974, on Morehead 1970). In the study quality was scored from records and collective scores for different health centres were computed in order to allow them to be ranked, and to assess the correlation of other factors (such as size, affiliation) with the quality rank. The study was also criticized on the grounds that the scoring system gave equal weight to therapy and diagnosis - therefore, diagnosis might be in doubt but therapy could be rated fair or good, and because the record assessors had to use considerable personal judgement (Shortbridge 1974). Although numerical approaches allow a picture of both the whole process and its components to be developed they may hide the fact that medical care can be all or nothing i.e. poor practice in only one aspect may be enough to ensure overall poor performance (Donabedian 1988a, Roemer and Montoya-Aguilar 1988). Otherwise good immunization performance, for example, may be undermined by the use of impotent vaccines

In most process assessments, results are presented simply (Appendix 3A). Explicit assessments have usually included percentage undertaking/failing to undertake each criterion, as well as mean scores

(e.g. Cutts *et al.* 1988, Fadhil 1987, Malone 1980a, 1980b, Srinivasa *et al.* 1982). Implicit assessments have presented the percent overall judged adequate and, sometimes, more qualitative review of findings (e.g. Centre for Health Policy 1991). Such analyses are sufficient to indicate failings in performance generally, to allow review of individual providers (e.g. Habicht 1979) and to compare different groups of providers (e.g. AFYA/UNICEF/AMREF 1985, Centre for Health Policy 1991, Kanji *et al.* 1990). Results from structural assessments are also commonly presented in terms of frequency distributions. The potential of scoring systems is illustrated by Thomason and Edwards (1991) who used scores to identify relatively weak/strong hospitals against components of structural quality; and Garner *et al.* (1990), who analyzed overall scores in relation to variables that might influence structure/quality such as: staffing levels, agency and type of health unit, regional variation, accessibility, costs, output and medical supervision.

3.3.5 Sampling approaches

Structural assessment requires only a sample of health units. In PNG a random stratified sample facilitated the inclusion of health units of different provider types based in different locations within the country. The WHO MCH/FP rapid assessment procedures allow the selection of districts, health units (hospitals, health centres and clinics), communities and households through a multi-stage random sampling technique (MOH/WHO 1989). More simply, Fadhil (1987) took a systematic sample of 6 health units in her study area to ensure evaluation of different health unit types.

However, in process assessments it is important to specify the universe to be sampled, which is dependent on the nature of the generalization required; it might be necessary to sample both health units and observations. Studies could be concerned with the care provided by a specified category of providers, the care received by a specified group of providers or the capacity of a specified group of providers to provide care. Studies of the first two types require samples of providers/recipients and care provided/received; and the last requires a sample of providers but not necessarily of care (Donabedian 1966). In addition, it is important to select the significant dimensions of care and to consider to what extent the care provided by physicians maintains a consistent level (do specific diagnostic categories, levels of difficulty or dimensions of care exist in which a physician performs better than in others? - if not, the diagnostic mix of assessment, for example, may influence final judgements).

Appendix 3A illustrates the variation in practice, from random sampling techniques to purposive sampling. In the studies reported in Nicholas *et al.* (1991), health units were selected according to a variety of factors: accessibility, interest of medical officers, representativeness, national policy or priorities, and programme characteristics. Such purposive sampling was justified because the *"problems appearing in the most reputable facilities were likely to occur throughout the system, while*

examination of poorer centres identified the scope of the problems needing to be addressed" (p.149). Moreover, *"One of the chief considerations was that the sampling strategy seem non-biased to managers who would be expected to use the information as a basis for subsequent action"* (p.149).

3.4 Quality assessment findings: structure and process

Quality assessments generally point both to the peculiarities and weaknesses of primary care, such as the features of clinical management. For example, although rarely assessed, counselling and client education have been found to be weak (Centre for Health Policy 1991, Nicholas *et al.* 1991, Peters and Becker 1991); a failing *"particularly serious in the context of primary health care, where the health provider and the patient (or caregiver) are supposed to enter into a partnership to achieve successful treatment"* (Nicholas *et al.* 1991 p.163). Other failings in inter-personal skills have been reflected in weaknesses in history-taking (Amonoo-Lartson and de Vries 1981, Cutts *et al.* 1988, Kanji *et al.* 1990, Nicholas *et al.* 1991) and information provision (Kanji *et al.* 1990). They are compounded by weak technical skills in examination practice (Amonoo-Lartson and de Vries 1981, Cutts *et al.* 1988, Kanji *et al.* 1990, Malone 1980a, 1980b, Nicholas *et al.* 1991).

The consequence of these failings may be inadequate diagnosis (e.g. AFYA/AMREF/ UNICEF 1985, Centre for Health Policy 1991, Kanji *et al.* 1990), particularly for medical cases (Pust and Burrell 1986) and with consequences for treatment accuracy. In South Africa, *"although the appropriateness of drug treatment given to patients was not formally assessed in the KaNgwane clinics, it is clear from the practice profile that nurses are not making many clinical diagnoses. Treatment then becomes largely a "hit and miss" approach based on the presenting symptoms"* (Centre for Health Policy 1991 p.70). Prescribing practices have been found to be variable: sometimes reasonable (Amonoo-Lartson and de Vries 1981, Cutts *et al.* 1988, Malone 1980a, Pust and Burrell 1986) and sometimes poor (Cutts *et al.* 1988, Kanji *et al.* 1990, Nicholas *et al.* 1991).

A second distinction of primary care relative to services at higher levels is the provision of preventive and promotive services, for which the failings in inter-personal skills are especially damaging. In Mozambique, whilst the technical aspect of ante-natal care was reasonable, communication between the nurses and the mothers *"very rarely included any general health education advice, or any explanation of the importance of preventive care for mothers attending clinics for the first time. Mothers were hardly ever asked if they had any doubt or questions, and if a mother did bring up a problem she was rarely given adequate attention or support"* (Jelley and Madeley 1984 p.780). Such problems are likely to undermine the "at risk approach" of MCH care, as support is not given to mothers of children at risk or to mothers themselves. In South Africa, despite some good aspects of performance, *"there appears to be little time for anything besides a fairly cursory assessment. There is even less time for*

individuals to raise problems and for individual counselling of women, a crucial part of ante-natal care. Although the attitudes of midwives was usually a friendly one, sometimes it became impersonal. It is possible that some women feel unsupported by, and even frightened by, the clinic staff" (Centre for Health Policy 1991 p.53). Nicholas *et al.* (1991) also noted similar weaknesses in counselling for growth monitoring and health education for immunization.

Finally, the third distinction of primary care is the importance of the supporting structures and systems in ensuring good quality. Many process evaluators have drawn relevant conclusions; for example, Pust and Burrell (1986) noted that *"this study suggests a need for problem-based paramedical education in diagnosis, specially in non-surgical problems. Visits by doctors to health centres could reinforce this diagnostic teaching and better evaluate paramedical' clinical accuracy in the health centre"* (p.38), although Bryce *et al.* (1992) concluded that *"performance deficiencies...may not always reflect a need for training. For example, most assessments identified logistic problems that limit the quality of service delivery"* (p.160). Amonoo-Lartson and de Vries (1981) suggested that their study showed *"... the need for refresher courses and continuing supervision in order to improve upon the skills of the [health workers] in examination and history-taking"* (p.741) and Malone (1980a) identified the importance of treatment manuals, *"if nurses therefore are to function effectively and safely....it is essential, at least until such time as they receive adequate tuition during training, that they be encouraged to use a manual or guidelines to help them in the task of diagnosis and management"* (p.21). She noted that the introduction of an ante-natal card led to improvement in *"the accuracy of medical and obstetric history and in the selection of 'at-risk' cases for appropriate management"* (Malone 1980b p.94). Overall, she concluded that for good ante-natal care performance various supporting items are required: clearly defined criteria and cards, necessary equipment (including cards), in-service training and clinical meetings, and concern for the impact of workload on staff.

Structural issues, thus, underpin process quality. In PNG, only 14% of all units assessed had the structure required to manage adequately three common problems. The structural failings included poorly maintained infrastructure, drugs shortages, poor fridge maintenance, disorganized preventive services and infrequent supervision (Garner *et al.* 1990). In Tanzania, a serious shortage in the equipment required for clinical examination was seen as *"a contributory factor to inadequate patient management"* (AFYA/UNICEF/AMREF 1985) and in South Africa, recommendations to improve care included the need for minimum equipment standards and regular monitoring (Centre for Health Policy 1991). In Botswana, although equipment availability was adequate, chronic manpower shortages undermined MCH services (MOH/WHO 1989).

Support weaknesses identified in structural assessments included infrequency of supervision (even where transport was available) and the failure to train supervisors appropriately; *"supervision systems*

have little or no focus on technical quality...[there is a] need for providing supervisors with training and tools for carrying out performance assessments and problem solving" (Nicholas *et al.* 1991 p.163). Valadez *et al.* (1990) concluded that supervisors needed to be more highly motivated; but, in Botswana, the organizational structure established by decentralization has caused *"confusion regarding lines of communication, supervision and responsibilities"* (MOH/WHO 1989 p.xiii). Recommendations for improvements in KaNgwane clinics made by the Centre for Health Policy (1991) included workloads, personnel policies (career structure, promotion and incentives, grievance and disciplinary procedures, overtime pay and leave), supervision and continuing education opportunities, and also highlight the organizational factors influencing structural quality. However, assessment of community health worker motivation concluded that feedback and rewards derived from the community had greater influence on their job performance than those from the health system - maybe because they are much more part of the community than the health system and more so than other health workers (Robinson and Larsen 1990).

Nicholas *et al.*'s (1991) wide-ranging experience led them to conclude that the programme deficiencies they identified could be improved and that problems were not simply related to resource availability. Instead qualitative elements of support are required to assure better quality care - such as a commitment to quality at highest levels, a team approach involving policy makers and front line health workers, better information systems, a focus on client education and counselling encouraging more patient satisfaction and demand for higher quality services, and iterative processes to facilitate continuous, incremental improvement of quality of care.

3.5   Satisfaction assessment

Satisfaction assessment can be used as a form of outcome assessment (Table 3.1) and to examine the inter-personal component of quality (Lohr 1988).

3.5.1 Methods

The common approach in assessment of satisfaction is to elicit patient opinions on a recent visit to a health care provider through structured questionnaires.

One recent UK-based example of this approach is given by Baker (1990), who discusses the development of a questionnaire about the doctor-patient relationship in general practitioner setting. The questionnaire was anonymous and self-administered, patients were given it on arrival at the practice and asked to complete it before departure. Patients were asked to identify the level of their agreement or disagreement with statements about the doctor and consultation, using a five point scale

(1=satisfaction, 5=dis-satisfaction), and addressing four areas: general satisfaction, professional care, depth of relationship and time of consultation.

Only two similar studies have been found for developing countries, from Brazil (Paine and da Gloria Wright 1988, 1989). In the first, a structured questionnaire sought to measure satisfaction with access, physician's role and the local community health centre. A 10% random sample of households surrounding this health centre was taken and the head of household or spouse was interviewed. In the second study, the cause of delay in seeking care among this same community was assessed and explained using access and attitude variables.

In such questionnaires the degree of satisfaction recorded is based on patients' prior expectations and experience, unknown to the analyst; therefore, a high satisfaction rating may reflect low self-esteem, low expectations, ignorance of alternatives and the view that the practitioner was a kind person (Martin 1986). Satisfaction judgements may, thus, reflect the patient more than the quality of care received and may be more critical of quality elements which patients feel more secure in judging. Hall and Dornan (1988), for example, note that across the satisfaction literature, humaneness, technical and overall quality ranked best in relation to patient satisfaction, but the bottom five aspects represented attention to other non-physical needs (e.g. for information, addressing psychosocial problems) and aspects involving patient's relation to system (e.g. cost, access, bureaucracy). Similarly, in Baker' study (1990), scores for general satisfaction and professional care were more likely to have a higher score than scores for depth of relationship and perceived time. Greater satisfaction with technical quality might suggest that patients feel they cannot judge technical skills or cannot judge them as poor; or that *health care systems emphasize technical performance to the neglect of patient needs that fall outside biomedical definition of health"* (Hall and Dornan 1988 p.938). Satisfaction assessment may, therefore, reflect actual quality only for non-technical items.

These problems could be addressed by the use of better questionnaires, in which questions about process (staff and intervention procedures) are separated from questions about the effects of service, and patients could be asked to specify and rank the 'helpful' and 'unhelpful' aspects of service (Martin 1986). On the other hand Calnan (1988) suggests that a *different methodology and perspective to the one used in satisfaction surveys needs to be adopted to examine effectively lay evaluation of medical care. This approach will involve a shift away from explaining actions in terms of medical rationality towards attempting to understand the lay person's action in terms of his or her own logic, knowledge and beliefs which themselves are closely tied to the social context and circumstances in which people carry out their daily activities"* (p.929). For example, from review of the associations between culturally linked behaviour and utilization, Heggenhougen and Shore (1986) identify three important issues in such decisions. First, that the choice of provider reflects beliefs about disease causation and the

disease-specific efficacy of alternative providers rather than their satisfaction or dissatisfaction with the available alternatives; second, that the interaction between patient and provider and, third, the past experience of the efficacy of treatment, are especially important to utilization decisions. Assessment of satisfaction must allow for the wider factors that motivate people to use health care and thus influence their perceptions of it.

Studies in developing countries have predominantly used data from household questionnaires to trace utilization patterns (e.g. Abu-Zeid and Dann 1985, Berman *et al.* 1987, Kloos *et al.* 1987, Lasker 1981, Mwabu 1986, Ward 1987). Some have focused, for example, on infant and child ill-health (Coreil 1983, Gesler 1979) or obstetric care (Murphy and Baba 1981), and some have used the data to develop econometric models of demand for health care (Akin *et al.* 1986, Chernichovsky and Meesok 1985, Heller 1982); little consideration has been given to preventive care. Household questionnaires have also been used to assess knowledge, attitudes and practices within the community, giving some ideas about satisfaction and perceived quality - for maternal care (MOH/WHO 1989), or for diarrhoeal disease control (Cliff *et al.* 1990, Cutts *et al.* 1988).

However, Calnan (1988) suggests that qualitative methods may be more useful than surveys with questionnaires to explore satisfaction. Comparison of different survey methods used in Nepal led to the conclusion that more accurate, reliable and useful information could be obtained through qualitative approaches than normal, quantitative surveys (Campbell *et al.* 1979). A detailed review of methods to assess the acceptability of childhood immunization has also suggested that *"the value of...studies seeking qualitative information which limit themselves to this method [of surveys using closed and pre-coded questions]...must be seriously questioned. It has been shown that much of the information sought is too sensitive to be accurately obtained by such a tightly structured and standardized method"* (Heggenhougen and Clements 1987 p.26).

Qualitative methods have been promoted internationally as rapid appraisal techniques (Scrimshaw and Hurtado 1987, WHO/MCH 1989); they range from anthropological-style, in-depth discussion and observation (Ugalde 1984), to focus group discussions (Attah 1986, MOH/WHO 1989, Waddington and Enyimayew 1990a, 1990b), to informal interviewing (Annis 1981, Howard 1978). Their advantages include (Nio *et al.* 1991): greater speed when compared with conventional methods of analysis; emphasis on learning directly from local people; a semi-structured multi-disciplinary approach with room for flexibility and innovation; an emphasis on producing timely insights or hypotheses rather than final truths or fixed recommendations.

However, such methods are sometimes criticized for using only small numbers of respondents and unrepresentative sampling, so preventing their findings from being generalized. Yet larger surveys using

formal questionnaires may suffer from a variety of biases and be very costly (Cliff *et al.* 1990). Moreover, whilst rapid appraisal methods cannot tell how many people are affected by the problems, they *"...can tell what the strength of feeling is within a community. For example, the number of people on hard drugs can be relatively small, but the problem this creates for community living can be experienced as extremely disturbing"* (Nio *et al.* 1991 p.910). The issue of representativeness may therefore be irrelevant to the concerns under assessment - not everything requires quantification to be valid. *"Quantitative methods can identify 'how' individuals behave in certain circumstances, while qualitative methods...are better equipped to answer the diagnostic question of 'why'"* (Folch-Lyon and Trost 1981 p.445).

Overall, *"it is hazardous to rely upon a single method or study for evaluating programmes"* (Martin 1986 p.197). Triangulation approaches have, therefore, been encouraged in social science research i.e. the use of several methods at once to allow data from one source to be cross-checked by that of others (Heggenhougen and Clements 1987).

3.5.2 Findings

Across the developed country literature the categories of satisfaction generally reviewed have included: overall levels, access, cost, overall quality, humaneness, competence, amount of information supplied by provider, bureaucratic arrangements, waiting time, physical facilities (aesthetic and functional), provider's attention to psychosocial problems of patient, continuity of care and outcome of care (Hall and Doman 1988). The Brazilian satisfaction studies similarly highlighted the importance of access, waiting time, the doctor-patient relationship to satisfaction and concluded that *"efforts to promote the timeliness of medical care in this community should focus on the doctor-patient relationship and not just on the material side of health services. A good first step could be increased continuity of care with a regular provider, shown to be highly associated with patient satisfaction and confidence in doctor's professional and personal qualities among low income patients"* (Paine and da Gloria Wright 1989 p.123)

Factors influencing the acceptability of immunization include both aspects of the service (organization, accessibility, availability) and aspects of the target population (socioeconomic and demographic characteristics, beliefs and behaviour) (Heggenhougen and Clements 1987). Review of utilization studies also identifies several similar, key issues influencing decisions: the user characteristics of socio-economic status, sex and age; and provider features of price, access, and perceived efficacy and quality of care (Gilson 1988). Discussion of perceived efficacy and quality has been summarized by Igun (1979) in a model of the stages of health seeking behaviour based on field experience in Nigeria. The four issues important to the selection of health care provider within this model are: the perceived

efficacy of care in relation to disease-causation beliefs (only traditional healers are acceptable for some diseases); their experience of the quality of care, which moulds community perceptions of efficacy; the costs (time, fees and bribes) of care, which are minimized in provider selection; and the severity of need, as perceived efficacy outweighs cost considerations for more severe problems.

Overall, the findings of these various studies suggest that simply knowing whether or not patients are satisfied with various aspects of service provision will not be enough to determine how to enhance their satisfaction and the acceptability to them of care. Concern for broader issues requires, rather, consideration both of the nature of the interaction with the provider (considering interpersonal skills) and also of the factors shaping that interaction (and their overall satisfaction with available services). Although not all of these factors can be addressed through the health system, knowledge of them is essential in understanding lay evaluations of health care.

3.6   Conclusions

This review of the quality assessment literature has shown that definitions of quality are tied to attributes that are both measurable and relevant to the focus of assessment. Although health care seeks to have an impact on health status, outcome-based definitions of quality are difficult to use in assessment and so definitions have tended to emphasize the triad of structure, process and outcome. In particular, quality assessments have concentrated on the medical-technical aspects of care provision due to the greater possibility of their validation in terms of correlation with outcome impacts. Such assessment is particularly based on consideration of the technical skills required to translate efficacious medical interventions into effective health care.

However, the predominance of technical process quality as the focus of assessment may ignore the wider needs of the population by under-emphasizing the importance of efficiency and satisfaction within 'quality', for example, and mis-specifying the requirements for effective health care (by ignoring interpersonal skills). It is also most difficult to apply and to validate in the context of primary care, particularly in developing countries, in which outcomes are more than usually dependent on structure - both for the correct application of processes and for the acceptability of care. In this context quality definitions should, rather, emphasize the importance of structure, process and perceived quality (based on satisfaction with available health services). The care available at this level has generally already been validated against outcomes (e.g. by WHO), and so quality assessment can validly focus on the difficulties of implementing the accepted processes. As with efficiency (Chapter 1), assessment should consider the resources available and the way they are used, together with utilization as an indicator of community satisfaction.

Methods of quality assessment must be based on both internationally and, more importantly, locally accepted criteria and standards. Explicit assessments have disadvantages in terms of flexibility but may be more appropriate than implicit assessments in the development of reliable, standardized assessment tools that could be used in performance review by district managers themselves, or less well-trained staff. Scoring systems facilitate analysis of the factors associated with quality, such as the connections between quality and efficiency, and thus are appropriate to use - but do not provide absolute measures of quality. Scores must be interpreted in the light of the local circumstances in order to understand the areas in which performance improvements will enhance quality. System-wide structural features are likely to be of particular importance and quality assurance requires careful analysis of what feasibly can be done to improve the quality of care provided.

Finally, assessment of satisfaction helps determine the perceived quality of health providers. In developing countries, in particular, allopathic providers compete with a range of other health providers and selection among them is not determined solely on the basis of satisfaction or dissatisfaction. To understand those choices and the factors influencing perceived quality, community-based assessments are required which, using qualitative methods, can fully explore the complex of relevant issues. Such assessments are important not simply to understand lay evaluations of health care but also because acceptability is important to the effectiveness of health care; and because the community's opinions should be respected.

3.7   Summary

This chapter has reviewed literature concerning assessment of health care quality. It has found that process quality is influenced by structural quality, particulary at the primary level in developing countries - indicating that both should be reviewed in an overall assessment. Satisfaction is both an important element of process quality and an outcome variable. Explicit assessment methods are most appropriate for district managers, reflecting internationally and nationally accepted standards. Satisfaction is better assessed through a combination of approaches, giving particular emphasis to qualitative methods that allow review of the complex of factors influencing community opinions.

CHAPTER FOUR:
STUDY LOCATION AND METHODS

4.1   Study site and health unit sampling

4.1.1 Country selection

Tanzania is both an example to other countries in relation to health policy development and a country representative of the economic difficulties facing sub-Saharan Africa. Evaluation of its system can, therefore, provide lessons for other countries seeking to emulate some of its policies (such as decentralization) whilst facing many of the same difficulties. Such evaluation is especially appropriate at a time of change, as indicated by Tanzania's consideration of new health care financing proposals (Abel-Smith and Rawall, forthcoming) and adjustments to public sector structure.

Tanzania has been a leader in the field of health policy development since the time of its independence in 1961, adopting policies that specifically strengthened rural health care provision through the re-allocation of resources and through the development of paramedical health cadres. In the twenty years following independence:

* the proportion of the national health allocation directed towards rural health care doubled

* the number of medical auxiliaries (medical assistants and rural medical aides) working in rural areas increased by more than 400%

* the proportion of the population living within 10 km of a health unit increased to 90%, and within 5 km, to 70% (Heggenhougen *et al.* 1987).

At the same time, life expectancy rose from 35 to 52 years (1961-1980) and the infant mortality rate (IMR) declined from 160/1000 live births in 1967 to 135/1000 live births in 1978 (Heggenhougen *et al.* 1987).

Health sector innovations were paralleled by development in public administration systems; Tanzania's early and wide-ranging decentralization policies were praised as ensuring that *"health, as indeed all other services, is very much a part of the decentralized system of decision making"* (Ebrahim and Ranken 1988 p.17). Initially decentralized to the regional level, in 1983 District Councils were given responsibility for primary education, primary health care, district roads and water supplies. They receive subventions from central government to cover most of their wage and salary costs and some of the other recurrent costs, but are expected to meet the rest of their costs (including, for example, the support of cooperatives, forestry, fisheries) out of their own revenues. These revenues are generated

by locally levied taxes and duties, particularly the District Development Levy, an adult poll tax. The District Council's chief executive, the District Executive Director, works closely with the Council Chairman, elected from among the councillors, representatives of Chama cha Mapinduzi (CCM, the Party), the District Administrative Officer (representing the Prime Minister's Office) and a team of technical advisors. Recent organizational adjustments have again strengthened the regional level relative to districts (Chapter 9).

However, public sector development in Tanzania has been challenged by international economic crises and population growth, as indicated by the:

* 19% decline in per capita income 1978-88
* 15% decline in aggregate government real expenditure 1980/81-1987/88
* 38% decline in central government real per capita expenditure for health 1980-87
* 55-75% decline in real salary rates 1981-87 (Andersson-Brolin et al. 1991, World Bank 1988).

Despite the economic and policy constraints facing the government, it has tried to maintain some commitment to publicly-funded health care: the health sector's percent of the national budget rose from earlier levels of 8% to 14% in 1991/92 (Mmuni 1991). Donors have assisted the government through infrastructural development, support of critical programmes such as immunization and drug supply for rural health units, and management training. However, the needs are great and the national resources small: it has been estimated that if per capita expenditures for primary health care remained at their 1987/88 level in real terms and there was no fertility decline, government primary health care expenditures would need to increase by 160% by the year 2015 just to maintain provision of the current level of services to the larger population (World Bank 1988).

4.1.2 Region selection

The wide-ranging nature of the evaluation required that, for logistical reasons, it was undertaken in a limited geographical area; the region was chosen as the most appropriate geographical unit because of its intermediate place within public sector organizational structures. From the 25 regions of Tanzania, the Morogoro region was selected for this evaluation because:

* it is relatively well-developed, for example in terms of access to health care, and so may provide an estimate of one of the better health care situations in the country
* it is varied in terms of topography and climate, and so allows review of the differing situations that can influence both health and health care performance
* it has four districts, allowing comparison of their performance
* voluntary agency health units are well-established in the region, facilitating their comparison with government units

* its health status profile is similar to that of the country as a whole
* logistic support within the region facilitated implementation of the evaluation.
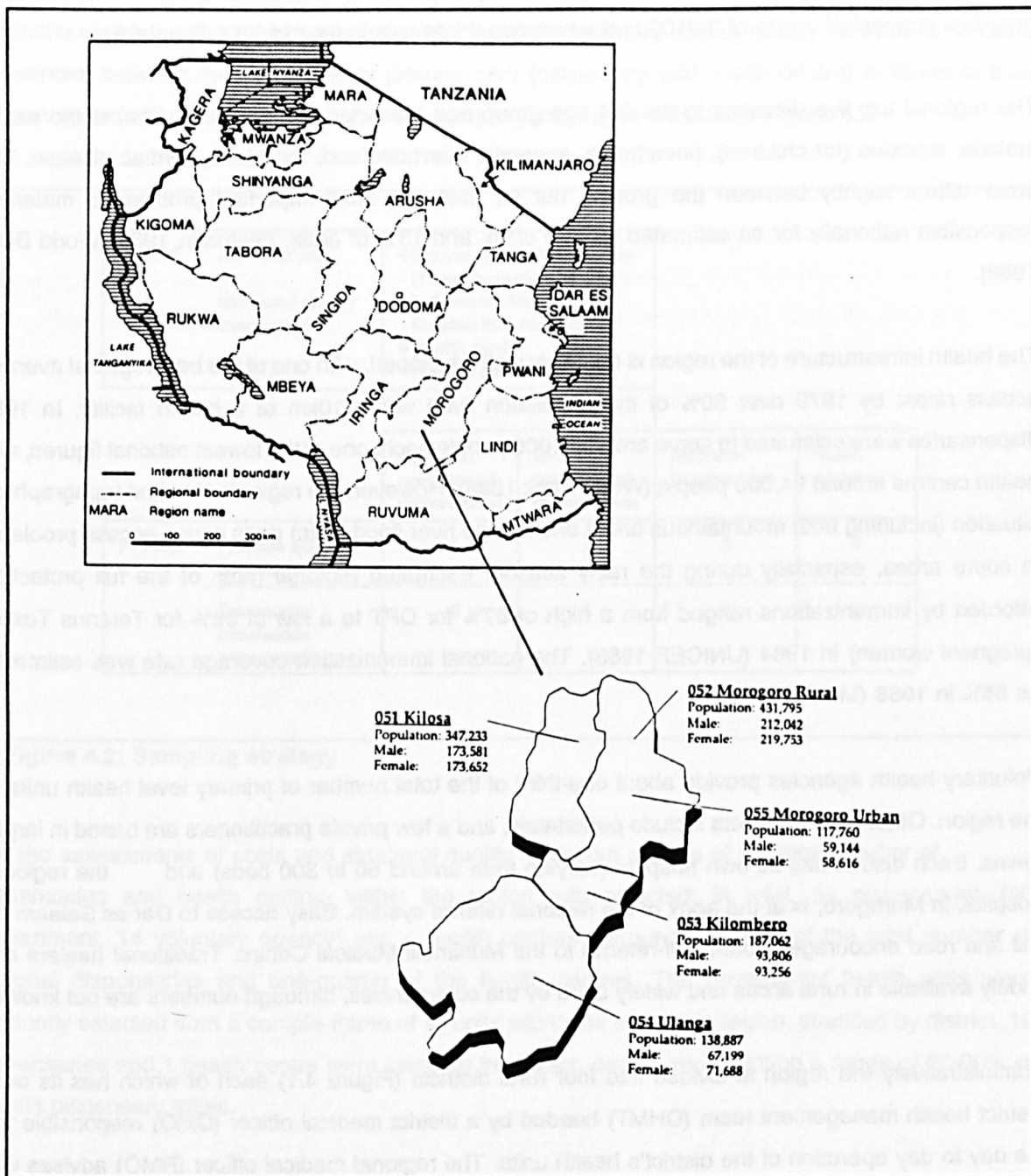
Figure 4.1: Study site, Tanzania and the Morogoro region

The Morogoro region is the third largest in Tanzania, covering an area of 73,039 km² (Figure 4.1). Its 1988 population was 1,222,737 (5.3% of the national total), growing at 2.6% (slightly below the national average of 2.8%) (Government of Tanzania 1988). It was estimated that the region's IMR was 140/1000

live births in the late 1980s, slightly above the national figure of 137/1000 live births; nearly 240 children out of every 1000 born alive die before the age of 5 years. There is little national data for maternal mortality but 1983/84 figures from a four-region survey of institutional deaths in rural health centres and hospitals suggested a rate of 37/1000; of which two-thirds was judged to be preventable.

The regional top five diseases in the 0-4 age group and the older age group are almost the same: malaria, measles (for children), pneumonia, anaemia, diarrhoea and, for adults, cardiac disease. The order differs slightly between the groups, but for both the most important problem is malaria - responsible nationally for an estimated 14% of child, and 13% of adult, deaths in 1984 (World Bank 1988).

The health infrastructure of the region is relatively well developed, with one of the best regional average access rates: by 1979 over 90% of the population lived within 10km of a health facility. In 1984 dispensaries were estimated to serve around 6,000 people each, one of the lowest national figures, and health centres around 94,000 people (World Bank 1988). However, the region's size and topographical situation (including both mountainous areas and a large river flood plain) does cause access problems in some areas, especially during the rainy season. Estimated regional rates of the full protection afforded by immunizations ranged from a high of 67% for DPT to a low of 38% for Tetanus Toxoid (pregnant women) in 1984 (UNICEF 1985). The national immunization coverage rate was estimated as 85% in 1988 (Mmuni 1991).

Voluntary health agencies provide about one-third of the total number of primary level health units in the region. Other care providers include parastatals, and a few private practitioners are based in larger towns. Each district has its own hospital (varying from around 60 to 300 beds) and   the regional hospital, in Morogoro, is at the apex of the regional referral system. Easy access to Dar es Salaam by rail and road encourages some self-referral to the Muhimbili Medical Centre. Traditional healers are widely available in rural areas and widely used by the communities, although numbers are not known.

Administratively the region is divided into four rural districts (Figure 4.1) each of which has its own district health management team (DHMT) headed by a district medical officer (DMO) responsible for the day to day operation of the district's health units. The regional medical officer (RMO) advises the regional development director on health development in the region and has operational responsibility for the regional hospital.

4.1.3   Sample health units/villages

This study targeted the rural primary health care services for assessment, focusing on the dispensaries

and rural health centres (unit of first referral) which form the backbone of the national health system. In 1989 the Morogoro region had 149 dispensaries (government and voluntary agency) and 15 health centres. The sampling strategy of the study aimed to allow comparison of each of the four districts within the region, to allow comparison of government and voluntary agency health units and to consider differences between the two levels of primary care (dispensary and health centre) in terms of their efficiency (including quality). The complete sampling strategy is outlined in Figure 4.2.

PHASE 1	Cost analysis	40 government dispensaries (10 each district)			
	Structural quality assessment	14 diocesan dispensaries (located in 2 districts) 4 health centre (1 each district)			

		high cost government dispensaries	low cost government dispensaries	diocesan dispensaries	health centres
PHASE 2	Process quality assessment	6	7	5	2
	Community satisfaction assessment	3	4	3	0

Figure 4.2: Sampling strategy

For the assessments of costs and structural quality a random sample of the total number of dispensaries and health centres within the region was selected; in total, 54 dispensaries (40 government, 14 voluntary agency) and 4 health centres - around one-third of the total number of regional dispensaries and one-quarter of the health centres. The government health units were randomly selected from a sample-frame of all units within the Morogoro region, stratified by district. 10 dispensaries and 1 health centre were selected from each district, representing a range of 20-90% of district dispensary totals.

Although several voluntary agencies support health care within the region, this study focused on a group of church dispensaries - centrally administered and supported by one Roman Catholic diocese. The inclusion of dispensaries from different agencies could have undermined comparison with government units because of the considerable differences in administration and practice between voluntary agencies. The 14 diocesan dispensaries selected for the study were located in two of the region's four rural districts and represented 82% of the total number within the diocese. Two dispensaries were excluded from assessment because access difficulties prevented them being visited

and one unit was excluded from all but the structural assessment because of data collection problems.

Logistic and time constraints required that a sub-sample of units be selected in which to assess process quality (health worker performance). The second sample frame was stratified by unit type, unit ownership and government dispensary cost performance; samples of only high and low cost government dispensaries were chosen to facilitate comparison of cost and process quality. Relative cost performance was judged by ranking the 40 original government dispensaries by total average cost results for three, always-provided activities (curative care, ante-natal&child welfare services, immunization), individual ranks were summed and an overall ranking established. Government dispensaries were assigned to high, average or low cost groups on the basis of their relative ranks and the random sub-samples of the high and low cost groups represented: 50% of each group, 35% of the total number of the original sample and 12% of the regional total of government dispensaries. In addition, 28% of the original diocesan (24% of total), and 50% of the original health centre (13% of regional total), samples were selected (Figure 4.2).

For the community satisfaction assessment, sampling procedures allowed villages with differing access to health units, a major influence over perceptions, to be selected. A random sub-sample of 10 units was taken from the total number of health units visited for process quality assessment and a total of seventeen, related villages were then selected: the 10 villages in which the chosen health units were located and, where present, one other in each unit's catchment area. Within the final sub-sample of health units there was roughly equal presence of diocesan, high and low cost government dispensaries. Perceptions of referral units (both health centres and hospitals) were assessed within every village visited.

4.2   Cost analysis methods

Based on the range of services commonly provided in primary health units, six specific activities were costed in addition to health unit total costs:

* curative care (outpatient-type care, including tuberculosis/leprosy care, laboratory and dental services)
* ante-natal/child welfare care (ANC/CW)
* immunizations
* deliveries
* in-patient care (using both admission numbers and estimates of in-patient days)
* other programmes (e.g. aspects of family planning, environmental sanitation services).

Ante-natal and child welfare services were combined as one activity because existing practices brought these services together in one clinic and staff consequently found it difficult to make separate time estimations for the two activities.

Cost estimation in this study was based on a health service perspective and excluded estimates of patient costs (fees, time). Using information collected through an ingredients approach the full costs of service provision were estimated for each health unit, including volunteer time and donated supplies, such as community contributions for fuel, and estimates of some support costs (distribution costs for supplies, supervision visits, in-service training). Personnel basic training and fixed district administrative costs were excluded because difficult to identify. Fixed regional/national administrative costs were also excluded, partly because they were difficult to identify but also because, being similar for each unit, they are unimportant in review of production efficiency (based on comparison of cost data between health units).

Table 4.1: Cost estimation methods and data sources

STEP	ACTIVITY	DATA SOURCES
1	Assess amounts of physical quantities consumed e.g. drugs, vaccines, time use	district data on drug use, on vaccine & kerosene use; unit data on drug, space & equipment use, supervision received; plus time use via staff interviews at units, complemented by special survey
2	Apply appropriate prices e.g. personnel=salary, allowances & pension; vaccine & drugs=resource use plus freight & transport; buildings=rental values[1]; equipment=straight-line depreciation; imports=official exchange rate	district data on e.g. furniture, diesel/petrol & kerosene; national data on vaccines, drugs & equipment; some district (government) or unit (mission) account/expenditure data
3	Allocate shared resources by space or time use: e.g. watchman time/operating costs shared by space use, supervision/space by time use[2]	unit data
4	Estimate total costs, cost profiles and average costs for each activity (except other programmes, no coherent output)	all data plus utilization figures from district & units

NOTE: 1. Rental value reflecting two different building quality states
2. In practice, the existence of strong vertical programmes providing their programmes with supplies limited the range of shared resources

Table 4.1 summarizes the cost estimation and data collection procedures; more detail is given in Appendix 4A and the potential for more regular cost analysis using these procedures is assessed in

Appendix 4B considers the reliability of the various data collected and identifies time and drug use as key areas for sensitivity analysis (Chapter 5). Two sets of time and drug use data were collected in order to facilitate such analysis. Original data were collected through staff interviews (time use) and from stock records (drug use). During the process quality assessment, health unit staff completed daily logs recording their time use patterns (Appendix 4C), whilst field workers made duplicate records of prescriptions from two recent and available patient registers - October/September 1989, dry season, and March/April 1990, wet season. A second estimate of annual personnel and drug costs was then determined and compared with the original figures.

Although financial costs were primarily used in this study, the appropriate shadow prices for labour and foreign exchange are discussed in Chapter 5.

4.3 Quality assessment methods

Assessment of quality in this study was rooted in the position that for health care to be effective certain minimum standards of performance are required. In developed countries, such standards are increasingly based on assessment of the effectiveness of carefully-defined health care interventions, undertaken through clinical trials. Although transfer of medical knowledge and technology to developing countries has been accompanied by some development of standards appropriate to the context and needs of individual countries (e.g. by the World Health Organization, WHO), objective assessment of effectiveness has rarely been undertaken. Existing medical standards in developing countries have also rarely been codified or used in quality assurance procedures, although quality measures can indicate the extent to which standards are being maintained. Quality standards form a proxy of effectiveness, and quality assessment allows identification of settings in which care is at risk of being ineffective.

Quality was assessed in this study by review of the inputs to health care (structure), the provision of health care (process) and community satisfaction (process and outcome). The starting point in assessment of both structural and process quality was to establish and codify the standards inherent in 'conventional wisdom', by collaboration with the regional and district health managers responsible for health care in Morogoro region. The research process gave these managers the final decision over appropriate quality assessment methods and the first chance to review, discuss and validate the findings of all assessments.

4.3.1 Assessment of structural quality

Drawing on existing Tanzanian supervision checklists, and experience from other countries, an initial draft list of structural criteria embodying international and national standards was developed. It was reviewed and finalized by health managers within the Morogoro region to ensure national relevance and common agreement (Appendix 4D).

Criteria were based on realistic expectations of the structure of health units and the services required for the provision of good quality care. For each criterion, good, sometimes average, and poor performance was defined as a statement of expected availability/practice. Criteria assessed the availability and condition of physical infrastructure and supplies (buildings, equipment, drugs), the availability of services and staff, staff working practices (reflecting service availability e.g. whether or not outreach was undertaken; cleanliness of key items of equipment), and the support received (supervision, in-service training). The dispensary checklist included two items related to drug provision that were not applicable to diocesan units and a sub-group of criteria concerning laboratory facilities that was applied to diocesan units and to a few government dispensaries. The health centre checklist was similar to that for dispensaries, but some criteria differed (e.g. different staff available standard) and it included criteria for the assessment of in-patient care. This sub-group was also used in assessing diocesan dispensaries offering in-patient facilities.

The relevant data overlapped considerably with that collected for cost analysis. District-based data was used wherever possible (e.g. drug and staff records); supplementary information was collected during health unit visits. All visits were undertaken by the project co-ordinator and an accompanying representative of the relevant district's management team.

A scoring system translated performance judgements across over 133 different criteria into more easily used assessment figures. For each criterion, good performance scored 2 points, average, 1 point and poor, 0 points. The scores for each unit were then calculated as a percentage of the maximum total, to reflect overall performance. On the guidance of regional health managers a standard of 60% was established to distinguish between health units providing good and poor quality care. The criteria were also categorized under a variety of sub-groups to allow more detailed assessment of aspects of structure; for example, curative, MCH and outreach services, equipment and staff. For each sub-group actual scores were calculated as the percent of the maximum total, to allow comparison across health units; and the 60% standard was again applied in assessing quality levels. Sub-groups and their criteria are listed in Appendix 4E.

The reliability and validity of this methodology is assessed in Chapter 6, together with consideration of the checklist's potential to be a monitoring tool.

4.3.2 Assessment of process quality

Process quality was assessed by reviewing the performance of their duties by health workers. As for structural quality, the first step was to codify conventional wisdom concerning good quality medical practice. Regional health managers reviewed and finalized draft assessment tools, each a checklist of the series of expected actions required for the provision of good quality care. The checklists reflected accepted practice for Tanzania and Morogoro but did not condone bad practice resulting from known resource/practice constraints.

The procedures included in the assessment were: curative consultations (general and child fever), nursing activities (injections, dispensing, sterilization and dispensing cleanliness) and ante-natal care (consultations and recording practice). Although ante-natal care was the only preventive service assessed, regional managers agreed that it represented a tracer activity for MCH care generally.

The checklists established with health managers were used by trained field workers, working in three-person teams and observing health workers in each unit for one week. Field workers were recently qualified medical assistants, introduced as researchers to health unit staff, who received two weeks of training, including class-based clarification of each checklist and practical experience of their use in health units similar to, but excluded from, the sample units. Each member of each team was assigned to a particular activity and retained that assignment throughout the period of field work. Table 4.2 outlines the expected number of observations, and sampling procedure, by activity; Appendix 4F presents the final sample sizes by procedure for each health unit.

Review of ante-natal recording practice was slightly different from other assessments, being based on interview not observation. It was introduced because the numbers of ante-natal consultations observed were expected to be low; and it allowed assessment of the past practice in ante-natal consultations as well as record-keeping practice in monitoring pregnant mothers. Mothers were interviewed to take a second history (answers were then compared against records), and to assess the mother's knowledge of her condition against information contained in the card. Finally, the cards were examined to see what other information about the process of providing ante-natal care had been recorded. A checklist, similar to the others, was used to guide the interviews and allow comparison of mothers' answers with recorded information.

Good performance for each procedure, including ante-natal records, was further codified through a

Table 4.2: Process quality assessment details

ACTIVITY/ PROCEDURE	NUMBER OF EXPECTED OBSERVATIONS	COMMENTS
1.ANTE-NATAL CARE * consultations	as many as possible	100% sample; assessment only possible in 17 health units; sample size range=6-33
* record card	as many as possible	review announced by authorities in each village served; interviews of every mother that came; not random sample; sample size range=7-44
2. CURATIVE CONSULTATIONS * general	up to 100 observations	systematic sample drawn from randomly selected times of day, each day of week; the third patient and then every second patient observed in each period; not always possible to achieve expected number of observations; sample size range=40-118
* fever in children (under 10 years)	as many observations as cases presented among sample of all consultations	random sample; sample size range=6-30
3. NURSING CARE * injections & dispensing	* up to 50 each	systematic sample drawn from randomly selected times of day, each day of week; the third patient and then every second patient observed each period; injection sample size range=13-50; dispensary sample size range=28-50
* sterilization & dispensing cleanliness	* daily (i.e. 6 each)	100% sample from week of field work; sterilization sample size range=1-6; dispensing cleanliness range=4-6

scoring system, itself reviewed and finalized by health managers. Each action in each procedure was assigned a specific score (e.g. 1 correct, 0 not undertaken) and some actions were assigned higher scores because deemed to be of particular importance. From the actual score across all actions, an overall percent score (percent of maximum possible) was calculated for an individual observation. Performance in each procedure for each health unit was then assessed in two ways: using median values and inter-quartile ranges drawn from all observations, and using pre-set professional standards. Observations scoring more than a required percent (the observation standard) were deemed acceptable and the proportion of total observations in each procedure judged as acceptable was then determined; finally, this proportion was assessed against unit standards (percent ranges) to determine whether the health unit's overall performance was good, average or poor. Observation standards were 80% for all curative procedures and 75% for ante-natal procedures. Unit standards were the same for all procedures: if 75% and over of all observations of the procedure within a health unit were judged as

acceptable, overall unit performance was also good; if 50% to 75% of all observations were acceptable, performance was adequate and if less than 50% of all observations were acceptable, performance was poor. These standards were applied both to overall scores and to scores for sub-groups of the expected actions.

Analysis by sub-group allowed a clearer overview of the strengths and weaknesses of each procedure, important in determining the actions required to improve performance. Three additional analyses of the data were undertaken:

1.   based on a minimum care level: established by identifying which actions within the total list are essential in order to avoid providing dangerous care; these actions all scored 1 if performed, assuming all were equally important; observation and unit cut-off standards were set at 100%; the child fever consultation checklist itself represented a minimum level.

2.   based on performance in process aspects: sub-groups of the overall checklist representing different stages in the process of giving care e.g. history-taking, examination, diagnosis, and medication within a curative consultation.

3.   based on performance in care aspects: sub-groups of the overall checklist, representing technical, record-keeping and inter-personal skills (note: the child fever checklist contained only technical actions).

The full checklists, the range of process and care aspects considered for each procedure and the actions within the different sub-groups are presented in Appendices 4G and 4H.

Two supplementary assessments of curative consultation practice were also undertaken, and are briefly reported. Prescription practice, determined from information collected during observations concerning diagnosis and drugs prescribed, was reviewed by two clinicians using the national treatment manual (MOH 1987). Initially working independently, their joint decision was taken as the final judgement on prescription accuracy. Patient knowledge of drugs received - a reflection of consultation and dispensing practice - was assessed by interviewing patients as they left the health units.

Methodological assessment in Chapter 7 considers the reliability of the observation findings, the use of professional standards and the impact of altering the implicit weights between care aspects on assessments of process quality. Study findings are also used to consider how checklists might be reduced to facilitate their use as regular monitoring tools.

4.4   Assessment of community satisfaction

Community satisfaction was the only form of outcome considered in this study, reflecting not simply the inter-personal skills of health workers but also perceptions of broader community involvement in the health care process. The study's implicit assumption that community views should be respected reflects the democratic principles of Tanzania. Rather than using questionnaires to measure satisfaction ratings, community expectations of, and experiences with, available health care were explored primarily through qualitative methods - as a basis for broad assessments of satisfaction.

Field workers involved in this assessment were development workers from the district level, from health, agriculture and community development sectors. They were trained over a two week period, initially through class-based discussion of the work and methods (including role-playing exercises). A second period of training involved field-based experience, under supervision.

For data collection, pairs of field workers visited each village for one week and undertook a range of discussions using prepared method and question guides (Appendix 4I):

*   3-6 interviews with key informants within the village, such as village chairman, traditional healer, traditional birth attendant, chairperson of women's organization, respected elder, religious leader, chronically ill person, very poor person. Informants were selected by field workers after review of each village's circumstances: the presence/absence of traditional healers and midwives, importance of religious groups and presence of women's organizations. Some informants, such as well-respected elders, were also identified through other discussions within the community. Most interviews were undertaken by one person, who both conducted and reported the interview.

*   3-6 focus groups discussions with a range of groups within the village, such as ordinary mothers living in different areas of the village, village council, groups of healers. Discussions were organized by field workers who collaborated with village leaders in securing representation from all parts of the village, but ensured that leaders were not involved in respondent selection or discussions. Each discussion was guided by one person, with a second taking notes; tape recorders were also used to record discussions.

*   20 interviews of mothers were undertaken using a standard questionnaire; households were selected randomly from different parts of the village by visiting each village water source, spinning a pencil and then interviewing a random selection of households in the direction the pencil pointed. Only a few households were selected from each area as the total number required per village was small. Each interview was undertaken by one person.

*   field workers involved mothers and school-children (standard six or seven pupils) in the research, when possible, by encouraging groups of them to ask their friends and neighbours about some of the issues and to report back on these conversations.

*   field workers also undertook informal conversations and made informal observations to cross-check information obtained through other methods.

The variety of topics reviewed in these discussions included:
* health resources available to villagers;
* health problems within the village;
* beliefs about disease causation ;
* perceptions of the dispensary mostly used by villagers - with special reference to drugs and maternal care;
* perceptions of preventive care (allopathic and traditional);
* perceptions of traditional care available - healers and birth attendants;
* perceptions of the main referral unit - health centre and/or hospital;
* patterns of resource use and the factors influencing those patterns;
* perceptions of the cost of obtaining health care and willingness to contribute in some way to supporting the local dispensary.

Field workers prepared nightly reports of their discussions using a pre-set format, which required both records of discussions and identification of interviewees' behaviour (for example, to indicate common agreement within a group or lone views, or disruptions that may have influenced the discussion). During their stay in each village, field workers received at least one supervision visit on an unspecified day. These visits were used to address both practical problems, such as field worker illness, and to monitor the research activities.

Data analysis involved a process of review and summary against the pre-identified topics, starting with village summaries and moving to: summaries against key issues across all villages, identifying commonly-held and strongly-expressed opinions; contrast of views between villages served by the same dispensary; comparison of views between villages served by government and by diocesan dispensaries. Direct quotations serve to illustrate the points made in discussions and additional descriptive statistics are drawn from analysis of household questionnaires.

Methodological assessment in Chapter 8 considers the reliability of the data and the potential value of the assessment procedures as regular, monitoring tools.

4.5   Quantitative data analysis procedures

Data analysis procedures allowed, for each sub-study, review of individual health unit performance and comparison of performance between dispensaries and health centres, between government and diocesan dispensaries and, where possible, between district groups of government dispensaries. The assessment of variance both within and between units and unit groups was of especial importance, as explanations of variation can help to determine appropriate action to strengthen performance.

Quantitative analysis of costs, structural quality and process quality used various exploratory data analysis procedures (Tukey 1977) rather than the statistical methods used in testing hypotheses. This approach reflects the exploratory nature of the overall evaluation - seeking to assess current health unit performance but making no prior assumptions about the factors influencing performance. For example, neither diocesan dispensaries nor health centres were assumed to be of different cost or quality levels from government dispensaries, rather the study assessed whether such differences existed and then sought to explain them. Such an exploratory approach to data analysis facilitated clear identification of existing patterns and levels of performance. For example, use of the median rather than the mean allowed fairer reflection of overall unit (over a number of observations), or unit group (over a number of units), performance because it is unbiased by unusually high/low points. Its use was based on the assumption that neither exceptionally good nor bad observations/units should influence overall assessment of cost or quality performance in any unit/unit group. The measure of variance associated with the median, the inter-quartile range, reflects the span of the middle 50% of a data set and is the difference between the first and third quartiles (Caswell 1989). It is referred to here as the central range.

Non-parametric statistics were determined from quality assessment data because these data were not normally distributed and were, at best, ordinal (Siegel and Castellan 1988). Similar approaches were, therefore, applied to analysis of cost data although these data were continuous and more normally distributed, to ensure uniformity. Non-parametric statistical procedures used included the Kruksal-Wallis test (analysis of variance, group differences) and the Spearman rank-order correlation coefficient (process quality assessment) (Siegel and Castellan 1988). Pearson's coefficient of correlation was also used in the cost analysis and multiple regression techniques were applied to the combination of cost, utilization and quality data in order to develop a cost function. In analysis, monetary values were rounded to the nearest shilling (Tsh), percentages to 1 decimal point, coefficients to 2 decimal points and p values to 3 decimal points.

4.6   Summary

This chapter has discussed the selection of the country and region selected for this research. Tanzania is an example of other countries in sub-Saharan Africa and has been a leader in the field of health policy development. The Morogoro region is varied in topography and climate, providing a mixture of conditions typical to the country, contains health units of different types, allowing comparison of their performance, suffers from health problems typical of the whole country and has slightly above average access to health care.

The stratified sampling procedures of the study aimed to allow comparison between different administrative districts, government and voluntary agency health units and health units at different levels of the system. They ensured that each sub-study included health units also assessed in other sub-studies. One-third of the region's dispensaries, and one-quarter of the region's health centres were selected for analysis of costs and structure; smaller numbers were reviewed in analysis of process quality and community satisfaction.

The research methods used in each sub-study drew on recommended practice, adapted where necessary to the conditions of the Morogoro region and developed in collaboration with regional health managers. The evaluation instruments used in the study are presented in appendices.

Qualitative data analysis procedures were used in analysing informal community discussions. Quantitative data analysis was exploratory in nature and sought to assess current health unit performance without making prior assumptions about influential factors.

CHAPTER FIVE:
RESOURCE USE AND COST ANALYSIS

The findings concerning physical resource use and costs are presented in this chapter, together with discussion of the factors influencing them. The chapter's first sections reflect the three groups of issues shown in Chapter 1 to have most influence over efficiency (resources available, resource combinations, and utilization levels), considering their cost implications. It directly complements, for example, Chapter 7's assessment of the structural quality implications of available resources. Average cost results are then presented and explanations for their variation between health units in the context of the Morogoro region are discussed. An estimated cost function is presented in section eight, and used to consider scale efficiency. Conclusions are drawn concerning both influences over costs and issues for further consideration in later chapters, and the study's methodology is then assessed. The tables and graphs presented in the text are supplemented by those of Appendices 5A-5C.

5.1 Resources available: overall expenditure levels and patterns

5.1.1 Total expenditure levels

Health centres are larger in physical size, have more staff, access to more drugs and are expected to provide a greater range of services than either government or diocesan dispensaries. Not surprisingly, therefore, health centres were the most expensive type of unit: their median total cost (3,257,561 Tsh) was 4 times that of government dispensaries (748,866 Tsh) and 6 times that of diocesan units (535,108 Tsh). Total cost by activity also indicated this dominance (Appendix 5A):

* diocesan:health centre total cost ratios varied from 1:3 for immunization, to 1:8 for ante-natal/child welfare services and delivery care;
* dispensary:health centre total cost ratios by activity were mostly steady at 1:3 or 1:4, rising to 1:15 for delivery care.

Despite similar roles within the health system, government dispensary total expenditure significantly exceeded that of diocesan dispensaries, both overall (p=0.005) and for all activities except deliveries and in-patient care (p$\leq$0.001 in each case). Total cost patterns do not appear to be related to structural quality findings (Chapter 6): health centre structural performance was no better than dispensaries', and for some activities clearly worse, than the cheaper units; despite higher total costs, government dispensaries had significant structural weaknesses when compared to diocesan units.
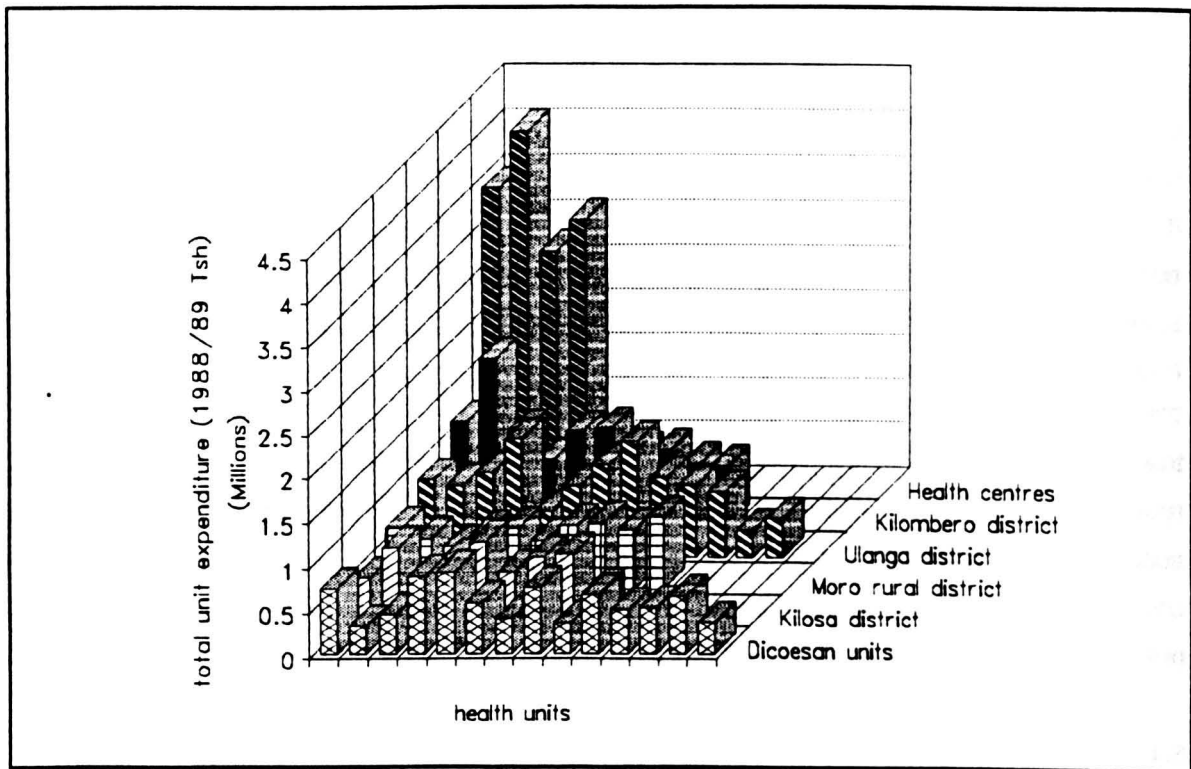
Figure 5.1: Total expenditure by unit and unit group (1988/89 Tsh)

Total cost differences within unit groups ranged from a minimum to maximum ratio of 1:1.5 for health centres to 1:3.1 for diocesan units and 1:5.5 for government dispensaries. Within the government dispensary group, Kilombero and Ulanga district total costs were, generally, higher than the other two districts (Figure 5.1).

5.1.2   Expenditure by activity: services available

In expenditure terms, the dominant activity across all health unit types was basic curative care (Figure 5.2, Appendix 5A). Immunization services were also important to dispensaries, but maternal care (ANC/CW and delivery services) captured the lowest shares of total dispensary costs. The activity profile of health centres was quite different from dispensaries, as basic curative care expenditure was offset by expenditure on in-patient and delivery services. The overall balance between general curative (outpatient care together with delivery and in-patient care) and preventive expenditure (ANC/CW, immunization and other programmes), therefore, varied from approximately four fifths against one fifth in health centres, to three-quarters against one-quarter in diocesan dispensaries and two-thirds against one third in government dispensaries. The greater weighting given to curative care in health centres is not surprising given the different expected functions of the two health unit types, possible differences in severity and case mix and the greater resource requirements of curative care. Overall,
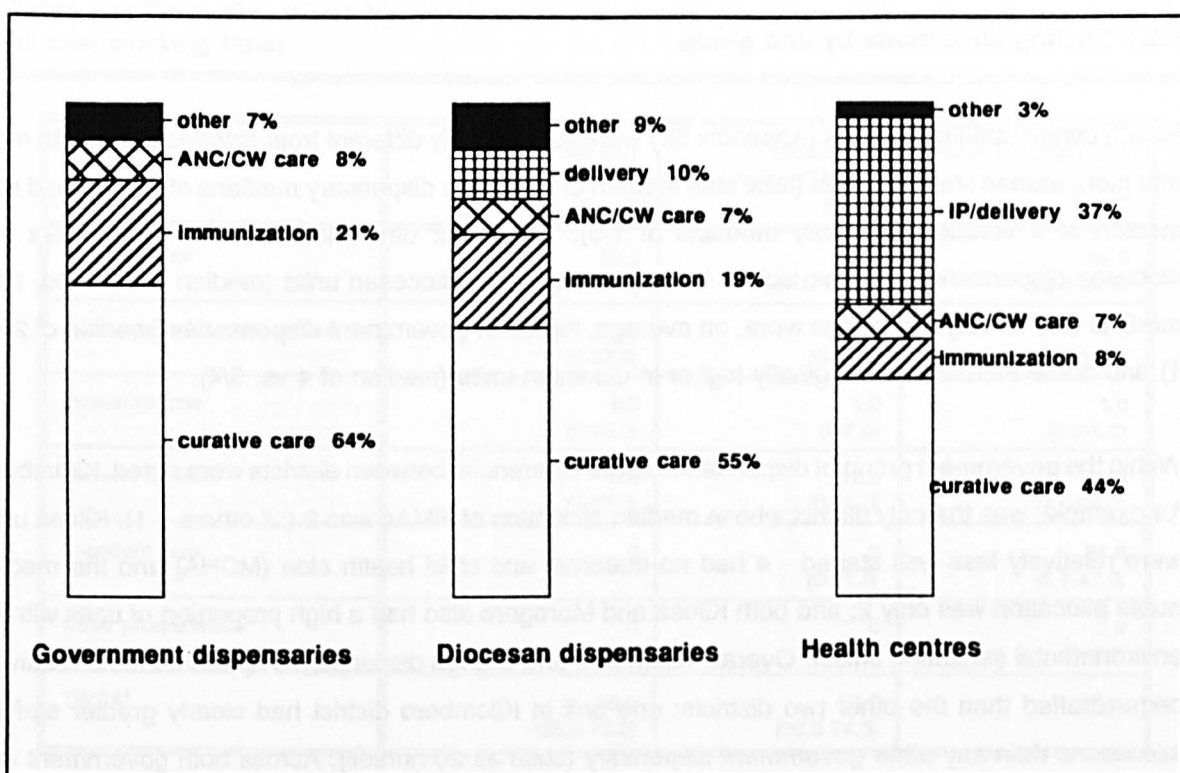
Figure 5.2: Activity shares of total expenditure, by health unit group (median values, %)

the greatest potential source of savings from efficiency improvements lay within basic curative care across all unit groups, with immunization services an important source for dispensaries.

A closer look at cost profiles highlights weaknesses in service availability, predicting structural quality assessment. For example, as a result of a shortage in trained MCH staff, four government dispensaries and one diocesan unit did not provide MCH services at all; and relatively low expenditure on environmental sanitation and family planning (combined in other programmes) is likely to have undermined the effective provision of primary health care. The greater overall dominance of curative services within diocesan, as compared with government, dispensaries shown in cost profiles also indicates their generally weaker provision of preventive care.

5.2   Resources available: personnel and curative drugs

This study's assessment of personnel allocations and time use was initially based on data collected through interview; additional information, collected from self-completed time logs, was used to cross-check patterns. Drug costs were, similarly, validated by comparing stock-based with prescription-based estimates (Chapter 4).

5.2.1 Staffing allocations by unit group

Health centre staffing patterns (Appendix 5B) were substantially different from dispensaries - with more and more trained staff available (total staff median of 21 versus dispensary medians of 5-8; trained staff median of 9 versus dispensary medians of 1-3). The major difference between government and diocesan dispensaries was the lack of trained MCH staff in diocesan units (median of 0). Also, rural medical aide (RMA) allocations were, on average, higher in government dispensaries (median of 2 vs. 1) and nurse allocations, marginally higher in diocesan units (median of 4 vs. 3/4).

Within the government group of dispensaries some differences between districts were noted. Kilombero, for example, was the only district whose median allocation of RMAs was 2 (all others = 1); Kilosa units were relatively less well staffed - 4 had no maternal and child health aide (MCHA) and the median nurse allocation was only 2; and both Kilosa and Morogoro also had a high proportion of units with no environmental sanitation officer. Overall, Kilombero and Ulanga dispensaries appeared to be relatively better staffed than the other two districts; one unit in Kilombero district had clearly greater staffing allocations than any other government dispensary (such as 20 nurses). Across both government and diocesan dispensaries, there was greatest variation in the numbers of nurses allocated to health units (government min:max ration of 1:20 and diocesan, 1:3.5). Differences in staff availability between units of the same group question whether staff allocations were rational and fair.

Figures from the validation survey (Appendix 5B) suggested slightly lower staff availability by unit group, particularly for nursing staff, apparently indicating that staff allocated to health units were not continuously available within them. For example, one government dispensary with a full staff complement of RMA, MCHA and 2 nurses was operated during the survey period by only the MCHA; other staff were either on approved leave or simply did not show up for work.

5.2.2 Personnel allocations by activity

Overall health unit time allocations (Table 5.1) and full time staff equivalent (FTSE) allocations (Table 5.2) confirm the picture of service availability presented by activity cost profiles (curative care dominated both expenditure and time/staff allocations; health centres had a different profile to dispensaries). FTSE allocations were determined from data concerning staff available and time use, for all staff.

Time allocations by cadre (Appendix 5B) also emphasize that the work of health unit staff could more appropriately be described as covering only basic curative care and the basic maternal and child health services; outreach, for example, was hardly provided. It is also noteworthy that the two groups of trained staff, RMAs and MCHAs, were mostly uninvolved in the other's area of work - suggesting that

Table 5.1: Time allocations by activity and unit group[1] (median, minimum and maximum, % of total working time)

ACTIVITY	GOVERNMENT DISPENSARIES[2] (n=40)	DIOCESAN DISPENSARIES (n=14)	HEALTH CENTRES (n=3)[3]
Curative care	68.5 (44.0-100.0)	64.0 (31.0-100.0)	32.0 (23.8-60.9)
Ante-natal/child welfare care	17.0 (0-37.0)	6.0 (0-49.0)	7.6 (3.7-13.0)
Immunizations	5.0 (0-19.0)	1.0 (0-7.0)	1.0 (0.6-1.2)
Delivery service	5.5 (0-37.0)	10.0 (0-38.0)	18.3 (7.0-34.7)
In-patient care	0	0 (0-51.0)	31.8 (8.7-47.0)
Other programmes	0 (0-11.0)	0	3.9 (0-4.9)
TWSA[4]	58.0 (25.0-78.0)	56.0 (38.0-74.0)	no figs

NOTE: 1. Total hours by activity calculated as percent of total working hours
2. There were no significant differences in time allocations between districts, for government dispensaries.
3. Information of sufficient detail only available for 3/4 health centres
4. Time without specific activity = the difference between total hours worked (excluding deliveries) and total daytime expected working hours in a year, calculated as a percent of total daytime expected working hours; data weaknesses undermined calculation of the proportion for health centres; district median (and full range) proportions were: Kilombero 58.0% (34-78%), Kilosa 53.5% (25-70%), Morogoro rural 58.0% (38-68%), Ulanga 59.0% (39-65%).

curative and MCH services were not as integrated as national policy required. Although nurses were predominantly engaged in providing curative care, time allocations also indicated their involvement in MCH services.

Significant differences in the time use patterns of staff working in diocesan and government dispensaries (Appendix 5B) indicated that diocesan MCHAs focused their activities on curative care and diocesan nurses, on immunizations, delivery and in-patient care, in contrast to their government colleagues. FTSE comparisons (Table 5.2) indicated that diocesan dispensaries had lower FTSE allocations across all activities except deliveries; and these differences were significant except for curative care and other programmes ($p \leq 0.01$). Health centres again had a different allocation pattern, with higher than dispensary FTSE allocations across all activities except immunization. District FTSE data _ _ _ reflected staff allocation findings and indicated that dispensaries in Kilosa district functioned with lower staff allocations than other districts across most activities, whilst Kilombero district had generally higher allocations. Significant differences between districts were found for curative care

(p=0.003) ANC/CW (p=0.020) and immunizations (p=0.000).

Table 5.2: Full time staff equivalent allocations per activity and unit group, median, minimum and maximum (staff numbers)[1]

ACTIVITY	GOVERNMENT DISPENSARIES (n=40)	DIOCESAN DISPENSARIES (n=14)	HEALTH CENTRES (n=4)
Curative care	4.00 (1.50-23.00)	3.19 (1.90-5.90)	6.96 (4.63-8.87)
Ante-natal/child welfare care	1.14 (0-6.70)	0.31 (0-2.10)	3.00 (1.61-3.68)
Immunizations	0.52 (0-2.40)	0.05 (0-1.20)	0.23 (0.22-0.48)
Delivery	0.27 (0-2.70)	0.47 (0-2.60)	2.59 (1.13-7.21)
Other programmes	0 (0-1.40)	0	0.34 (0-1.23)
In-patient care	0	0[2] (0-3.70)	5.12 (1.42-7.47)

NOTE: 1. Rounded to 2 decimal points
        2. Median value of those providing in-patient care was 1.72

Validation data confirmed the curative care dominance in time and FTSE allocations (Appendix 5B), although suggesting greater diocesan allocations to ANC/CW care and no time use for deliveries in government units. It seems likely that these differences reflected the particular utilization pattern of the survey week: some government units, for example, saw no ante-natal mothers and undertook no deliveries during that week.

Table 5.1 also shows that the proportion of the working year not allocated to any specific work (TWSA=time without specific activity) was generally high, over 50% in both dispensary groups. Differences between unit groups and districts in the TWSA allocation were not significant (p=0.744 and 0.466 respectively). These findings are complemented by findings regarding staff use from assessment of structural quality. Although it was found that the required staff were generally available in dispensaries, even for night emergencies, less than 50% of total staff time was given to preventive services and all staff had over two hours a day in unspecified activities. Findings from the validation survey confirm the level of TWSA allocations in diocesan units (around 50%), but suggest a considerably lower allocation to TWSA in government units: 35% rather than 58% (Appendix 5B). The survey, in contrast to the interview, allowed staff to record the time they spent in administrative tasks

such as record-writing, preparation and cleaning; lower TSWA figures may, therefore, partly reflect this time use which was included as TWSA in the original figures. More importantly, the validation survey was undertaken during a week of drug availability for government units when utilization levels were relatively high (and TWSA consequently low) - even then, roughly one-third of staff time in these units (from **self-reported** data) was indicated to be TWSA.

Overall, there appears to be considerable spare personnel capacity which could be used to enhance technical efficiency.

5.2.3 Curative drug costs

Drug cost estimates were initially determined from stock records for the period June 1988-July 1989; a second estimation procedure used prescription records from patient registers to determine both total and per contact costs for 1989/90, as patient registers were not available for 1988/89 (Chapter 4). The initial cost estimates were first compared with 1989/90 stock-based cost estimates to assess the validity of inter-year comparisons. The initial estimates were then compared with prescription-based costs for 1989/90; and, finally, stock-based and prescription-based cost estimates for 1989/90 were compared.

Validation of diocesan drug costs was difficult because of poor stock records and the original use of accounts data; for one of the four sample units patient registers were missing. Analysis suggested that no common pattern of under or over-estimation was evident in the other three units. Only two health centres were assessed; in both the initial per contact cost was about four times the 89/90 stock-based estimate and, respectively, 4 and 2.5 times the 89/90 prescription-based estimate. Part of this difference between years can be explained by the exclusion (due to lack of data) of in-patient costs from the 89/90 estimates. However, there would still appear to be a shortfall between figures from the two years and there was an even greater difference between stock- and prescription-based estimates for 89/90: stock-based per contact costs were 17 and 11 times prescription-based costs in the two centres.

More wide-ranging comparisons were possible for government dispensaries, as shown in Appendix 5C. Overall, initial per contact costs were within 10% of 1989/90 stock-based estimates in 9/14 units, suggesting that it was reasonable to compare cost estimates between years. Initial per contact costs were within 20% of 89/90 prescription-based estimates in 7/14 units - and were at least 20% above the latter in 5/14 and at least 20% below, in 2/14. The similarity between cost estimates from the initial and subsequent analyses in half the dispensaries at least partly validates the initial cost estimates.

However, as for health centres, comparison of 89/90 stock-based costs with 89/90 prescription-based costs identified 7/14 units in which the stock-based per contact cost was over 50% higher than that

calculated on the basis of prescriptions. These findings appear to suggest not only that recording practice of both stock records and patient registers was poor, but also that drug wastage was fairly high in at least half the units. Prescription-based costs only considered those drugs actually prescribed to the patients, ignoring expired drugs and the possibility of drugs being sold and not recorded. Poor recording practice is not unusual in developing country primary health units; however, because the essential drugs programme (EDP) has given strong emphasis to monitoring overall drug use and record-keeping, it may be limited in Tanzania. Process quality results, for example, showed good record-keeping practice (Chapter 7). Given also that the size of the differences in cost estimates between stock and prescription per contact costs for 1989/90 ranged from -25% to 100% it seems unlikely that they were only caused by record-keeping errors. Rather, as identified in assessment of community satisfaction (Chapter 8), illicit drug sales seem likely to have underlain the differences.

These findings partially validate initial drug costs whilst indicating the difficulties of accurately costing this input. More importantly, they point to drug wastage within health units as a problem of current resource use patterns, like personnel wastage.

5.3   Resource combinations: cost profiles by input items

Two groups of cost profiles were examined in considering the aspects of resource combination that may affect both efficiency and quality: the relative share of input items in total health unit expenditure and in each activity (Appendix 5A).

Of capital input items, buildings generally accounted for the largest share of total expenditure (group medians of 4.0-11.5%) - except for health centres, for which car costs were most important (11.5%, predominantly captured by in-patient and delivery programmes in reflection of vehicle use patterns). Building costs were particularly important to ANC/CW care across all units as a result of the large area allocated to growth monitoring activities; delivery building shares were also relatively important. Equipment shares varied between unit groups but were generally important within immunization services due to the cold chain requirements (group medians of 5.5-12.0%).

Significantly greater proportional diocesan expenditure on most capital inputs compared to both dispensaries and health centres reflects the availability of spacious buildings and equipment - the legacy of their overseas founders. Some also benefitted from the continued maintenance of buildings through local or overseas donations. The differences were particularly great for delivery care and in-patient care.

Recurrent expenditure, not surprisingly, dominated all activities in all groups, and among the recurrent
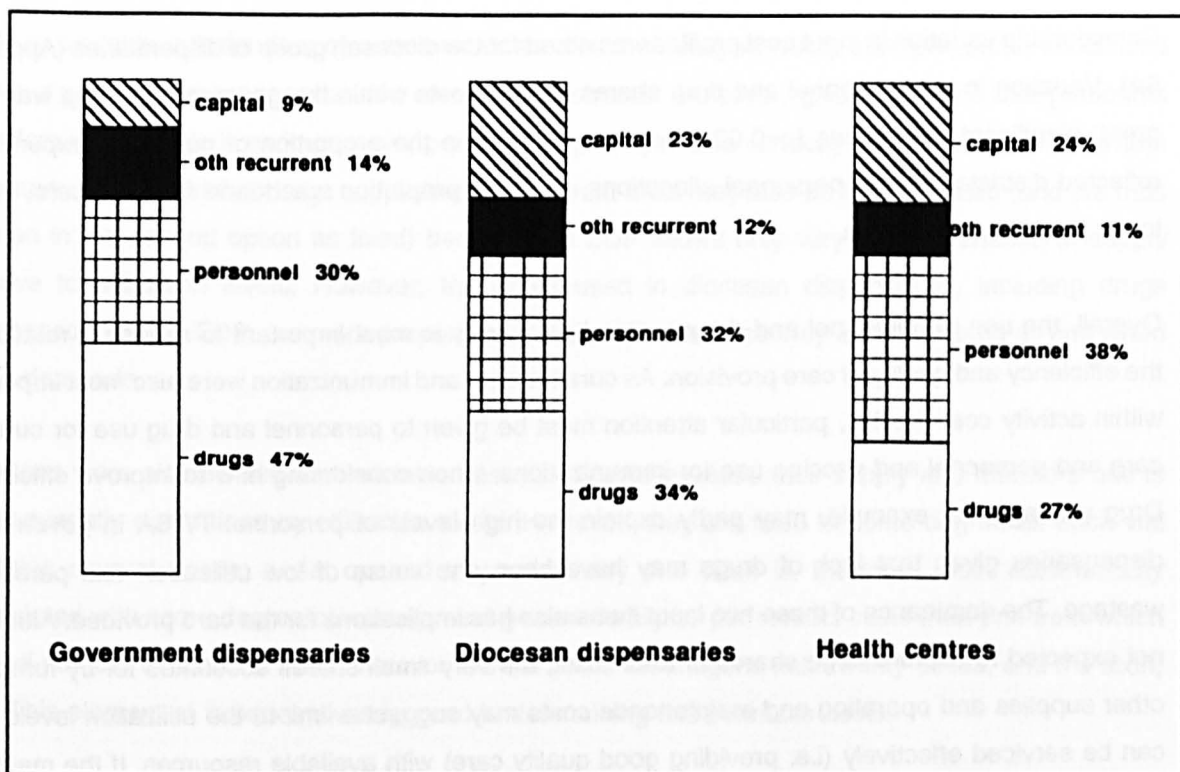
Figure 5.3: Input shares of total expenditure, by unit group (median, %)

inputs, personnel and drugs accounted for the greatest proportion of total costs overall (Figure 5.3) and across all activities. Personnel costs were particularly important within ANC/CW care, delivery care, other programmes and in-patient activities; whilst drug costs were particularly important to curative care and immunization services. Personnel costs were also more dominant within health centres than dispensaries, capturing a higher share of total expenditure than other unit groups for all activities except curative care (diocesan greater median share), and immunizations (government greater median share). At least partly as a result of this personnel dominance, overall drug expenditure was lower in health centres relative to other units.

Total expenditure on other supplies and operating and maintenance generally fell under 5% for all unit groups and activities; however, regular supply of kerosene through the expanded programme of immunization (EPI) generated relatively high proportions for operating and maintenance expenditure for immunization services. Supervision and in-service training (together equalling 'support') captured only small shares of total unit expenditure: training 1.0-2.0%; supervision 2.5-7.0%; together only 3.5-8.0% (based on unit group medians). This level of expenditure reflected the weaknesses of support performance found in assessment of structural quality (Chapter 6). Higher supervision expenditure for immunization across all unit groups indicated the expenditure impact of the regular visits of district cold chain officers to deliver immunization supplies.

Considerable variation in input cost profiles was noted for the diocesan group of dispensaries (Appendix 5A). Variation in the personnel and drug shares of total costs within the government group was also great; significant differences (p=0.026) between districts in the proportion of personnel expenditure reflected districts' relative personnel allocations. A higher proportion was found for Kilombero, and a lower proportion for Kilosa.

Overall, the use of personnel and drugs within health units is most important to assess in relation to the efficiency and quality of care provision. As curative care and immunization were also most important within activity cost profiles, particular attention must be given to personnel and drug use for curative care and personnel and vaccine use for immunizations, when considering how to improve efficiency. Drug wastage, for example, may partly explain the high levels of personnel TWSA in government dispensaries given that lack of drugs may have been one cause of low utilization and personnel wastage. The dominance of these two input items also has implications for the care provided. Although not expected to capture large shares of total costs, the very small shares accounted for by furniture, other supplies and operating and maintenance costs may suggest a limit to the utilization levels that can be serviced effectively (i.e. providing good quality care) with available resources. If the matches and kerosene required to sterilize syringes and needles are sometimes not available, for example, the relevant injectables will be used incorrectly or not at all. Capacity constraints on improving efficiency may result not only from limits on the availability of the major input items, but also from their dominance within resource combinations and the implications of this dominance for quality.

5.4   Resource combinations: fixed and variable costs

Analysis of the fixed/variable combination of input items is particularly helpful in considering the degree of local influence over efficiency (Chapter 2). The greater the variable proportion of total costs, the more flexibility local managers have in managing resources in the short term to improve efficiency and influence quality of care. By contrast, the major influence over the productivity of fixed cost inputs is utilization and although management action to influence utilization levels is possible, it requires consideration of service delivery strategies rather than resource allocations and use.

5.4.1 Definitions

Two definitions of fixed cost were used in this analysis. Under the first, support (supervision and in-service training) and personnel were included with capital input items as fixed costs. Under the second, curative drug costs were added to the group of fixed costs.

Support (supervision and in-service training) is independent of output levels; personnel costs are also

likely to be fairly independent of output levels as district managers rarely alter personnel allocations within a year due to managerial and resource constraints. However, given evidence that personnel transfers are possible in serious cases, personnel is perhaps more correctly called a semi-variable item (Berman 1986). Curative drugs supplied to government units may also be semi-variable (and are thus treated in the second option as fixed) because the EDP allows only very limited variation in supply relative to utilization levels. However, the drugs used in diocesan dispensaries, including drugs purchased from the EDP, are more properly a variable input because they are purchased as and when need demands.

Vaccines were also treated as a variable cost for all units because their supply and therefore use is predominantly determined by utilization levels. However, they are fixed to some degree as each vial contains several doses; a vial opened to provide only one dose is, therefore, both automatically associated with some degree of wastage and generates higher per contact costs than one from which the full number of doses is used. Vials for five out of the six antigens held twenty doses, and the sixth, ten. This element of fixedness was ignored in determining fixed/variable costs.

5.4.2 Variable/fixed combinations by activity and group

Table 5.3: Fixed proportion of total costs, by activity and option (unit group medians, %)

ACTIVITY	UNIT	CUR	ANC/CW	IMM	DEL	OTH	IP
UNIT GROUP	option 1/option 2						
Govt Dispensaries (n=40)	47.0/ 94.5	41.0/ 96.0	97.0/ 98.0	37.0/ 37.0	85.5/ 100.0	85.0/ 100.0	n/a
Diocesan Dispensaries (n=14)	62.0/ 62.0	61.5/ 61.5	96.0/ 96.0	32.0/ 32.0	90.5/ 90.5	100.0/ 100.0	74.0/ 74.0
Health Centres (n=4)	63.5/ 96.0	50.5/ 95.0	96.5/ 97.0	25.5/ 25.5	89.0/ 92.5	94.5/ 99.0	77.0/ 87.0

Fixed costs dominated total costs for all health unit groups and activities (Table 5.3) and the inclusion of EDP drugs as a fixed cost (option 2) only enhanced the share of fixed costs within government dispensaries and health centres.

Review of fixed shares under both options indicates that ANC/CW services across all unit groups were most fixed and so least open to local manipulation of resources. The proportion of fixed costs within

curative care increased most between the two options, although changes were also noted for delivery and in-patient care; flexibility in managing curative care was particularly reduced by the inclusion of EDP drugs as a fixed cost. The dominance of variable costs within the immunization total may appear surprising given the substantial fixed cost requirements of equipment for this activity. These results suggest that vaccine use was particularly important for the efficiency of immunization delivery.

Overall, the relative fixedness of both semi-variable inputs, drugs and personnel, and vaccines, is likely to have had a vital influence over management flexibility for all units and for individual activities within them. Differences between unit groups in their share of fixed and variable costs may indicate that management flexibility varies by group, with greater flexibility for diocesan units.

5.5   Utilization patterns

Table 5.4: Utilization levels by activity and unit group, median and range

CONTACTS BY ACTIVITY[1]	GOVERNMENT DISPENSARIES (n=40)	DIOCESAN DISPENSARIES (n=14)	HEALTH CENTRES (n=4)
Curative	17,576 (9,300-37,650)	6,866 (2,874-21,317)	34,960 (22,478-68996)
ANC/CW	5,304 (1,509-13,551)	3,004 (1,542-6,585)	12,319 (8,610-32,327)
Immunization	2,244 (456-6,544)	1,250 (149-2,788)	5,185 (4,198-19,057)
Delivery	50 (3-256)	49 (22-181)	263 (156-372)
In-patient days[2]	n/a	358 (160-1,630)	2,954 (1,106-3,274)
In-patient admissions	n/a	90 (40-458)	1,264 (299-1,671)

NOTE: 1. Statistics determined only for those units actually undertaking each activity within each unit group.
2. Determined using unit group estimates of average length of stay.

Table 5.4 shows that health centre utilization levels were significantly greater than that of either group of dispensaries, for all activities (p<0.050). Utilization in government dispensaries significantly exceeded that in diocesan dispensaries for all activities except deliveries (p<0.050). Within the government group, the only difference of note indicated that a significantly lower number of deliveries was made in dispensaries in Kilombero district (Ulanga district greatest).

Further analysis sought to assess the influence of catchment populations and total cost (as a reflection of structural quality) on utilization. Scatterplot and correlation analysis indicated that catchment populations were associated with utilization levels: r=0.81 for all units and r=0.67 when health centres, which serve significantly higher populations (p=0.003), were excluded. Diocesan dispensaries had significantly lower catchment populations than government units (p=0.005). Total cost and utilization levels were also found to be associated, though slightly more weakly: r=0.77 for all units and r=0.56 when health centres were excluded. As total cost is determined by resource availability this finding may suggest that utilization was also associated with elements of structural quality.

As noted earlier, utilization in government units also varied during each month for the busier units, with greater utilization in the early part of the month in line with drug availability.

5.6   Average cost comparison

The contact over which average costs were calculated varied with activity: per visit for curative care and ANC/CW, per immunization, per delivery and two values, per in-patient day and per in-patient admission for in-patient care. Two contact types were used for in-patient care because the paucity of data required that standard average length of stay figures were used to determine patient day numbers for some

Table 5.5: Total cost per contact by activity, unit group medians and means (1988/89 Tsh)

ACTIVITY	GOVERNMENT DISPENSARIES (n=40)		DIOCESAN DISPENSARIES (n=14)		HEALTH CENTRES (n=4)	
	med.	mean	med.	mean	med.	mean
Curative care	28	28	39	40	47	43
ANC/CW	12	15	13	13	17	20
Immunization	77	104	91	146	52	47
Delivery	738	890	1,402	1,225	1,679	1,703
In-patient day			309	337	345	362
In-patient number			1,402	1,399	986	1,077

health units; patient admission numbers were always based on unit-specific data.Despite lower total costs, median and mean average costs were greater in diocesan than government dispensaries across all activities (Table 5.5); the differences were significant for curative care (p=0.003) and delivery care

(p=0.014). Health centre median and mean average costs exceeded government dispensary average costs for most activities, but were lower for immunization; the only significant differences between these groups were for delivery (p=0.012) and in-patient care. Health centres also had significantly lower immunization average costs than diocesan dispensaries (p=0.039) but no other differences by activity between the two groups were significant. Differences between median and mean costs were particularly noteworthy for immunization in the two dispensary groups, indicating some dispensaries had unusually high average costs for this service.

For government dispensaries, closer examination of differences between districts (Table 5.6) highlights, in particular, Kilombero's higher overall and curative average costs and Kilosa's lower ANC/CW and immunization costs; differences between districts were not significant for any activity. Variation in average costs within groups of health units was, however, considerable   . - from a low minimum:maximum ratio of 1:2.9 (diocesan, curative care) to a high of 1:16.6 (government dispensaries, delivery care). Variation in immunization costs was particularly great for government and diocesan units (1:11.1 and 1:13.2). Generally, variation was least for health centres, of which only 4 were assessed; but although there was little difference in the minimum:maximum ratio for either type of contact for in-patient care in diocesan dispensaries, in health centres the ratio based on in-patient admissions was about double that based on in-patient days i.e. 1:7.3 as opposed to 1:4.9.

Table 5.6: Total cost per contact by activity, district dispensaries' median and mean (1988/89 Tsh)

ACTIVITY	DISTRICT							
	KILOMBERO (n=10)		KILOSA (n=10)		MOROGORO RURAL (n=10)		ULANGA (n=10)	
	med.	mean	med.	mean	med.	mean	med.	mean
Curative care	32	33	26	26	26	26	26	27
ANC/CW	12	14	9	11	14	14	13	18
Immunization	88	92	49	59	88	116	107	129
Deliveries	725	784	868	886	651	1,170	703	696

Such variability in average costs and, by implication, economic efficiency within unit groups for individual activities requires further explanation. Six groups of factors are considered: the relationship between utilization and output, the prices paid for inputs, staff use, vaccine use, drug use and, in section 5.8, economies of scale.

5.7 Explaining the variation in average costs

5.7.1 The relationship between average costs and output
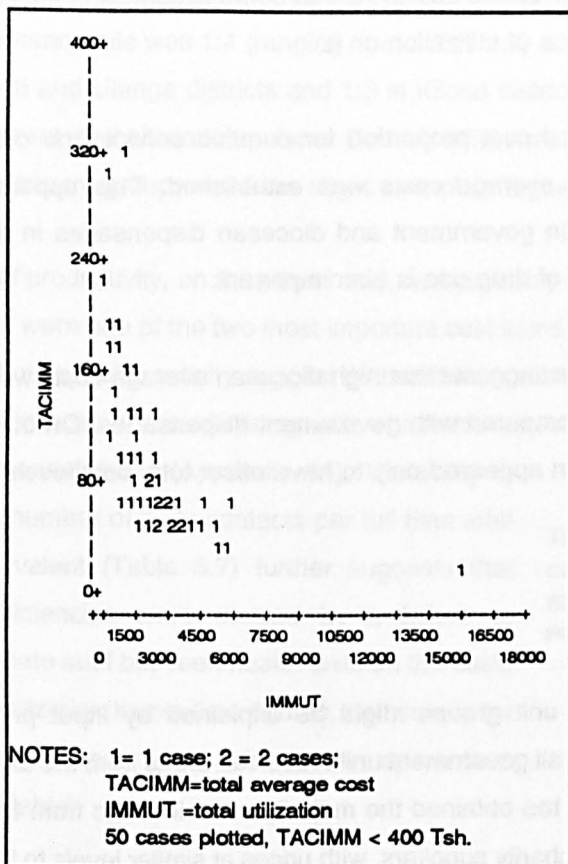
Figure 5.4: Scatter plot of immunization average costs and utilization
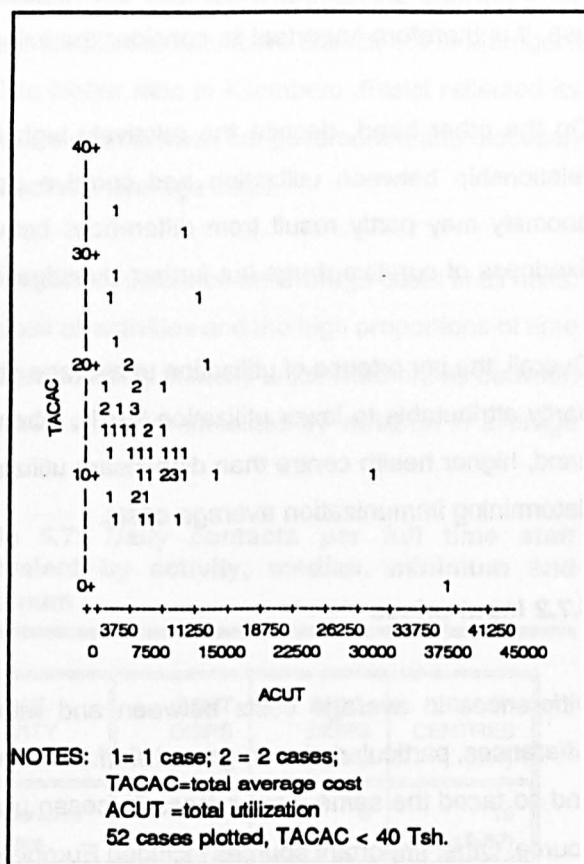
Figure 5.5: Scatter plot of ANC/CW average costs and utilization

Average costs were plotted against utilization for each activity to consider the relationship between the two, using only dispensary results because the significantly greater health centre utilization levels distort the curves. The curve for immunization services most clearly paralleled that suggested by economic theory (Figure 5.4), although there was some similarity between the curves of theory and reality for ANC/CW care (Figure 5.5); less similarity was noted for either curative or delivery care.

For immunization, the relationship suggests that immunization average costs may have reached their minimum point at around 60 Tsh per immunization (utilization levels of 3000 vaccines per year and over). Although costs did not rise after this point (indeed two points suggested even lower costs) they did appear to reach a plateau; by contrast, ANC/CW costs appeared to be more or less continuously falling within the range studied.

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The importance of utilization to ANC/CW average costs clearly reflected the high fixed proportion of ANC/CW costs. The immunization finding, however, suggests that despite its considerable variable proportion and the consequent potential of local managers to influence resource use, utilization was a major (possibly the major) influence over efficiency for this activity. Given some fixedness in vaccine use, it is therefore important to consider the influence of utilization on it.

On the other hand, despite the relatively high fixed cost proportion for curative services no clear relationship between utilization and curative care average costs was established. This apparent anomaly may partly result from differences between government and diocesan dispensaries in the fixedness of curative drugs but further investigation of drug use is also important.

Overall, the importance of utilization to average costs suggests that high diocesan average costs were partly attributable to lower utilization levels, when compared with government dispensaries. On other hand, higher health centre than dispensary utilization appeared only to have offset total cost levels in determining immunization average costs.

5.7.2 Input prices

Differences in average costs between and within unit groups might be explained by input price differences, particularly for drugs and staff. However, all government units received drugs from the EDP and so faced the same input prices. Diocesan units too obtained the majority of their drugs from this source. Other important sources included European charity suppliers, with prices at similar levels to the EDP; few drugs were obtained from more expensive commercial retailers.

Salary levels, on the other hand, did differ between unit groups. The minimum RMA salary estimate for diocesan units was 33,330 Tsh compared to minimum levels across districts ranging from 29,000 Tsh to 44,000 Tsh. Nursing staff in diocesan units earned considerably less than their government colleagues. Whilst less than 20% of the total number of diocesan nurses earned over 20,000 Tsh, resulting in a group average rate of around 17,000 Tsh, the vast majority of government nursing staff earned more than this level - rising to over 30,000 Tsh.

However, whilst these salary differences help to explain lower total diocesan costs, they do not explain higher diocesan or health centre average per contact costs.

5.7.3 Staff use

Staffing ratios may help to explain average cost differences, via different staff mixes. Differences in

staffing ratios between dispensaries and health centres, with employment of a more expensive staff mix in health centres, are likely to have partially explained greater health centre average costs. However, lower health centre immunization average costs contradicted the general finding. Diocesan and government units differed little in terms of staffing ratios. The average RMA:nursing staff ratio for diocesan units was 1:4 (ranging from 1:7 to 1:2) compared to 2:4 in Kilombero district, 1:4 in Morogoro Rural and Ulanga districts and 1:3 in Kilosa district. The higher ratio in Kilombero district reflected its different staff allocation pattern. Overall, differences in staff mix between the government and diocesan dispensary groups were too slight to explain higher diocesan average costs.

Staff productivity, on the other hand, was probably an important influence on average costs in all units: staff were one of the two most important cost items across all activities and the high proportions of time without specific activity suggest that staff were used unproductively in many units. Differences between health units in the efficiency with which this resource was used are indicated by variation in average personnel costs (Appendix 5A). Variability in the number of daily contacts per full time staff equivalent (Table 5.7) further suggests that inefficiencies were caused by a failure to allocate staff between health units on the basis of utilization levels (low figures, particularly for curative care, also point to the spare time available).

Higher diocesan contact numbers per FTSE for ANC/CW and immunization, when compared with government dispensaries, reflects the lower diocesan FTSE allocations to these activities (Table 5.2). Yet despite the greater productivity of diocesan staff in these activities, average costs were the same or higher in diocesan units. This finding may suggest that inefficiency was a necessary consequence of their providing the service at all, given comparatively low utilization levels. For immunization, however, it is also important to consider the influence of vaccine use, the other major input, over efficiency. The considerably greater productivity of health centre, over dispensary, staff in immunization services, appears likely to have been an important cause of lower health centre average costs for this activity. In contrast, health centre and diocesan staff productivity at the same or lower levels as government dispensaries were likely to have

Table 5.7: Daily contacts per full time staff equivalent by activity, median, minimum and maximum [1]

ACT-IVITY	GOVT DISPS (n=40)	DIOC. DISPS (n=14)	HEALTH CENTRES (n=4)
Curative care	19 (4-38)	9 (4-31)	19 (10-57)
ANC/ CW	16 (5-49)	21 (6-150)	21 (13-35)
Immun-ization	14 (2-148)	31 (9-240)	76 (44-328)
Delivery	0.6 (0.3-0.9)	0.4 (0.1-0.8)	0.4 (0.2-0.9)
IP day		1 (0.5-3)	2 (0.7-9)

NOTES: 1. Calculated on the basis of 264 working days/year, rounded to nearest whole number except where less than 1.

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underlain these groups' higher average costs in curative and delivery care (and health centre ANC/CW care).

Correlation analysis and scatterplots also suggested that staff and time allocations were not associated with utilization (health centres were excluded from the analysis because their larger staffing patterns and higher utilization levels had considerable influence over correlations). Although scatterplots did indicate some association between total curative staff and total MCH staff allocations and utilization, neither correlation was particularly strong: for curative staff $r=0.33$, for MCH $r=0.50$. Slightly higher correlations were found between ANC/CW and delivery full time staff equivalent figures and utilization, and these were higher than for curative and immunization services (Table 5.8). Whilst these findings may point to an association between staff allocations and utilization for some MCH activities, the evidence is not sufficiently strong to determine that staff allocations were clearly based on utilization levels. Correlations between total unit time allocated by activity and utilization (Table 5.8) confirm this conclusion. TWSA showed an even more limited relationship with utilization (correlation coefficients less than 0.4) i.e. allocation of time to unproductive activities was not clearly a consequence of either low or high utilization.

Overall, therefore, these findings suggest considerable scope for improving the productivity of personnel use by allocating staff (and time) on the basis of utilization levels. The potential impact on costs of improving personnel productivity is illustrated by comparison of health centre and government dispensary immunization personnel average costs: median values of 52 Tsh versus 77 Tsh, respectively. Substantially higher total personnel costs for health centres were offset in immunization by limited staff allocations to this activity combined with higher utilization levels: the staff available worked more intensively in health centres than dispensaries.

Table 5.8: Correlations between utilization, and full time staff equivalents and time allocations

ACTIVITY	CORRELATION BETWEEN UTILIZATION AND	
	FTSE ALLOC-ATIONS	TIME ALLOC-ATIONS
Curative care	0.39	0.51
ANC/CW	0.66	0.26
Immunization	0.38	0.61
Delivery[1]	0.75	0.78
IP days		0.53

NOTE: 1. The strength of these associations was probably primarily a result of using a standard time per delivery to determine the total time allocation.

5.7.4 Vaccine use

Vaccine costs were determined in this study from district supply records for each health unit and these records were also used to calculate overall wastage rates: an estimate of the proportion of total doses received (combining all vaccine types) that was not used in immunizing children.

High median wastage rates (Table 5.9) point to considerable problems in the technical efficiency of vaccine use, although minimum rates indicate that some units used vaccines efficiently. Differences between the groups were not significant but diocesan wastage rates were probably important causes of higher diocesan than government dispensary average costs, given greater diocesan staff productivity. Slightly lower rates in health centres also contributed to lower health centre than dispensary average costs.

Table 5.9: Vaccine wastage rates[1]

	GOVT DISPS (n=40)	DIOCESAN DISPS (n=14)	HEALTH CENTRES (n=4)
Median	O.70	0.69	0.64
Min:Max	0.1 - 0.9	0.1 - 0.97	0.0 - 0.8

NOTE: 1.Rates calculated over all types of vaccine on basis: (doses received-doses used)/doses received, rounded to 2 decimal points

Analysis of the link between utilization (total vaccines administered, any kind) and vaccine use (total doses received, any kind) generated a correlation coefficient of $r=0.67$. Utilization was an important influence over vaccine use. The correlation between utilization and wastage rates was even higher, $r=-0.71$. Removing two diocesan outliers, one low wastage and one high utilization, led the coefficient to rise even higher and when the dispensaries of individual districts were examined, the coefficient rose to $r=-0.99$ for Kilombero district (n=10). High wastage was associated with low utilization. Assessment of the association between catchment population and vaccine variables also generated coefficients of $r=-0.54$ for population/wastage and $r=0.70$ for population/vaccine use.

These findings suggest that the efficiency of vaccine use was enhanced at higher levels of utilization (as found in health centres) through reductions in wastage rates. Lower costs were also associated with greater catchment populations, presumably because utilization was also higher for these units. Provision of an immunization service in dispensaries with low catchment populations (such as diocesan units), therefore, necessarily involved relatively high vaccine wastage and poor efficiency. It might be justified either on the grounds of raising/maintaining coverage levels or of ensuring equal access to the service. Tanzanian policy also stresses that any child that comes to a health unit at any time must be vaccinated. However, the very high wastage rates found in this study are also likely to have reflected both carelessness and cold chain weaknesses (poor supply of kerosene and vaccines, Chapter 6).

5.7.5 Curative drug use

The technical efficiency of curative drug use is closely linked to wastage and prescribing practices, requiring particular consideration of the links between efficiency and quality (Chapter 1). Any reduction in average cost that compromises quality also represents inefficient resource use i.e. quality

considerations set an upper limit to utilization levels and a lower limit to acceptable cost reductions. For vaccines, utilization beyond this limit is not possible because vaccines are not available; for staff, utilization beyond this limit is possible if staff are willing to continue to work, with potentially negative impact on process quality (for example, due to the impact of tiredness). For curative drugs, especially with pre-packed kits, the upper limit to utilization is based on drug availability but the level at which this limit is reached will vary between units depending on case mix, staff involvement in illicit drug use (with unknown impact on quality) and prescribing practices (an element of process quality).

Earlier findings (section 5.2.3) have pointed to the possibility of illicit drug sales from many government units. Such sales represent wastage, as drugs are leaked from the formal allopathic health system to unknown, and potentially, dangerous alternative drug supply channels. They appeared to be less a problem of diocesan units.

Individual prescriptions were costed, using the data collected from patient registers, on the basis of each drug prescribed (Table 5.10). The median cost per prescription across all units was found to be 9 Tsh (US$ 0.05) (mean = 14 Tsh, US$0.08). Differences between unit groups in prescribing costs were not significant and differences within groups were not large - despite drug supply variation between

Table 5.10: Cost per prescription by unit group (median, mean, min:max ratio, 1988/89 Tsh) [1,2]

	HIGH COST GOVERNMENT DISPENSARY (n=7)	LOW COST GOVERNMENT DISPENSARY (n=7)	DIOCESAN DISPENSARY (n=3)	HEALTH CENTRE (n=2)
Median of medians	8	9	9	10
Mean of means	13	14	15	14
Min:max, health unit medians	1:1.4	1:2.75	1:1.5	1:1

NOTE: 1. Based on all prescriptions reviewed for each unit group
2. Zero cost was allocated either when no drug was given or where costs could not be calculated due to insufficient information (eg.for ointments, or for drugs not on the EDP list). Only sixty-seven of the total number of prescriptions (1.8%) were zero cost, and these were found more among the health centre prescriptions than other unit groups; however, they are unlikely to have much impact on estimated median/mean prescription costs.

individual units and between unit groups. Although mean values were higher than median values, these costs are low and indicate the success of the EDP programme in this respect. However, assessment of the quality of prescribing practice also indicated that these costs reflected some elements of poor practice, particularly under-prescribing (Chapter 7, Gilson et al. 1992). Better quality prescribing would,

therefore, probably be associated with slightly higher cost prescriptions.

These findings point to the links between efficiency and quality that will be considered further in later chapters, and suggest that raising the efficiency of curative care is not simply a matter of improving productivity. Wider action is required to address wastage problems and to improve prescribing practices, whilst maintaining overall low cost levels.

5.8   Economies of scale

Cost functions allow economies of scale to be identified. They are estimated on the basis of assumptions both about the relationship of costs to output and other factors, and about the behaviour of service managers (Chapter 2). In estimating a cost function from this study it was assumed that total costs (C) were linked to output, in line with common practice, and that the relationship was non-linear, using a quadratic form to allow for the possibility of economies of scale. Two output variables were used (U and U^2), reflecting the total range of activities undertaken. They were determined by weighting the utilization figure for each activity by its proportion of total time use, as a reflection of the intensity of resource use in each activity, and summing to produce a total weighted utilization level. Group mean time allocations were applied for each of the three unit groups. Ownership (O) and structural quality (represented by an overall unit score) (Q) were assumed to influence the relationship, together with health unit type (health centre/dispensary) (T) and district (D). The equation for the assumed relationship was:

$$C = x + aU + bU^2 + cO + dQ + eT + fD$$

and step-wise regression techniques were used in its assessment. The resulting cost function is summarized in Table 5.11.

This cost function indicates that ownership and district were unimportant influences on total cost, and that total costs and structural quality were related. It suggests that health centres did not benefit from increasing returns to scale, rather pointing to constant scale economies. The overall marginal cost was an estimated 25 Tsh and the cost of increasing structural quality by one percentage point, 15,111 Tsh (1988/89 prices).

Two further regressions, for diocesan (n=14) and government dispensaries (n=40) separately, used the same model (Appendix 5A) and broadly confirmed these findings. The final diocesan model linked total costs only to the structural quality variable, and the final government dispensary model generated a marginal cost of 23 Tsh. Constant scale economies were again indicated. These latter two models,

Table 5.11: Cost function

VARIABLE	COEFFICIENT	95% CONFIDENCE INTERVAL	t-STATISTIC (p VALUE)
U	25	(16, 35)	5.35 (0.000)
Q	15111	(7,693, 22,529)	4.08 (0.000)
T	2511247	(2,274,793, 2,747,702)	21.29 (0.000)
constant	-301995	(-673,683, 69,693)	-1.63 (0.109)
O			-0.45 (0.658)
D			-0.33 (0.745)
U²			-0.82 (0.416)
		adjR² = 0.90	n=58

however, had more limited explanatory power than the first, with adjusted R-square figures of 0.36 (diocesan) and 0.44 (government).

5.9   Research conclusions

Average cost differences between health units suggest that efficiency improvements within existing resource levels were possible; cost profiles highlight curative (and, for dispensaries, immunization services) and personnel and drug use as key areas of review.

Low staff productivity was, for example, shown by the high proportions of time without specific activity within total time use. Two causes were important. First, the inappropriate allocations of personnel between units and staff time within units, which generated variation in contact numbers per FTSE by activity and led some staff to be under-utilized. Second, the lack of complementary resources, particularly curative drugs, with which to work which suggested that the existing resource combination itself set limits to achievable improvements in efficiency.

Drug wastage was also a problem. Vaccine wastage was partly associated with low utilization levels and catchment populations, and was in these cases perhaps justifiable. However, the very high vaccine wastage rates found also pointed to supply system inefficiencies and carelessness. Similar management problems seem likely to have influenced curative drug wastage, given that differences between stock-record and prescription-based drug costs suggest that there were both recording problems and illicit drug use. In addition, prescribing practice failures are likely to have generated low costs and poor quality. The complex links between drug costs and process quality make identification

of the influence of drug use patterns on efficiency difficult to determine for curative care, and point to the importance of addressing existing drug use problems. They may also help to explain why it was more difficult to identify an association between utilization and average curative care costs than for immunization and ANC/CW care.

These various influences on average costs can be seen in unit group cost performance. Health centres had higher total costs than dispensaries (with, for example, more and more expensive staff) and generally higher average costs, except where total costs were offset by greater utilization and, in particular, greater staff productivity (immunization). Utilization levels in diocesan dispensaries were too low to generate lower than government average costs, despite lower diocesan total costs. Staff productivity was, therefore, similar to government units for most services and where higher, in immunization services, appeared to be at least partly offset by vaccine wastage rates. Although government dispensaries had the lowest total average costs across most activities, their services were also characterized by inefficiencies such as low staff productivity, vaccine and drug wastage and poor prescribing practices.

These findings validate the analysis framework proposed in Chapter 1. Resources available, resource combinations and utilization all influence the overall efficiency of service provision. Resource combinations and utilization appear to have particular importance, but resource availability can influence both these factors - most clearly in the impact of government drug shortages on staff productivity and drug use. The combination of all three factors was also of importance in explaining average cost differences between unit groups.

What management strategies are required to enhance efficiency, given these influences? Will altering the balance of current resource combinations encourage improved efficiency? What impact might it have on quality? Can such management interventions, anyway, be introduced? Four key groups of issues have been identified in this chapter for later consideration against quality findings.

First, MCH services were dominated by curative care and of the MCH services, ANC/CW average costs were the lowest of all activities across all groups: was low cost ante-natal care also of poor quality? The range of MCH duties undertaken by relatively few full-time staff must by its diversity have represented a considerable burden that was not shared by RMAs, the officers in charge of dispensaries. Rather, other staff (untrained nurses and environmental sanitation officers) were found to assist MCHAs. Deliveries, on the other hand, were the most expensive services in dispensaries and at a similar cost level to in-patient care where it was available: were these cost findings reflected by the quality of delivery care? Could the costs of maternal health care have been reduced without harming quality?

Second, greater health centre than dispensary total costs were not surprising given considerably greater staffing and utilization levels, but were the higher total and average costs of health centres justified by the provision of better quality services? If not, given also no evidence of increasing returns to scale, what role should health centres play within the health system?

Third, comparison of diocesan and government dispensary costs raises concerns for further consideration; for example, the greater curative dominance among activities in diocesan than government dispensaries. Did cost differences between the two unit groups reflect quality differences? Did lower utilization of diocesan units suggest lower perceived quality? What role might non-government health units have within the health system?

Fourth, cost differences between districts were explored carefully and only a few were found to be significant. Kilombero district had more expensive units and higher staff allocations than the other districts, although Ulanga district also had relatively well staffed units. Kilosa district dispensaries did not always provide MCH services and were, generally, less well staffed and had lower costs. However, average costs did not differ significantly between the districts. Does this lack of differences suggest that the power of district managers to manage is, in practice, very limited, or that district management is equally poor or good? Across the government dispensary unit group, the fixed cost proportion of total costs was found to be high: does this finding confirm that local management flexibility to influence resource allocations was very limited? Does it suggest that local management action to improve efficiency must focus on influencing utilization rather than resource allocations? What are the implications of the answers to these questions for strategies to improve both efficiency and quality?

These issues are partially reviewed in subsequent chapters presenting findings concerning structural and process quality, and community satisfaction, and are more fully discussed in Chapter 9 which considers the policy implications of the study.

5.10   Methodological assessment

5.10.1 Research methods

As the main aim of this analysis was to assess efficiency through comparison of costs between health units, financial costs only were determined in the costing process (Chapters 2, 4). This study's particular methodological strengths relative to other cost analyses reviewed in Chapter 2 include the sample size, the validation of time and drug cost estimations and the inclusion of supervision and in-service training costs using, at least for supervision, comprehensive data. Estimation of a cost function is also rare since sample size is often smaller.

Key areas for sensitivity analysis, as identified in Chapter 4, concern time use and drug cost determination. Time use estimates from the two data sources provided roughly the same picture. The main differences indicated by the validation survey using time log data were lower overall staffing allocations, especially for government units, smaller differences between government and diocesan staff time allocations and higher diocesan than government time allocations to ANC/CW care. However, both data sources are problematic. The original data relied on staff recall of time use, whilst considering all staff allocated to each unit; the time logs collected prospective data and their completion was supervised, but they were only completed by staff available within the unit during the survey week. The noted differences between time use data seem most likely to reflect peculiarities of the survey week: in particular, the non-availability of some staff, and curative and ANC/CW workloads. The absence of staff, further emphasizing the under-use of personnel,suggests that use of time log data alone could underestimate the full costs of time use by all staff allocated to each unit. Practical factors, lower study costs and the broad validation of recall data, also favour the use of recall over time log data.

As with time log data, drug costs estimated from prescription data may underestimate total drug costs by ignoring the potential wastage associated with overall drug use. Although stock records are not always reliable, this research suggests that drug costs may be better based on stock use records than prescription-based cost estimates; similar practice is recommended for vaccine cost estimation (Fielden 1991). Differences in drug cost estimates, therefore, do not invalidate the original costs whilst pointing to the importance of reliability checks on drug use information. In some circumstances, special surveys using prospective data collection techniques may be required to guarantee the validity of drug cost estimates. Such surveys may not, however, pick up the drug wastage indicated by comparison of prescription and stock-report estimates in this study because they involve unusually tight monitoring of drug use.

In order to allow comparison of this study's findings with other studies, it is useful to consider what differences would result from calculation of economic costs and, in particular, the use of economic prices for wages and foreign exchange. Wages were initially estimated at government salary levels. These levels were particularly low, perhaps explaining the small percentage of total costs accounted for by staff and suggesting that shadow wage rates were above official salary levels for skilled labour. However, it is difficult to determine either the value of the next best alternative use of labour outside the health sector, given the limited development of private health care, and the widespread involvement of formal workers in the informal sector makes estimation of remuneration levels difficult (Maliyamkono and Bagachwa 1990). The low productivity of workers indicated by this study's findings may anyway suggest that salary rates are a reasonable reflection of the value of services at current productivity levels (Fielden 1991).

Initial costs also used the official exchange rate (US$1=125Tsh, on average 1988/89) although the black market rate was roughly twice that rate during the study period. The economic price for foreign exchange might be assumed to be roughly half the difference between the official and black market rates, allowing for the premium charged in the black market, i.e. US$1=190Tsh (or US$1=170 Tsh,

Table 5.12: Sensitivity analysis of impact of shadow foreign exchange rate on cost findings

COST TESTED	RESULTING INCREASE IN HEALTH UNIT TOTAL COSTS	RESULTING INCREASE IN DISTRICT MEAN COST PER CONTACT BY ACTIVITY[1]
Equipment	1-2%	immunization: 92 to 96 Tsh (4%) delivery: 784 to 858 Tsh (9%)
Drugs	8-19%	curative: 33 to 41 Tsh (24%) delivery: 784 to 862 Tsh (10%)
Vaccine	2-4%	immunization: 92 to 110 Tsh (20%)
All relevant	11-22%	curative: 33 to 41 Tsh (24%) immunization: 92 to 114 Tsh (24%) delivery: 784 to 936 Tsh (19%)

NOTE: 1. For activities where any increase noted

drugs only). Sensitivity analysis of the impact of this new rate on relevant costs was undertaken for one district, Kilombero, and findings are summarized in Table 5.12. Drug cost increases resulting from use of the shadow exchange rate have most impact on total health unit costs and, overall, curative care and immunization average per contact costs are most affected. However, as the shadow rate is applied equally to all units it does not affect conclusions about production efficiency which are based on relative costs.

5.10.2 Management monitoring tools

Valuation of resource use in monetary terms allows all resource use to be simultaneously assessed; this study has shown that health unit costs can be calculated in the Tanzanian context using existing information. The existence of vertical programmes (the EDP and EPI) facilitated the task because of their special information systems and their impact on the division of labour and space within health units; data collected by district MCH co-ordinators concerning supply and equipment allocations and some accounts records were also helpful. The time use validation procedures used in this study also suggest that informal interviews can generate as reliable time use data as more complex and costly

survey procedures. Nevertheless, complete costing procedures require considerable time, skills and facilities - for example, computer-aided analysis is essential. It is, therefore, unlikely that without better information systems, which bring expenditure and output data across all activities together, and personnel with the necessary skills, that regular costing will be possible in the Tanzanian context.

However, this study has also highlighted the potential for more regular review of the use of key resources: personnel, curative drugs and vaccines. Relevant information is already available concerning drug/vaccine allocation and use, personnel allocations and utilization levels. Resource use need not be valued in monetary terms to allow identification of productivity problems and the associated technical inefficiencies. District staff (the district EDP co-ordinator/pharmacist and cold chain operator) are often already responsible for monitoring drug and vaccine supplies but require encouragement to undertake these tasks and report their findings. Assessment of staff use against utilization requires only simple calculation procedures and six monthly reviews would be enough to identify problems worthy of investigation; more detailed time use assessments could be undertaken periodically, using informal procedures, during supervision visits. Monitoring these items of physical resource use would be an important step in encouraging action to enhance the efficiency of primary level health care provision.

5.11 Summary

This chapter has examined the costs of providing care from government and diocesan dispensaries, and health centres - considering total health unit costs, cost profiles by activity and input item, fixed versus variable costs and average costs. It has also reviewed physical resource use, in particular staff and time allocations, and curative drug and vaccine use. A cost function was estimated.

There was a 4-6 fold difference between the median total costs of health centres and dispensaries, and the median total cost of government dispensaries was 1.3 times that of diocesan units. Curative care captured 40-60% of total costs across all unit groups and from 32% (health centres) to over 60% (dispensaries) of total time allocations. Personnel and drugs together accounted for over 60% of total costs across unit groups and their fixed nature resulted in fixed cost proportions within total costs of up to 90-100% across most activities in government health units.

Average per contact costs varied by activity and unit group: from 12 Tsh for immunization in government dispensaries to 1,679 Tsh for deliveries in health centres. Diocesan median average costs were higher than those of government dispensaries across all activities by 8-90%; health centre median average costs were higher than those of dispensaries by 40-130%, except for immunization for which they were 30% lower. Three to sixteen-fold differences in average costs were found within unit groups, the latter for government delivery care.

Considerable levels of resource wastage were found for the key inputs: time without specific activity levels of around 50%, median vaccine wastage levels of 70% and estimates of up to 100% for curative drug wastage. Further analysis indicated that technical inefficiencies underlay these problems: low staff productivity appeared to result from failure to align staff allocations with utilization levels and vaccine wastage appeared to be greater in health units with lower utilization and catchment populations. The technical inefficiencies associated with curative drug use, however, resulted more from wastage (illicit drug sales) and quality failures such as under-prescribing, than utilization differences. Estimation of a cost function generated an overall marginal cost estimate of 25 Tsh and suggested only constant returns to scale.

Based on the cost analysis findings, the chapter's research conclusions raise questions concerning quality and community satisfaction that must be considered before final determination of management strategies to raise efficiency.

Methodological assessment confirmed the reliability of cost findings through validation of time use and drug cost estimates. An estimation of the increase in costs resulting from the use of an economic price for foreign exchange was made. The study has shown both that cost analysis can be undertaken within Tanzania and that assessment of physical resource use can more easily provide information helpful from which to derive management strategies for enhancing efficiency.

CHAPTER SIX:
ASSESSMENT OF STRUCTURAL QUALITY

Structural quality is an important element of the overall quality of health care, especially at the primary level (Chapter 3). Its assessment was undertaken by use of a standard checklist, embodying relevant standards (Chapter 4). The results of the assessment presented here complement cost analysis (Chapter 5) in review of efficiency, with a specific focus on resource availability (Chapter 1).

Snapshots of a typical health unit in each of the three unit groups were developed using the structural assessment findings and are presented first, as background to the quantitative analysis presented in the second and third sections. Responsibility for performance failures and associations with cost results are then assessed. Finally, the conclusions drawn from this assessment and its methodology are discussed.

6.1   Snapshots of 'typical' health units

GOVERNMENT	DIOCESAN
located close to roads and/or population concentrations, accessible for at least nine months of year;	more likely to be located in remote village, worse access difficulties in the rainy season;
usual referral centre (health centre or hospital) within 25 km (4 hours travel) but patients rely on own efforts to reach it;	
building in poor condition, bat-infested;	buildings in better condition, less chance of bats & better security;
kept secure by windows/doors or a watchman;	
swept and tidy;	
50% chance of 10 min walk to protected water source;	less likely to have access to protected water source but more likely to have reasonable sanitation facilities;
pit latrines in need of maintenance;	
housing only for one staff member;	housing and uniforms more likely to be available (and housing for more staff).
uniforms probably worn by most staff.	

Figure 6.1: Basic infrastructure compared, government/diocesan

The basic structural differences outlined in Figure 6.1 particularly emphasize the normally better availability and condition of buildings used by diocesan dispensaries (as indicated by cost profiles, Chapter 5). However, comparison against the staff and service availability of the typical government dispensary (Figure 6.2) points to the poorer availability of trained staff in the typical diocesan unit, and the narrower range of services provided. Although an RMA was available, no trained MCH staff worked in the diocesan unit. Like government staff, diocesan staff spent most time on curative services but were even more likely to have spare time during the day. Perhaps this was not surprising as the

diocesan unit did not provide family planning services, and probably did not offer environmental sanitation services or TB/leprosy & mental health care; in contrast to the government unit, laboratory facilities were available.

The typical government dispensary had not received a true supervision visit (with supervisor staying for at least an hour) in at least the last three months and rarely received feed-back to complaints and requests to the district. MCH staff were more likely to have had opportunities for in-service training than curative care staff,

staffed by basic minimum of RMA, MCHA, Health Assistant (HA) and nurse auxiliary;

adequate range of services offered but unlikely to provide environmental sanitation, TB/leprosy care, mental health care, laboratory;

at least one member of staff available for emergency night calls;

most staff time within unit spent on curative care;

staff, especially MCHA, likely to spend 3 hours a day in activities not connected to serving patients;

rarely necessary for RMA or MCHA to be away for more than 2 days a month;

records available but not used by staff to monitor work

Figure 6.2: Staff and service availability in a typical government dispensary

but no staff member had received more formal up-grading training. Similarly, although part of district health services, the typical diocesan dispensary had received few visits from district health management team members; but it had been supervised by the diocesan supervision team, who stayed for 1-2 days. All staff in the diocesan unit had also had the opportunity to attend an in-service training seminar in the previous six months.

Curative services (Figure 6.3) in the typical government dispensary were undermined, in particular, by drug shortages and lack of equipment. At best, for example, there was a 40% probability of having the required level of injection equipment in the typical dispensary; shortages of diagnostic and dressing equipment were almost certain. There was a 50% chance of having chloroquine all month and only a 20% chance of having penicillin all month. The typical diocesan dispensary had a better drug situation, at least for key drugs (90% chance of having chloroquine, and 70% chance of having penicillin, all month), but also lacked equipment (most unlikely to have required package of injection equipment). It did, at least, offer laboratory facilities, although reagents were in short supply and staff had received little formal training. The government units that did have laboratory facilities usually had no specific laboratory area, nor the furniture and equipment needed (other than the microscope) nor the required reagents. As a result only some of the required tests could be undertaken (stool, urine, haemoglobin, sputum for acid fast bacilli, malaria blood slide) and, although staff undertaking laboratory tests had some training, they sometimes performed tests despite lacking the appropriate reagents.

GOVERNMENT	DIOCESAN
consulting room, area for injections and dressings, separate dispensing area & specific waiting area;	space & privacy more likely to be adequate;
privacy limited by open doors; space limitations might lead to disorganized patient flow system;	
enough furniture in the consulting room, but in dressing and injection areas probably nowhere for patient to sit, no table to place equipment on;	more furniture available;
little equipment available for diagnosis, injections or dressings;	similar equipment availability & cleanliness problems, higher chance of lacking injection equipment;
only injection equipment kept clean (boiled after use by kerosene stove, sometimes charcoal burner or a wood fire);	
drugs usually available every month, but not necessarily on the first day;	more chance of suffering drug supply irregularities and of keeping expired drugs;
chloroquine (all forms) and diazepam sometimes lasted for the whole of each month, but painkillers (aspirins and paracetamol) and penicillin (all forms) did not;	key drugs and supplies all fairly constantly available;
wound dressing supplies rarely adequate each month & additional antiseptic for wounds or cleaning equipment rarely available;	
hand washing facilities not available in the dressing/ injection areas, & gloves not used by the experienced nurse giving injections;	hand washing facilities more likely to be available;
no manual available to assist staff in their work or to maintain their skills.	no manual

Figure 6.3: Curative structure compared, government/diocesan

MCH services in the typical diocesan dispensary suffered similar problems to the government unit (Figure 6.4) but were more likely to have immunization service problems - equipment shortfalls, problems with the fridge temperature level, irregular vaccine and kerosene supplies, inadequate sterilization facilities (perhaps forced to share with curative services). There was only a 30% chance, for example, of having unexpired vaccines available and of having kerosene regularly available in the previous 3 months in the typical diocesan dispensary, compared to a 50% chance of both in the government unit. The typical diocesan unit had an 80% chance of the fridge temperature being incorrect for more

space and patient flow problems, one room shared for most activities;
privacy possible by staggering the services;
waiting mothers sit on floor because no benches;
equipment more available than for curative services but probably no blood pressure (BP) machine;
no facilities to test the haemoglobin (Hb) and albumin of ante-natal mothers;
family planning pills or condoms available, but not both;
ergometrine available for delivery emergencies;
equipment for delivery care not all present and not clean;
scale and trousers for weighing children and immunization equipment available;
fridge temperature incorrect for more than two days in previous month & kerosene and vaccine supplies sometimes not received;
health education generally given to waiting mothers;
outreach equipment (vaccine carrier, ice packs etc) and bike available;
little outreach, home visiting and few school visits undertaken.

Figure 6.4: MCH services in a typical government dispensary

than 4 days in the preceding month, compared to 70% for the government dispensary. Outreach (home visiting, school visiting) was also less likely to be undertaken than in the government unit. Better features in the diocesan unit were noted for delivery services: a 60% chance of having the standard

complement of equipment and an 80% chance of its being clean, as compared to the near guarantee of limited and dirty equipment in the typical government unit.

The typical rural health centre differed most obviously from dispensaries in its provision of a wider range of services and in its greater number and range of staff. The cadre typically in charge of health centres, the medical assistant (MA), is also a more skilled health worker than the RMA who can be upgraded through further training to medical doctor status. Even the nurses working in health centres had typically received more formal training than those working in dispensaries who were often only trained on the job. However, staffing levels did not reach the required health centre standard because of shortfalls in the numbers and mix of nursing staff. Buildings were bigger and mostly newer than those of the dispensary, with more space available for basic curative and MCH services and privacy more likely, but they also needed repair and maintenance. Staff were probably not especially busy, as in dispensaries, and most of their time was also allocated to curative care. Staff housing and uniforms were, again, in short supply.

Although generally accessible, the health centre was most probably over 25 km from the hospital to which it referred patients and did not easily function as an onward referral point because it had been without regular access to transport for, at least, the previous three months. The health centre's staff did not regularly visit the surrounding health units, but they received more support from the district level than dispensaries - with managers staying for longer periods. At least one member of staff had also received in-service training in each area, curative and MCH, in the last six months.

Curative service problems differed little from dispensaries. Equipment shortfalls were the same - and despite the fact that the health centre was supposed to offer minor surgical operation facilities it probably had lower performance scores for dressings than many dispensaries. Whilst chloroquine of some sort was mostly available, stocks of penicillin and painkillers often ran out before the end of a month. Available laboratory services were also undermined by reagent and other shortages. MCH services differed even less from dispensaries: equipment was not fully available and fridge temperatures were not maintained at correct levels. Delivery services were especially weak (for example, hardly any emergency obstetric equipment was available), and even below the level of the typical dispensary - despite this service being one of the most important provided by the health centre. Limited outreach was undertaken. Finally, in-patient services were generally provided; but whilst staff were available at reasonable levels (1 nurse day and night in the wards), equipment for the wards was minimal, the full complement of beds and mattresses was not always available, and food was rarely provided to patients. The structure of the in-patient facilities was, at best, basic.

6.2   Performance against structural criteria
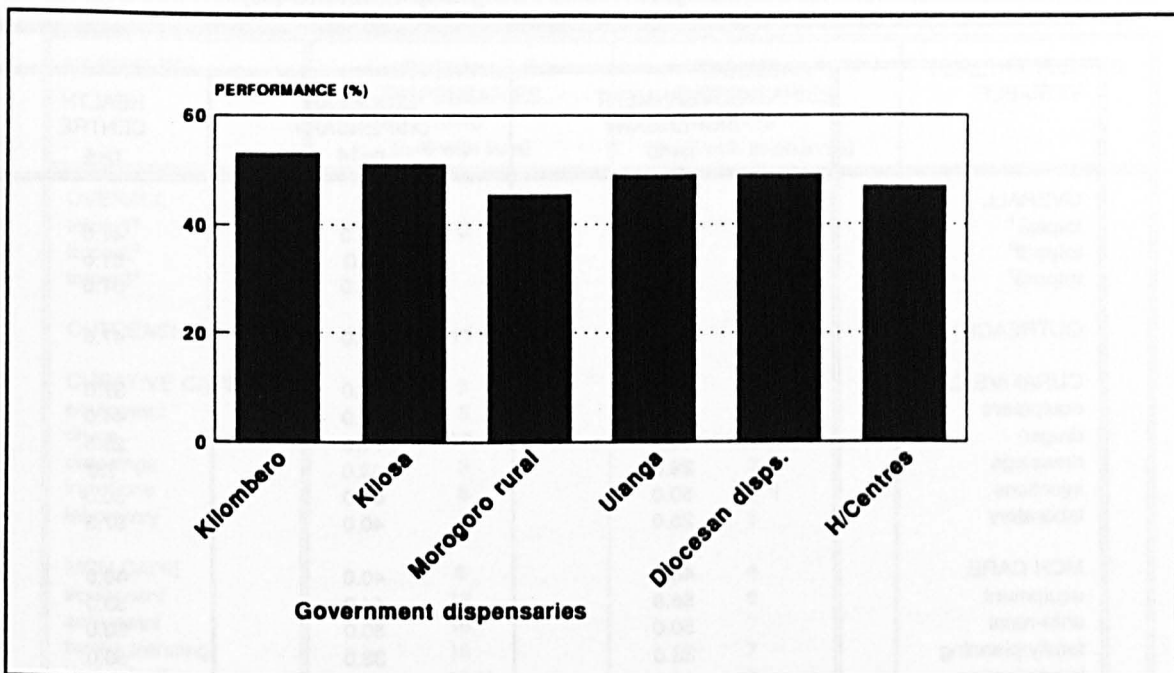
Figure 6.5: Overall structural quality, unit group medians (totper1, %)

Quantitative analysis of findings was undertaken using percentage performance scores calculated over a range of summary variables by health unit and unit group. Table 6.1 presents median scores by unit group, Table 6.2 identifies the number of health units performing at good levels against the standard of 60%, set by Morogoro region health officials; significant differences between the unit groups are summarized in Table 6.3.

6.2.1 Overall performance

Figure 6.5 and Table 6.1 show that overall performance (as judged from the totper variables) was not high. Median scores calculated across all criteria fell around 50% for all unit groups and all variables. Only three units out of the total of fifty-nine were judged to perform at good levels against the 60% standard (Table 6.2): two government dispensaries and one diocesan unit. The diocesan unit performed at good levels across all totper variables: the basic summary (totper1), basic plus laboratory (totper2) and basic plus laboratory and in-patient services (totper3). Health centres only scored at similar levels to dispensaries although supposed to provide higher level care.

Determination of the number of units performing at reasonable levels against the 60% standard for specific aspects of structure (Table 6.2), gives a slightly better impression of performance levels. Even so, for half the variables reviewed more than half of the units in each group performed at poor levels

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Table 6.1: Structural assessment by variable, unit group medians (%)

VARIABLE	GOVERNMENT DISPENSARY n=40	DIOCESAN DISPENSARY n=14	HEALTH CENTRE n=4
OVERALL			
totper1[1]	49.0	49.0	47.0
totper2[2]	49.5	48.0	51.0
totper3[3]		52.0	51.5
OUTREACH	44.0	19.0	47.0
CURATIVE CARE	42.0	56.0	37.0
equipment	25.0	38.0	44.0
drugs	50.0	71.0	25.5
dressings	29.0	43.0	7.0
injections	50.0	67.0	50.0
laboratory	25.0	40.0	67.5
MCH CARE	48.0	40.0	46.0
equipment	56.0	44.0	53.0
ante-natal	50.0	50.0	50.0
family planning	33.0	33.0	50.0
immunization	69.0	50.0	69.0
child welfare	50.0	50.0	50.0
deliveries	40.0	60.0	20.0
health education	67.0	33.0	63.0
IN-PATIENT CARE		44.0	59.0
equipment		17.0	25.0
staff		50.0	75.0
GENERAL			
staff	63.0	50.0	43.0
infrastructure	50.0	65.0	62.0
support	33.0	44.0	60.0

NOTE: 1. Basic total score
            2. Basic plus laboratory score
            3. Basic, laboratory plus in-patient score

(in 14/22 more than 60% of units performed at poor levels). Relatively strong performance was noted for health centres and dispensaries against the immunization, health education and record-keeping variables, and health centres also did well against the support, laboratory and in-patient staff variables. Diocesan units performed particularly strongly against the drug and injection curative care variables, but performance for curative care by both health centres and dispensaries was generally poor. Extremely poor performance in deliveries by health centres highlights their weaknesses; although expected to back up dispensaries in delivery services by providing a higher level of care, their structure was too weak to allow them to fulfil this role.

Table 6.2: Structural quality assessed against a standard[1]; number of dispensaries with good performance by variable and unit group

VARIABLES	GOVERNMENT DISPENSARIES n=40 (n=8 with labs)	DIOCESAN DISPENSARIES n=15 (n=7 with in-patients)	HEALTH CENTRES n=4
OVERALL			
totper1[2]	2	1	0
totper2[3]		1	0
totper3[4]		1	0
OUTREACH	11	0	1
CURATIVE CARE	3	7	0
equipment	5	0	0
drugs	10	9 *!	0
dressings	3	3	0
injections	6	9 *!	1
laboratory	2	1	3 *!
MCH CARE	6	4	1
equipment	12	6	1
ante-natal	16	7	1
family planning	16	7	2
immunization	27 *!	7	3 *!
child welfare	19	7	1
deliveries	8	8 *	0
health education	28 *!	5	3 *!
IN-PATIENT CARE			
equipment		0	2 *
staff		0	0
		2	4 *!
GENERAL			
staff			
infrastructure	21 *	4	1
support	7	8 *	2
	4	1	4 *!

NOTE: 1. Good performance = 60% or more
2. Basic overall performance
3. Basic performance plus laboratory scores
4. Basic, laboratory plus in-patient scores
* = more than 50% of unit group performing at 'good' levels
! = more than 60% of unit group performing at 'good' levels

6.2.2 Performance by activity

Performance can also be assessed in terms of the specific activities undertaken within the units: basic curative care, MCH care and outreach. Figure 6.6 compares the unit groups for these three activities and indicates the relative strengths of each group: diocesan dispensaries in curative care, government dispensaries in MCH care, and health centres in outreach. The scores (Table 6.1) again indicate the overall and curative care weaknesses of health centres, with several significantly lower scores when compared to diocesan units (Table 6.3). Outreach service scores were uniformly low, but significantly

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Table 6.3: Structural assessment, significant differences between unit groups by variable[1]

GROUPS COMPARED	SIGNIFICANT DIFFERENCES (p< 0.05)
Government dispensary versus all mission	Mission higher[2] for: curative care total, drugs, dressings, injections Government higher for: outreach, health education (infrastructure p=0.071, mission higher mean rank)
Government dispensary versus health centres	Health centre higher for: support Dispensary higher for: deliveries (laboratory p=0.06 health centre higher mean rank)
Mission with in-patient facilities versus health centres	Health centre higher for: outreach, laboratory, IP staff, support Mission higher for: totper1[3], curative care total, drugs, dressings, injections, deliveries

NOTES: 1. Analysis of variation using the Kruksal-Wallis test.
2. Higher=higher mean rank of scores, indicating better performance.
3. Basic total score

worst for diocesan units, and performance unacceptable against the standards of monthly immunization sessions, weekly home-visiting and at least one visit to a school in previous two months.

These outreach criteria, more than other aspects of structural performance, reflect health worker performance of duties. Informal exploration of this important failure highlighted the poor level of health worker morale as a major factor in health worker's refusal to undertake outreach - some MCH outreach areas were far, sometimes bicycles were not available, never was an outreach allowance paid (despite its provision through the EPI). RMAs hardly ever saw home visiting as a part of their work - even in TB/leprosy defaulter follow-up - and home-visiting by MCHAs was also minimal. In contrast, record-keeping, the completion and submission to the district of activity records, was much better performed. This appeared to reflect the importance given to record-keeping by district authorities, who themselves must submit reports based on their health units' activities to higher authorities, and suggested that performance improvements through supervision were possible.

Closer examination of curative care performance (Table 6.2) indicates that drug availability was the strongest aspect for diocesan units, with significantly higher scores than the other two groups (Table 6.3); equipment availability, however, was their weakest aspect. Despite equipment problems, diocesan units had significantly higher scores for injections and dressings than other groups - suggesting that diagnostic equipment shortfalls were the main problem (such as stethoscope, spatula, thermometer).

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PERFORMANCE (%)

Government dispensaries

⊠ curative ■ MCH ◩ outreach
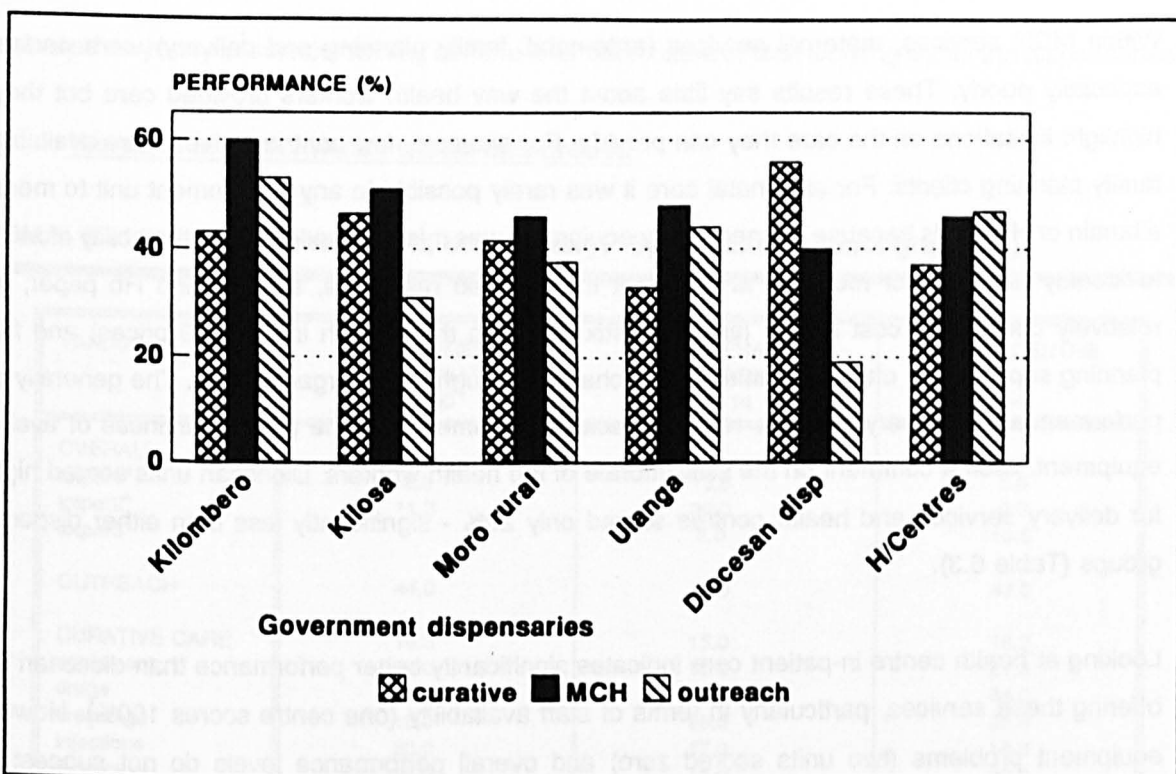
Figure 6.6: Structural quality compared: curative, MCH and outreach care, group medians (%)

In contrast, equipment availability was least in dispensaries and drug availability worst in health centres; and injection and dressing scores fell to a low of 7% for health centre dressing performance. The only real comparative advantage of health centres in curative care was in their laboratories, with significantly higher scores than diocesan units and higher scores than government units (Tables 6.2, 6.3).

Scores for MCH variables were generally higher than for curative care variables, although some government dispensaries in one district and some diocesan dispensaries did not offer MCH services at all. Overall, diocesan units performed MCH services relatively poorly, for example few diocesan units undertook health education regularly. Equipment was also more of a problem for diocesan than other units, but was always more available than curative equipment. In terms of services, immunization scores were comparatively high but still perhaps not good enough given the strong supply system and considerable available resources. Diocesan units had general weaknesses in these areas. Weaknesses in health centre immunization services might also have undermined their provision of the service and their role as supporting centres in the logistical chain. Problems of supply were caused by a variety of factors: delays in delivery of vaccines to the district level, shortages of, and difficulties of getting, funds for kerosene purchase within districts, vehicle breakdowns, access difficulties to some units, some district management failures.

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Within MCH services, maternal services (ante-natal, family planning and delivery) were performed especially poorly. These results say little about the way health workers provided care but they do highlight limitations on the care they can provide. For example, few contraceptives were available for family planning clients. For ante-natal care it was rarely possible in any government unit to measure albumin or Hb levels because the necessary equipment was missing, undermining the ability of MCHAs to identify and monitor mothers 'at risk'. Yet the required resources, albustix and Hb paper, were relatively cheap (the cost of one jar of albustix was less than 600sh in 1988/89 prices) and family planning supplies are often available, free of charge, through donor organizations. The generally poor performance for delivery services reflected lack of equipment and the poor cleanliness of available equipment, itself a comment on the skills/morale of the health workers. Diocesan units scored highest for delivery services and health centres scored only 20% - significantly less than either dispensary groups (Table 6.3).

Looking at health centre in-patient care indicates significantly better performance than diocesan units offering these services, particularly in terms of staff availability (one centre scores 100%). However, equipment problems (two units scored zero) and overall performance levels do not suggest that services were adequate - even against a very basic standard.

6.2.3 General infrastructure and support performance

The three general support variables further illustrate differences between unit groups. Health centres, for example, performed least well in terms of the availability of staff but best, in terms of support received. Staff were available at good levels in over half the government dispensaries, but little support was received by them. Diocesan units performed best against the infrastructure variable.

Significantly better health centre support performance (Table 6.3) reflected the greater frequency and duration of supervision visits to health centres than dispensaries, and the greater opportunities for in-service training. Looking more closely at comparative dispensary performance indicates that diocesan units scored highest for both supervision (median 100%) and in-service training (median 67%). A supervision visit was defined as a visit of at least one hour undertaken once every three months by the DMO or district nursing officer and once every three months by the district MCH co-ordinator. Government dispensaries received little supervision of this kind whilst better diocesan performance was based on 2 or 3 visits per unit each year of roughly one day each, by a team of one or two people.

Government dispensary in-service training median scores were generally above supervision score levels, although still not high - and were based on one member of the curative and MCH staff having received any form of in-service training in the last six months. The slightly better diocesan performance

was based on yearly in-service training seminars for each cadre of staff working within the dispensaries.

6.3   Variation in performance within unit groups

Table 6.4: Structural assessment, central range[1] by variable and unit group (%)

VARIABLES	GOVERNMENT DISPENSARY n=40	DIOCESAN DISPENSARY n=14	HEALTH CENTRE n=4
OVERALL			
totper1[2]	8.8	13.8	8.8
totper2[3]	11.3	30.0	9.0
totper3[4]		8.0	10.8
OUTREACH	44.0	12.0	43.5
CURATIVE CARE	19.5	15.0	16.3
equipment	25.0	13.0	21.8
drugs	34.8	29.0	34.0
dressings	15.0	28.0	35.8
injections	23.0	17.0	18.8
laboratory	37.5	15.0	20.0
MCH CARE	16.0	27.0	18.0
equipment	17.0	50.0	18.0
ante-natals	33.0	50.0	24.8
family planning	34.0	50.0	34.0
immunization	38.0	72.0	30.8
child welfare	50.0	50.0	37.5
deliveries	20.0	80.0	15.0
health education	67.0	34.0	58.5
IN-PATIENT CARE		15.0	36.3
equipment		33.0	50.0
staff		50.0	18.8
GENERAL			
staff	13.0	13.0	26.3
infrastructure	15.0	29.0	42.0
support	42.5	11.0	15.0

NOTE: 1. Judged with respect to the size of the variation between the first and third quartile scores
        2. Basic overall performance
        3. Basic performance plus laboratory scores
        4. Basic, laboratory plus in-patient scores

Variation within all unit groups was considerable (Table 6.4), with the size of the central range being more than 30% for 10/25 (40%) of health centre and diocesan variables and 8/21 (38%) of government dispensary variables. Variation within groups was most marked for the variables assessing MCH care performance, particularly for the diocesan group - for which the size of the central range of 7/9 MCH variables was greater or equal to 50%. For the other two unit groups, this degree of variation was noted for only two of the total number of variables.

Further examination of significant differences within unit groups implies that only the better diocesan units seek also to provide in-patient care. Diocesan units with in-patient facilities performed significantly better across seven of the eight MCH variables (the generally weaker activity of the group overall) than other units ($p \leq 0.050$), apparently explaining the large variation in scores for these variables.

Table 6.5: Structural assessment, significant district comparisons

VARIABLE	DISTRICT MEDIAN SCORES (%) (n=10, each district)			
	KILOMBERO	KILOSA	MOROGORO RURAL	ULANGA
totper1[1]	53.0	51.0	45.5	49.0
immunization[2]	86.0	50.0 (71.0)	57.0	57.0
support	56.0	33.0	22.0	44.0
dressing	29.0	43.0	14.0	14.0

NOTES: 1. Basic total score
2. Kilosa bracketed score = median of those units providing immunization only

Differences between districts for government dispensaries were limited but there were significant differences between districts overall (totper1) and for the dressing, immunization and support variables. District median scores (Table 6.5) indicated that overall (totper1) score differences were not great (range of 7.5% between districts). Kilosa's better dressing performance reflects better equipment availability and cleanliness practices. Differences in the immunization and support variables reflect, in large part, district management practice differences. Better support performance in Kilombero district was, for example, made possible by external assistance, which enabled both higher than normal levels of both supervision and in-service training and more effective supervision practices. Kilombero's better performance in the immunization variable, which included consideration of the supply and support of the cold chain, suggests that performance improvements even within available resource levels were possible for this variable. Calculation of Kilosa district's immunization median score after excluding units not providing immunization, raised the score from 50% to 71%, nearer to Kilombero's level.

Despite variation levels of performance were generally low, emphasizing the weaknesses of structural quality and suggesting that improvements will require additional resources. For example, improving health centre curative and delivery care will require additional equipment, building maintenance and so on. Without enhancing resources in these ways health centres cannot fulfil their role as units of first referral.

6.4   Responsibility for performance strengths and weaknesses

PERFORMANCE (%)

Legend: ▨ unit staff   ☐ unit/district   ◩ district   ■ district/external   ▧ unit/dis/ext
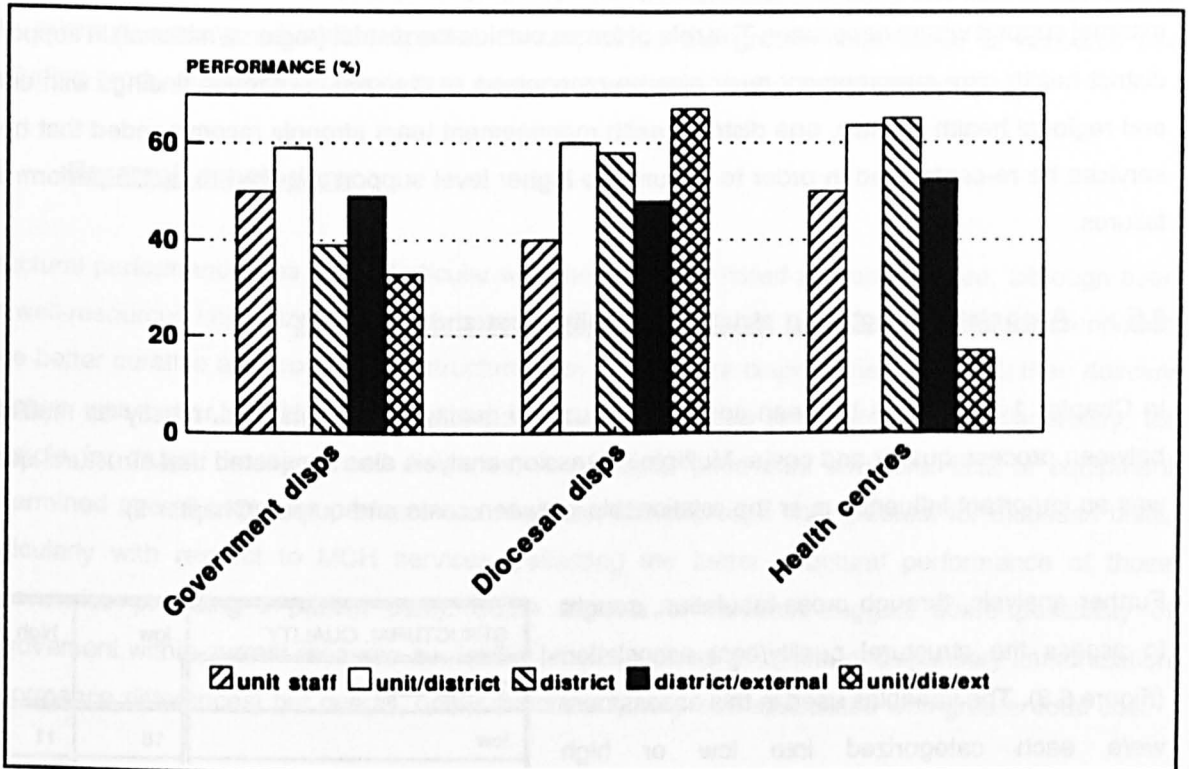
Figure 6.7: Structural quality failures, median values by responsible and unit groups (%)

In order to assess responsibility for current performance patterns, the structural quality criteria were identified as the responsibility of five groups: the unit staff, the district staff, forces outside the district, a combination of two of these groups or a combination of all three. For diocesan units this allocation was slightly re-formulated so that 'facility staff' included the parish priest, 'district staff' implied the diocesan supervisors and 'forces outside the district' implied forces outside the supervisors (Appendix 6A). Of the total number of criteria, 34% were assigned as the responsibility of unit staff, 11% to unit/district collaboration, 19% to district managers alone, 31% to district/external collaboration and 6% to unit/district/external collaboration (the drug availability criteria).

Examining performance scores against responsibility assignments (Figure 6.7) indicates that strengthening performance, in each district and for both government and diocesan units, required the collaborative action of all responsible groups. Unit/district collaboration was at its best in relation to diocesan units, but unit staff action at its worst. Health centres performed well due to their better staff performance than any other group, and to the better support received from the district level than dispensaries; district support was least effective with respect to dispensaries.

Overall, the findings emphasize that although the district is not solely responsible it has a pivotal role

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in improving its own performance, motivating an improved performance of health unit staff and seeking external support where necessary. The role of forces outside the district (regional/national) in supporting district health care management must also be recognized. In discussion of these findings with district and regional health officials, one district health management team strongly recommended that health services be re-centralized in order to ensure the higher level support required to tackle performance failures.

6.5   Associations between structural quality, cost and utilization

In Chapter 1 some links between costs and structural quality were suggested, mostly as mediators between process quality and costs. Multiple regression analysis also suggested that structural quality was an important influence over the relationship between costs and output (Chapter 5).

Further analysis, through cross-tabulation, sought to assess the structural quality/cost association (Figure 6.8). The variables used in this assessment were each categorized into low or high scores/costs/ranks on the basis of the median value of the variable across all health units (less than median=low, higher than or equal to median=high), in order to facilitate cross-tabulation. Structural quality was determined from the totper1 variable. In addition to the health unit total cost variable, an overall health unit average cost variable was established by ranking units as low or high against a summary rank determined from curative, ANC/CW and immunization average costs. Only

STRUCTURAL QUALITY	low	high
TOTAL COST		
low	18	11
high	9	20
AVERAGE COST	low	high
low	12	14
high	10	16
UTILIZATION	low	high
low	14	13
high	16	15

Figure 6.8: Structural quality associations

these three activities were used in establishing the summary rank because they were the most frequently provided services across all health units. Finally, the weighted utilization variable established for each health unit to facilitate determination of a cost function, was also considered.

A significant association was found between structural quality and *total cost* ($p=0.010$) suggesting the greater cost was associated with better quality. However, associations between structural quality and both the *average cost* variable and the *utilization variable* were not significant; and two-by-two tables did not suggest an association.

These findings confirm the links between total costs and structural quality identified in Chapter 5 and

suggest that improvements in quality can only be achieved at greater total cost. The lack of association with average costs or utilization appears to emphasize the greater importance of resource use (including productivity and wastage) than resources available (structure) to efficiency.

6.6   Research conclusions

Structural performance was poor. Particular weaknesses were noted for curative care, although even the well-resourced immunization service had surprising deficiencies. Diocesan dispensaries tended to have better curative and worse MCH structure than government dispensaries, although their delivery structure was better. Health centres' structure was poor relative to the lower level dispensary, for example for drugs, dressings and deliveries; and despite good staff structure, lack of equipment undermined overall in-patient performance. Variation within groups was greatest for diocesan units, particularly with respect to MCH services (reflecting the better structural performance of those dispensaries providing in-patient care). Some aspects of variation suggest some possibility of improvement within current resource availability levels (such as government dispensary immunization performance differences) but overall, better structural quality was associated with greater total cost.

Considering the issues outlined in Chapter 5 against existing levels of structural quality suggests:

*   both low cost ante-natal care and high cost delivery care were poor quality, in structural terms;

*   the greater costs of health centres were not justified by their structural quality; delivery quality was particularly poor and in-patient care, basic, despite the considerable expenditure on these activities within health centres;

*   diocesan structural quality varied considerably by activity; greater expenditure on curative care than government units seemed at least partly to be justified by better structural quality but low cost MCH services were of poor structural quality;

*   differences between districts in structural quality were, like cost differences, limited and district authorities were not solely responsible for tackling problems.

Overall, and despite performance variations, structural quality was so poor that improvements would have required additional resources. Collaborative action between all the groups (unit staff, district, regional and national managers) responsible for health care provision would have also been necessary.

6.7   Methodological assessment

This assessment of structural quality was undertaken using standards that reflected both international and national practice. The checklist embodying these standards was based on others from similar studies outside Tanzania and supervision checklists available within Tanzania, and was developed in collaboration with health managers from the study region (Chapter 4). Assessment methods were explicit and scoring procedures facilitated comparison of performance between units and unit groups; qualitative analysis of differences complemented this approach. As all observations were undertaken by one person, assessment of inter-observer variation was not necessary; explicit assessment would, anyway, facilitate use of the checklist by others. The reliability of the findings was also enhanced by the use of criteria verifiable by observation, and by confirmation from district and regional health managers of both the overall picture of structural quality and that of individual health units.

The two main methodological difficulties that were noted concerned establishing an overall standard, and the length and range of the checklist.

6.7.1 Setting standards

Setting standards for each criterion is a simple task, based on codifying accepted practice. With a complex list of criteria, understanding findings and comparison between units and unit groups is facilitated by establishing an overall standard, represented by a percentage value. In this study a figure of 60% was chosen, on the basis of the professional judgement of health managers. It was intended to validate this level by consideration of the impact of alternative standards on judgements of performance. However, because the overall percentage scores were so low only limited analysis was possible. Reducing the standard to 50%, for example, would still have allowed less than half of all units to be judged as performing at good levels - yet a standard of 50% was felt to be clearly unacceptable by regional health officials.

6.7.2 Reducing the checklist

The checklist of this study was detailed both because regional health officials were concerned to assess all relevant issues, having never previously reviewed their health units in this way, and because the division of services within units required similar but separate criteria for both curative and MCH care. Two alternative approaches to reducing the checklist are considered.

Using a comprehensive checklist, otherwise good performance might be undermined by poor performance in some criteria if criteria are of different importance. It may, therefore, be preferable to

use a reduced checklist covering only priority items, with an overall standard of 100%. Such re-assessment was undertaken for this study, with advice from regional health officials. Scores using high priority criteria only were not significantly better than original totals: only two units exceeded the 60% standard level, and against a standard of 100% none would have been judged as performing well. Structural quality would, therefore, be judged slightly more harshly than in the original assessment.

Table 6.6: Alternative checklists, unit group median scores and central range (%)

CHECKLIST	GOVERNMENT DISPENSARIES	DIOCESAN DISPENSARIES	HEALTH CENTRES
Original (totper1)	49.0 (44.0-52.8)	49.0 (43.0-56.0)	47.0 (42.3-51.0)
High priority	45.0 (38.3-49.0)	43.0 (36.0-51.0)	38.5 (36.0-50.0)
Discriminating criteria	47.0 (35.0-52.85)	48.0 (45.0-63.0)	53.5 (42.3-51.0)

Performance of unit groups was also not significantly different against the high priority total: overall totals were always less than original (totper1) values, although health centre performance was particularly reduced (Table 6.6). Across all units, moreover, the original totals were found to be highly correlated with high priority totals (r=0.89), indicating that use of the high priority list would little alter relative performance judgements between units and unit groups.

A second way of reducing the checklist might be to identify those criteria which most discriminate between units in performance. Using the original findings of this study, Table 6.7 presents two groups of criteria, those most, and those adequately, discriminating between dispensaries. The first group includes those criteria for which performance was almost equally good or poor across all health units, and the second, those for which the frequency of good or poor performance across all units never exceeded 70%. Other criteria were not particularly discriminating because performance was either predominantly poor (e.g. availability of dressing equipment) or predominantly good (e.g. drugs regularly available). Using this approach the number of criteria within the overall checklist could, therefore, be reduced to a minimum of 33 in total (29 excluding laboratory variables) from 113 (110).

Further analysis of performance against only the most discriminating criteria suggested some slightly higher performance levels (five units scoring over 60%). Health centres perform relatively well in this assessment but little overall change was found in unit group median performance scores (Table 6.6). Examining relative performance indicates considerable correlation between performance against

Table 6.7: Discriminating criteria from the structural assessment

DISCRIMINATORY LEVEL	VARIABLES
Most	GENERAL: building condition, security, water availability, sanitation facilities, curative space, MCH space, waiting area, emergency light, housing, uniforms, DHMT visits, MCH feed-back, curative care continuing education,
	CURATIVE CARE: timeliness of drug supply, chloroquine availability, diazepam availability, dressing room cleanliness, dressing supplies, injection room furniture, hand-washing facilities for curative care, laboratory space, laboratory sterilization facilities, laboratory furniture, laboratory record-keeping,
	MCH CARE: MCH equipment, delivery room lighting, oxytocic available, MCH sterilization facilities, kerosene availability, health education time-table, availability of education materials,
	OTHER: bicycle availability, good reason for undertaking home visits
Adequate	GENERAL: unit environmental cleanliness, staff availability, distance to referral centre, supervision for curative care, supervision for MCH care, curative care feed-back,
	CURATIVE CARE: diagnostic equipment availability, treatment manual availability, curative care privacy, availability of painkillers, availability of penicillin, storage of opened drug kits, presence of expired drugs, dressing room furniture, curative care patient flow, laboratory equipment cleanliness, laboratory disinfectant, lab tests undertaken for which no reagents
	MCH CARE: MCH inventory, immunisation equipment, vaccine availability, MCH care patient flow,
	OTHER: regularity of other home-visiting, catchment population details available

discriminating criteria and original basic total scores (totper1) (r=0.80) suggesting that use of these criteria would little alter relative performance judgements. Performance scores using the two reduced checklists were also correlated (r=0.71).

6.7.3 Methodological conclusions

The main weakness in the wider use of these methods for *research purposes* concerns the validity of the overall standard (percentage score). Scoring procedures are valuable in summarizing complex data and facilitating comparisons between health units and unit groups. Analytical approaches, therefore, should consider the validity of any standard in terms of performance judgements. Composite total scores are better understood through dis-aggregation of scores by aspects of performance, such as curative and MCH care, or equipment and so on. Standards for individual criteria and overall performance must also reflect the circumstances of the particular country setting.

Wider use of this study's checklist as a *management tool*, for example during supervision, would be facilitated by its reduction but if the circumstances of the units assessed changed the criteria would need to be re-assessed. Improvements in maintenance or drug supply, for example, would make continued assessment of them unnecessary, and allow focus on other, initially less important issues. As the use of any checklist is intended to encourage good performance, obsolescence is inherent and checklists must be re-assessed regularly to ensure their continuing validity (Garner *et al.* 1990,

Thomason and Edwards 1991).

Checklist development is itself a useful management exercise, clarifying expectations of health units and identifying likely performance failures. In this study discussion of the full checklist within the Morogoro region allowed health managers to consider how to address known, but previously not quantified, problems and how to motivate action to identify and address performance failures. Quantitative analysis was helpful in emphasizing the strengths and weaknesses of current practice: identification of the percent of units performing well or badly against a commonly accepted standard gives district managers the opportunity to channel their support to relatively weak health units and to obtain external assistance where required.

6.8   Summary

This chapter has presented the findings from assessment of structural quality. For each of the three unit groups, it has reviewed evidence about a typical health unit and the median percentage structural quality scores for overall performance and performance in aspects of structure. Differences within unit groups have been considered and responsibility for structural weaknesses, evaluated.

Overall scores were under 60.0% across all unit groups (medians of 49.0% for government and diocesan groups, 47.0% for health centres). Diocesan units scored more highly for curative care (median of 56.0% versus 42.0%) and government units, for MCH care (median of 40.0% versus 48.0%). More than 60% of the diocesan group achieved the standard of 60% in two curative care variables and more than 60% of the government dispensary group, in two MCH variables. Health centres scored little better than dispensaries (curative median of 37.0%, MCH median of 46.0%) and, for some activities, considerably less; there were only few significant differences between health centres and dispensaries. Variation within the diocesan group was most marked for MCH care with central ranges of 15.0% (health centre, child welfare) to 80.0% (diocesan, child welfare). Differences between districts for government dispensaries were only significant for the overall (totper1), immunization, support and dressing variables.

Responsibility for structural quality weaknesses was spread between the different groups involved in providing care. Unit/district (i.e. supervisors) collaboration was best for diocesan dispensaries, health centres benefitted from better unit and district performance and government dispensaries particularly suffered from particularly poor district performance.

The significant associations between structural quality and total cost (p=0.010) confirmed that improvements in structure can only be achieved at greater cost. The chapter's other research

conclusions concerned the issues identified in Chapter 5 as most important in determining management strategies to enhance efficiency.

Methodological assessment confirmed the reliability of the findings and pointed to the potential of using the methods both for further research and for management.

CHAPTER SEVEN:
PROCESS QUALITY ASSESSMENT

Process quality is the most often used operational definition of health care quality (Chapter 3). In this study it was assessed by observing health workers performing selected procedures in ante-natal care, curative consultations and nursing care, in a sub-sample of the study's original health units (20/58). For each procedure an observation checklist was used, embodying expected standards and facilitating the determination of performance scores both overall and for aspects of the care provided (Chapter 4). This chapter reports the findings of this assessment, first summarizing practice in each area of assessment with respect to the process of providing care, the basic minimum actions required to avoid dangerous practice (minimum care) and the technical and inter-personal skills used in that process. Unit group performance is then reviewed and compared, and other factors influencing performance are considered; in particular, the links between costs and process quality are explored. Finally, the methodology of the study is assessed.

Results are presented primarily in the form of graphs, supplemented by Spearman rank correlation coefficients (r_s). In addition, Appendix 7A presents tables of scores and performance assessments against professional standards, and Appendix 7B indicates, for each procedure and across all health units, performance against each criterion.

7.1   Performance overall and by process aspect

7.1.1 Ante-natal care

Evaluation of ante-natal consultations was supplemented by specific and separate review of ante-natal record cards.

Consultation median performance scores varied from 30.0-70.0%; only one unit achieved an adequate performance level judged against professional standards (Figure 7.1). Much better, but still variable, performance was found in the ante-natal record card review; seven units achieved adequate performance levels, and one, good performance. Only four units achieved lower scores in the record card review than in the consultation assessment; and three of these were clearly the worst performers in completion of records. Within unit variation in scores was sometimes considerable.

Review of unit group median scores by process aspect (Figure 7.2) clearly showed the weaknesses of the key elements of the consultation: history, measurements (e.g. Hb, BP), physical examination,

ANTE-NATAL CONSULTATION
OVERALL PROCESS QUALITY
central range, median & mean by unit
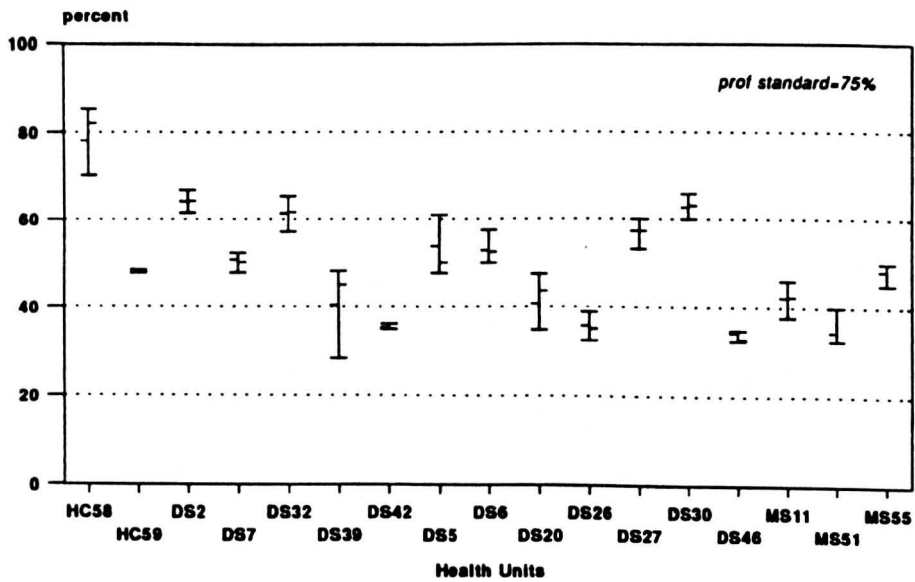
ANTE-NATAL RECORD REVIEW
OVERALL PROCESS QUALITY
central range, median & mean by unit
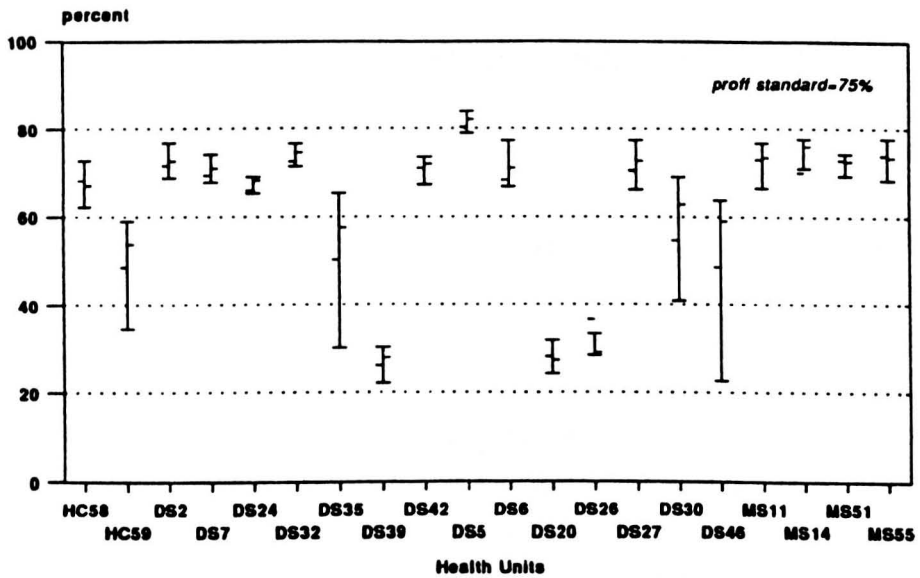
Figure 7.1: Ante-natal process quality
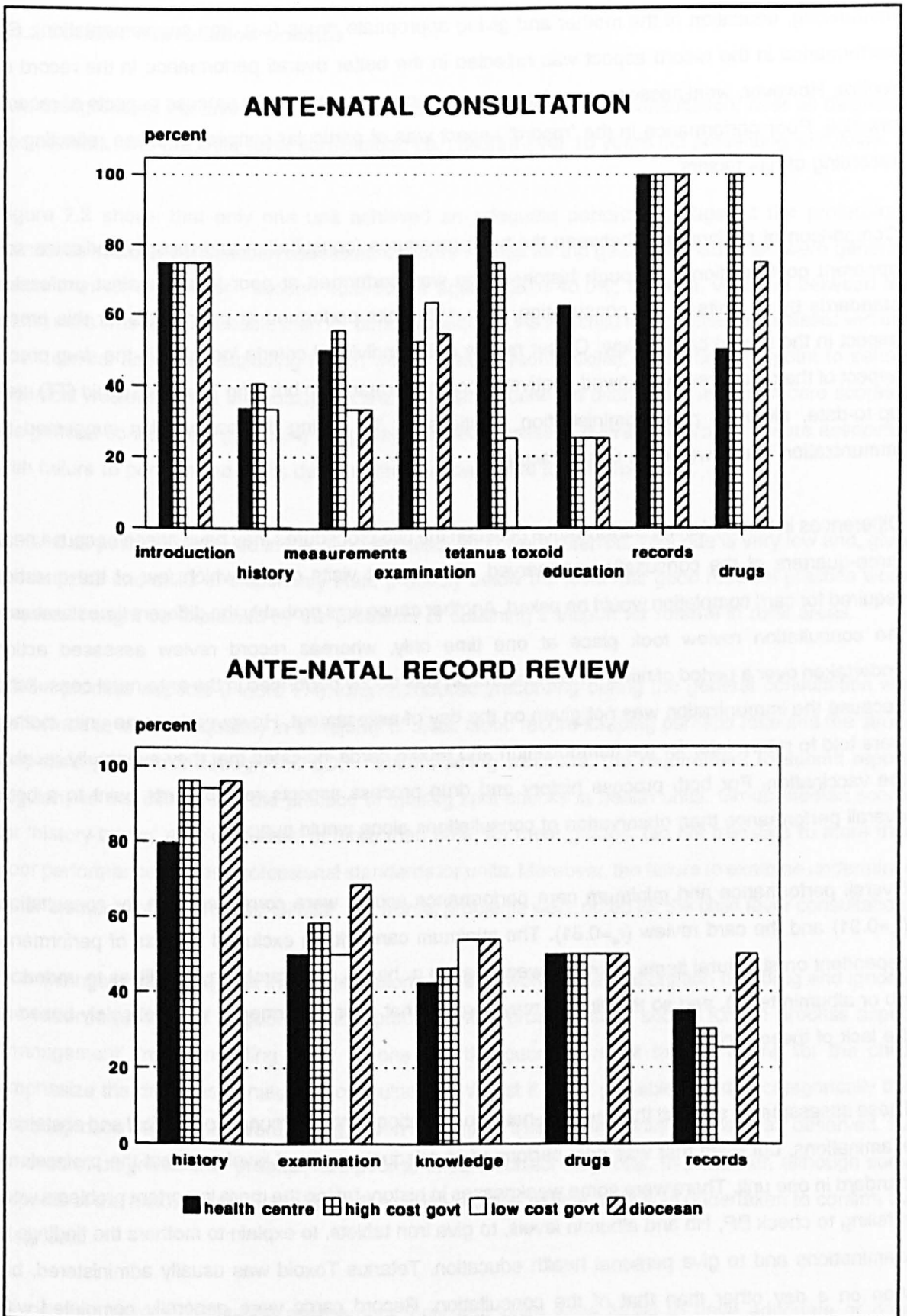
Figure 7.2: Ante-natal process quality, group performance by process aspects (medians, %)

immunizing, education of the mother and giving appropriate drugs (e.g. iron supplementation). Good performance in the record aspect was reflected in the better overall performance in the record card review. However, weaknesses were also noted for some of the specific process aspects of recording practice. Poor performance in the 'record' aspect was of particular concern because reflecting poor recording of risk factors.

Comparison of performance between the two procedures (consultation and records) indicates some apparent contradictions. Although history-taking was performed at poor levels against professional standards by all units in the consultation, only 4/20 units performed at poor levels for this process aspect in the record card review. Closer review of the individual criteria included in the drug process aspect of the record review showed relatively good performance in bringing Tetanus Toxoid (TT) status up-to-date, although poor administration practices for TT during the consultation suggested that immunization status would be unsatisfactory.

Differences in history-taking performance between the two procedures may have arisen because nearly three-quarters of the consultations observed were repeat visits during which few of the questions required for card completion would be asked. Another cause was probably the different times assessed: the consultation review took place at one time only, whereas record review assessed actions undertaken over a period of time. TT administration was poorly performed in the ante-natal consultation because the immunization was not given on the day of assessment. However, in some units mothers were told to return later for the immunization and record cards indicated that they eventually received the vaccination. For both process history and drug process aspects record cards point to a better overall performance than observation of consultations alone would suggest.

Overall performance and minimum care performance scores were correlated both for consultations (r_s=0.91) and the card review (r_s=0.81). The minimum care criteria excluded aspects of performance dependent on structural items of known weakness (e.g. health units rarely have facilities to undertake Hb or albumin tests), and so this finding may suggest that poor performance was not solely based on the lack of these facilities.

These assessments suggest that the ante-natal consultation centred around the physical and obstetrical examinations, but even that was only performed at adequate or good levels against the professional standard in one unit. There were some weaknesses in history-taking the more important problems were in failing to check BP, Hb and albumin levels, to give iron tablets, to explain to mothers the findings of examinations and to give personal health education. Tetanus Toxoid was usually administered, but often on a day other than that of the consultation. Record cards were generally completed with whatever basic information was obtained, but risk factors were not well identified.

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7.1.2 Curative consultation practice

Two categories of curative consultation were evaluated: the general consultation, over all diagnoses and patients, and the child fever consultation i.e. children over 10 years old presenting with fever.

Figure 7.3 shows that only one unit achieved an adequate performance against the professional standards in either consultation assessment. Score ranges for the general consultation were generally better than for child fever - around 40.0-60.0% against 20.0-40.0%; for both, variation between and within units was less noticeable than for other procedures. As the child fever consultation assessed only basic clinical activities (excluding health worker inter-personal skills), these findings point to serious technical weaknesses in the quality of care. Correlation between overall and minimum care scores in the general consultation ($r_s = 0.94$) suggests that weaknesses in overall performance were associated with failure to perform the tasks deemed most fundamental to the procedure.

2.3% of all patients observed in the general consultation were referred. This rate is very low and, given the facilities and skills of dispensary staff, probably below the level that good medical practice would require. It might be explained by the problems of obtaining transport for referral in rural areas.

Of the process aspects (Figure 7.4), only introduction/recording during the general consultation was performed at least adequately in a majority of units. Good record-keeping perhaps reflected the strong emphasis given to it through the EDP - initial training seminars, the requirement to submit reports regularly to the district and the practice of making spot-checks in health units. Group median scores for 'history-taking' and 'diagnosis' of more than 60%, for most groups, did not translate to more than poor performance against professional standards for units. Moreover, the failure to examine undermined other elements of the process. Similar, but worse, problems were noted for the child fever consultation.

The findings broadly suggest that consultations largely involved the prescription of a drug and ignored the wider requirements of good medical practice. Zero group median scores for the process aspect 'management' (recommending basic actions that the guardian might take in caring for the child) emphasize the drug-based nature of consultations. Whilst it is not possible to judge categorically that the diagnoses determined were wrong, given the limited training and skills of most staff observed, the process of diagnosis was probably too poor to ensure correct diagnosis. In particular, although some aspects of the history of the complaint were reviewed, little examination was undertaken to confirm the diagnosis.

In the child fever consultation assessment, only four units were found to have adequate or good performance in the treatment process aspect which reflected prescribing practices (leading to the 100%

GENERAL CONSULTATION
OVERALL PROCESS QUALITY
central range, median & mean by unit
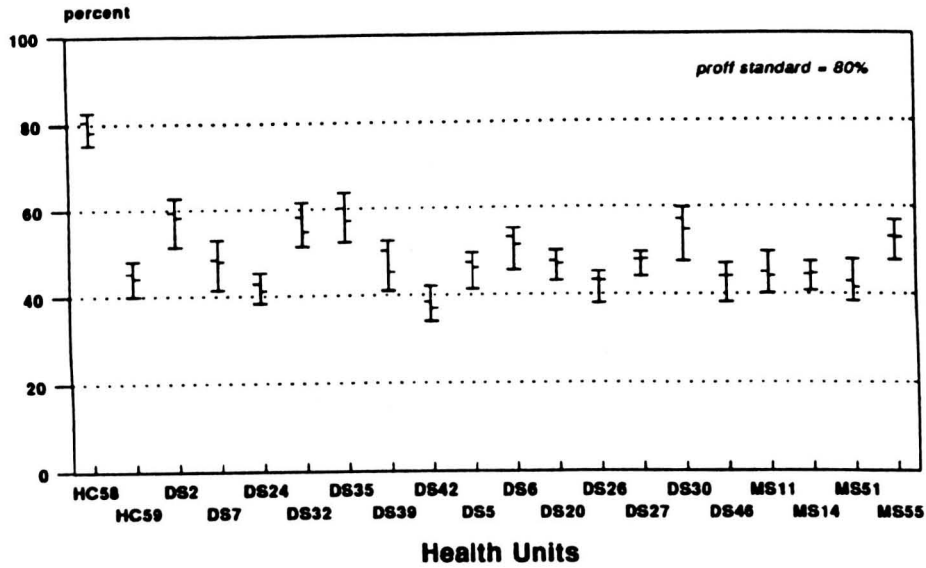
CHILD FEVER CONSULTATION
OVERALL PROCESS QUALITY
central range, median & mean by unit
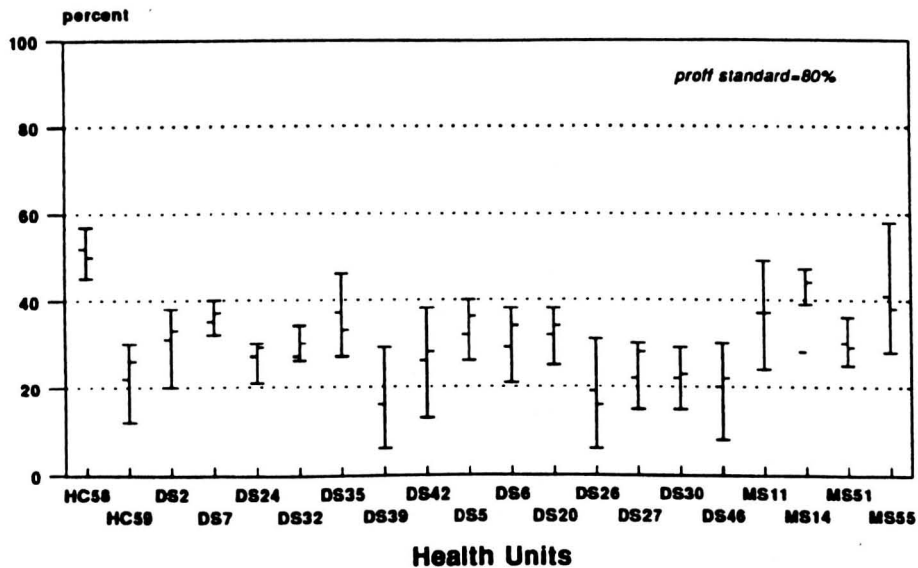
I central range ⊢ median ⊣ mean

HC=health centre; DS2-DS42=high cost govt; DS5-DS46= low cost govt; MS=diocesan

Figure 7.3: Curative consultation process quality

GENERAL CONSULTATION

percent

referral excluded as too few values

CHILD FEVER CONSULTATION

percent

■ health centre ⊞ high cost govt □ low cost govt ▨ diocesan
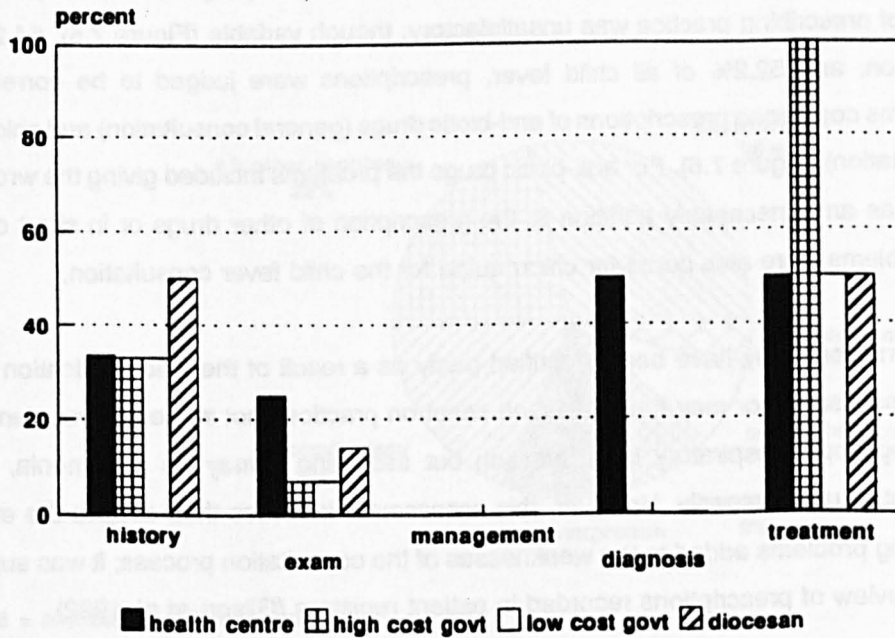
Figure 7.4: Curative consultation process quality, group performance by process aspects (medians, %)
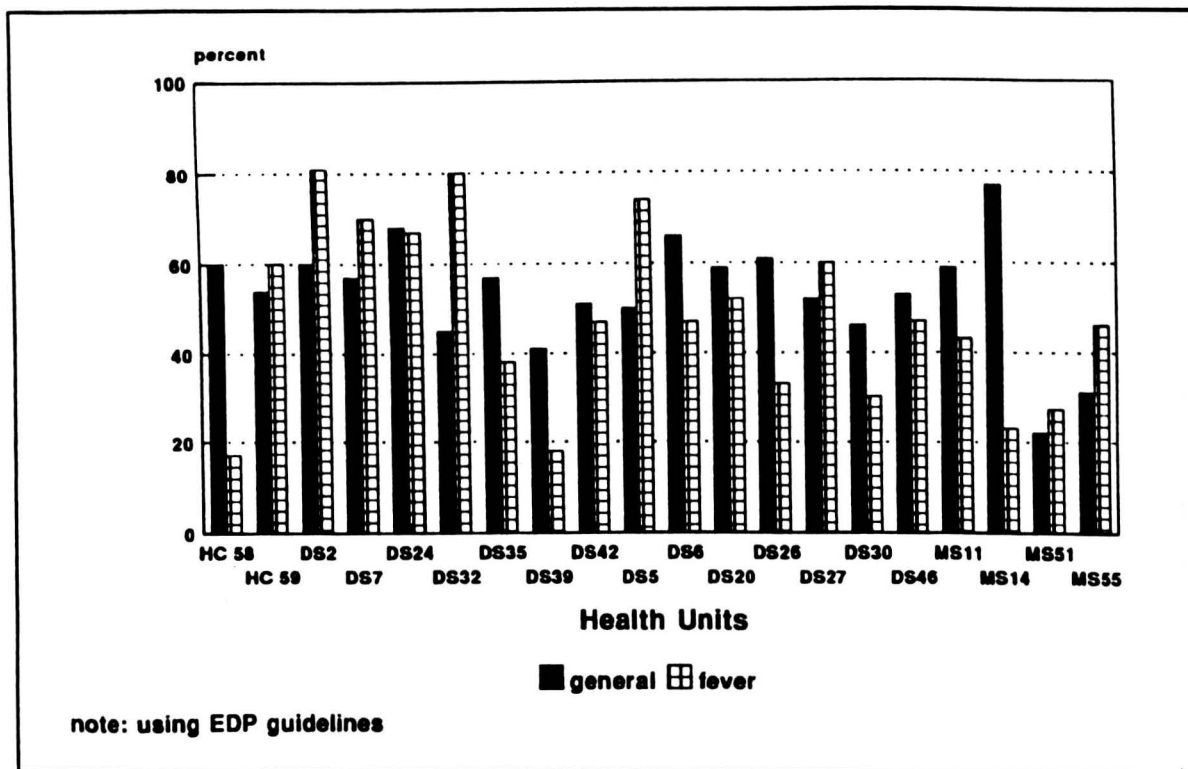
Figure 7.5: Prescription accuracy, percent of total prescriptions correct by unit

group median score for high cost government dispensaries). A more detailed review of prescribing, based on prescription details and undertaken by two independent clinical judges (Chapter 4), found that the general level of prescribing practice was unsatisfactory, though variable (Figure 7.5). 54.2% of all general consultation, and 52.2% of all child fever, prescriptions were judged to be correct. Most prescribing problems concerned prescriptions of anti-biotic drugs (general consultation) and chloroquine (child fever consultation) (Figure 7.6). For anti-biotic drugs the problems included giving the wrong drug for the diagnosis, as an unnecessary addition to the prescription of other drugs or in short duration. Dose/duration problems were also noted for chloroquine for the child fever consultation.

Poor prescribing practices may have been identified partly as a result of the rigid application of EDP guidelines in the assessment or may have reflected common practices not in themselves dangerous, such as diagnosing upper respiratory tract infection but assuming it may be pneumonia, and so prescribing anti-biotics unnecessarily. However, this assessment indicates that, despite the efforts of the EDP, prescribing problems added to the weaknesses of the consultation process; it was supported by more detailed review of prescriptions recorded in patient registers (Gilson *et al.* 1992).

GENERAL CONSULTATION PRESCRIBING PROBLEMS

AB missing 2%

AB unnecessary 27%

AB short 34%

AB wrong 37%

poor dose 14%

unnces. drug 7%

wrong drug 7%

inadequate 6%

referral reqd. 4%

diagnosis/approach 21%

AB problems 41%
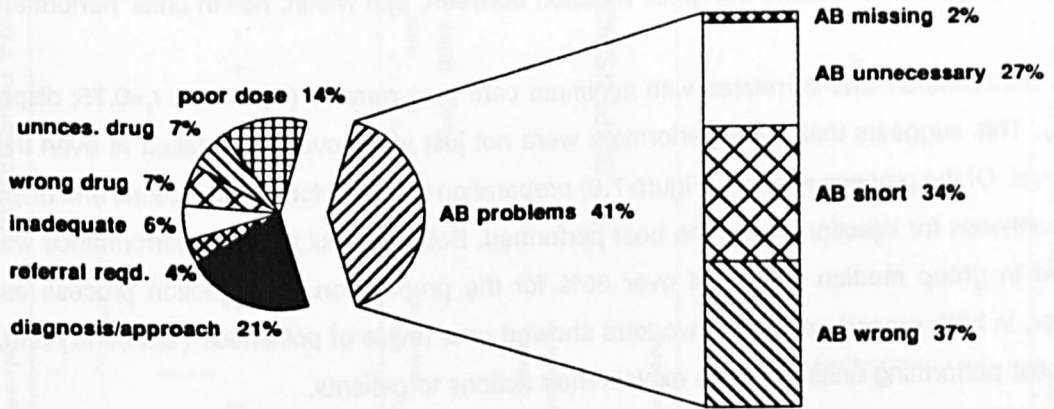
CHILD FEVER PRESCRIBING PROBLEMS

AB other problems 22%

CQ overdose 29%

CQ problems 5%

unnecessary other drug 7%

miscellaneous 9%

AB unnecessary 18%

diagnosis/approach 11%

AB = anti-biotic; CQ=chloroquine
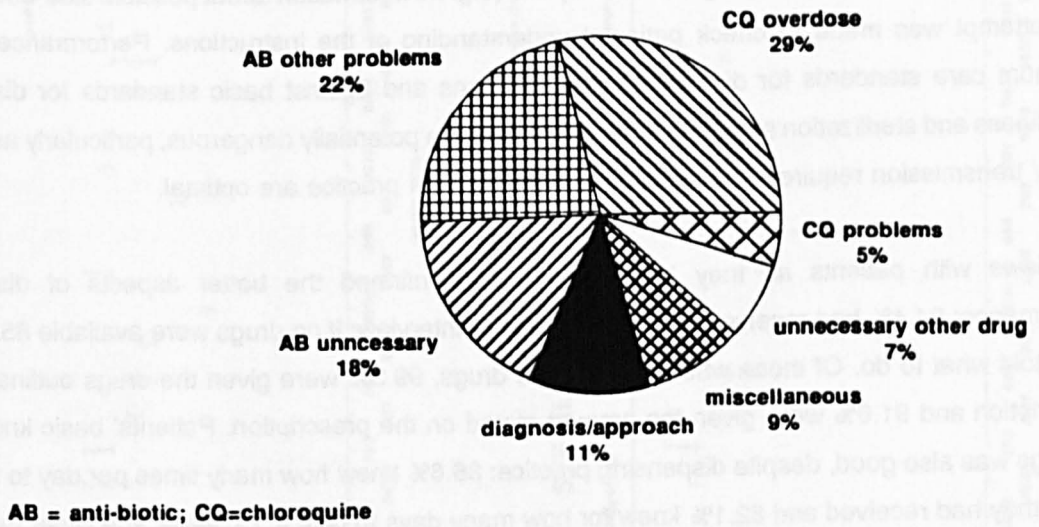
Figure 7.6: Prescribing practice problems

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7.1.3 Nursing practices

Overall performance in injections and dispensing was uniformly poor (Figure 7.7); median scores lay around 60.0% for injections but only around 40.0% for dispensing. Performance was also generally poor for sterilization and dispensing cleanliness, although four units achieved a good standard in the former and one in the latter. Sterilization performance scores were above dispensing cleanliness for many units. The graphs also indicate the great variation between, and within, health units' performance.

Overall performance was correlated with minimum care performance (injections: r_s=0.75; dispensing: r_s=0.73). This suggests that weak performers were not just weak overall but failed at even the most basic level. Of the process aspects (Figure 7.8) preparation activities for both injections and dispensing and cleanliness for injections were the best performed. Better overall injection performance was also reflected in group median scores of over 60% for the preparation and injection process aspects. However, in both procedures health workers showed poor levels of politeness ('start/end') and, even in the best performing units, failed to explain their actions to patients.

These findings suggest that although nurses generally ensured that they gave the right drug to the right patient, injected it technically correctly (e.g. first checked no air in syringe, chose correct injection site) and disposed of syringe, needle and swab correctly, few steps were taken to re-assure the patient during the procedure, to show politeness, to explain, where necessary, the need to return or to be aware of possible side-effects. In dispensing, although nurses usually checked that they gave the right drug to the patient and gave basic information about the drug, first doses were rarely given on the spot, explanation of how to use the drug was inadequate (e.g. no information about possible side-effects) and little attempt was made to check patients' understanding of the instructions. Performance against minimum care standards for dispensing and injections and against basic standards for dispensing cleanliness and sterilization suggested that practices were potentially dangerous, particularly as the risk of HIV transmission requires that injection and sterilization practice are optimal.

Interviews with patients as they left health units confirmed the better aspects of dispensing performance: 94.4% had received drugs on the day of interview; if no drugs were available 85.1% had been told what to do. Of those who had received drugs, 99.3% were given the drugs outlined in the prescription and 91.6% were given the amount stated on the prescription. Patients' basic knowledge of drugs was also good, despite dispensing practice: 86.6% knew how many times per day to take the drugs they had received and 82.1% knew for how many days to take it. However, the wider failures of nursing procedures were again emphasized by the finding that only 34.9% had been told if and when to return for further treatment (less importantly, only 27.8% knew the name of the drug they had been given). Patients' knowledge of treatment schedules is anyway not surprising given that only a few,

Figure 7.7: Nursing process quality
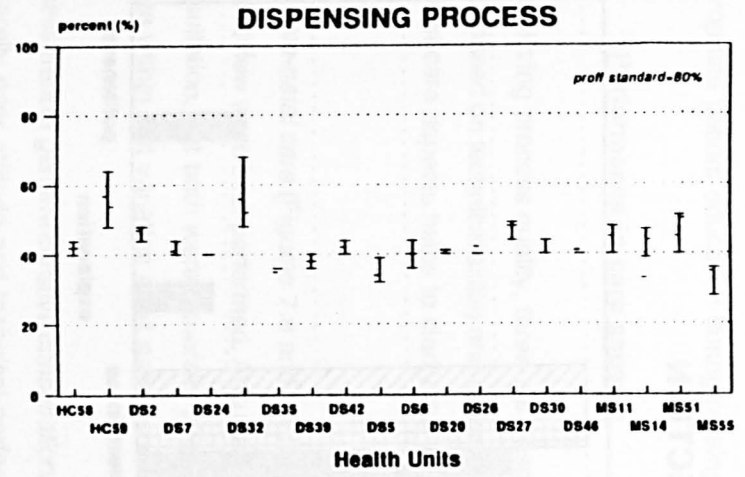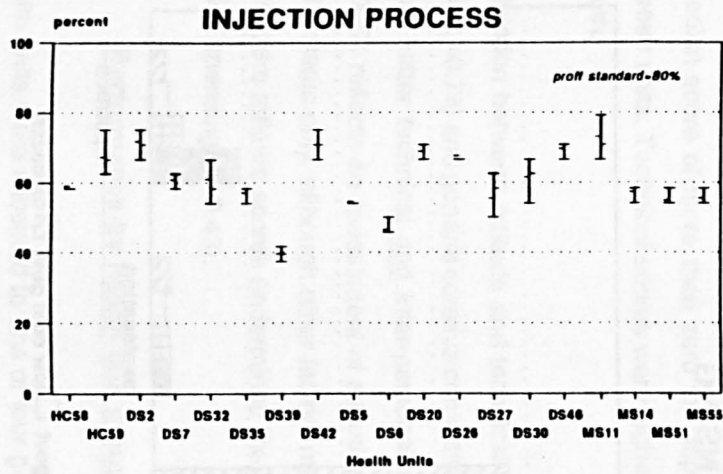
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INJECTION

DISPENSING

■ health centre ⊞ high cost govt □ low cost govt ▨ diocesan
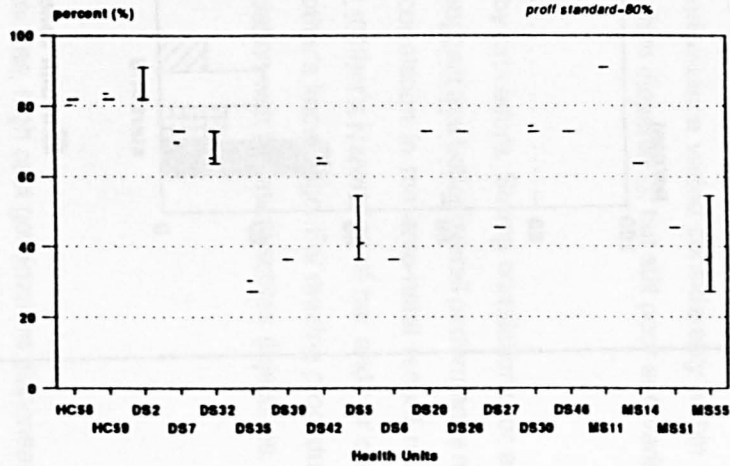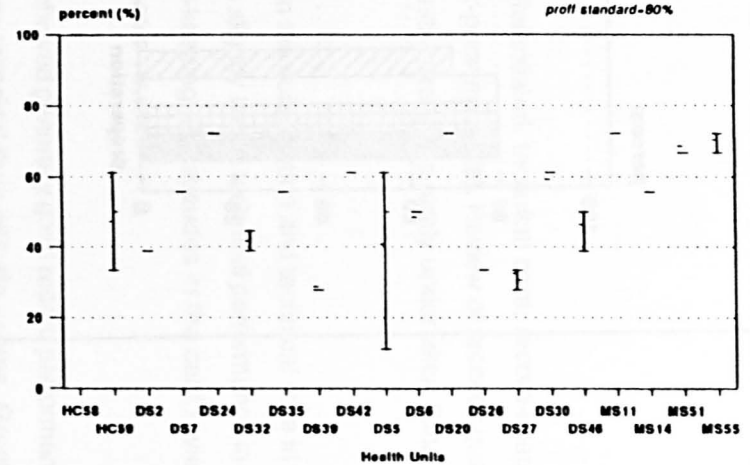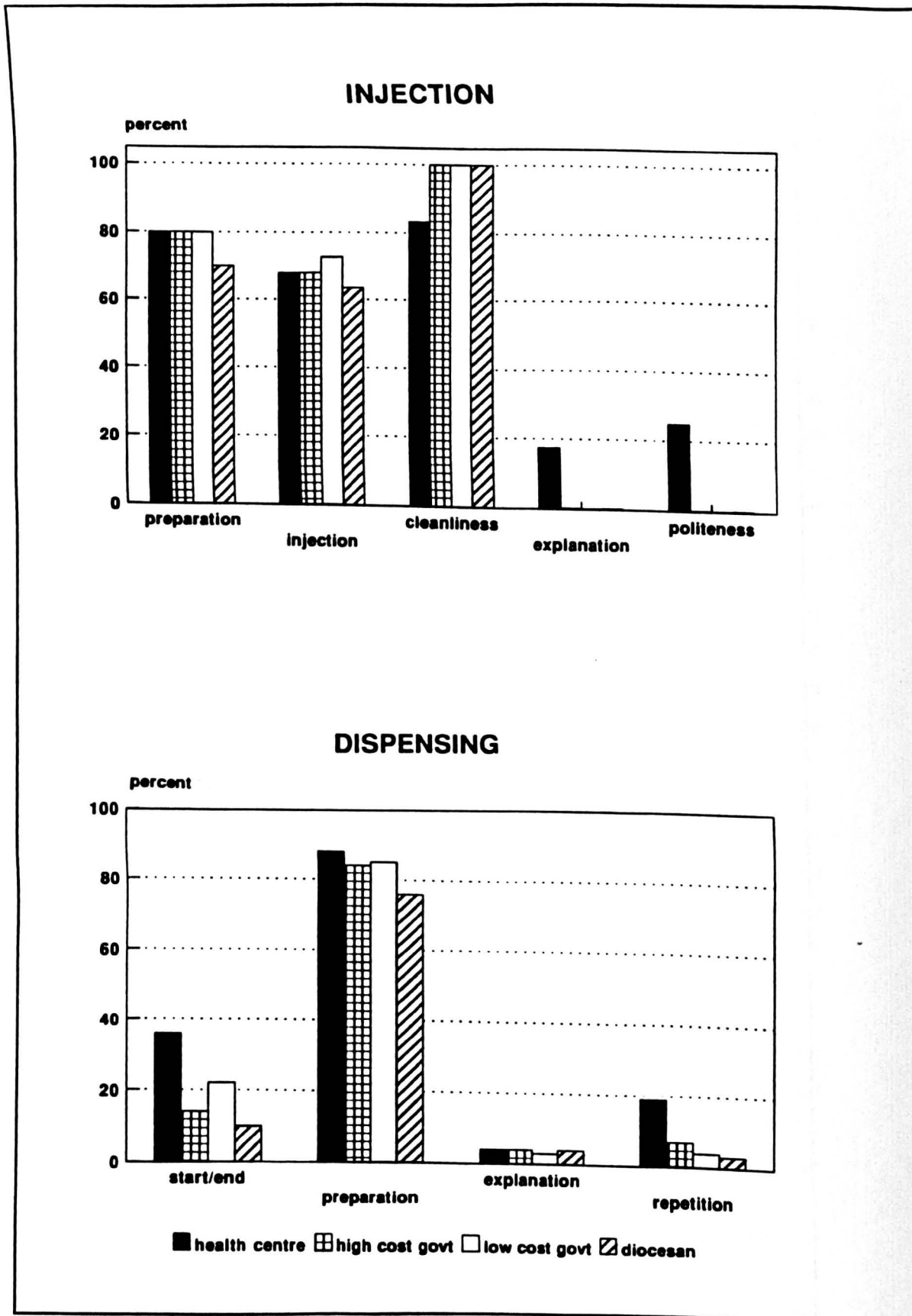
Figure 7.8: Nursing process quality, group performance by process aspect (medians, %)

commonly used drugs are generally available; it does not redress the significant failure to give appropriate patient education during nursing procedures.

7.2 Performance in care aspects

In analyzing process quality, three care aspects can be differentiated: technical care, record-keeping (both based on technical skills) and attitudes (based on inter-personal skills). Review of process quality against care aspects helps to clarify the weaknesses of health care but is rarely undertaken (Chapter 3).

For *ante-natal care* (Figures 7.9 and 7.10), record-keeping in the consultation and technical care in the card review were best performed. Attitude performance was slightly below technical performance in the consultation, but both were generally poor; as were record-keeping and attitudes in the card review. Large within unit variation in all aspects was noted for the card review.

Assessment of *general curative consultations* (Figure 7.11) showed generally good record performance, generally poor attitude and technical performance and lower technical than attitude scores. Greatest within unit variation was noted for attitudes; one health centre performed particularly well.

Nursing procedure attitude scores were especially poor (Figures 7.12 and 7.13). Only three units had a median score of more than zero for dispensing, and performance varied considerably within and between units. Technical scores were higher for injections than dispensing, but still poor and variable in both.

Correlation between attitude and technical scores varied by procedure. Strong correlations for ante-natal (r_s=0.75) and general curative consultations (r_s=0.68) suggest that better overall performance must reflect better technical and inter-personal skills. Limited correlation in the ante-natal record review (r_s=0.27) reflects an assessment of attitudes based on the mother's knowledge of her and her child's health status only, although other factors may influence mother's knowledge. For nursing procedures, low or zero attitude scores undermined the potential association with technical scores (injections, r_s=-0.20; dispensing, r_s=0.43).

7.3 Performance by health unit group

Health units were allocated to one of four groups: health centres, high cost government dispensaries, low cost government dispensaries and diocesan dispensaries. The division between government dispensaries was based on summary rankings reflecting average cost performance in different activities

CARE ASPECT-TECHNICAL
central range & median by unit
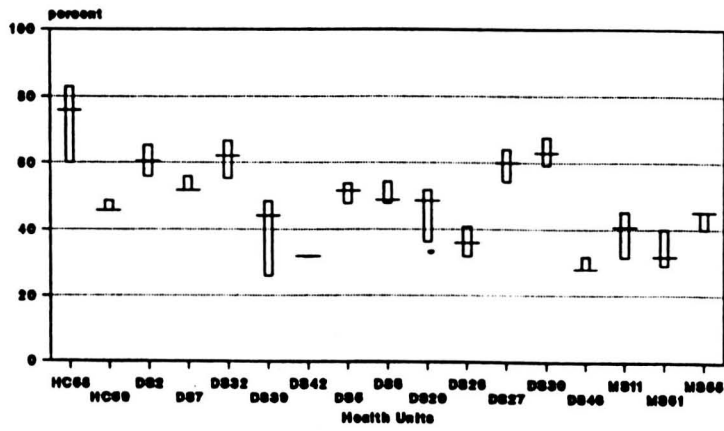
CARE ASPECT-RECORDS
central range & median by unit
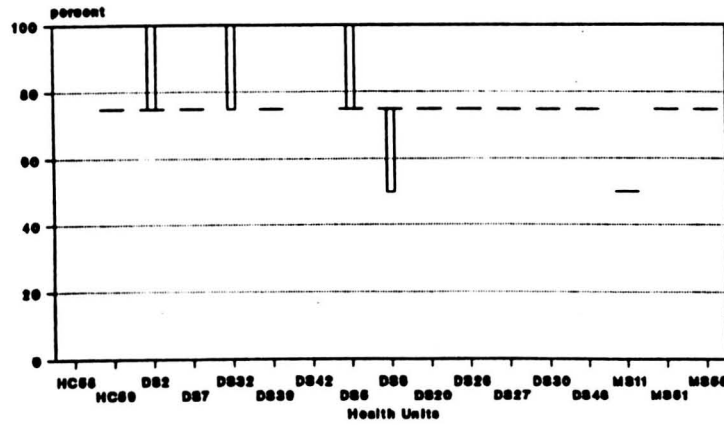
CARE ASPECT-ATTITUDES
central range & median by unit
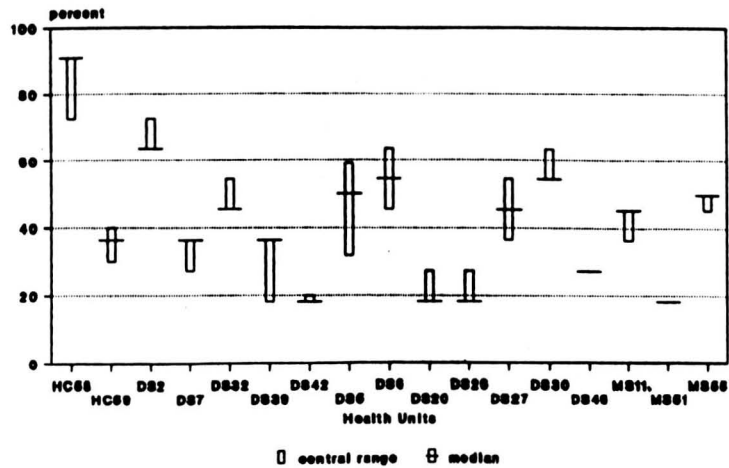
Figure 7.9: Ante-natal consultation process quality, unit performance by care aspect

CARE ASPECT-TECHNICAL
central range & median by unit
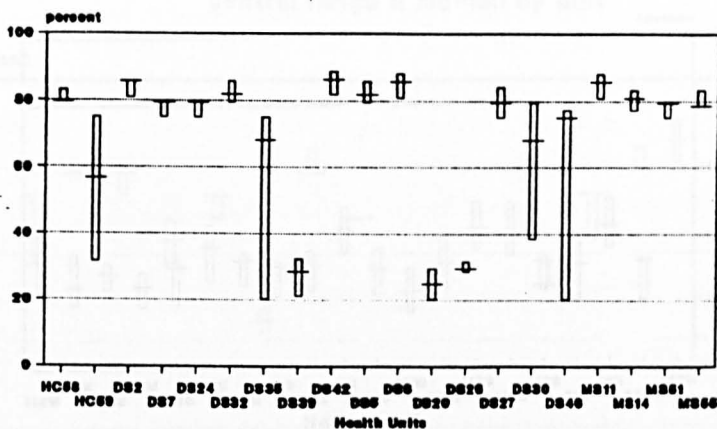
CARE ASPECT-RECORDS
central range & median by unit
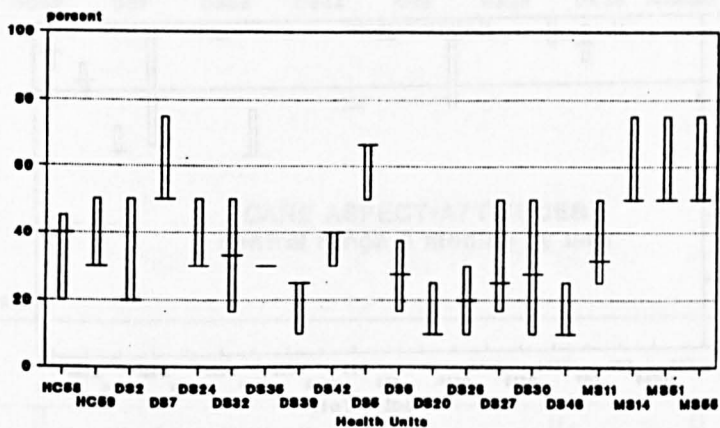
CARE ASPECT-ATTITUDES
central range & median by unit
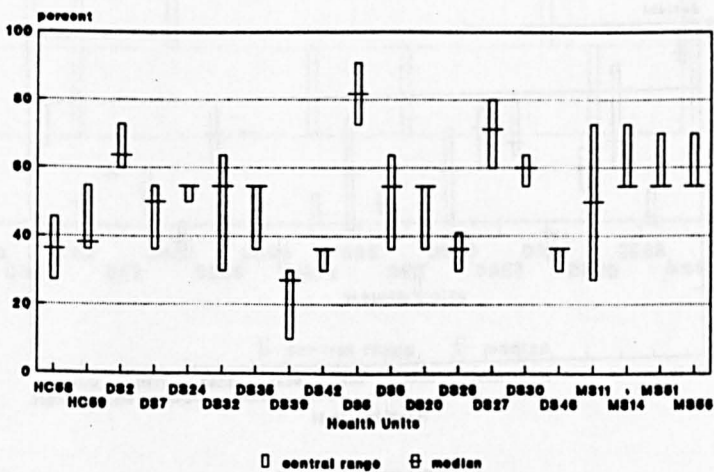
☐ central range   ⊕ median

Figure 7.10: Ante-natal record review process quality, unit performance by care aspects
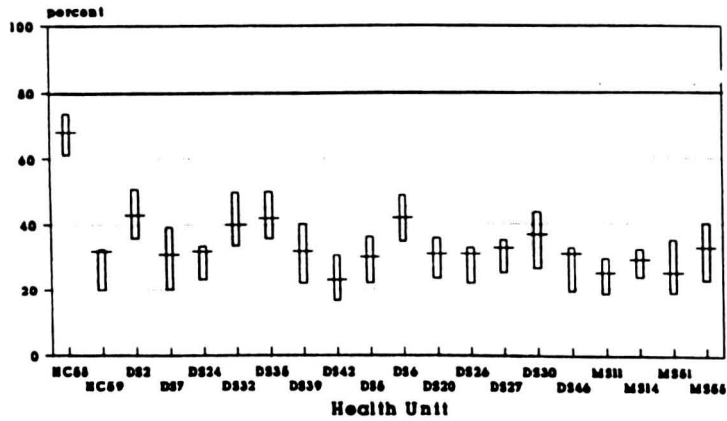
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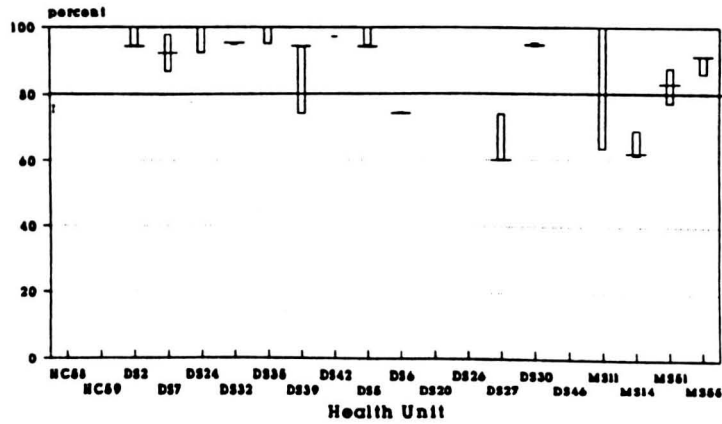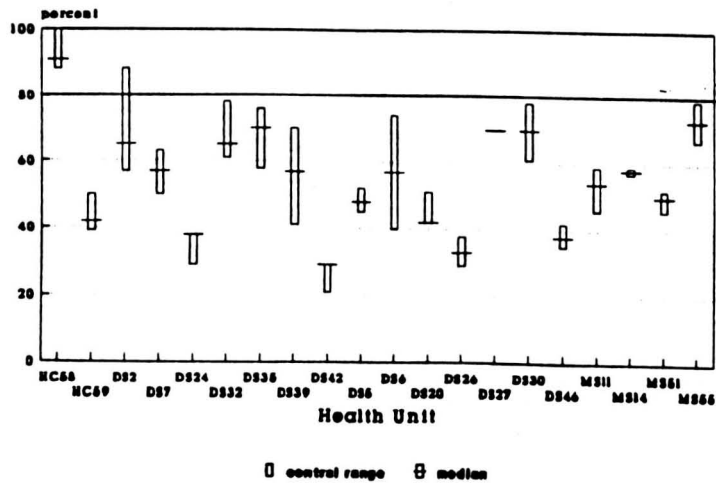
Figure 7.11: Curative consultation process quality, unit performance by care aspect

CARE ASPECT·TECHNICAL
central range & median by unit
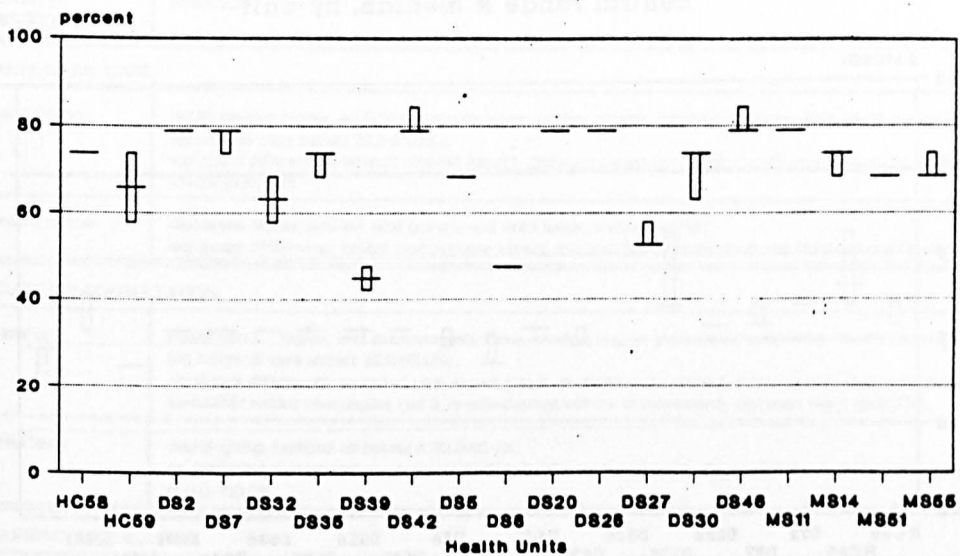
CARE ASPECT·ATTITUDES
central range & median by unit
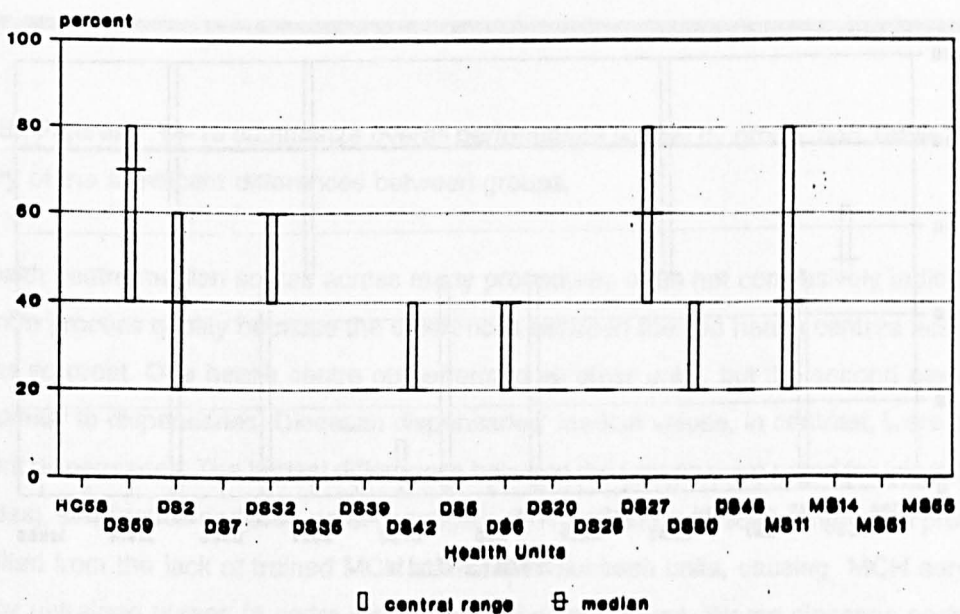
Figure 7.12: Injection process quality, unit performance by care aspect

CARE ASPECT-TECHNICAL
central range & median, by unit
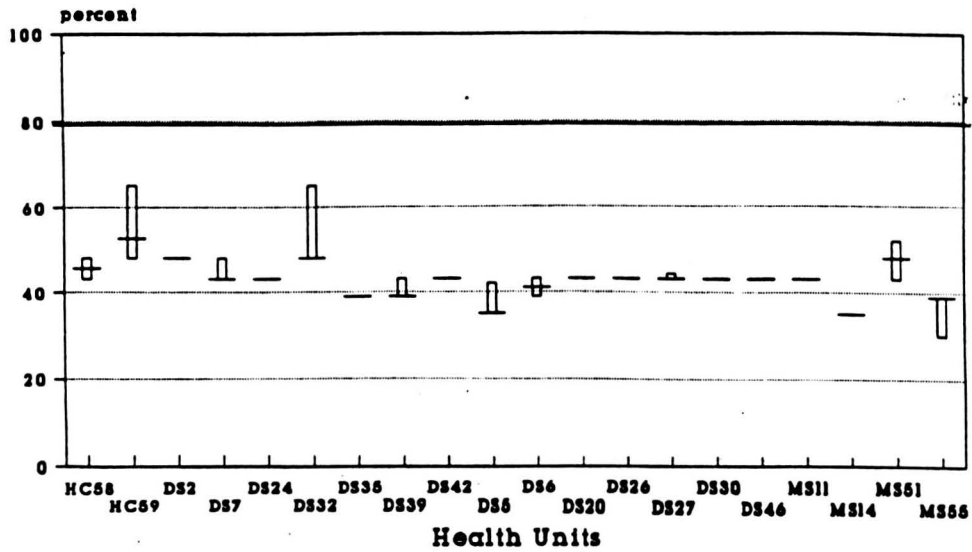
CARE ASPECT-ATTITUDE
central range & median, by unit
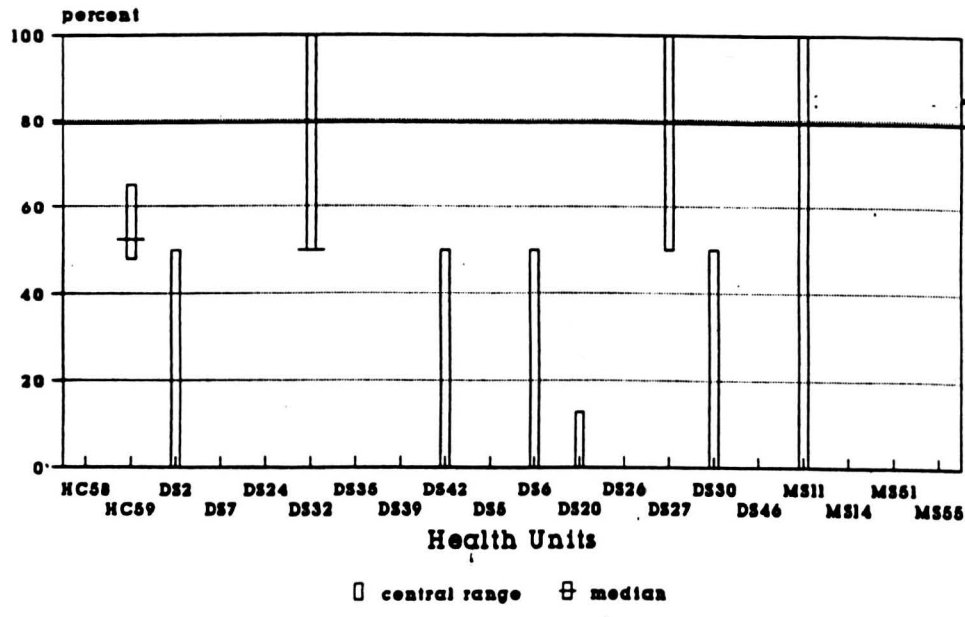
☐ central range   ✛ median

Figure 7.13: Dispensing process quality, unit performance by care aspect

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Table 7.1: Summary of differences between unit groups[1,2]

ACTIVITY/ PROCEDURE	FINDINGS
1.ANTE-NATAL CARE	
* consultation	health centres higher, and diocesan units lower, median scores; greatest variation within health centre group (eg.attitude care aspect 26.0-91.0%); significant differences: tetanus process aspect, diocesan lowest (p=0.070); record care aspect (1st visit), diocesan lowest (p=0.080)
* record review	diocesans higher, and low cost government units lower, median scores; significant differences: record process/care aspect, low cost government worst and diocesan best (p=0.080);
2.CURATIVE CONSULTATION	
* general	health centres higher, and diocesan units lower, median scores; greatest variation within health centre group (eg.technical care aspect 32.0-68.0%); significant differences: technical care aspect (1st & re-attendances without improvement), diocesan lowest (p=0.080); record care aspect (1st & re-attendances without improvement), diocesan worst (p=0.070),
* child fever	overall group medians all between 30.0-40.0%; no significant differences; great variation within health centre group eg.diagnosis & treatment process aspect scores of 0.0-100.0%
3.NURSING PROCEDURES	
* injection	diocesan lower scores; significant differences: preparation process aspect, diocesan lowest (p=0.05) but all scores above 70%; explanation process aspect, health centre highest (p=0.04) but all scores under 17%
* dispensing	diocesan higher scores; no significant differences

NOTE: 1. Significant differences assessed using a p value of p=0.1.
2. Using unit group median scores, determined from the median scores of all units within each group;

(Chapter 5). Figures 7.14-16 summarize overall performance scores by group, and Table 7.1 presents a summary of the significant differences between groups.

Higher health centre median scores across many procedures does not conclusively indicate better health centre process quality because the differences between the two health centres assessed were themselves so great. One health centre outperformed all other units, but the second performed only at levels similar to dispensaries. Diocesan dispensaries' median values, in contrast, were often below government dispensaries. The largest differences between the groups were noted for injections (overall and attitudes), sterilization and ante-natal consultation (overall and technical). Ante-natal problems may have resulted from the lack of trained MCH staff within diocesan units, causing MCH services to be provided by untrained nurses (a cadre with noted skill weaknesses). Worse diocesan performance in the general consultation is harder to explain, especially as RMAs working in these units were seconded from government and had the same training as government staff. Comparison of median values between the two government dispensary groups suggest that the high cost group had slightly greater median scores across procedures, but differences were slight. Within-group variation anyway indicates
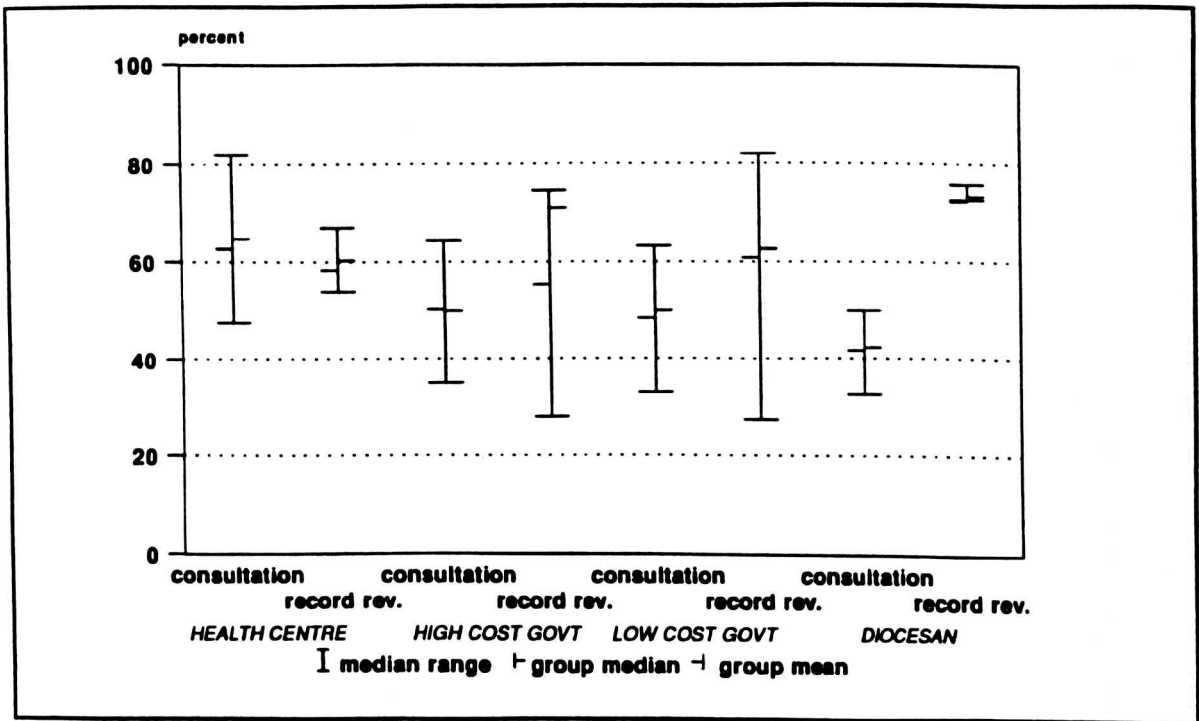
Figure 7.14: Ante-natal process quality, overall group performance
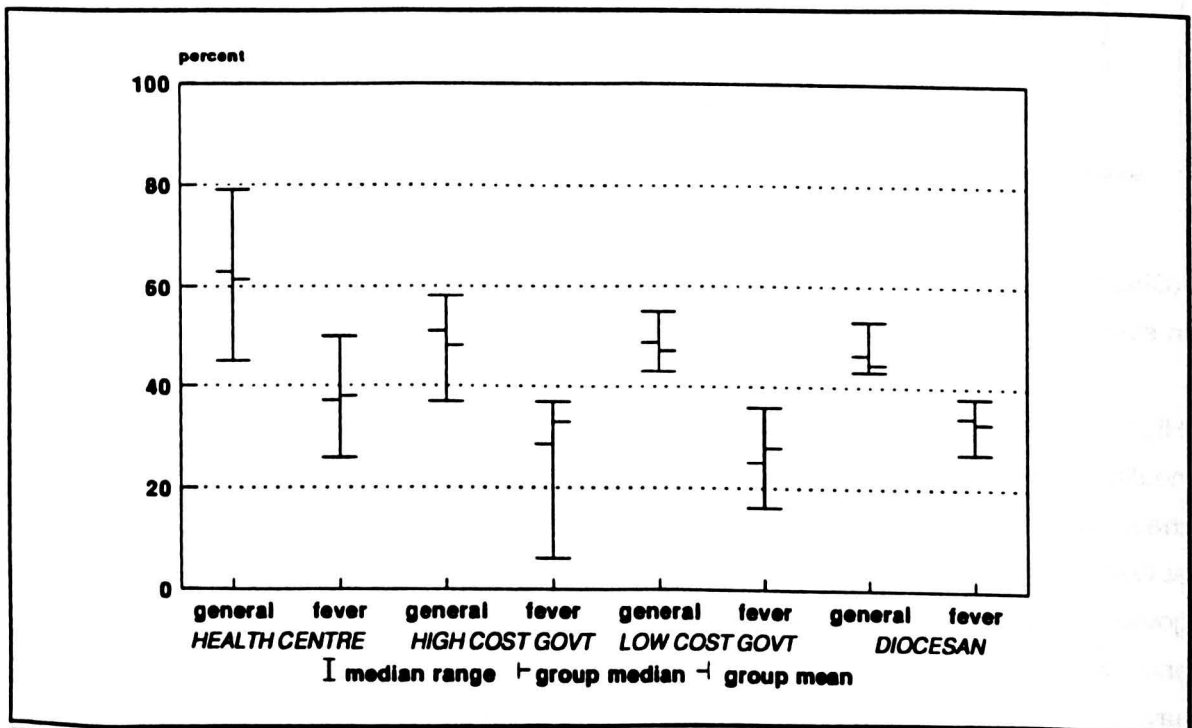
Figure 7.15: Curative consultation process quality, overall group performance
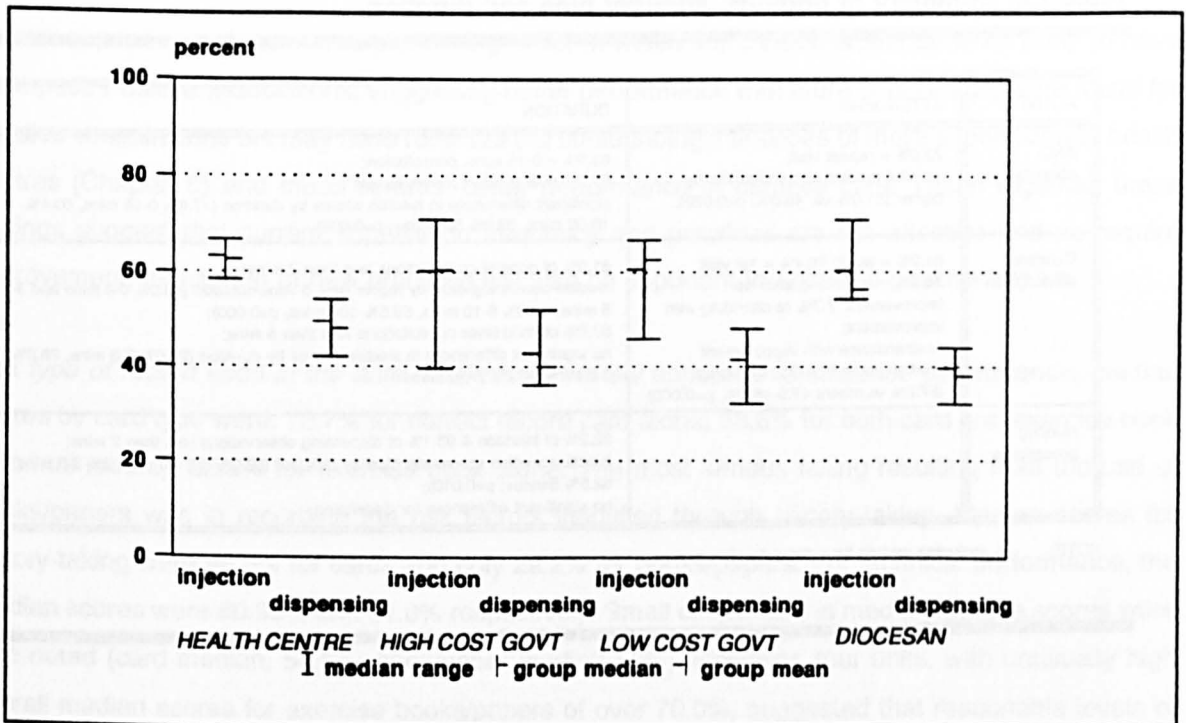
Figure 7.16: Nursing process quality, overall group performance

high cost group sometimes had both the best and the worst government dispensary performers in a procedure (e.g. injection, sterilization); but more often no trend was discernible.

7.4 Type of attender and duration of procedure

Details about attenders and duration of procedure were determined during observations and, together with median scores, are summarized in Table 7.2.

In both procedures the follow-up of patients was found to be poor. Mothers making repeat visits for ante-natal care need continuing high levels of care in order to provide an effective monitoring service. Similarly, patients re-attending curative consultations after no improvement need particular attention in order to address their problems. Moreover, children, who should receive more attention because of their greater vulnerability, also received inadequate attention.

Ante-natal consultations were the longest of all procedures and curative consultations and nursing procedures more or less equally short. Longer duration was found to be associated with higher median scores for some procedures, reflecting the possibility, for example, of taking a more complete history or doing a more thorough examination. For nursing procedures, duration was so short as to permit only the most basic actions (probably also undermining the duration/performance association); better performance requires longer duration. The generally low level of median scores across all consultations,

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Table 7.2: Summary of findings, attender type and duration

ACTIVITY	ATTENDERS	DURATION
ANC consultation	73.6% = repeat visit; 1st visit median score significantly higher (51.0% vs. 48.0%; p=0.020).	83.5% = 0-15 mins, consultation; 55.2% over 2 hours for whole visit[1]; significant differences in median scores by duration (47.6% 0-15 mins, 60.4% 16-30 mins, 52.0% 30 mins+; p=0.002)
Curative consultation	84.9% = adult; 75.4% = 1st visit, 16.9% re-attending after no improvement, 7.7% re-attending with improvement; re-attendance with improvement median score significantly higher (57.0% vs.others 47.0-48.0%, p=0.000)	61.9% of general consultations less than 2 mins; median scores significantly higher over 5 mins duration (48.0% 0-2 mins and 3-5 mins, 57.0% 6-10 mins, 59.5% 10+ mins, p=0.000); 87.8% of child fever consultations less than 5 mins; no significant differences in median scores by duration (26.0% 0-3 mins, 28.0% 3-5 mins, 33.0% 5-10 mins)
Nursing procedures		92.2% of injection & 93.1% of dispensing observations less than 2 mins; injection median scores significantly different (62.5% 0-2 mins, 54.2% 3-5 mins, 62.5% 5mins+; p=0.010); no significant differences for dispensing

NOTE: 1. Including waiting time, for example.

however, indicates that patient care cannot simply be improved by spending more time with the mother/patient; more effective care is also required.

7.5 Further analysis of performance variation between units

To assist in the determination of management interventions that might encourage process quality improvements, variation between units in performance scores was analyzed against five groups of possible explanatory factors: health unit factors (time allocations and workloads), district management practice (supervision and type of ante-natal record), structural factors and staff allocations. Association between performance scores and these factors was assessed using the Spearman rank order correlation coefficient; Appendix 7C summarizes the variables used and the correlation findings (using correlations only over 0.3).

Correlations between scores and *time allocations* reflect duration findings, broadly suggesting that better performance was associated with longer duration. *Workloads* were associated with various aspects of nursing care performance but were hardly linked to curative consultation scores. Some ante-natal care findings and nursing correlations suggested that greater workloads were linked to higher scores. Perhaps the better units were more heavily used? However, two negative correlations for ante-natal care suggested that greater workloads may have led to worse performance.

Supervision appeared to have quite limited impact; many correlations were negative and supervision may, therefore, have discouraged performance. Alternatively, negative correlation may have reflected

greater supervision of the worse performing units, in which supervision would be least likely to have an impact. Positive associations, suggesting better performance with more supervision, were found for curative consultations but may have reflected the confounding influences of more supervision to health centres (Chapter 6) and these centres' better performance of curative care. Taken together, these findings suggest that current supervision frequency and practices are not effective and so require improvement; monitoring of new practices will also be important to ensure a positive impact.

The *type of record used in the ante-natal record review* appeared to influence performance, median scores by card type were: 70.7% for correct record card alone; 58.6% for both card and exercise book (informal record); 32.8% for exercise book alone. The most serious failing resulting from the use of books/papers was in recording the risk factors identified through history-taking. Median scores for history-taking were 96.3% for cards and only 22.2% for books/papers. For technical performance, the median scores were 80.95% and 31.0% respectively. Small differences in median attitude scores were also noted (card median, 54.5%; book/paper median 50%). However, four units, with unusually high overall median scores for exercise books/papers of over 70.0%, suggested that reasonable levels of performance were possible despite the absence of the proper record cards, if health unit staff acted responsibly.

Structural factors appeared to have mixed influence on process quality. Negative correlations were common for the staff available variable and for associations between structure and attitudes across nursing procedures, suggesting some association between better structure and worse performance. Some positive correlations, however, pointed to the encouraging influence of structure on performance. For example, relatively high correlations with equipment variables for the ante-natal consultation, injections and dispensing cleanliness. Structural factors may also have influenced performance via staff morale; when interviewed staff most often cited lack of equipment/other supplies as a problem of routine work and more equipment was identified as the third most important action for improving services (Alilio 1991).

Associations between *staff allocations* and performance were limited in number but, especially for trained staff availability, relatively strong. All but one correlation was positive, suggesting that better performance was linked to greater numbers of staff. For ante-natal care the impact appears to have been more on attitudes than technical performance, but for curative consultations the reverse pattern was suggested. Fewer correlations were found for nursing care, even for the trained staff variable. Perhaps trained staff were not involved in nursing care, either directly or in supervising the work of untrained staff.

7.6   Performance by cadre

Table 7.3: Summary of key cadre-related findings

ACTIVITY/ PROCEDURE	CADRE-RELATED FINDINGS
1.ANTE-NATAL CARE * consultations	*Staff involved:* of total observations: MCHA, 56.6%; untrained nurse, 30.5%; 10.2%, RMAs; untrained nurses used in 8/17 units; in three units only untrained nurses at work, in one, only health orderly, in one, only RMA; village health worker observed in one unit *Median scores:* MCHA = 55.0%, RMA=49.0%, untrained nurse=45.4%, village health worker=35.0%; significant difference between MCHA/RMAs & other cadres overall, first and repeat visits (p=0.0001); better than average performance by an untrained nurse working alone in one unit (median 61.7%). *Score range:* MCHA, 32.9-82.0%, untrained nurses 28.0-61.9%;
* record cards	not applicable
2. CURATIVE CARE * general consultation	*Staff involved:* of total observations: RMA, 83.9%; also MAs, MCHAs, untrained nurses, health orderly; *Median scores:* MA = 62.0%, RMA = 48.0%, MCHA = 48.0%, untrained nurse = 44.0%, health orderly = 42.0%; differences significant (p=0.000)
* child fever consultation	*Staff involved:* of total observations: RMA 86.1% observations; also MAs, MCHAs, untrained nurses, health orderly; *Median scores:* MA = 30.0%, RMA = 29.0%, Health orderly = 6.0%; differences significant (p=0.001)
3.NURSING CARE * injections	*Staff involved:* of total observations: untrained nurse 87.0%, trained nurse 7.7%, MCHA 4.5%, Health Orderly 1.5% (1 unit) *Median scores:* trained nurse = 70.8%, untrained nurse = 62.5%, MCHA = 58.3%, health orderly = 37.5%; differences significant (p=0.000)
* dispensing	*Staff involved:* of total observations: untrained nurse 92.6% *Median scores:* MCHA = 48.0%, trained nurse = 44.0%, untrained nurse = 40.0%, RMA = 32.0%; differences significant (p=0.000)

The cadre of health worker involved in a procedure was often an important influence on performance, even though differences between median scores by cadre were not always large (Table 7.3). Curative

consultations and nursing procedures were primarily undertaken by one cadre, but ante-natal care was provided by a variety of staff. Untrained nurses (that is staff with at most a one year pre-nurse training) were involved in all procedures to different degrees.

Although these findings are based on the total number of observations undertaken by each cadre, some caution in interpretation is required because both sample sizes and the numbers of workers by cadre are sometimes small (for example, only two MAs were observed for general curative consultations). There was also considerable within-cadre variation (MCHA performance in ante-natal consultations varied from 28.0% to 64.9% for technical care and from 18.0% to 90.9% for attitudes). However, assessment of performance in care aspects (Tables 7.4-7.6) highlights some important differences between cadres.

Table 7.4: Ante-natal consultations, cadre median scores (%)

CARE ASPECT	MCHA n=193	NURSE n=122	RMA n=39	VHW[1] n=10
technical	52.0	45.5	52.0	32.0
records	75.0	75.0	75.0	100.0
attitudes	54.5	36.4	27.3	18.2

NOTE: 1. VHW = village health worker

Table 7.5: General curative consultation, cadre median scores (%)

CARE ASPECT	MA n=119	RMA n=1506	MCHA n=85	NURSE n=56	HO[1] n=30
technical	47.0	32.0	32.0	23.0	30.0
records	100.0	100.0	60.0	73.0	93.0
attitudes	67.0	54.0	70.0	58.0	39.0

NOTE: 1. HO=health orderly

MCHAs were found to perform significantly better than other cadres in the attitude aspect across all activities, suggesting that their inter-personal skills were strongest. Relatively good technical performance was observed for MAs in general consultations and trained nurses in the injection procedure. Untrained nurses also supported/covered for their colleagues in other procedures (especially

ante-natal care), but their technical performance in these procedures compared badly with most other cadres and their performance in the attitude care aspect across all procedures compared badly with MCHAs. Poor performance by MCHAs and health orderlies in the injection procedure is worrying given their involvement in immunization activities. RMAs, the senior staff member in dispensaries, neither performed their own duties well nor those of their colleagues.

Table 7.6: Nursing procedures, cadre median scores (%)

PROCEDURE/ CARE ASPECTS	UNTRAINED NURSE	TRAINED NURSE	MCHA	HO[1]	RMA
Injection	n=676	n=60	n=35	n=12	n/a
* technical	73.7	78.9	52.6	42.1	
* attitudes	20.0	40.0	60.0	20.0	
Dispensing	n=821	n=62	n=50	n/a	n=10
* technical	43.0	48.0	43.0		35.0
* attitudes	0	0	100.0		100.0

NOTE: 1. HO=health orderly

Closer review of cadre findings suggests that there may have been a unit effect, encouraging or discouraging good performance and overlying the cadre effect. Differences between health units were most clearly seen for ante-natal care. Median ante-natal consultation scores were always lower for untrained nurses than MCHAs working in the same unit, but the median scores of MCHAs and untrained nurses working together were found to be correlated (overall r_s=0.70). Excluding one unit with an extreme value gives a correlation of r_s=1.00.

Comparison of MA and RMA performance for general curative consultations (in two units) and RMA and untrained nurse performance, for child fever consultations (in two units) also points to a unit effect. For the general consultation MA/RMA scores of 81.1% compared with 45.8% (MA) and 42.4% (RMA) in the second unit; for the child fever consultation, scores of 29.5% (nurse) and 38.0% (RMA) compared with scores of 6.0% (nurse) and 30.0% (RMA). Although scores differed by cadre, there was a better performing unit and a worse performing unit across cadres in both cases. The existence of a unit effect cannot be explored for nursing procedures because they were predominantly undertaken by untrained nurses.

7.7 Process quality associations

Chapter 1 suggested some possible direct links between process quality and costs, and some indirect links mediated by structural quality.

Findings already presented give only limited support to the influence of structural quality on process quality. Further analysis using cross-tabulation sought to explore the associations between structural and process quality, between process quality and total/average costs, and process quality and utilization. The analysis built on that used in assessing structural quality associations (Chapter 6). Three process quality variables were used, reflecting overall health unit technical, record-keeping and attitude (inter-personal) skills. These variables were established by summing scores across all procedures for each of the three aspects, then expressing them as a percentage of the maximum possible score for the health unit.

Although no associations were significant, trends are suggested by the two-by-two tables (Figures 7.17-7.20). There appeared to be a negative association between attitudes and *total costs*, suggesting that better attitudes were associated with lower costs and worse attitudes with higher costs; this was also partially apparent in comparing total costs and technical skills (but not clear with respect to record-keeping skills). In contrast, the analysis suggested a positive association between technical skills and attitudes and *average costs*: higher quality may have been associated with higher average costs. There was also some suggestion of a positive association between technical skills and *structural quality*, but no trend was discernible in relation to either record-keeping skills or attitudes. Finally, there was little evidence of an association between *utilization* and any process quality variable.

The inter-linkages between the different variables considered make explanations of these patterns difficult. Whilst better quality may imply lower total cost it may, at the same time, imply greater average cost, perhaps suggesting that the way resources are combined (the corollary of process quality) is a stronger influence on average costs than resource availability (Chapter 1). The lack of association with utilization suggests that the link is not mediated through the influence of process quality on satisfaction and, thus, utilization. Although the influence of structure on process quality appears to be quite limited, detailed examination of specific procedures does show that some process quality weaknesses can be traced to structural quality weaknesses - such as failure to perform Hb and albumin tests in the ante-natal consultation. Structural quality might, therefore, influence process quality via other factors, such as health worker morale.

TECHNICAL SKILLS	low	high
TOTAL COST		
low	3	5
high	7	5
ATTITUDES	low	high
TOTAL COST		
low	2	6
high	8	4
RECORD-KEEPING	low	high
TOTAL COST		
low	4	4
high	5	7

Figure 7.17: Process quality associations with total costs

TECHNICAL SKILLS	low	high
AVERAGE COST		
low	6	4
high	4	6
ATTITUDES	low	high
AVERAGE COST		
low	6	4
high	4	6
RECORD-KEEPING	low	high
AVERAGE COST		
low	4	6
high	5	5

Figure 7.18: Process quality associations with average costs

TECHNICAL SKILLS	low	high
STRUCT.QUALITY		
low	6	2
high	4	8
ATTITUDES	low	high
STRUCT.QUALITY		
low	4	4
high	6	6
RECORD-KEEPING	low	high
STRUCT.QUALITY		
low	3	5
high	6	6

Figure 7.19: Process quality associations with structural quality

TECHNICAL SKILLS	low	high
Utilization		
low	5	7
high	5	3
ATTITUDES	low	high
Utilization		
low	6	6
high	4	4
RECORD-KEEPING	low	high
Utilization		
low	6	6
high	3	5

Figure 7.20: Process quality associations with utilization

7.8   Research conclusions

Although process quality was poor for most procedures there were some positive signs. Variation between procedures suggested better performance for ante-natal care and injections than curative consultations and dispensing. Variation within and, in particular, between units also suggested that improvement was possible even within the existing resource and organizational structure. One health centre, for example, showed the promise of adequate performance for both ante-natal and curative consultation procedures. MCHAs were found to show better, and sometimes adequate, inter-personal skills than other cadres. The possible existence of a unit effect on performance suggests that the influence of better-performing trained staff can encourage better performance among lower-skilled staff.

Considering the issues raised in Chapter 5: ante-natal care was found to be of poor quality, diocesan units performed relatively poorly in comparison with government dispensaries and health centres generally performed better than dispensaries, although the difference was not conclusive because of considerable disparity in scores between the two centres assessed.

Exploration of the factors influencing performance most strongly suggests that a co-ordinated management strategy at all levels is required to raise process quality; no single factor was by itself a major explanation of variation. The existence of a unit effect also emphasizes the re-enforcing nature of combining staff development and support of the whole unit (through improved equipment or staff availability, for example).

Two areas not fully considered in this study but suggested by Morogoro health managers to be essential elements of the required management strategy are: a thorough review of training curricula, teaching and examination practices to ensure that staff are trained appropriately; and detailed evaluation of the factors influencing health workers' and managers' motivation and of the links between motivation and performance. Other necessary actions include:

*   within units, health staff must re-assess their time allocations, counter-balancing workloads through the allocation of tasks between staff. The cadres of RMA and untrained nurses appeared to be especially weak, although RMAs are the dispensary leaders and nurses often become involved in activities for which training is essential (such as patient consultations). RMAs and MCHAs must work as a team to manage and provide health care.

*   district action can encourage better performance through re-assessment of inter-unit staff allocations, in order to ensure, first, that allocations fairly reflect workloads and, second, where possible, to support health units through additional allocations of trained staff.

District action should also target skills' development, particularly the inter-personal and managerial skills of trained staff. Within any health care procedure the skills of listening, understanding and explanation are essential to the provision of good quality care; they complement technical skills and can, if improved, encouraged better technical process quality. Encouraging trained staff to support nurses is critical, but the cost-effectiveness of additional interventions to strengthen nurses' technical skills should also be assessed. Although the findings of this study are equivocal about the impact of supervision, the direct contact with staff that it provides for district health managers is necessary for the effective support of health units. Re-assessing the practice of supervision and combining it with broader performance monitoring procedures are important aspects of better supervision. Using checklists, monitoring performance via health utilization information, developing the motivation skills of supervisors are all examples of feasible ways of strengthening supervision.

* diocesan health managers must give priority to strengthening services, particularly MCH care. Re-assessment of the staff needs of diocesan units may suggest that MCH services cannot effectively be provided in diocesan units. Alternatively, additional specialist training might be provided to nurses identified as primarily responsible for MCH services. Consideration must also be given to the steps required to raise the morale of RMAs working in diocesan units who fall outside the normal government management structure, given their potential influence over all staff.

* experience elsewhere points to the influence of low morale on performance and this influence was also suggested by these findings: for example, as a possible mediating factor between structural and process quality. Regional health managers felt that its important, and currently invidious, influence required a range of additional actions: continuing education; incentives for good work; improving the working environment (equipment, buildings, housing, uniforms); delivering salaries and supplies to health units; establishing job descriptions and organizational charts to guide work within health units. Review of employment practices might also ensure that only committed and skilled staff are employed, and that an appropriate period of probation is undertaken before posting to remote health units. Taking disciplinary action when necessary could also set an example for other staff; and regular transfer of staff might prevent complacency among staff.

Overall, this assessment provided only limited evidence of a link between process quality and costs. However, there was at least some suggestion that better process quality was linked both to lower total costs and greater average costs. More generally, process failures have resource implications to the extent that ineffective care represents resource wastage and as curative consultations, nursing procedures and ante-natal care are key elements of primary level health care, improving their process quality is essential in ensuring effective and efficient use of available resources.

7.9   Methodological assessment

7.9.1 Reliability and validity of results

The presence of observers may bias performance assessment. Scores were, therefore, reviewed to see if they changed over the week of observations, perhaps as health workers became used to the presence of observers. Variation was insignificant, and if the low scores found in this study do represent better-than-usual performance, they only justify concern for process quality.

The use of three different observers to assess each procedure in different units may have led to inter-observer differences, although study methods sought to minimize the extent of required observer judgement by using standardized checklists and through careful field worker training (Chapter 4). Differences were insignificant for both curative consultation procedures and for dispensing, but significant differences were found in observer median scores for both injections and the ante-natal consultation. Median scores for the three injection observers were: 66.7%, 62.5% and 58.3% (p=0.000); and for the three ante-natal consultation observers: 60.8%, 50.0%, and 37.1% (p=0.000). These findings appear to suggest that one observer may have judged injection performance more leniently than others and that one observer may have been particularly harsh in judging ante-natal consultations. However, given the training field workers had undergone and the explicit nature of the assessment (requiring little observer judgement in these procedures) it is also likely that the differences between observers reflected real differences between health units; these findings do not undermine the reliability of the assessment methods.

Finally, for some procedures and some health units only small numbers of observations were made, possibly undermining performance judgements for individual units. However, the results have primarily been pooled across health units to determine common patterns of performance (overall and for unit groups) and so the validity of the conclusions drawn is not challenged by small observation sample sizes. The small number of health centres (2 out of 15 in region) and diocesan dispensaries (4 out of 17) reviewed does suggest that caution should be exercised in generalizing from these findings for these unit groups.

7.9.2 The use of professional standards

This study reviewed actual scores in assessing process quality and also assessed scores against standards (for each observation and across all observations within a unit by procedure), in order to facilitate understanding of the meaning of scores for process quality (Chapter 4). As with structural quality assessment (Chapter 6), the standards were based on professional judgements but were not

initially validated.

However, re-assessment of the observation standard against actual performance indicates that standards would have had to be reduced considerably for any procedure to be judged as representing good quality. For example, to around 50% in general curative consultations (See Figure 7.3). Morogoro health managers felt that such reduction was inappropriate: process quality was poor and variation of the standard used in professional judgements only emphasized the weaknesses.

Standards used in summarizing unit performance across all observations for a procedure also contain an implicit judgement about what determines good quality. Using hypothetical examples: Unit A which scored 100% in 49% of cases and zero otherwise is classed as poor, yet Unit B which scored 80% in 75% of the cases, and zero otherwise, is classed as good; a large difference in classification for a relatively small (11%) difference in mean values. The implicit judgement of this approach is, therefore, that better performance results from consistently average scores rather than from some very good and some very poor scores. Further analysis of conventional medical wisdom and patient preferences is required to justify this judgement.

Setting standards, however, is an important element in both evaluative research and regular management monitoring (Chapter 3), in order to determine whether actual practice is acceptable. For regular monitoring it would also be valuable to make periodic re-assessments of the standards to ensure they remain valid against changing practice. In evaluative research it is also helpful to complement summary judgements of quality by presenting and using as much of the available data as possible. In this analysis, for example, median and mean scores and central ranges have been graphed and used together with assessments against professional standards to interpret the findings. Detailed presentation is especially important where assessment is undertaken with a scoring system.

7.9.3 Weighting systems

The overall scores determined for each procedure in this analysis included implicit weights balancing technical, record-keeping and inter-personal care aspects. Checklists and standards were developed by identifying the individual actions deemed necessary to the process of providing care, and allocation of scores reflected the relative importance of each action to the overall process (Chapter 4). In the consequent balance between the care aspects, inter-personal skills (attitudes) and record-keeping were deemed less important, to varying degrees in each procedure, than technical skills (Table 7.7).

Alteration of these weights allows assessment of the impact on performance scores of giving greater emphasis to inter-personal skills, important but often forgotten in process quality assessments (Chapter

Table 7.7: Balance between care aspects in original checklists (%) [12]

PROCEDURE	TECHNICAL	RECORDS	ATTITUDES	TOTAL
1.General consultation	52.0	20.0	28.0	100.0
2.Ante-natal consultation	68.0	9.0	24.0	101.0
3.Ante-natal record care	72.0	12.0	18.0	102.0
4.Injections	79.0		21.0	100.0
5.Dispensing	92.0		8.0	100.0

NOTE: 1. Expressed as percent of total score
2. Mean balances, average over first and repeat visits, with or without drugs etc. for each procedure

3). Two alternative weighting approaches were considered: multiplying the care aspect scores together (multiple weighting) and reversing the balance between technical and attitude weights (reverse weighting). Figures in Appendix 7D illustrate the consequences of these alternatives for overall performance scores (line graphs are used to facilitate comparison of relative performance under different options).

Both alternative weighting systems had only limited impact on relative performance between units. However, *multiple weighting* resulted in a 30-35% reduction in scores across most units for ante-natal and curative consultations, cutting the ante-natal best performer score by only 12% but taking this status away from the original best curative performer. Nursing scores were cut by up to 60% and differences between units, exacerbated. *Reverse weighting* only slightly reduced ante-natal scores, but cut curative care scores by 30-40% and nursing care scores by up to 50%. Scores with reverse weighting were above those of multiple weighting for both ante-natal and nursing care, but below, for curative care.

These findings indicate that scoring weights influence judgements of performance through their impact on absolute levels of performance. Weighting systems that emphasize inter-personal over technical skills reduced original performance scores. As correlations suggest a positive association between inter-personal and technical skills, this finding again stresses that management intervention to raise quality of performance must particularly target improvements in inter-personal skills.

7.9.4 Explicit versus implicit assessment

Process quality can be assessed using explicit or implicit methods. Explicit methods are generally deemed more reliable for repeated use by different observers and implicit methods are often criticized because of their greater use of observer judgement (Chapter 3).

The reliability of explicit methods has been partially demonstrated in this study. However, assessment of the study's scoring system has also shown that value judgements are made in designing summary scores based on explicit criteria. Results of such assessments must, anyway, be interpreted qualitatively, using general information about individual health units and drawing on overall knowledge of the health system. For some assessments, implicit judgement may even be preferable: assessment of the accuracy of diagnosis, for example, is best undertaken by clinical counter-checks; assessing prescription accuracy may be difficult using only explicit methods. Evaluative research is, therefore, likely to require both approaches and must always make clear their inherent assumptions.

As a management tool, explicit assessment forces consideration of the elements of good process quality; checklist and standards' development can be a participatory process in which all health workers are involved (assessors and assessees). Such participation is particularly important as quality assurance is introduced for the first time, when agreement on its use and on the foci of assessment is especially important to its effective development. Although quality assessment may be seen to be (and may be) a tool for punishment rather than for staff/health care development, explicit assessment procedures are relatively transparent quality assurance tools which can provide a framework for training during regular supervision and can be easily used by supervisors. The measurable criteria of explicit assessments can, if used appropriately, generate information with which to monitor performance over time, to determine management action and to demand additional support.

Implicit assessment approaches are usually less open, more dependent on personal judgement, than explicit assessments; there is considerable potential for inter-observer variation. They are more difficult and time consuming to apply; it may be difficult to summarize the information they produce, or to use it to monitor performance and justify management action. However, the skills required for implicit assessment (observation, using professional judgement) may be useful in management. It is also likely that the best practice of supervision will entail some combination of implicit and explicit assessment. Regular monitoring should not become tied to one set of criteria but should reflect the changing pattern of performance and needs. Quality assurance of any kind should aim to release the potential of good quality care within the health system, rather than becoming a mechanistic application of outdated regulations.

7.9.5 Reducing checklists

Some checklists used in this study were lengthy; their reduction might facilitate their wider use in evaluative research or regular monitoring, and guard against some of the weaknesses discussed.

One approach to reduction might be to identify a sub-group of actions absolutely necessary to avoid providing dangerous care. These groups, called minimum care levels, were identified for each procedure and results already reported indicate considerable correlation between performance against the full list and the minimum list. There are two disadvantages to this approach to reducing checklists, however. First, the degree of reduction can be quite limited - in the ante-natal consultation checklist, for example, only 14 criteria were dropped out of a total of 51 for first, and 41 for repeat visits (28%/34%). Second, and more important, most of the criteria dropped concerned the exercise of inter-personal skills, deemed unimportant in the provision of dangerous care (as also shown by the child fever checklist). Yet inter-personal skills are an important element in care and the two types of skills re-enforce each other; it would, therefore, be inappropriate to exclude attitudes from evaluation of process quality.

A second approach might be to identify the most discriminating criteria, as discussed in relation to structural quality assessment. Appendix 7B lists overall frequencies for each criteria by procedure and identifies those criteria for which performance was mixed i.e. good/poor frequencies of less than 70% and more than 50%. The reductions under this approach can, however, be too severe; from the injection checklist, for example, only two criteria were discriminating and for dispensing, none were. Such crude reduction approaches are also inappropriate because of the inter-linkages and balances between individual criteria within each checklist; the process in its entirety is assessed not simply individual actions. Structural quality criteria are, by contrast, less inter-linked and individual criteria have value in their own right rather than as part of a process.

A third approach to checklist reduction might be based on correlating each variable within the checklist with the overall score; those that are most strongly correlated can be included in the new checklist. However, it is also important to select variables having considered the requirements of the whole process. Scores would also require re-assessment to ensure that the weighting they imply reflects professional judgements of good quality. Two examples of this analysis have been undertaken to illustrate its application, using the general consultation and the injection procedure checklists. Appendix 7E lists correlations and identifies variables selected for the reduced checklist

The injection procedure was reduced to 10/24 variables by, first, selecting criteria with a correlation greater than 0.4 and, second, adding other criteria which were important to the process. For example,

the criterion 'polite hello' was added to allow some assessment of inter-personal skills, the criterion, 'checking right injection for right patient' was added to allow some assessment of preparatory activities and the criterion, 'choosing the right place to inject' was added because originally deemed to be of particular importance. The complexity of the reduction process is especially illustrated by considering the consultation checklist. Using correlation values only, the number of criteria could be reduced to 10/60. However, consideration of whether only these criteria should be included raises difficult questions. For example, should checking for missed immunization opportunities be included despite low correlation? Very few history-taking or examination criteria have sufficiently high correlations for initial selection, but given their fundamental importance to correct diagnosis some of them must be included: which are most important? Finalizing the reduced checklist, therefore, requires professional judgement, and reduction techniques cannot be used by themselves to establish shorter process quality criteria checklists.

7.9.6 Sampling strategies

In this study, samples were taken of both health units and procedures reviewed; the wider use of the assessment procedures might be promoted through some sample size reductions. Many studies do not seek to provide an estimate of quality within individual health units, rather pooling their findings across units to provide an overview for an area. Such studies may require fewer observations per health unit than studies such as reported here which seek to consider both individual units and groups of units. However, as this study's findings have shown a high degree of similarity in performance patterns across observations they suggest that, for example, the 100 observations made of the general consultation were not all necessary. On the other hand, small ante-natal consultation sample sizes undermines conclusions about performance being drawn for some units.

The number of units selected depends on whether representativeness is sought, for example, to give an overview of quality throughout a district. The larger the sample size the better the representativeness, although the use of sentinel sites can allow representative pictures to be drawn from a limited number of health units (Bryce et al. 1992). An alternative sampling strategy might purposively select units expected to be providing the best and the worst quality, to identify problems common across most units and units possibly falling below minimum acceptable levels (Nicholas et al. 1991).

Sampling strategies must, therefore, reflect the objectives of the assessment and allow valid performance judgements to be made; but large sample sizes of observations or units are not always required.

7.9.7 Methodological conclusions

Wider use of this study's process quality assessment tools in *evaluative research* is valid but would require their review against the specific context in which they were to be used. It would be particularly important to consider the standards (both in relation to a single observation and in relation to assessment of unit performance against all observations) and the scoring system (with its implicit weighting). Some reduction of checklists might be possible but an initial survey would be better based on the full list of criteria, in order to ensure that later reduction was appropriate to the existing patterns of performance. Sampling strategies should ensure reasonable research workloads and allow valid conclusions to be drawn.

Use of these tools for *management* would require careful re-assessment, by both assessors and assesses, to ensure their relevance to a different context and their acceptability within it. Initial evaluation using full checklists would also aid their later use as management monitoring tools by providing base line information against which to assess changes in performance. These explicit assessment methods have been shown to be fairly reliable and, especially if reduced appropriately, checklists could easily be used during supervision visits. As with structural assessment tools (Chapter 6), however, reduction should be accompanied by regular review to ensure that the tools appropriately reflect changing circumstances. Sampling strategies can also encourage the use of such procedures by reducing monitoring workloads. Simple analyses of the data collected, allowing both for overall summaries of process quality and detail of strengths and weaknesses, would also facilitate their regular use.

Study findings highlight the importance of technical **and** inter-personal skills in process quality; the methodology used for assessment of process quality illustrates a feasible approach for measurement and analysis of the often-forgotten, inter-personal skills.

7.10   Summary

This chapter presented findings concerning process quality: overall performance scores by procedure, unit and unit group, scores for process and care aspects. It also considered a range of influences over performance and differences between cadres in their performance. Associations between process quality and costs, structural quality and utilization were assessed.

Ante-natal quality scores varied from 30-70% for the consultation with better, but still variable, scores for the record-card review (mostly 60-80%, some 20-60%). Particular process weaknesses were noted in undertaking relevant measurements and in explaining findings to mothers. Both the general (40-60%)

and the child fever (20-40%) curative consultations had lower overall scores and particular process weaknesses were noted in examinations and explaining actions to the patient. Prescribing practice problems, particularly under-prescribing, were also found. Nursing procedure scores varied from around 60% for injections to around 40% for dispensing. The only dispensing process strength was in preparation, but stronger performance was noted for three out of the five injection process aspects. Considerable variation between and within units was noted for most procedures and minimum care scores were associated with overall quality scores. Few differences between unit groups were noted, although there was some suggestion of better health centre than dispensary, and worse diocesan than government, process quality. Differences within unit groups, particularly for health centres, prevented conclusive judgements from being made.

Of the care aspects, record-keeping was the best performed across all procedures with worse technical and attitude scores - nursing care attitude scores were particularly poor (median levels of 0%). Correlations for ante-natal and curative consultations suggested an association between technical and attitude scores.

Continuity of care problems were shown in the relatively low scores of ante-natal re-attendances, curative re-attendances with no improvement and curative child visits. Few of the other potential influences over health unit performance were found to be important, although comparison of cadre performance did suggest that there might be a unit effect - encouraging staff to perform above the level of colleagues of the same cadre in other health units. MCHAs were found to perform relatively well in the attitude care aspect and MAs relatively well in the technical care aspect; relatively poor performance by RMAs and untrained nurses was noted.

Associations between process quality findings and other research findings were confusing, suggesting that better quality was associated with greater average cost but not greater total cost; only limited association with both structural quality and utilization was found. The chapter's other research conclusions emphasized the need for a wide-ranging management strategy to tackle process quality weaknesses and enhance efficiency.

Methodological assessment confirmed the reliability and validity of the methods and considered their use for both research and management purposes.

CHAPTER EIGHT:
ASSESSMENT OF COMMUNITY SATISFACTION

Community satisfaction with available health care was assessed primarily through qualitative interviewing techniques. This chapter describes the community's expectations and outlines their judgements on the care available; Appendix 8A summarizes community perceptions expressed in informal discussion against individual health units, and Appendix 8B summarizes household questionnaire (HHQ) results. The community's opinions on whether charges should be introduced for government health units and accountability within the health system are also presented in this chapter. Finally, the associations between community satisfaction and other aspects of health unit performance are considered and the methodology of the study assessed.

The 17 villages visited in this study were typical of the Morogoro region. They included villages with and without a dispensary, served by government and by diocesan units, more and less accessible, located in different topographical areas of the region, long-established and more recently created (e.g. due to the national villagization policy). Subsistence farming, fishing and animal husbandry were the primary economic activities of villagers. A variety of tribal groups lived in the villages - the majority of people being waPogoro, the dominant tribe of the region; the two main official religious groups of the country, Christian and Muslim, were fairly equally represented in the villages. Modern and traditional power structures were found to coexist. Modern leaders included the elected CCM village and ten cell leaders, and, in some cases, Christian leaders; traditional leaders, on the other hand, were those of established and powerful families within the village, such as the man after whose family one village was named, and, sometimes, traditional healers. Perhaps the greatest difference in the situation of the villages concerned the differing degree of administrative cohesion. In some villages the leaders were well-respected and able to organize villagers; in others, they were criticized for failing to support local development efforts.

The following discussion identifies the key issues influencing satisfaction, the degree of agreement concerning them across villages, and community judgements about dispensary/health centre and government/diocesan care. Quotations from discussions are identified by village and by type of discussion: ID = in-depth interview with one person; FGD = focus group discussion; PT = discussion generated by participatory research methods; IC = informal conversation. Descriptive statistics are drawn from the household survey.

8.1   Community expectations of allopathic health care

Community opinions about formal health care must be seen in the context of the range of health care sources available within rural areas. Appendix 8C summarizes these sources for the study villages; they included a variety of traditional healers and informal suppliers of drugs.

Traditional medicine was perceived to be the only efficacious cure for some illnesses, *"you go to hospital if you are suffering from diseases like fever, headache, coughing; for diseases like convulsions and measles we always go to the traditional healers"* (Mngeta FGD women). 78% of respondents in the HHQ said that the kind of illness led people to select certain health providers; and when asked to explain why, 61% said that each disease had its own treatment (31% highlighted traditional care and 14%, allopathic). The search for a cure is, however, still a process of trial and error, *"if you have a patient who is very sick first you take him to a doctor [allopathic] to get treatment, and if the disease becomes severe you take him for further investigations but perhaps the disease is not seen. The next step is to return home and you start again, straight to a traditional healer for diagnostic procedures in order to know which way he can be treated"* (Rubeho ID ten cell leader).

Many factors influence this serial pattern of resource use; *"....for example, my child broke his leg during a football match and was treated by local medicine after the health personnel at Sofi Majiji [government dispensary] failed and he did not want to be sent to Lugala [church hospital]. The factors influencing this decision were 1.ability of local treatment 2.I had no money for Lugala treatment 3.time was reduced so I was able to continue with my farming activities"* (Sofi Majiji FGD ten cell leaders). Respondents in the HHQ identified looking for drugs (14%), trust in the provider (13%), the search for higher level care (12%), whether patients get better after treatment (12%), severity (11%), and looking for better care (11%) as influences over the selection of health provider. Ultimately, *"changing treatment aims at helping a patient to get a fast cure, before the disease builds up to become a chronic or well-established one"* (Iragua ID assistant ten cell leader).

The community is, therefore, not a passive receiver of allopathic health care but judges its value and relevance against both their needs and the alternative health providers. In this setting the local dispensary remains an important source of health care, *"most of us believe in dispensaries. Modern medicine cures a lot of the disease we have here"* (Iragua ID old man). Asked in the HHQ where treatment was sought household members who had been sick in the previous month, most respondents replied the local dispensary first (65%), second (75%), and third (60%). These responses are likely to underestimate the use of traditional medicine, given sensitivity about its use, but they do point to the acceptance of dispensary care.

8.1.1 Curative care

The process of curative care treatment begins with diagnosis, to determine the cause of illness, *"....even hookworm [which may be caused by bewitching] is treated by looking at the problem and the source of that problem*" (Kisitwi PT schoolchildren). Diagnostic tools are commonly used within traditional medicine, *"[traditional healers] use the devil to take an x-ray and then they know the illness and the cause of it*" (Kiswago ID teacher) although the equipment available to traditional healers is *"...not equivalent in quality to those services from the dispensary.. even myself I attend there at the dispensary where there is scientific management*" (Maharaka ID traditional healer). In contrast, the simple laboratory equipment of dispensaries (to undertake stool, urine, blood and Hb analysis) is seen to be very effective; without such equipment, *"...when they treat it's just trial and error*" (Kisitwi ID traditional healer).

Obtaining drugs is perhaps the most important factor underlying community patterns of health care use, *"people go anywhere where drugs are available*" (Maharaka FGD women). Drug availability was identified by villagers as a very positive aspect of the care offered in dispensaries: *"the goodness of the dispensary comes from when the medicines are available*" (Gomelo FGD women's association). Such medicine was specifically praised for its scientific nature - being given in exact amounts because doses are determined from the requirements of individuals. Traditional medicines, however, *"..., firstly...can raise many problems because no-one can know completely if the medicine he takes is related to the disease he is suffering from. Secondly it is difficult to know the proper dose for the sick person. The hospital drugs are essential for human health because a doctor can know the dose a patient should use*" (Mofu FGD women).

Villagers often expressed certainty about what drugs are required for their illnesses and in what amounts, and complained about drugs/doses which did not match their expectations. There is a common preference for injections because they aid speedy recovery - *"we love to get injections rather than tablets; injection medicine goes direct to the blood while tablets do not and sometimes tablets are not good. For example, chloroquine is bitter and causes irritation*" (ID Kidugalo traditional midwife). 37% of respondents in the HHQ identified injections as the drug most likely to cure illness and 50% said injections were more effective than tablets. Such expectations can lead to unfair community assessment of health worker performance when failure to prescribe a drug is an appropriate medical response to a particular patient's needs.

8.1.2 MCH care

Within MCH services, immunization was seen to be an efficacious attack on previously common

problems: "*the preventive service is very important because it protects us from different diseases. For example, nowadays not many children suffer from measles and even if they get it after being vaccinated it is not serious*" (Kisitwi ID old man). So accepted is the immunization service that the common kiSwahili word for 'to prevent' is synonymous with 'immunization' (kukinga). When asked to identify what ways of preventing ill-health existed, the most commonly identified allopathic method was vaccination. When asked to identify what vaccinations there were, many people (although not all) could give either the names of at least some vaccinations or the place where they are injected (arm, leg - the terms often used in vaccination education).

Ante-natal care was generally seen to be important because "*...like a farm, if you take care of it you get a good harvest*" (Msimba ID village secretary); 99% of respondents in the HHQ said that they had been to the ante-natal clinic. However, the community recognizes that achieving the overall objectives of ante-natal care requires a range of inputs, reflecting professional standards. Vaccines are perhaps the most important, along with blood and urine checks, full physical and obstetrical examinations, and weighing; "*not to do them leaves a big gap in helping a pregnant mother*" (Iragua FGD village council). The value of health education was often emphasized, "*..health education is very important, especially for pregnant mothers... this service must be insisted on*" (Mofu FGD ten cell leader), although not always acted on, "*a pregnant mother is supposed to eat balanced food and put on clean clothes, but the problem is that according to our situation it is very difficult for her to follow these instructions [because] she must work very hard [even] when pregnant*" (Kisitwi FGD village council).

Modern delivery services and practices are accepted as important in most villages. "*..Maternity women love to give birth in the dispensary*" (Msimba ID member village council), and although "*traditional midwives are present and are being used,...in serious cases they take [mothers] to the dispensary*" (Rubeho FGD village council). However, delivery services are expected to provide at least as good care as that available at home to be acceptable. Demands include being able to "*... see...[health staff] at any time...you can even call a nurse to your home if you are not able to go to hospital*" (Msimba ID female farmer) and receiving constant attention during delivery, "*I am impressed by the fact that when mothers go for delivery they don't get any problem. The health worker stays around full-time and when complications arise [they] take the patient to Kilosa*" (Msimba ID ten cell leader).

8.2   An overview of dispensary performance against community standards

Appendix 8A provides an overview of dispensary performance against community expectations. The multi-faceted nature of community judgements is indicated by this general comment:

> "*Good things: availability of drugs at the beginning of the month; we get treatment quickly; we are well known to our doctors; it is near the main road; there is a clinic for children and maternity women; they get vaccinations; hospital surroundings are clean; nurses they have*

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good behaviour; doctors are very smart;
Bad things: there is no toilet; no staff quarters; dispensary is very small; patients are not admitted; there is no lab equipment; there is no ambulance to go to Gairo when you are very ill; there are few nurses; there is one bed, specially for giving birth; there is one doctor" (Rubeho PT schoolchildren).

Overall, 65% of respondents in the HHQ said they were satisfied with services received during their last visit to the local dispensary; but there were clearly differences between dispensaries. The most appreciated dispensary appeared to be a diocesan dispensary, although the need to pay for its services was seen to be a disadvantage in its use. One diocesan and two government units ranked roughly second overall. In the diocesan unit's favour were, in particular, the constant availability of drugs and workers with good attitudes; but it was again seen to be disadvantaged by providing services for payment, and by the weak skills of its RMA. The strengths of one of the government units were seen to be particularly associated with the previous RMA, who not only provided good care himself but worked within the community in training traditional birth attendants and motivating construction of an MCH building; his successor and the nurse responsible for MCH activities (not an MCHA) were perceived to be less skilled. The other government unit was staffed by workers judged by the community to be skilled and respectful, particularly the RMA and MCHA; but its services were seen to be undermined by lack of drugs, poor nursing staff and some discrimination in providing care. The major weaknesses of the more poorly perceived units (one diocesan and six government) were seen to be: skills, attitudes, poor relationship with parish priest (diocesan unit); lack of drugs due to their being sold and abusive/unskilled MCHA (government units). More detailed review of the findings, moreover, points to considerable dis-satisfaction with the allopathic care available in villages, undermining the indicators of overall satisfaction.

In addition to differences in perceptions between communities served by government and diocesan units, differences in perceptions between communities with and without a dispensary in the village and between people of different educational background within villages were noted in discussions and responses to the HHQ.

8.3   Community perceptions of structural quality

The distance of the dispensary from the home was an important aspect of performance especially with respect to night/labour emergencies - *"the best of this dispensary is that it is very near"* (Sofi Majiji FGD ten cell leaders). The seven villages without their own dispensaries inevitably saw distance failings more strongly than other villages as, for example, *"from here to Msimba it is a little far, it is mountainous you should climb and go down into the valley. It is difficult for a sick person to get to Msimba"* (Mfuruni FGD women).

Good building condition was sometimes specifically identified by villagers (3/10 units) but building failures, such as limited space for patients/mothers to rest, were more commonly identified (6/10 units), particularly for government dispensaries. *"There is no place to get rest for a very ill patient or those who are waiting for their injection hours"* (Kidugalo FGD women) and, more critically, *"the place to give birth is the same place where they examine maternity women. If you have bad luck then you collide with a woman wanting to give birth and you will not get services until the woman delivers"* (Rubeho ID women's organization chairperson).

Whether or not the space is available, all health units claim to offer a form of in-patient service through delivery care. Additional criticisms, particularly for government dispensaries (5/7), resulted from their failure to provide appropriate ancillary services: water, sanitation facilities, lamps for the night, staff to undertake ancillary tasks. *"...The delivery process is extremely bad, they don't like to go there for delivery because there is no privacy. They say that the delivery room is the same one used for physical examinations. After delivery there is no place to rest, or even a place to wash themselves, so they move out whilst still dirty. There is no place to dispose of the placenta. You must also clean hospital articles before returning them. So it is seen that it is better to deliver at home rather than having the humiliation of someone giving you blood [placenta] to take home"* (Rubeho ID ten cell leader).

For three dispensaries (all government) the lack of staff houses was also seen to undermine the provision of night services, and particularly delivery care: *"..the mid-wife lives far away and so may not be available, so they decide to deliver at home"* (Mkgangawalo ID retired teacher). Mothers may be forced to wait outside the dispensary whilst health staff are fetched, and may even deliver outside because the staff do not come quickly enough.

As a consequence of these widespread structural failures delivery care was seen as a very weak aspect of government care, and an expensive part of diocesan units' care - where ancillary services may have to be provided by the mother in addition to the delivery fee. Asked in the HHQ where most children in the village were born, 37% of respondents answered at home, 32%, government dispensary, 26%, diocesan dispensary and 4%, health centre/hospital. In seven villages children were said to be born at home in over 20% of interviews and, linking villages to their local dispensary, in over 20% of the interviews associated with two government dispensaries. Asked why mothers did not deliver in the local dispensary, 39% of respondents said it was too far, 14% said they were not used to it and 13% said the services were bad. Similar responses were found in reviewing where the youngest child in the household had been born, although greater weight was given to distance as a factor preventing use of the local dispensary. More infrastructure and services were required to distinguish dispensary deliveries from home deliveries - and, thus, to encourage general use of the service, particularly by high risk mothers.

Lack of equipment for all services was common in government dispensaries, *"it is like a music hall because there is no equipment"* (Msimba ID ten cell leader). Of the ten focal dispensaries in this assessment, only two were found to have laboratory equipment in use and both were under diocesan authority. 17% of respondents in the HHQ identified lack of equipment as a major criticism of their local dispensary (the second most important response), and as more a problem of government than diocesan dispensaries. The consequence of equipment shortages may be that *"...they just look at the patients and they say this child has no blood. When we go to the diocesan dispensary they examine the child and do a test to know the actual amount of blood"* (Kiswago ID TB patient), or that because *"...health workers have no equipment, such as microscopes, so diseases are not known"* (Rubeho FGD village council). Lack of laboratory equipment also undermined the early and correct identification of mothers at risk, *"examinations like blood pressure, blood, urine is for other places. That's why a mother can't know that she has a lack of blood until the last day, and some die. For example, one mother died on the road...as a result of the nurse's mistake in not informing her all those days that she was anaemic"* (Iragua FGD women). Finally, equipment problems were the major criticisms of outreach services where they were undertaken, as *"services are done on the floor"* (Nyarutanga PT women) or *"women have to lie on the [school] desks which is very painful"* (Mkangawalo ID Masai woman).

Perhaps the major failing of government dispensaries, and a common reason for using alternative health care, was the lack of drugs in the latter half of each month. It was the most often identified problem of dispensaries in the HHQ (21%); and, when asked specifically, 69% of respondents said drugs were insufficient. *"Drugs to be frank are a big problem, it has reached a stage where we have to buy drugs and put them in our pockets then go the dispensary for administration"* (Msimba FGD village council). However, communities also recognized that their demand for drugs may itself be a cause of shortages. Utilization of primary level health units increased by 150% following the EDP's introduction (Hedqvist 1987), and people may invent illnesses, may take drugs for future need and so exacerbate the drug 'shortage' problem: *"when the drug kit is open everybody would like to get drugs. Since all people know the kit has been opened people come to get drugs to use them in the time of need. Many come pretending to be sick"* (Mkangawalo ID teacher). The crudeness of the utilization indicator used in allocating drug kits (one kit per 1000 new patients monthly, two kits above that figure) may also lead to drug shortages: drug kits *"...don't satisfy the needs, as this dispensary serves 4 villages...[the problem is] due to small allocation of one kit per month"* (Rubeho FGD village council). In 1987 it was estimated that 30% of the EDP's sentinel dispensaries and 40% of the health centres had exceeded their monthly kit utilization targets, and that 20-25% of all dispensaries/health centres would require 2 or 3 kits to meet demand (Hedqvist 1987).

In contrast, the regular availability of drugs within diocesan units was usually a major positive feature of their care, as *"they show to the patients the good behaviour of having a constant supply of drugs"*

(Kisawasawa FGD ten cell leader). 20% of HHQ respondents identified drugs as a pleasing aspect of the local dispensary, but this response was more often given when a diocesan dispensary was the local health unit.

Asked in the HHQ if dispensary services could be improved, 75% of respondents agreed; by more drugs (25%), more equipment (24%), repairs (16%), more staff (13%) and changing staff (10%). These answers were particularly likely to be given in communities served by a government dispensary or in villages without a dispensary.

8.4   Community perceptions of process quality

8.4.1 Technical skills

The good *curative skills* of government workers were often noted - five of the seven government units were judged as good or mostly good in relation to staff skills; but of the three diocesan units only one was unequivocally perceived to have some skilled workers. Good skills were identified by 15% of respondents in the HHQ as a pleasing factor about the local dispensary (third most important response); two of the three diocesan units were among the three units for which this response was least frequent overall. Shortages of staff, especially trained staff, were identified in four dispensaries (three government, one diocesan) and a major criticism in four units (two government, two diocesan) was that nurses were untrained. Although 63% of respondents in the HHQ said that they did have confidence in the skills of the local dispensary's staff, the answers clearly favoured government over diocesan dispensaries. Problems were seen to be caused partly by employment procedures, *"some staff come only as sweepers but after a while they are given posts as dispensers and nurses. It is very dangerous"* (Msimba ID male workers), particularly in diocesan units where *"those who are the sisters' or parish priest's friends or who come from their family are the people who are employed in the dispensary"* (Mofu FGD women).

Poor diagnostic practice in terms of listening to the patient was sometimes identified, *"..they write on the clinic card without being given the problem from the patient. If you are suffering from abdomen pains they give you chloroquine with which it is difficult to become cured"* (Mkangawalo FGD village council); but, more often than not, good listening skills were noted (6/10 units). However, lack of equipment often prevented examination and, even where available, failure to use it might be criticized, *"...here ...in our dispensary we have an instrument for examining fever [thermometer] but we wonder that our doctors don't use it. They give treatment without examining a patient"* (Rubeho FGD women), or failure to use it correctly, *"they examine you at the diocesan dispensary you get Hb 35 but the following day when you go to Lugala [hospital] after examination you get Hb55, this is because at the*

dispensary they use paper...Also the RMA has a lack of knowledge. For instance he can tell you that you suffer from one thing and when you attend Lugala they tell you it's something quite different" (Sofi Mission PT women). Only one, diocesan, unit was clearly judged to have good diagnostic practice.

Many villagers were worried because services in all units at times failed the tests of 'getting enough drugs' and the 'right drug for the disease': *"drugs are insufficient: one tablet or half tablet. Now can you get rid of illness with that?"* (Nyarutanga PT mothers); *"we are sometimes puzzled because two people can go to the dispensary with different diseases such as malaria and chest pain, but you are both given chloroquine"* (Msimba FGD Women). In government units the community often linked such problems to drug shortages, skill failings and poor attitudes, whilst in diocesan units the problems were seen to result from the practice of prescribing on the basis of patient funds: *"...here they ask you first what amount of money you have. If you have 50/- you get treatment equally with 50/-. If you have 200/- he gives you the amount of medicine which is equal to that money"* (Kisawasawa PT women).

Curative skills were often judged overall on the basis of whether or not patients were known to get better after care (and this was seen to be linked to the drugs given). Thus, *"they are not skilled for their jobs because you can have treatment for a long time without getting better"* (Sofi Mission ID ten cell leader) but, *"...some they have skills for their work. For instance the RMA writes the right medicine for the problem that you have because when you take that medicine you get rid of the problem"* (Mfuruni FGD women). Correct referral of patients was also sometimes assessed, *"they know their work, all who get referred are certainly serious cases"* (Nyarutanga FGD women). However, differences between groups within villages using the units make overall judgements on these issues difficult to make. Personal experience was both important to such judgements and very variable. Unequivocally positive judgements were more often given concerning correct referral than in relation to effective treatment.

For two dispensaries (one diocesan and one government), deaths due to poor care were identified and seen to indicate both skills and attitudes' failings. *"Another mother took her child who was critically sick [to the dispensary]. When she reached there she found a big queue and she asked the health worker in-charge to help but was told 'don't you see a queue, if you saw the child was sick why didn't you attend earlier? Stay there!'...after a short while the baby was struggling with illness and died"* (Iragua FGD women).

Nursing practice was less often mentioned. A diocesan dispensary was particularly criticized in dispensing: *"sometimes nurses distribute drugs without any prescription from the doctor. They don't explain the use of the medicine. There was one child who died because of this negligence"* (Mofu FGD women). A more common complaint concerning injection practice was that *"staff are very harsh to the patients. They mix water with medicine and when you get that medicine there is no improvement"*

(Gomelo PT schoolchildren). Less common but worrying was the complaint that *giving injections is not good because they can use one instrument for more than five patients without changing it...What about AIDS? Will they not get it?*" (Nyarutanga PT mothers).

MCH skills were most often assessed in relation to ante-natal care, partly as a result of the focus of questions. Although 84% of respondents in the HHQ said they were satisfied with the ante-natal clinic because they at least got some attention/procedures (such as immunization, 70%), informal discussions suggested that for most units there was concern about skills. Problems were seen to revolve around poor examination, "..*they are not competent to do their work. For example, for a pregnant mother, they just touch her stomach*" (Kisitwi FGD women), so that "...*when you go there and tell them you're pregnant at 4 months they do not accept it and say that you have 7 months...and you deliver at the time you counted yourself*" (Mngeta FGD women's organization). The consequences may include unnecessary referral, "*nurses are not clear with risk factors, you may be told to go to Ifakara but when you get there you deliver safely*" (Mkangawalo FGD women) or delayed referral, "...*those who are pregnant have to stay a long time with some problems. At the end they are told to go to Ifakara [hospital]*" (Mofu FGD women). There was often concern that potential problems would not be identified early enough to allow appropriate referral and stories were told of mothers who died on the way to hospital after late referral from two government units.

Such skill failures were perceived to be tied to weaknesses in the content of ante-natal services; in particular the failure in all government units to examine Hb and urine due to lack of equipment. "*When they give the services they do not examine blood, urine, BP etc...That check up cannot be enough to know diseases*" (Nyarutanga PT women). On the other hand, good content was seen in relation to the receipt of immunizations, health education for mother and child, and (for diocesan units, in particular) the fact that ante-natal care is a free service. "*Services at the diocesan units are quite good. The nurse makes a check up for women and gives them vaccination for tetanus and they tell them the expected date of delivery. Clinic services are free because vaccination and equipment are from the government*" (Sofi Mission FGD village council).

Delivery skills were also generally judged to be poor. The weaknesses identified were related to the failure to provide constant attention and to allow family members to be with mothers, for example, "..*at the dispensary all relatives are excluded and you remain with the midwife only, therefore many are afraid [to deliver there]*" (Mkangawalo PT women). These criticisms were not as strongly expressed as criticisms of delivery structure and staff attitudes. Overall, however, maternal care appears to fail most groups of mothers, even those at most risk.

By contrast, where mentioned, child care (largely immunization) was regarded most positively. "*They*

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deliver at the dispensary because they will get good services for the child later" (Gomelo ID traditional nurse) and "*women prefer to deliver in a dispensary where the newborns get immunization and other preventive services*" (Mofu FGD women). However, some problems with this services were identified, such as a lack of drugs or abscesses caused by vaccination (4/10 units).

8.4.2 Inter-personal skills

Some of the most severe community criticisms of dispensaries concerned the poor attitudes of health staff. Poor attitudes, together with poor structure, for example, severely undermined perceptions of delivery care, often the worst perceived service in dispensaries. Figures 8.1 to 8.4 outline the process of getting care in government dispensaries from the community's perspective for ante-natal, delivery services and curative care, and demonstrate that whatever the structure and the skills available, the key items affecting satisfaction most often reflect inter-personal skills.

Weak *MCH inter-personal skills* underlay a variety of the criticisms of health units. Two dispensaries stood out for the bad delivery care they were perceived to offer and stories from the associated villages emphasized the role of bad attitudes in determining negative judgements:

> "*When they go there at night nurses will not get up to help and as a result they give birth outside. And during the daytime when they go there to call the nurse she says she is going to the shamba [farm] because they are paying her nothing.... The MCHA appointed a TBA and arranged that every maternity woman will give her 100/- for her services. Now people are asking, where are government services?*" (Nyarutanga PT schoolchildren);

> "*One mother said in a lonely voice that her child died after one day because she delivered outside the dispensary [because the MCHA did not come]. The child sucked the dust and when the RMA came he gave some help but it was too late*" (Sofi Majiji FGD women).

Where difficulties in getting night care were identified (5/10 units), the cause was mostly seen to be poor attitudes (although staff lived far away from two dispensaries). The degree of care provided (reflecting both structure and inter-personal skills) was at least sometimes satisfactory (6/10 units), but poor attitudes did discourage the use of both ante-natal and delivery care. "*Mothers used to go to the clinic but the MCHA is not polite to them. For example, when you put your card on the table, the nurse can say 'look! your card is very dirty and it has got a bad smell' she throws it down and says 'I cannot examine you!' Sometimes we mothers we face a lot of problems*" (Kisitwi FGD women); "*...the language of that nurse is not good. She tells them that their underwear is too dirty in front of other women. For that reason many don't like to attend the dispensary... many give birth at home*" (Nyarutanga PT women). Unequivocal judgements of good attitudes in ante-natal care were made in relation to only three units (two diocesan and one government).

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              │ START ATTENDING AN SESSIONS │
              └────────────────────────────┘

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    │ NO SKILLS/       │              │ KIND/WORKING     │
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    │ TOUCHING         │      │ LIMITED      │   │              │
    │ STOMACHS'        │      │ - NO LAB TEST│   │              │
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                                         │ OR TOO LATE      │
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  ┌──────────┐    ┌──────────┐          ┌──────────┐
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  │ DELIVERS │    │ DELIVERS │          │ DELIVERS │
  │ BUT      │    │ SAFELY   │          │ SAFELY   │
  │ PROBLEMS │    │          │          │          │
  └──────────┘    └──────────┘          └──────────┘
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Figure 8.1: Community experience of government ante-natal care

Another aspect of poor attitudes was seen to be the practice of informal charging for the range of MCH services: *"she sells ante-natal cards, when we lose them we pay 100/- ....we used to cultivate and plant mchicha [spinach] at the dispensary for demonstration purposes and when it was ready it was sold, but we don't know what happened to the money"* (Gomelo FGD women). Family planning services were only mentioned in relation to two units, and were criticized because *"when I go to the clinic I am always*

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 ┌─────────────┐  ┌──────────────────┐  ┌──────────────────┐
 │ DELIVER IN  │  │ DELIVER OUTSIDE  │  │ DELIVER AT       │
 │ DISPENSARY  │  │ DISPENSARY (ONLY │  │ HOME (WITH       │
 │ (WITH       │  │ RELATIVES' HELP) │  │ TRAD.MIDWIFE     │
 │ ASSISTANCE) │  │                  │  │ OR TBA)          │
 └─────────────┘  └──────────────────┘  └──────────────────┘
      ┌──────────────────┐  ┌──────────────────┐
      │ MOTHER           │  │ MOTHER DELIVERS  │
      │ DELIVERS BUT     │  │ SAFELY           │
      │ PROBLEMS         │  │                  │
      └──────────────────┘  └──────────────────┘
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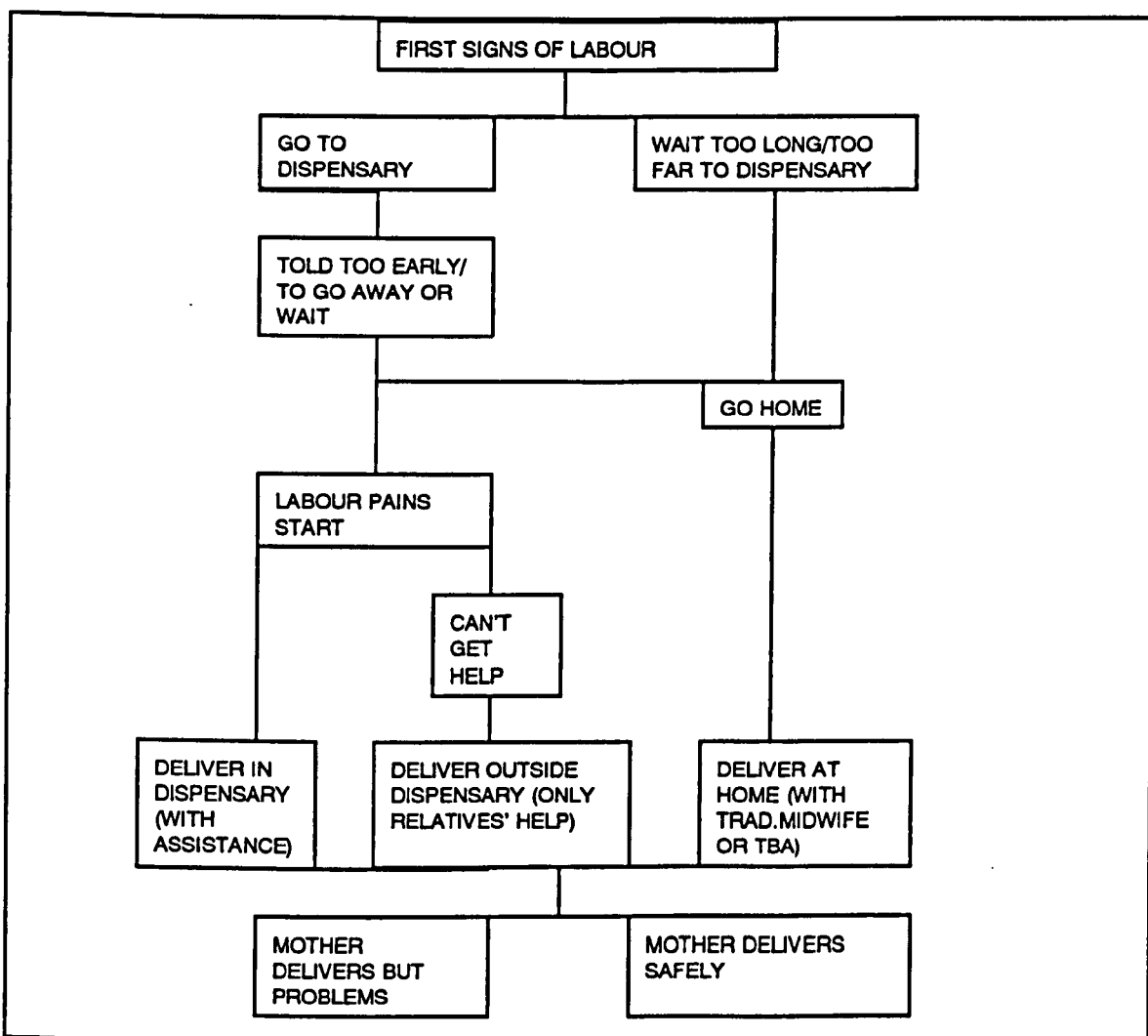
Figure 8.2: Community experience of government delivery services

asked why are you giving birth after only a short interval. But the family planning drugs are sold very expensively, you should pay 100/- and we don't have money" (Kiswago FGD women).

In half the dispensaries assessed unsympathetic attitudes were associated with community-perceived punishments for delivering at home. "...Some people give birth on their way home or they get services from a traditional midwife. Myself I faced that problem and the midwife gave me services... When the next day I went to the dispensary the nurse was angry with me 'why did you give birth at home?'... Now for that they charge 50/- for the vaccination...we pay that money as a punishment for giving birth at home" (Kidugalo IC).

Differences in personal experiences make judging the overall perceived attitude performance of MCH care in dispensaries difficult; only two units unequivocally appeared to be judged well in this respect

(both diocesan). Sometimes different views within villages seemed to reflect the differing relationships with the health workers; teachers, for example, were often more positive than other people but may also, as fellow government workers, have been more likely to receive preferential treatment. In the HHQ, good welcome (22%) and good attitudes (12%) were sometimes pleasing factors about dispensary services and 72% of respondents disagreed with the suggestion that mothers might not attend ante-natal clinics because of poor staff attitudes. However, 50% agreed that at least sometimes staff had no kindness for patients. This view was expressed more often by those served by a government dispensary, those living in a village without a dispensary and those with more than primary schooling.

Curative care inter-personal skills were judged largely in relation to: the abuse of drugs in government units, discrimination in service provision, staff welcome, lack of emergency care, delays in providing care and nursing practices (see Figures 8.3 and 8.4).

Staff in four of the government dispensaries were definitely said to sell drugs, in two there was some suggestion of selling and only in one was this suggestion not made: *"they all agreed on that point: 'the speed of money'"* (Nyarutanga PT mothers). Responses from the HHQ were more confusing. Asked why there was a drug shortage in the local dispensary, 37% said there were too few drugs for the population, 25% said staff create the shortages and 25% could not explain; staff problems and inability to explain were more often given as answers by people served by a government than diocesan dispensary and villagers without their own dispensary more often identified staff problems than those with a dispensary. On the other hand, 84% responded no when asked if drugs could be bought in government dispensaries. The evident experiences and strength of feeling expressed in the informal discussions, however, suggest that responses to the HHQ under-stated the problem and highlight the difficulty of addressing sensitive questions through a formal questionnaire approach.

Various ways of selling drugs were identified. Patients might be expected to give bribes during the consultation, *"I went with my child and the RMA told me 'think more about this illness'. I didn't know what I should think of, after I came to learn that he wanted money"* (Kiswago FGD women).

Patients might have to go after hours to get drugs, *"medicines are divided into two groups - one for ordinary people and the other for the RMA to treat his people who pay. He says 'come at 6pm'"* (Gomelo ID traditional healer).

Special services (e.g. circumcision, dental care with anaesthesia, home visiting) might be provided for a fee, *"sometimes if you take with you rice, chicken, eggs, the health worker can come to your house to give treatment (up to when you get full recovery). There have been several occasions when we have*

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                          ┌─────────┐
                          │ GET ILL │
                          └────┬────┘
                               │
                    ┌──────────┴──────────┐
                    │ GO DISPENSARY, DRUGS │
                    │ AVAILABLE            │
                    └──────────┬──────────┘
                               │
        differences between villages and between people within villages
            ┌──────────────┐              ┌──────────────────┐
            │  FAVOURED    │              │  NOT FAVOURED    │
            └──────┬───────┘              └────────┬─────────┘
                   │                               │
            ┌──────┴───────┐              ┌────────┴─────────┐
            │ RMA          │              │ WAIT LONG TIME TO SEE │
            │ LISTENS      │              │ RMA              │
            └──────┬───────┘              └────────┬─────────┘
                   │                      ┌────────┴─────────┐
      ┌────────────┴──────┐   ┌───────────┴──────┐   ┌───────┴──────────┐
      │ RMA MAKES         │   │ TOLD TO COME     │   │ RMA WRITES       │
      │ DIAGNOSIS WITH ALL│   │ TOMORROW         │   │ PRESCRIPTION     │
      │ AVAILABLE         │   │                  │   │ WITHOUT          │
      │ EQUIPMENT         │   │                  │   │ LISTENING OR     │
      └─────────┬─────────┘   └────────┬─────────┘   │ EXAMINING        │
                │             ┌────────┴─────────┐   └───────┬──────────┘
                │             │ LEAVE VERY       │           │
                │             │ DIS-SATISFIED    │           │
                │             └──────────────────┘           │
      ┌─────────┴─────────┐   ┌──────────────────┐   ┌───────┴──────────┐
      │ RMA PRESCRIBES    │   │ RIGHT DRUG IN    │   │ WRONG DRUG       │
      │ RIGHT DRUG IN     │   │ RIGHT DOSE       │   │ and/or WRONG     │
      │ RIGHT DOSE        │   │                  │   │ DOSE             │
      └─────────┬─────────┘   └────────┬─────────┘   └───────┬──────────┘
      ┌─────────┴─────────┐   ┌────────┴─────────┐   ┌───────┴──────────┐
      │ NURSE DISPENSES   │   │ NURSE            │   │ NURSE GIVES      │
      │ CORRECTLY WITH    │   │ DISPENSES        │   │ SHORT DOSE       │
      │ SOME EXPLANATION  │   │ CORRECTLY,       │   │ and/or NO        │
      │                   │   │ SOME             │   │ EXPLANATION      │
      └─────────┬─────────┘   │ EXPLANATION      │   └───────┬──────────┘
                │             └────────┬─────────┘           │
      ┌─────────┴─────────┐   ┌────────┴─────────┐   ┌───────┴──────────┐
      │ LEAVE VERY        │   │ LEAVE DIS-       │   │ LEAVE VERY       │
      │ SATISFIED         │   │ SATISFIED BUT    │   │ DIS-SATISFIED    │
      │                   │   │ AT LEAST GOT     │   │                  │
      │                   │   │ DRUGS            │   │                  │
      └───────────────────┘   └──────────────────┘   └──────────────────┘
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Figure 8.3: Community experience of government curative care, when drugs available

seen the RMA coming to treat the people in this village that give him money" (Kiswago FGD women).

Finally, drugs might be sold directly to informal drug sellers or shops, "...for example, if they have 10 bottles of penicillin they sell 5 and use the remaining for the patients. All these medicines are now available in the shops though they are not normally found there" (Kisitwi ID teacher).
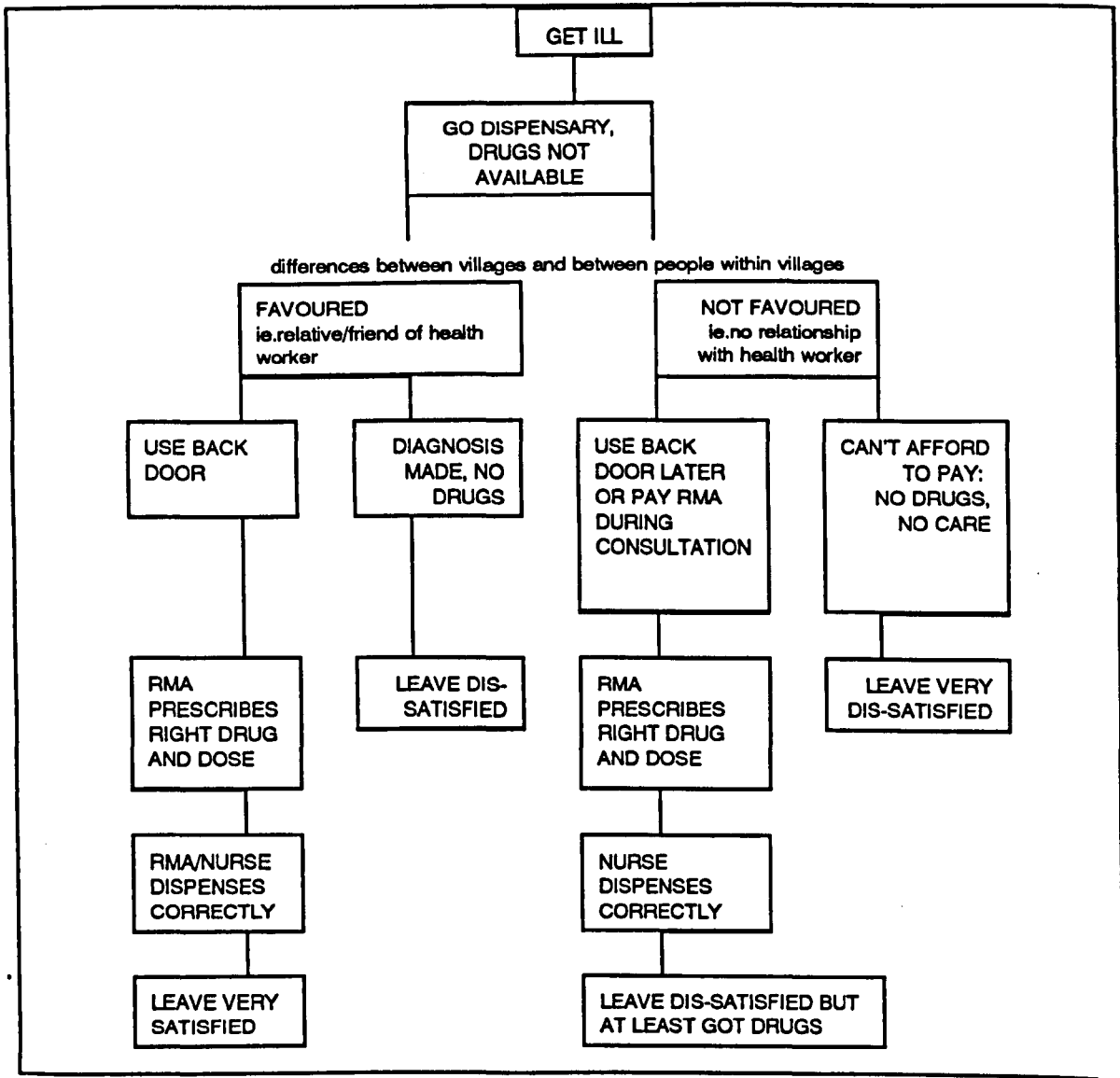
Figure 8.4: Community experience of government curative care, when drugs not available

It was also said that "sometimes patients give money as an appreciation for service therefore it has become a custom that if you don't pay you can't get good treatment" (Mkangawalo ID Pastor). The more common view was that, "[staff] attitudes are based on making fortune for themselves because anybody with good attitude cannot sell drugs to the patients when you know that everybody is poor" (Kiswago ID TB patient).

Discrimination in service provision, serving one group of patients before another, was partly linked to informal payments: "there are two doors - the front door and the back door. Those who use the back door are known to the RMA or they are those people who pay something (bribe). When you go there they tell you there are no drugs while those known to them or those who gave them money get

treatment" (Gomelo PT schoolchildren). However, it was also often a result of differences within villages, "if there is medicine we workers [formally employed] get first treatment before peasants" (Msimba ID member village council); and differences between villages could be important, "the distribution of drugs there is according to friendship. For us who do not belong to that village we do not get proper treatment" (Kisitwi FGD women's organization). Such discrimination was clearly identified in six of the seven government units, particularly by those coming from outlying villages - and in all three diocesan units, where the more wealthy or more influential may get quicker care although all pay.

As with MCH services, the language used to welcome and deal with patients was seen to be important: "...those who have sympathy are the RMA and one nurse. When you go there, maybe you don't get medicine but their language can give you hope" (Gomelo ID traditional healer). Differences between government and diocesan units were graphically expressed by one person, who commented that "...in Ilonga church dispensary they have polite language. When they give you an injection they say 'pole' [sorry] and 'karibu tena' [welcome again]. In government dispensary they say 'Come on, why are you tensing your buttocks? You should relax!'" (Msimba ID ten cell leader). Diocesan staff were generally perceived to have better attitudes, "the health workers are honoured by the people and also respect the patients" (Kisawasawa ID respected person).

Villagers also linked attitude problems to the lack of emergency curative services, available in only three units (two diocesan), and to the late opening hours and long waiting times perceived in half the units assessed (only one diocesan unit).

The close link between bad attitudes and poor skills was most clearly perceived for the untrained nurse cadre: "... when we go to dress our wounds if you don't wash your wound first they use abusive language when attending you...some quarrel with the health staff and therefore you can't go there because he may ...discipline you by giving a water injection...In government centres the low cadre workers do not do what they are supposed to do. They are only interested in their salary" (Msimba ID ten cell leader). Unequivocally good nurse attitudes were noted for only one, diocesan, unit.

8.5   The performance of health centres against community standards

Eight health centres were indirectly reviewed through this study. Two appeared to be hardly used by the surrounding population. Of the others, four were said to be used by only some people from the villages within their catchment areas - because of distance and better access to/better care available at a hospital. Distance was generally a more strongly perceived structural failing of heath centres than dispensaries.

Of the six more commonly used health centres, at least mixed positive and negative views about the perceived quality of care were expressed about three but the other three centres were more generally regarded as providing poor quality care. Overall, *"nowadays services there are no different from the dispensary. When you go there many times there is no medicine and they direct you to buy from shops"* (Nyarutanga FGD women).

Positive aspects of the services provided included structural features such as the size of buildings, the number of trained staff, twenty-four hour service provision, the provision of some ancillary services (water, toilets), the availability of laboratory tests and, in some, the possibility of transport. Staff skills were sometimes also applauded, *"if you go to the MA and you have serious problems you can be referred to the medical officer in-charge... there is also good services for admitted patients...services are good for babies and pregnant mothers. I am saying things of which I have an experience, I went there when I was pregnant and delivered safely"* (Msimba ID women's organization chairperson). Pleasing factors identified in the HHQ were staff skills (20%), equipment (16%) and drugs (15%).

The MCH (and especially delivery) services were particularly appreciated because *"the nurses don't leave you alone in the labour ward...after delivery they clean your baby and they wash all of the clothes themselves"* (Ichonde ID member village council). *"Mothers with labour pains get good reception...they use good language to the patients and when the nurse feels that a case is beyond her they seek assistance from the doctors"* (Kiswago ID village secretary).

Despite these good points, structural weaknesses were more often perceived to undermine the services provided in health centre and require onward referral to hospitals. *"...It is better to go Dar es Salaam or Ifakara. One pointed out an example. He had a child with a broken leg and he stayed [at the health centre] for two days without getting any services just because they didn't have plaster of paris"* (Nyarutanga FGD ten cell leaders).

Similar problems to those of dispensaries were identified and lack of drugs was most important: *"...if you want to go [to the health centre] you have to have an agreement with God to be sick only from the 1st to the 5th of each month to get drugs"* (Ichonde ID teacher). Staff practices and attitudes were also perceived to be poor, often because of informal charging: *"last week we sent a patient to Duthumi [health centre] because she hurt her backbone. She managed to be admitted but nothing was done for 2 days after admission. When we consulted a doctor, he said 'the ink in my pen is finished'; when we asked again he said 'my lamp at home has no kerosene'. We didn't get discouraged but went to another doctor who said 'do you think the service is free of charge? do you think it is possible?' We then asked for a letter of transfer to Ifakara hospital"* (Gomelo FGD women).

41% of respondents in the HHQ felt that services at health centre/hospital could be improved (particularly in health centres), by providing a higher level of care such as made possible by more equipment (33%), by increasing the space available (22%) and by giving more drugs and better management (9%). However, 51% did not know if or how the services could be improved.

8.6   Community willingness to pay for health care

International discussion of health financing policy has stressed the potential for introducing user fees, but few studies have explored community opinions about such introduction. Views of diocesan health units indicated the balance between costs and quality in community perceptions, and this balance was also highlighted in response to direct questioning concerning community willingness to pay for government health units.

8.6.1 Cost and quality trade-offs in using diocesan care

Although diocesan health care was perceived to be of high quality, the costs of obtaining it were sometimes a deterrent to its use: *"there was a time when due to the high price at the diocesan dispensary the number of people attending decreased day by day. Afterwards the dispensary management had a meeting and they decide to reduce the prices"* (Sofi Mission FGD village council). Discussions in two villages allow review of these influences on the use of diocesan dispensaries.

In Mofu, the diocesan dispensary was the only dispensary available within this relatively remote village and was one of the worst perceived of the dispensaries reviewed. The balance between costs and existing quality of care led one villager to comment that *"costs are very high now compared to the past. In the past there were many drugs and we were getting services at the real value of our money, not like now"* (FGD women). A common perception was that, *"the services are just to make money, nothing else"* (FGD women) because in curative care, for example, services were dependent on *"...the amount of money you have. On arrival at the 'hospital' a doctor can ask you 'how many shillings do you have?' If you have got 100/- or more, they give your drugs based on that amount"* (FGD women). Weaknesses in quality included the poor practices of nursing staff, the laziness of the RMA and particular failings in the delivery care offered. In these circumstances it was perhaps not surprising that the range of available informal drug sellers were used. The *"lack of proper dispensary services encourage the people to use local medicine or to buy from 'black marketeers'.... These services are good and suitable for human health so it is better to go to them than to the dispensary...where you can pay more"* (FGD women); for example, *"for a young child one injection [from informal sellers] is 20/-...while at the dispensary it is 40/-"* (ID outspoken woman).

However, a second diocesan dispensary, Kisawasawa, presented a very different picture. Located close to a main road, it is surrounded by a number of other villages where government dispensaries are located; in one there is a health centre. Good quality care in Kisawasawa (it was the best perceived of the dispensaries reviewed) outweighed considerations of cost in most cases, and people valued the dispensary's services: *...patients come from different areas to be cured...they don't come to buy drugs because they could have both at..shops..but they are after the whole services, a good one* (FGD women). Cost was still seen to influence the care provided, for example in prescriptions, but for most people these concerns did not deter use as good quality tipped the cost/quality balance in favour of the dispensary.

8.6.2 Willingness to pay for government care

Communities were also asked about their willingness to make formal payments for government dispensary care; their discussions indicated the complexity of this issue, including the cost/quality balance. Most informal discussions generally concluded that people were unwilling to pay for health care, because *we can't afford to pay. For example, one day the whole household was suffering, now if treatment was for payment the only solution would be to die* (Kisitwi ID disabled person). However, asked in the HHQ whether they would be prepared to pay for government care, given that they already pay for other care, 44% of respondents indicated willingness, 43% unwillingness and 12% said 'yes and no' (1% 'don't know'). Villagers without their own dispensary were more often prepared to pay, as were those with primary schooling. In explaining their response, 33% said 'no, not all could afford' (8% 'no, supposed to be free', 6% 'yes and no, difficult for some') and 27% said 'yes, to get better care/more drugs'. Those served by a government dispensary and with primary or no schooling were more likely to be willing to pay in order to get better care, whilst those with no schooling were more likely to be unwilling because they felt not all could afford to pay.

Informal discussions emphasized that current costs already deter utilization: *...because costs are very high...this makes it necessary for people to use locally available herbs and roots, or to buy tablets from nearby shops* (Kiswago ID ten cell leader); *payment will mean death for poor people. People are even thinking twice about bribes and that's why they use traditional healers* (Nyarutanga ID head of poor household). Current costs may also influence drug use, as *people do not finish their doses. For example, if a person is told to come for 5 injections and tablets to use for 4 days, he will only attend the first 2 and take tablets for 2 days, then he will stop if he feels it is better to avoid costs* (Mkangawalo ID teacher).

Moreover, cash incomes are both low and seasonal, *they will not afford to pay for health services due to the low income of peasants...Their income is dependent on cotton but it is two years now since they

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were paid for their crops. Now where will they get money?" (Nyarutanga PT women) , and other demands are constantly made on the cash income that is available: *"We can't contribute. Contributions are killing us. We contribute for school every year,... we pay CCM fee, we pay for CCM headquarters in Dodoma, we pay tax, we can't pay hospital services"* (ID Ichonde member village council). Indeed, *"we are not ready to pay because up to today we pay that development tax, now development also means giving free health services"* (Sofi Mission ID ten cell leader).

Some villagers, as noted, *"would be ready to pay for the sake of getting drugs"* (Rubeho ID woman) and other quality improvements; indeed, *"...today we do not get good treatment - we have to bribe, therefore, it will be better if we pay a price announced by the government and also get enough medicine"* (Sofi Mission FGD women). 53% of respondents in the HHQ agreed that if you pay for health care you get better services (25% disagreed, 19% agreed sometimes and 4% did not know); those agreeing completely were more likely to be served by government dispensaries, or to have primary schooling (as opposed to above primary or none). However, informal discussion also indicated a concern that payment would not necessarily lead to better care: *"we cannot pay because we are not sure that we will get good services, it can be mere words"* (Kiswago FGD women). Management intervention would be required, for example, to ensure that villagers did not suffer from double-pricing, *"..there should be high supervision to ensure that a doctor is not demanding a high price e.g. if the price for aspirin was 2/- without supervision he can add 3/- to take it for himself"* (Sofi Mission FGD village council). Although 46% of respondents in the HHQ felt payment would lead to better care (more among villagers without a dispensary and with primary schooling), 15% said that money could not help and 15% said that fees could not be afforded.

Not all of those willing to pay were the èlite of villages, the employed workers, although they appeared to be more willing than other villagers. Willingness derived from consideration of personal income and of the need to improve the health services. Even those who felt that they would themselves be prepared to pay tried to consider the position of others. Many considerations were covered in the discussions held within villages, illustrating the complexity of the related issues:

> *"If the price will be less than in church units maybe people will try their level best - we can't say they can because people are different with thoughts and money...*
>
> *it will be better because 'free is very expensive'; here they treat selectively, one person is treated for free while another one has to pay. Who uses that money?...*
>
> *when you are talking you have to be silent and weigh the question, and measure your ability and that for your fellows at home. Don't just pronounce - others may die...*
>
> *we beg the government to increase free services by using development taxes to import drugs, to supervise the use of drugs, to give transfer to the lazy staff...*
>
> *continue with free services: our income depends on agriculture and agriculture is temporary only, sometimes you may get and sometimes you miss. Cash crops like cotton are decaying in the stores - with nobody to buy it and the government doing nothing. Cooperatives have failed to purchase the crops and cotton was at least giving people some money. Now if people will pay the nation wants*

to remain without people...

we have agreed to pay for school fees and development taxes but not hospital services, otherwise the people will die" (Sofi Majiji FGD village council).

8.7   Community responsibility for health care

Part of the unwillingness to pay for government health care appeared to stem from concern about the lack of accountability within government systems, evidenced by questions over the use of existing tax revenue and suspicion that the introduction of fees would not be accompanied by quality improvements. Community views suggest that, despite the theoretical importance of the CCM administration at village level, the dispensary and its staff are rarely accountable to the community. Table 8.1 summarizes views on the community sense of ownership of the local dispensary, their willingness to be involved in aspects of dispensary management and their current relationship with health staff.

Rarely did they see the village dispensary as 'theirs' for which to make decisions (2/10). In those villages served by a diocesan dispensary the health units were all seen as the responsibility of the parish priests. Most regarded the fee they paid for diocesan care as the only acceptable form of contribution, as they were never consulted by the priest and did not see what role they could have in the management of the dispensary, *"the villagers have little contribution in rectifying health services at diocesan dispensaries...[they] are not expected to do anything because the running of the dispensary is in the hands of Catholic Diocese"* (Kisawasawa ID respected person). Villagers without their own dispensary may have made contributions for the one they use but also felt somehow outside it (5/6 villages) - reflected in complaints about discrimination in service provision - and would prefer to have their own dispensary. *"We will not contribute any more because the dispensary is far from here. We are only going to contribute to build our own dispensary"* (Kisitwi FGD women). Asked in the HHQ whether villagers could do anything to improve the local dispensary, 55% of respondents said yes, but villagers served by a government dispensary or by a dispensary in their village were most likely to say yes.

Even where a government dispensary was located in the village, problems in 'ownership' may have arisen, *"we need high authority to send people secretly to see the bad acts which the health workers do. Ourselves we fear to make a follow-up"* (Kidugalo ID traditional healer). In less than half the government dispensaries could some villagers envisage having some authority in relation to drug use. More generally, villagers felt that village leaders cannot act effectively to stop drug abuse, *"recently a committee has been created which will start monitoring how drugs are used. But if someone wants to 'eat' he can still 'eat', it is just a matter of convincing the other members of the committee and they 'eat' jointly"* (ID Nyarutanga traditional healer). The daily control and knowledge of the health workers anyway would undermine village monitoring of drug use: *"this (the presence of village council) will be*

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Table 8.1: Community opinions about dispensary management

DISPENSARY	ADMINISTRATIVE ISSUES		
	OWNERSHIP SENSE	PREPARED TO BE INVOLVED?	RELATIONSHIP WITH STAFF
DIOCESAN			
Kisawasawa	none	not prepared	good
Mofu	none	not prepared	bad - priest's influence
Sofi Mission	none	not prepared	mixed - priest's influence
GOVERNMENT			
Mngeta	considerably less sense in outlying village than in Mngeta	less prepared in outlying village than in Mngeta	not said
Rubeho	a little less sense in outlying village than in Rubeho	mostly prepared	good
Msimba	less sense in outlying village than in Msimba	less prepared in outlying village than in Mngeta	good
Kisaki	positive sense both villages	prepared	poor - MCHA
Maharaka	positive sense (only one village)	prepared	good, but questions about new RMA
Iragua	less sense in outlying village than in Iragua	mixed	poor
Sofi Majiji	less sense in outlying village than in Sofi Majiji	some prepared	great problems - MCHA

good for nothing because they will only be there when opening the kit but they cannot dictate how those drugs should be used. He (the RMA) is expert he knows how many tablets he can give out and how many he can keep for his own benefit, still books can show all drugs were used as they should" (Sofi mission FGD village council).

There was a strong sense that health workers are outside the control of villagers and get their salary whatever they do; in 5 out of the 9 health units for which this issue was discussed, the community's relationship with health staff was said to have problems. Asked in the HHQ how to improve the services of the local dispensary, 10% of respondents said that staff changes were required. For the two diocesan units with these problems, the role of the parish priest was crucial; but for the government units, problems were primarily because health workers had clearly defied village authority. For example, *"that MCHA is not willing to wake up. This has happened to me. I went to the dispensary in order to give birth. After reaching there the MCHA told me 'I don't know this and I'm planning to go to take my salary. Don't come, go back'. My relative brought me back home where I managed to deliver safely.*

I was much helped by a local midwife. My husband went to the CCM office and complained that she refused to give her services. She was called to apologize before the village chairman but still nothing has improved" (Gomelo FGD women).

Perhaps part of the weakness lies with the village administration. Of the seventeen villages visited during the community sub-study, field worker experiences and community discussions suggested that 9 (52%) had relatively ineffective administrations and in 14 (82%) village health committees hardly functioned.

Actions to address the problems are, therefore, seen to be the government's responsibility. Community suggestions included:

1.staff transfer -

"the staff should be given a seminar so that they know the meaning of being in a dispensary. They should also be answerable. Staff should be transferred because some have stayed for 10 years and they are used to the situation" (Kiswago FGD Village Council);

2.staff allocations reflecting workloads -

"that MCHA always she is angry with us. Staff are not enough. That MCHA she is alone, she helps the maternity women and also all clinic services are under her. In fact sometimes she becomes very tired. Maybe that is the reason she is angry with us" (Nyarutanga FGD women)

3.actions to tackle poor working conditions -

"another reason [for the problems] is the government economic situation. Maybe medicines given to the dispensary are not enough. These doctors use their positions in order to get something for their lives" (Nyarutanga village council); therefore,

"government should struggle, should supply staff with essential things and the salary should be enough to reduce temptation" (Kiswago ID TB patient).

8.8   Community satisfaction associations

8.8.1 Quantitative analysis

In order to consider whether any association exists between community satisfaction and the other aspects of health unit performance evaluated in this research, dispensaries were initially classified as more or less well-perceived by communities on the basis of an overall judgement of community satisfaction. Using procedures similar to those applied for other quality/cost comparisons, cross-tabulation was used in comparing overall health unit satisfaction with health unit total and average costs, structural quality, process quality and utilization.

Although sample size prevented the determination of significant differences, some trends were apparent. Greater satisfaction appeared to have no association with *utilization* and no association was evident in comparison of satisfaction and *cost* categories (Figure 8.5). Of the *process quality variables*, only the satisfaction/technical skills comparison suggested an association, with better technical skills perhaps associated with greater satisfaction. Similarly, it appeared that better *structural quality* might be associated with greater satisfaction (Figure 8.6).

Overall, these findings give some support to the links between satisfaction, utilization and average costs outlined in Chapter 1 and suggest that the influence of satisfaction on costs is mediated through other quality elements and utilization. Such a relationship points to the achievement of greater satisfaction through better quality and, because of the quality/cost links, through greater costs.

8.8.2 Qualitative analysis

A second assessment explored the association between community satisfaction and other aspects of health unit performance through case studies, as summarized in Table 8.3.

SATISFACTION	low	high
TOTAL COST		
low	2	3
high	2	3
AVERAGE COST	low	high
low	3	2
high	2	3
UTILIZATION	low	high
low	2	3
high	4	1

Figure 8.5: Comparison of satisfaction, cost and utilization

SATISFACTION	low	high
TECHNICAL SKILLS		
low	4	1
high	2	3
RECORD-KEEPING	low	high
low	3	2
high	2	3
ATTITUDES	low	high
low	2	3
high	2	3
STRUCTURAL QUALITY	low	high
low	3	2
high	1	4

Figure 8.6: Comparison of satisfaction, process and structural quality

There were clear similarities between structural quality assessments and community satisfaction: Kisawasawa performed best in both professional and community eyes. Some similarity also existed between process quality and community satisfaction. The importance of inter-personal skills appeared to receive particular weight in community judgements; for example, considering whether or not drugs were sold and past experience in obtaining care rather than just current actions in a consultation. The examples of the two government units might also appear to suggest that low cost equals poor all round quality; but the diocesan unit, better quality but average

Table 8.2: Case studies of the association between community satisfaction and other aspects of health care performance

HEALTH UNIT/ COST GROUP	STRUCTURAL QUALITY	PROCESS QUALITY	COMMUNITY SATISFACTION
Kisawasawa, diocesan: average cost	above average overall structure; particularly good curative structure (drugs & nursing procedures); average/poor MCH structure, delivery especially poor	2nd/3rd best of 4 diocesan units across all procedures; average performance relative to govt units except better child fever & nursing care; no obvious difference in technical & inter-personal skills	best perceived overall, despite having to pay & having no responsibility for unit: good structure, except shortage of trained staff; especially good curative services (structure, technical skills & attitudes)
Maharaka, government: high cost	just below average overall & curative structure; mixed MCH structure, poor delivery but better ANC/CW	better than most government units for curative care; particularly good ante-natal care relative to other government units (despite provision by nurse); nursing only average relative to government units; inter-personal better than technical skills for some procedures	best perceived, government & positive sense of ownership: particularly good previous RMA; structure reasonable but no staff houses and lab equipment; curative skills mixed but attitudes mostly good & little hint of drug selling; MCH care reasonable though provided by nurse
Sofi Majiji, government: low cost	below average (and Maharaka) overall & for curative structure: mixed to relatively poor MCH structure	average to poor relative to other government units for most procedures; better injection & worse ante-natal performance; poor technical and worse inter-personal skills across procedures	one of 3 worst perceived overall & different sense of ownership between catchment villages: MCH structure poor & no lab equipment; mixed curative skills but poor attitudes & drugs sold; nursing skills poor; very poor MCH care & problems with MCHA attitudes

cost, contradicts that judgement. The low numbers of units reviewed anyway prevents final conclusions from being drawn.

Overall, this qualitative analysis further supports the links between the quality variables suggested by cross-tabulation.

8.9 Research conclusions

Broad generalizations about community perceptions of health care must be made with caution, not only because of methodological concerns, but, more importantly, because perceptions clearly varied from village to village. They were often dependent on the circumstances of each village: the presence/absence of a dispensary, the ownership (government/diocesan) of the local dispensary, and

access to alternative health providers. The local dispensary is only one health care option and is judged both on its own merits and in relation to the strengths and weaknesses of others. The care, particularly the drugs, that it offers is valued, but weaknesses in the way care is provided can encourage use of other health care providers.

Community expectations of both structural and process quality in health care appeared to be similar to those of health professionals and some association between the various quality elements was identified. The community, however, gave greater weight to drugs, for example, and to inter-personal skills; perceptions of technical skills were, therefore, coloured by judgement of inter-personal skills. Given that the effectiveness of services, particularly MCH and preventive care, relies on the provider-patient interaction, perceived inter-personal skill weaknesses were also likely to undermine process quality. These weaknesses were only compounded by the poor structure of dispensaries, the lack of privacy and ancillary services for delivery care, the lack of equipment for effective curative and ante-natal care. Overall, the identified facets of community satisfaction concern structure and process more than outcome.

Consideration of the issues raised in Chapter 5 against these findings suggests, broadly, that:

*   maternal care was highly regarded by the community but found to be of poor quality, because of a mixture of structural and inter-personal skill failings;

*   health centres were little better than dispensaries despite their greater costs and some elements of better perceived care;

*   satisfaction with diocesan dispensaries was often higher than with government units but was also influenced by the financial costs of obtaining care; perceived quality was traded against such costs in the decision of whether or not use care.

Overall, the community indicated little ability to address the problems they perceived and, not surprisingly in this context, only limited willingness to pay for government health care. Their experience of trying to take action, their vulnerability to the providers of drugs, their own divisions and their role as receivers of services have all undermined their belief in themselves. Although assumed to play a role in the management of drug supplies, communities rather saw themselves as victims of the bad practices of health staff: tackling the quality problems requires that the accountability of health staff be improved.

8.10   Methodological assessment

8.10.1 Representativeness and bias

The representativeness of informal interviewing approaches may be questioned because sampling is not random and the numbers interviewed, small. In this study, in addition to 3 to 6 in-depth interviews, 4 or 5 focus group discussions, with between 6 and 12 people, were also held in each village giving reasonable interviewee numbers of 50-60 per village (1-13% of village populations) and around 1000 in total. Interviewee selection by field workers sought to ensure as wide as possible representation, allowing for the circumstances of each village (e.g. tribal and religious groups, co-operation of different population groups, settlement pattern, presence of community groups such as women's groups). Although community leaders assisted with the organization of group discussions, they neither selected people to be interviewed nor were present during discussions. As experienced community workers, the field workers were accustomed to liaising with village authorities and aware of the potential biases resulting from letting leaders become too involved in selection. Use of the household questionnaire was based on simple selection procedures - systematic samples in different areas of the village. Initial training included a focus on both types of selection procedure and the appropriateness of interviewee selection in each village context was checked during supervision. These steps to safeguard selection procedures and ensure reasonable sample sizes suggest that generalization across discussions, villages and dispensaries is valid.

In this study, data analysis was, therefore, a process of summary across common themes - initially building pictures of community perceptions at the village and dispensary level, before making wider generalizations. Field workers reported on each discussion using a pre-set format that brought together comment and experience against the study's main themes; village and dispensary summaries then allowed common perceptions to be identified by comparing and contrasting experience. This process of review enabled identification of both community expectations of health care as well as community judgement of the available care, based on issues for which there was common agreement and greatest strength of feeling.

The findings of qualitative interviews were then compared with those of the quantitative approach, which used household questionnaires. The two sets of findings were broadly similar. Where contradictions were identified they appeared to be because formal questioning approaches and, in particular, closed questions, undermined the nature of the response by not allowing full expression of the complexity of community views and the links between the factors involved. For example, concerning illicit drug selling or willingness to pay for health care. Where the focal topics in a survey concern opinions it is anyway important to get a sense of the strength of those opinions and this is better done through discussion

as quantified responses to pre-coded questions give little hint of the depth of people's views. This study showed that people's own words and experiences brought into sharp focus the problems they experience in relation to health care.

8.10.2 Use of methods at the district level

In comparing their experience of interviewing approaches, all field workers preferred the more qualitative techniques to the formal questionnaire. They were uneasy using the questionnaire and found interviewees were uncomfortable, resenting the time taken to answer questions. In contrast, both in-depth interviews and group discussions usually generated considerable interest among interviewees and allowed field workers to probe opinions.

Field workers were experienced community workers based at the district level, 3/6 were health workers and others were from community development and agricultural departments. They showed clear skills in dealing with the both the logistical and interviewing aspects of their work, suggesting that more common use of informal interviewing techniques in monitoring performance is possible. For example, supervision might include some discussion both with village authorities and mothers, an important group of service users. Although supervisors would be identified as health staff the very act of seeking to consult with the community would probably be seen positively. Many respondents in this study welcomed the opportunity to express their opinions, indicating the value of greater consultation with communities as a way of strengthening the accountability of health workers to them. Discussions should, however, take place in a pre-set context of issues and concerns, regularly reviewed with community members. The dispensary health workers could also be involved in some discussions to encourage better relationships with the community; although other actions are also needed to foster good relations.

All discussions should be reported in order to strengthen the process, to ensure that community opinions are truly heard, and for later reference. However, the work entailed in reporting can be substantial: although a relatively small number of discussions were organized in each village for this study, the total number of reports across 17 villages was considerable. A simple report framework was used to facilitate later analysis, but summarizing the reports was time consuming and required particular skills. Analysis of household questionnaires was equally difficult, given the numbers and length of questionnaires and the use of open-ended questions which then required coding. Regular use of these sorts of interviewing approaches, therefore, seem likely to be undermined more by the analysis required than by a lack of skilled interviewers (Cliff et al 1990).

8.11   Summary

This chapter presented the findings of the assessment of community satisfaction with available health care. It discussed both community expectations and their experiences, drawing on informal discussions and the results of the household questionnaire.

Diocesan dispensaries appeared to have some strengths over government units - availability of drugs, equipment and adequate structure, for example, and, in some, staff attitudes were praised. Perceived problems included weaknesses in technical skills, particularly of nurses, and the payment required to obtain health care. Balancing costs against quality led some to view payments as a deterrent to utilization.

Satisfaction with government units varied more considerably. The most common complaint concerned the shortage of drugs and the abuse of drugs by health staff. Informal payments and discrimination in care provision were also important. Although informal payments for MCH care were also noted in some units, a more important reflection of MCH staff attitude problems was the poor experience, including verbal abuse, of maternal care. In contrast, technical skills, particularly for curative care, were generally well-perceived. Health centres were often seen to be little different from dispensaries, although it was hinted that MCH services were better in some. More generally, their better staff availability and structure was outweighed by the lack of drugs and the practice of informal charging. Although accepting that paying for government health care might lead to quality improvements, the community was concerned that accountability problems, for example, would prevent quality improvements and that some villagers would not be able to afford to pay fees. Overall, they preferred not to pay.

Assessment of the association between community satisfaction and other elements of the research findings suggested that the achievement of greater satisfaction was associated with better process and structural quality and, consequently, greater costs.   The chapter's other research conclusions emphasized the dangers of generalizing about community opinions but the similarity of community and professional judgements of quality. The issues raised in Chapter 5 as important to assess in determining management strategies for enhancing efficiency were considered.

Methodological assessment confirmed the reliability and validity of the findings and considered the use of study tools for research and for management.

CHAPTER NINE:
MANAGEMENT AND POLICY IMPLICATIONS

Against the international background of economic recession, cuts in social service expenditure and discussion of the measures required to sustain health care (Chapter 1), this chapter draws on the research findings in considering what management actions are necessary to sustain the future provision of primary level health care. First, the management strategies required to bring about improvements in the efficiency of primary health units are considered (sections 9.1 and 9.2). Second, the lessons for development of health care financing policy are reviewed (section 9.3). Third, the feasibility of recommended management action in the organizational context of the Tanzania health care system is assessed (section 9.4). The lessons of this Tanzanian experience are also important for other, particularly sub-Saharan, countries facing similar economic and health care settings.

This study has shown that primary health units in Tanzania are inefficient, characterized by low staff productivity, high levels of drug and vaccine wastage, poor structural quality (i.e. lack of basic equipment and poor condition of buildings), weak process quality (health worker performance of duties at levels below expected standards) and community dis-satisfaction with the available services. From the professional standpoint, the consequences of these performance failures are poor diagnostic procedures and prescribing practices, potentially dangerous nursing practices and ineffective monitoring of pregnant mothers. In the community's eyes the problems lead to a balance between the costs and benefits of obtaining care that may favour private purchase of drugs, self-medication or the use of traditional healers over the local government dispensary. The benefits of a widely accessible infrastructure are being undermined by these failures. However, variation in average costs and levels of quality indicate that improvements may be possible even within the current resource context. Some health staff, even in the most remote health units, remain at their posts, do not abuse patients, and provide some care. Communities value these staff, respect the potential of modern health care and desire improvements.

9.1   Improving the care available within government dispensaries

In Tanzania, like other sub-Saharan African countries (Government of Swaziland 1984, Walt 1990), government dispensaries (or clinics) represent the foundation of the health care system; their weaknesses, therefore, undermine the whole system. Table 9.1 summarizes this study's findings concerning the two key resources in dispensaries, drugs and personnel. It points to five key aspects of dispensary performance which require review in order to identify ways of improving efficiency:

Table 9.1: Summary of findings concerning personnel and drug use

SUB-STUDY	DRUGS	PERSONNEL
Costs	20-50% of total health unit expenditure; correlated with total average costs for curative care and immunization; drug wastage suggested by validation survey; vaccine wastage rates of up to 90%, correlated with utilization; min:max ratios between units of 1:4 for average drug costs & 1:11 for average vaccine costs	20-40% of total health unit expenditure; correlated with total average costs for curative ANC/CW & immunizations; TWSA[1] rates of over 50%; little evidence of link with utilization levels; min:max average personnel cost ratios varied from 1:4 for delivery care to 1:60 for immunization; resource combination constrains capacity and staff productivity
Structural quality	key drugs not available for full month; reasonable availability of EPI supplies but some units with severe problems; fridge temperature problems may affect vaccine potency	min requirements met; staff available for emergencies; time mostly spent on curative care; long periods of TWSA; infrequent outreach
Process quality	consultation procedures do not allow correct diagnosis & prescription; only around half prescriptions correct for diagnosis, great variation between units; prescribing undermined by use of untrained staff; limited patient drug education	longer duration associated with better performance; time allocations and workloads apparently little influence on performance; availability of ANC cards associated with better performance; greater (trained) staff some association with better performance; better MCHA attitudes but poor technical skills across cadres
Community satisfaction	appreciate: curative drugs & vaccinations for curing/preventing illness; criticize: lack of drugs resulting in lack of care, need to buy own drugs & favouritism in use of available drugs; illicit sale of drugs by staff	appreciate: skills of trained staff criticize: nurses' skills failures; poor attitudes, possibly due to range of MCH workload; lack of drugs means staff have nothing to do

NOTE: 1. TWSA=time without specific activity

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* curative drug allocations and use;

* staff allocations;

* resource adequacy and resource combinations;

* service delivery strategies;

* the primary health care package;

* support procedures.

9.1.1 Curative drug allocations and use

The cost and quality characteristics of the current Tanzanian situation with respect to drugs are: intermittent supply, irrational prescribing (largely under-prescribing), variable to high wastage and high,

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sometimes unnecessary, community demand (Table 9.1). These characteristics are inter-twined. For example, in some health units under-prescribing may result from the inadequate supply caused by unnecessary community demand; in other units, the problem may be associated, through its impact on drug availability, to high levels of wastage. It is not surprising, therefore, that the drug-related cost and quality findings of this study did not appear to be linked - the more expensive health units had similar problems to the least expensive. This pattern suggests that a package of actions is required to raise efficiency, with the goal of achieving a situation of adequate supply, rational prescribing, low wastage and reasonable community demand. Table 9.2 summarizes the necessary actions.

Essential drug lists and programmes have addressed vital quality weaknesses in many health systems, ensuring drug availability and reducing supply costs (Foster 1991, Kanji *et al*. 1992). It has been estimated that savings of 20-30% in drug costs were made through the introduction of the EDP in Tanzania; and the increase in utilization following the introduction illustrates the community-perceived improvement. However, the considerable inflexibility of EDP programmes may help to undermine efficiency. For example, in Tanzania one kit per month per unit is supplied if less than 1000 new episodes of illness are treated per month and two kits, if over 1000 new episodes are treated. A slightly larger kit is provided to health centres. Re-assessment of kit allocations is made

Table 9.2: Addressing drug problems

ISSUE	TANZANIAN SITUATION	ACTION
Drug Supply	intermittent	greater flexibility in re-allocating drugs between units, more frequent re-assessment of drug kit adequacy, alternative supply system
Prescribing	irrational	monitoring, clinical manuals, clinical supervision, continuing education
Wastage	variable/ high	more effective monitoring and disciplinary procedures, regular supervision
Community demand	high	patient education during consultation, broader community-based health education, community accountability for drug supply

annually by national EDP managers. Although it was intended that district managers would re-allocate drugs between those with excess and those with inadequate supply, in practice no re-allocation occurs in the Morogoro region and every unit uses more or less all the drugs available to it during the month. Illicit drug selling and community demand are important factors contributing to this situation. EDP planning also assumed that additional funds from the district budget would be used to purchase drugs to supplement stocks in the busiest units; again, this practice is unknown in Morogoro. The centralized nature of the drug supply system undermines management action in relation to drug allocations; decisions about drug supply are not seen to be the responsibility of the DHMT. Greater flexibility in the

supply system could redress this balance of power, giving DHMTs the power to re-allocate and, through considerable re-structuring of the system, to order drugs on behalf of their health units. Such systems are already used in other parts of the world and can, with effective monitoring procedures, allow flexibility without waste.

There is also international recognition (Foster 1991, Kanji *et al.* 1992) that rational drug prescribing is an area for urgent action. Prescribing practice monitoring procedures have been developed (INRUD 1991), and an integrated package of clinical supervision and continuing education is recommended to correct irrational prescribing (Laing and Ruredzo 1989, Mnyika and Killewo 1991). Such actions also address the problem of wastage. Tanzanian national officials already use monthly stock reports from dispensaries to monitor drug use, compare the practice of different dispensaries, direct supervision, identify possible drug wastage and, where necessary, identify improper practice. At the district level the potential for such action is even greater, given proximity to dispensaries and more detailed knowledge of staff and communities. The prescribing indicators recommended by the International Network for Rational Drug Use have already been used in Tanzania and shown to be effective (INRUD 1991). They could facilitate more detailed clinical and administrative supervision (Gilson *et al.* 1992). However, to the extent that drug abuse is a reflection of low morale and poor working conditions, wider action to tackle drug wastage is also necessary. The problem of unnecessary community demand similarly highlights the importance of seeing drug problems in a wider context. Improving patient education will have only limited benefits in this respect and it seems likely that more effective action will require an 'education' programme that gives some responsibility to communities to monitor drug availability. Current monitoring procedures do not appear to be effective and lack of health system accountability to the community re-enforces both community ignorance and their denial of responsibility for the available resources.

9.1.2 Staff allocations

Current Tanzanian personnel allocations are inefficient and time use is predominantly unproductive (Table 9.1), echoing experience elsewhere (Desai and McCaw 1987, Lewis *et al.* 1991, Thomason and Kolehmainen-Aitken 1991, Wheeler and Ngcongco 1990).

Raising staff productivity and reducing wastage requires allocation of staff between health units relative to workloads. However, personnel allocation procedures must recognize quality constraints. For example, the minimum staffing standard applied in the structural assessment of this study was unrelated to utilization levels because it was deemed necessary to ensure adequate provision of the expected service range. Generally good structural quality against this criterion was reflected in community perceptions as lack of staff was not clearly identified as a quality problem (Table 9.1).

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Despite low staff productivity some dispensaries, particularly those in more remote areas with lower catchment populations, could not function at acceptable levels of quality with fewer staff. Above this minimum standard, allocation of staff relative to workloads would bring about greater technical efficiency without compromising quality.

More complex staff allocation systems have been proposed, such as the workload indicators of staffing needs method, which establishes the average time allocations per activity that are necessary to allow good quality care to be provided. Current utilization levels are then converted to time requirements and compared with available staff time. The resulting indicator gives an indication both of absolute staff shortages and of allocation inefficiencies (Kolehmainen-Aitken and Shipp 1990, Centre for Health Policy 1991). The key problem of this method includes the initial establishment of time requirements. Often based on lengthy and difficult discussion among health managers, the durations established can be unrealistic, leading to over-estimation of staff shortages (although not affecting assessment of relative allocations). A simpler staff allocation system that allowed for quality might use different staffing standards for different utilization ranges. Minimum staffing patterns could be developed for each range based on a more simple assessment of workloads acceptable for the provision of good quality care. Allocations would partly reflect these standards but could also, within utilization bands, reflect relative utilization levels (using a simple indicator like patient numbers per full time staff equivalent).

In the current Tanzanian context, however, the first step is to initiate some simple steps for rationalizing personnel allocation. The pressures towards irrational personnel use are illustrated by one dispensary in Kilombero district, in which the total staffing allocation was 34 (including 20 nurses). The influences over staff postings to this unit included the placement of untrained nurses to a large unit, the availability of accommodation in a semi-urban area and the practice of posting married women to units closest to the place of their husbands' appointment. This latter factor may have been the most important, as many of the staff were married to district officials whose duty station was the town where the dispensary was located. The minimum standard plus utilization-based allocation procedure could be at least an initial tool in identifying staff allocation problems and seeking to address them.

9.1.3 Resource adequacy and combination

Reviewing resource allocations and use also requires reassessment of current resource adequacy and the current combination of resources used. The study's findings (Table 9.1) suggest that even if staff were re-allocated according to workloads or if more trained staff were made available for curative services in an attempt to improve the quality of health worker performance, their capacity to work would be limited by the poor availability of complementary resources. Such recurrent cost problems have also been noted elsewhere (Abel-Smith and Creese 1989, Attah 1986, Gesler 1979, Government of

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Swaziland 1984, Kloos *et al.* 1987, Lasker 1981). Resource inadequacies can be seen in structural quality failures, whilst resource combination problems are likely to be tied to process quality failures. The links between the two sets of problems in Tanzania are identified in Table 9.3.

For example, the resource adequacy problem of drug shortages also leads to a major resource combination problem for curative care i.e. low staff productivity, as *"some of the nurses don't have a job there as there is no medicine, they get their salaries for nothing"* (Mngeta FGD woman's organization members). The influence of resource combination on process quality is shown by findings which indicate better performance during longer consultations, or better ante-natal record review performance where proper ante-natal cards are available (Table 9.1). Comparison of the resource combination used in providing maternal care in dispensaries and health centres, and review of community perceptions emphasizes the structural weaknesses (i.e. resource inadequacies) of these services in dispensaries and the lack of resources to complement staff. Enhancing productivity and quality, therefore, requires consideration of appropriate resource combinations.

Table 9.3: Resource adequacy and combination problems, links by activity and input item

RESOURCE ADEQUACY	RESOURCE COMBINATION	
	inappropriate	appropriate
low	lack of drugs due to inadequate supply, sterilization resources lacking, weak ANC/CW and delivery structure	drug and vaccine shortage due to wastage
high	low staff productivity for curative care in most units, for other services in some units	staff and vaccines for immunization

For curative care the current expenditure balance between staff and drugs actually favours drugs, but not all drug expenditure results from official prescribing. Given that the EDP makes careful estimates of drug requirements it seems unlikely that greater expenditure on drugs will be required everywhere in order to address drug shortages; for some units efficient use of current drug supplies might ensure adequacy. Managers need the flexibility to re-allocate resources on efficiency grounds and to influence the resource combination, as required by the different situations of health units. Other curative recurrent needs should also be re-assessed. In particular, given relatively high HIV/AIDS prevalence rates, the fuel and supplies required to allow good quality sterilization practices should be provided. Additional expenditure on such items would incur relatively little cost and would only marginally change the resource combination, but would permit productivity and quality improvements important from both professional and community perspectives. Assuming that double the current operating and maintenance expenditure would be required to ensure adequate fuel supplies, the additional expenditure would have represented an additional 3% of the median total dispensary expenditure. The

example of diocesan units suggests that expenditure increases of around only 8,000 Tsh may have been enough to ensure adequate fuel supply, 1% of total median expenditure.

For ante-natal care the resource needs are also relatively small. Staff and equipment are mostly available but resources such as albustix and Hb papers are required to provide an effective monitoring service within current national standards. In 1988/89 a jar of 50 albustix cost less than 600 Tsh; assuming that 30 jars would have been required annually, the total additional expenditure would have represented 2-3% of the median total dispensary expenditure. However, this additional cost would have been nearly 30% of total ANC/CW expenditure.

The needs for delivery care are more substantial: basic equipment, basic medical supplies, space for privacy, ancillary services like water and rubbish disposal. Other community criticisms of delivery care reflect personnel attitudes more than structural failings and cannot be addressed simply by more resources; although the availability of the appropriate equipment may have a positive knock-on effect on staff morale. Interviewed about their problems, 38% of staff identified lack of equipment and supplies as the priority problem undermining their working practices (Alilio 1991).

Where additional resources are required, there are two possible approaches to changing the resource balance: providing additional finance for the missing items or trading the more plentiful resources (particularly staff) for the less plentiful. Such trade-offs are particularly justified where staff are, at least to some extent, in excess supply and so unproductive. Securing additional finance requires consideration both of alternative financing mechanisms and of the community's willingness to pay (section 9.3).

9.1.4 Reviewing service delivery strategies

In contrast to the quality weaknesses of other services in dispensaries, immunization was generally found to be well-provided (Table 9.3), although vaccine wastage reached high levels in some units (Table 9.1). Whilst partly associated with structural failings in the cold chain, wastage also seemed to be closely tied to the low utilization levels associated with low catchment populations. In these settings efficiency and equity appear to be traded against each other, as ensuring equal access to immunization services may entail unproductive use of immunization resources.

However, productivity improvements within current levels of resource availability could be secured by adopting new immunization service delivery strategies (Berman et al. 1991, Robertson et al. 1984). Almost no outreach was undertaken from dispensaries (Table 9.1), even in communities serving several villages; but, where utilization was especially low, the total cost increases resulting from greater

outreach appear likely to be minimal. Existing staff, vaccine and equipment capacity would be sufficient to meet the additional demands, and additional utilization would, therefore, lead to lower marginal and average costs than under a static delivery strategy. Quality as satisfaction would also probably be enhanced by providing a well-appreciated service closer to the homes of the outlying communities.

Radically different service delivery strategies could also protect quality and equity whilst enhancing productivity. For example, immunization services in dispensaries of low catchment population could be closed but regular immunization campaigns could be undertaken by the unproductive staff of other dispensaries to ensure that immunization coverage levels were maintained. The additional costs of such campaigns would be set against the savings resulting from closing the service down. Such a strategy might even generate greater benefits if outlying communities were visited more frequently through campaigns, requiring staff mobilization on only a few occasions, than through regular outreach provided by unsupported and unsupervised staff working full-time in remote communities. Pursuit of equity does not necessarily justify inefficient strategies of care, and more efficient strategies may lead to better access within current resource levels.

Adopting new delivery strategies is particularly relevant to preventive services. Some curative outreach might also be important, such as tracing defaulters from TB, leprosy or sexually transmitted diseases clinics; but the demand from the community for curative care is already so great that low productivity in curative care is usually more a consequence of the resource combination than service delivery strategies.

9.1.5 Re-assessing the primary health care package

Reassessment of service delivery strategies may, therefore, lead to reassessment of the primary health care package where provision of the full package is not the most efficient delivery strategy. Current levels of resource availability may also simply not allow the full package to be provided in every unit. For example, some units in Kilosa district did not offer MCH services because MCH trained staff were not available.

International experience has, moreover, already highlighted the unnecessary burden of child growth monitoring (Gerein and Ross 1991), pointing to the importance of re-assessing the effectiveness of the standard, primary health care package. Growth monitoring services consumed up to 75% of MCH staff time allocations in Tanzania and the release of this time could have eased the pressure resulting from a multi-product workload and so contributed to improvements in other services. Process quality assessment indicated that increased staff availability did appear to be associated with improvement in ante-natal consultation practice (Table 9.1). The community also suggested that the variety of the

MCH workload might be a factor leading to the poor health worker attitudes of which they were especially critical.

Maternal care appears to be the weakest aspect of existing dispensary services in Tanzania. Low ante-natal cost care is set against very high cost delivery care. Although better performed than other procedures, ante-natal care was still only poorly performed across most units. The dis-satisfaction of the community with the delivery service is well illustrated by low utilization levels. Improving care may require additional inputs, as discussed above, but it also requires new approaches. What ante-natal care is really required? How many visits should a mother be required to make? What should be undertaken during those visits? It is most critical to re-consider care of the at-risk mother: what is the possible role of traditional birth attendants and the link between them and the health system?

Reduction in the range of service provision may appear to compromise quality, defined as service availability, but should only be undertaken when that reduction can be compensated by more productive and higher quality provision of the reduced package i.e. by the provision of more cost-effective services. Regular service provision is anyway not the only strategy for ensuring service availability.

9.1.6 Support procedures

Clinical and administrative supervision and support of dispensaries appears infrequent and ineffective in the health units assessed. Yet there is international evidence to suggest that well-supported health workers operating with very limited resources can work effectively (Walt 1990). The findings of this study provide evidence that is consistent with the view that lack of effective support leads to inefficient services (Centre for Health Policy 1991, Garner *et al.* 1990, Nicholas *et al.* 1991). Possible improvements, and their potential to address performance failures, are identified through review of study findings (Table 9.4).

Improving the delivery of necessary supplies - such as drugs, vaccines, kerosene - is an important requirement. Some problems, such as the lack of kerosene for curative services, result from resource shortages and some, delivery problems are connected with the remoteness and inaccessibility in the wet season of some health units; but others result from weak supply systems. For example, any problems in the cold chain are difficult to justify given the logistical and resource support it receives - vehicles in each district, funds for transport, funds with which to purchase kerosene, funds for allowances, regional support. The practices of district managers should themselves receive close scrutiny as carelessness in support systems only compounds the problem of low morale at the health unit level.

Table 9.4: Improving performance through better support procedures

PROBLEM	SUPPORT REQUIRED AND ITS POTENTIAL
Drug allocation and use	monitoring drug availability and use, identifying possible drug abuse, re-allocating drugs where possible, supervision and continuing education for rational prescribing, promoting community accountability
Staff allocations	review staff allocations against workloads, identifying dispensaries with special needs, supervision to maintain quality levels
Resource adequacy and combination	provision of necessary supplies, re-allocation of supplies (e.g. drugs, staff) where possible, supervision to ensure staff availability, supervision of clinical practices
Service delivery strategies	supervision to encourage outreach, monitoring utilization and resource use to determine dispensaries where radical changes in strategy may be required
Primary health care package	review of service delivery strategies, promoting links with traditional birth attendants

Monitoring and supervision procedures need to be closely linked to ensure that supervision is effectively directed at weak dispensaries and their problems. For example, rapid review of prescribing data and use of rational prescribing indicators can provide a focus for future supervisory action. Effective supervision must develop staff skills, boost staff morale and include discussions with the community (Flahault *et al.* 1988, Heaver 1991). Checklists, such as those used in this study's assessment of structural and process quality, can promote such supervision, although their use must not become the only purpose of supervisory visits. Communities can, at least, be consulted and their responsibility for health care encouraged both by supervision visits that involve them (Heaver 1991, Robinson and Larsen 1990, Valadez *et al.* 1990) and by periodic assessment of their perceptions using qualitative approaches, as in this study. More generally, health systems research can help to develop appropriate strategies within current resource constraints and to develop supervisory skills.

Such strategies are particularly important in the drive to raise efficiency. Regular assessment of health sector costs has, therefore, been demanded in order to allow better management of resources (e.g. Robertson *et al.* 1991) but is rarely undertaken because existing information systems often do not encourage or allow such assessment (Abel-Smith and Creese 1989). However, this study has highlighted the potential for more regular review of the physical use of key resources (personnel, curative drugs and vaccines). Berman and Sakai (1992) have suggested that unit-based indicators of productivity could be used, among other purposes, to monitor and reward the performance of local managers and to encourage flexibility and resource reallocation within health units and programmes.

More effective support is likely to require more resources. The cost of diocesan supervision in 1988/89

(2/3 visits per health unit annually) was estimated as an average of 14,000 Tsh per health unit, which, although under 2% of the median total cost for government dispensaries, would only just have been feasible within the 1988/89 transport expenditure of each district. Appropriate actions to address dispensary performance failures clearly do not end with health managers and, indeed, may be beyond their control. Illicit drug sales are a result of low morale and low salaries. Low salary levels are a national issue, disciplinary procedures are ordained by national guidelines, and the support of the police may be essential in tackling illicit drug selling. Changing community attitudes towards drugs and encouraging community accountability for health care also requires a broader approach to community development. However, district managers could, through more effective supervision, at least begin to identify problems and to discourage abuse.

9.2   Consolidating primary health care provision

Within the Tanzanian health system, government dispensaries are complemented by health centres, the health unit of first referral, and voluntary agency dispensaries, sometimes the most accessible health units for villages. As with government dispensaries, however, considerable weaknesses in health centre and voluntary agency provision of care have been identified and re-assessment of the role of both groups of health units within the primary health care system is an important element in management strategies to consolidate that system.

9.2.1 The role of health centres

Comparison of health centres and dispensaries is complicated by potential differences in case mix and quality of care. However, diagnosis patterns did not differ significantly between the two levels (Gilson et al. 1992) and community discussions suggested that the most severely ill patients were more likely to self-refer to hospitals (transport allowing) than to use a health centre. Comparison reveals some important concerns.

The health centre median total cost was four times that of dispensaries and average per contact costs were greater across all services except immunization (Table 9.5). Closer review of this particular service shows that:

- health centre utilization exceeded dispensary levels by a factor of 2.3 (about the same as for ANC/CW, more than for curative care and less than for deliveries)
- dispensary immunization personnel average costs per contact were roughly equivalent to health centre levels despite the latter's use of more expensive staff
- dispensary average vaccine costs per contact exceeded health centre levels by a factor of around 1.5 (vaccine wastage rates were only slightly less in health centres than dispensaries;

median values of 0.64 vs. 0.70).

Table 9.5: Comparison of utilization, average costs and quality in health centres and dispensaries

ACTIVITY/ AVERAGE COST (AC)	COST FINDINGS (group medians 1988/89 Tsh)		QUALITY COMPARISON ACROSS ALL ACTIVITIES
	GOVERNMENT DISPENSARIES	HEALTH CENTRES	
Curative care - utilization - total AC - personnel AC - drug AC	17,576 28 8 14	34,960 47 17 15	**structure** quality little different: HCs' some advantages in terms of curative care (equipment and lab facilities) but generally same or worse (for delivery care) than dispensaries
ANC/CW - utilization - total AC - personnel AC	5,304 12 7	12,319 17 12	**process** quality of HCs above dispensaries, but great variation within group indicates problems
Immunization - utilization - total AC - personnel AC - vaccine AC	2,244 77 3 44	5,185 52 3 30	**community satisfaction** differs little: HCs have some advantages because of more trained staff & better structure, but have similar problems to dispensaries & are more costly to use
Delivery - utilization - total AC - personnel AC - drug AC	50 738 247 99	263 1679 758 61	

NOTE: 1. HC=health centre

More efficient health centre immunization care, therefore, again illustrates the links between utilization, productivity and efficiency in relation to this service. Greater health centre utilization is primarily a function of their location in larger settlements than dispensaries, but may also reflect community knowledge of the possibility of better vaccine availability in centres which act as forwarding depots in the cold chain. These findings do not, therefore, suggest that greater efficiency is an inherent characteristic of health centres; for example, there was no evidence of economies of scale in their operation. The evidence rather points to the potential for resources to be used more productively in dispensaries.

Comparison of quality between the two unit levels (Table 9.5), moreover, suggests that existing levels of curative care structure cannot allow health centres to treat patients of much greater severity than dispensaries. The main relative structural strength of health centres' curative care was the availability

of laboratory services to facilitate diagnosis, but these were not of sufficient sophistication to do more than allow confirmation of diagnoses. Drugs were in equally short supply in health centres and dispensaries, undermining both quality and the productivity of staff. The structural quality of nursing procedures was considerably lower in health centres. Given this context it is not surprising that assessment of process quality in health centres was equivocal. Although median performance levels were generally higher than in dispensaries, performance differed considerably between the two health centres assessed. The potential of more highly trained staff was demonstrated in one centre; but the other reflected the picture painted by the community - staff of low morale, providing technically weak care with little grace (Table 9.5).

These structural and process quality weaknesses probably also undermined the quality of in-patient care. Providing little more than an observation bed, health centres are an emergency-only solution for patients requiring in-patient care. However, delivery care was quite highly regarded by the community and was better perceived than dispensary delivery care. Professional assessment of the structural quality of these services still identified considerable weaknesses; and assessment of the process quality of ante-natal care did not clearly distinguish health centre performance from that of dispensaries. Like curative care, the potential for good quality was not always realized. Maternal care quality failures can only be addressed by additional inputs, raising total costs, or by changes in service delivery strategy. Such failures indicate the importance of re-assessing the relevant services at all levels of the health system.

Criticisms of the health centre level have also been made elsewhere. There is evidence from both Indonesia (Berman 1989) and PNG (Mitchell *et al.* 1991) to show that it is inefficient, and in Indonesia it has also been criticized on equity grounds (Berman *et al.* 1989b). The generally more expensive but relatively poor quality care of Tanzanian health centres requires that their broader role within the health system be re-considered. Might it be better to re-allocate the staff of health centres to work within existing dispensaries, or to supervisory duties? Should health centres specialize in the provision of maternal care, providing an effective back-up to dispensaries? The greater costs incurred by health centres cannot be justified in quality terms; rather, inefficiencies lead health centres to function as little more than expensive dispensaries - a luxury that health systems can ill afford.

9.2.2 Non-government providers

As in other sub-Saharan African countries, non-government health care provision is an essential element of primary level health care in Tanzania. Offering a similar range of services and staffed by

a similar range of workers, efficiency within the group of diocesan dispensaries has, nonetheless, been found to vary considerably and some units' performance was below the generally low levels of government dispensaries (Table 9.6). These are unusual findings as voluntary agency services are more commonly considered to be of better quality than government units. Indeed, such assumptions have been used to promote greater private (including non-government) provision of health care (Bennett 1991, Green 1987, World Bank 1987). However, there is little hard data: studies in Tanzania (Andersson-Brolin *et al.* 1991) and PNG (Garner *et al.* 1990) have suggested that non-government health units are of better structural quality than those of government, but Peters and Becker (1991) found few significant differences in structural or process quality between public and private (for-profit) outpatient clinics in the Philippines.

Table 9.6: A summary of comparative diocesan and government performance

SUB-STUDY	GOVERNMENT VERSUS DIOCESAN UNITS
Cost analysis	significantly greater government total and curative expenditure; greater diocesan average per contact costs for curative care and delivery care; diocesan staff spent less time on ANC/CW, more on delivery care, than government; the resource combination in diocesan units was less of a constraint on productivity than in government units; utilization in government units significantly exceeded that of diocesan units for all activities except deliveries
Structural quality	immunization, health education and outreach in diocesan units relatively weak but delivery services and curative care, relatively strong; infrastructure and support better in diocesan units but staff availability worse
Process quality	better diocesan performance in ante-natal record review & child fever consultations; worse diocesan performance in ante-natal and general consultations; worse diocesan injection, & better dispensing, performance
Community satisfaction	variable perceptions but generally diocesan better than government units; less trained staff & better drug availability in diocesan units; perceptions of parish priest important; cost/quality trade-off particularly strong for diocesan units

The voluntary agency units included in this study all fall under the umbrella of one Roman Catholic diocese, receive some administrative support from a diocesan dispensary supervisor and additional technical support from the local diocesan-run hospital. All are staffed by one RMA seconded from government and locally employed nursing staff. Within this apparently coherent organization, their first line of responsibility is directly to the local parish priest - who collects the fees, pays the locally-employed staff and is responsible for maintaining drug supplies. Fee levels are theoretically set across the diocese, but some local variation was noted during the study. Some dispensaries benefit from donations of drugs and equipment, but such support is only limited.

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Comparison of costs (Table 9.6) indicates that total overall and activity expenditure was lower in diocesan than government units but that the average cost per contact of all services was generally higher. Cost differences were especially highlighted in the four cases of this study where both a government and diocesan unit were located in the same village (Table 9.7). Although personnel average cost per contact was always less in diocesan than government dispensaries, presumably as a result of lower salary rates and lower staff allocations, vaccine average cost per contact was greater for each village except Kichangani. In each village, at least one unit exceeded the government median average cost suggesting that provision of an immunization service from two dispensaries in the same village is unlikely to be efficient. Re-assessment of primary health care delivery strategies is required in such situations. Quality, in terms of service availability, could be safeguarded whilst reducing costs if co-operation between the staff of both units allowed an outreach service to be provided from one to the other, requiring only one fridge and one kerosene supply.

More generally, significantly lower diocesan utilization levels appear to have been the main cause of the noted cost differences. Time and vaccine wastage levels were not significantly different between the groups and low staff productivity in curative care was not caused by drug shortages but rather by low utilization. One factor constraining utilization is the catchment populations of diocesan dispensaries. Some units are in fairly remote areas with small surrounding populations and others are located in the same village as a government unit. Although differences in the estimated catchment populations of diocesan and government units were not statistically significant (p=0.246), the trend was towards lower populations for diocesan units: diocesan median 2,564 (central range 1,670-3,867) and government median 4225 (central range 3,441-6,587). Low catchment populations again suggest the need for re-assessment of service delivery strategies and the primary health care package.

Table 9.7: Comparing government/ diocesan immunization service costs (1988/89 Tsh)

HEALTH UNIT	AVERAGE COST		
	TO-TAL	STAFF	VAC-CINE
Govt. median	77	8	39
Mngeta, govt	55	9	24
Mchombe, diocesan	82	1	41
Kichangani, govt	321	63	100
Igota, diocesan	90	1	42
Iragua, govt	182	20	77
Iragua, diocesan	182	4	90
Sofi, govt	65	5	25
Sofi, diocesan	158	2	80

The practice of charging fees is, however, likely to be a further factor influencing diocesan utilization levels via its effect on community satisfaction and the decisions of which health care provider to use. Community opinions about the quality of care available at diocesan dispensaries varied considerably, and their concerns were tied to both

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technical/management weaknesses and assessment of the balance between the costs and benefits of the services available (Table 9.6).

Wider comparison of the relative quality of diocesan and government units (Table 9.6) also points to diocesan shortfalls. For example, although government units' structural quality for immunization was generally good, diocesan units fell below the expected standard. On the other hand, the structural quality of their delivery care was generally above that of government dispensaries. Structural weaknesses were compounded by process quality failures. The potential for poor ante-natal consultation practice is not surprising given the lack of trained MCH staff in diocesan units and the consequent involvement of relatively untrained nursing staff whose performance of their own tasks was as poor as government nurses. However, curative consultation process quality also appeared to be slightly worse in diocesan units although the same cadre of staff (RMAs) was responsible in both unit groups. Review of patient register prescriptions showed that diocesan units gave significantly greater proportions of injections and were four times as likely as government units to give chloroquine in injection form, although there was no evidence suggesting the greater severity of patient condition required to justify this pattern on clinical grounds (Gilson *et al.* 1992).

Poor motivation may explain such process quality failures, particularly as diocesan nursing staff often have even less training than government staff. Moreover, although RMAs are clinically in charge within health units they are not always administratively in charge. Rather, in some units a member of the locally-employed nursing staff is appointed by the priest to be responsible for fee revenue and, in some cases, to monitor drug and other supply needs. Thus, when interviewed, no-one working in a diocesan unit regarded the RMA as the immediate supervisor, as compared with 27% in government health units (50% identified the parish priest in diocesan units and 54%, the DMO in government units, Alilio 1991). This division of responsibilities may undermine the authority of RMAs and their accountability for the care provided.

Differences in the management skills of priests may also contribute to diocesan unit problems, as shown in their differing relationship with the local community. Although there were some positive comments, *"the patients are treated even though they have no money and pay after getting cured, or have to do some job instead like digging, fetching water"* (Kisawasawa FGD Village council p.8), some communities were very critical of their priest: *"...instead of listening to [the community's] problems he said that he was going to close the dispensary and even to shift it to another village"* (Mofu FGD women); *"normally the dispensary is closed because the priest is angry with the villagers e.g. he can direct them to clean the cemetery and when the villagers do not do that work he orders the dispensary to be closed"* (Sofi Mission participant schoolchildren). The dispensary is also only one activity of the parish and may be seen as a source of revenue to supplement other services (e.g. milling, tractor).

Given the priest's authority over the dispensary, low staff motivation is a likely product of such circumstances, with consequences for process quality.

Whilst reflecting only one group of voluntary agency units, these findings indicate that the efficiency of non-government care provision can vary. It cannot always be assumed to be better than government care. The package of services voluntary agency units offer must be re-assessed and steps must be taken to regulate their quality. More effective co-ordination of services is essential to bring about and sustain the necessary management interventions. How can DHMTS influence the technical and management practices in non-government dispensaries, whilst recognizing that they cannot take responsibility for the day to day running (or financial liability) of the units? Diocesan and voluntary agency authorities must recognize that regular supervision and in-service training is not enough to ensure that good quality care is being provided. The management structures and procedures, the lines of responsibility, the accountability of both health personnel and managers are vital influences over the quality of care. Parish priests should not see the dispensary as 'theirs', but as a community resource held in trust by the church.

9.3   Health financing policy

Health financing policy is the second facet of sustaining health care. Its consideration is especially important given international (World Bank 1987) and Tanzanian (Abel-Smith and Rawall, forthcoming) discussion concerning the introduction of health care charges. Wouters (1991) has highlighted the importance of quality issues to this debate, identifying four questions to address when assessing the net costs of quality:

1. what costs can be reduced by eliminating inappropriate health care?
2. what opportunities are there to improve quality of care which can also save costs or can be done at no extra cost?
3. of those quality improvements which require additional resources, which are most cost-effective?
4. what costs are required to operate the quality assurance mechanism itself?

Although it has not addressed the fourth question, this study provides some evidence in relation to question 2, and has indicated the importance of questions 1 and 3. It has shown that improving efficiency does not always require more resources; for example, drug shortages are not only a consequence of inadequate supply. Making more drugs available would not address the problems underlying drug wastage, excess community demand for drugs, the lack of technical skills that lead to poor prescribing or the failures of inter-personal skills that result in poor drug dispensing. On the other hand, the wide-ranging weaknesses of maternal care appear to require additional resources. However, the study has also indicated the importance of considering the cost-effectiveness of current delivery

strategies and the existing primary health care package.

This review of the efficiency of primary health care in Tanzania also suggests that savings may be secured by revisions of health care delivery and management strategies which at the least will not undermine quality, and may enhance it. For example, if government dispensaries of relatively low staff productivity in curative, ANC/CW and immunization services had been raised to the median level for this group, the equivalent of 72 staff would have been generated (48 for curative care, 13 for ANC/CW and 11 for immunization) representing a 29% overall increase in the personnel available for these activities; an increase sufficient to put 1 or 2 new staff in each dispensary assessed. Estimations of efficiency savings can also be made using the average per contact costs for personnel in the three activities considered above and for drugs in the curative and immunization services only. Raising efficiency to the median level for government dispensaries would have secured 89,131 Tsh for personnel and 662,282 Tsh for drugs: 8% and 4.5%, respectively, of total expenditure for these items. Some of these savings may be inappropriate because of the need to maintain minimum staffing levels whatever the utilization. However, additional savings could be made by raising the median level of efficiency through review of delivery strategies, for example. Indonesian estimates (Berman and Sakai 1992) also point to the potential of resource generation through efficiency savings.

The study also suggests that additional resources are likely to be required in Tanzania in order to address current capacity limits and to improve quality. The most likely cost recovery system is some form of user fee strategy and the government is currently considering proposals to introduce fees at the hospital level (Abel-Smith and Rawall, forthcoming). The potential and difficulties of a user fee strategy are considered here in relation to primary care.

It is assumed that charges would only apply to curative care. Given that a maximum of around 30% of the population probably cannot afford to pay (McPake et al. 1992) and that reduction in utilization as a result of the introduction of fees is estimated as 10%, the proportion of those willing and able to pay is assumed to be 60% of original utilization figures. The curative care price level is assumed to be the estimated marginal cost of care, 25 Tsh, roughly equivalent to the price initially considered for Tanzanian primary health care (20 Tsh) but considerably less than price levels under discussion for hospital care (e.g. 100 Tsh per out-patient visit at district hospitals). With these assumptions marginal cost prices for curative services could have generated an average of around 263,700 Tsh per government dispensary, in 1988/89 prices - 35% of their median total cost. Over all 40 dispensaries examined in this study, this recovery level would have represented around 10.5 million Tsh: 33% of total dispensary expenditure. It is roughly 14 times the estimated level of potential efficiency savings, equivalent to 73% of total drug expenditure and double total personnel expenditure.

This is a maximum estimate of revenue at this price level given that the administrative costs of running the system have been ignored and utilization reductions might be greater than estimated. However, it is considerable and could make significant contributions to improved structural quality, with possible consequences for process quality. For example, it would have allowed overall delivery expenditure to increase 7-8 times, or ANC/CW expenditure 3-4 times. It would have almost doubled total immunization expenditure and represented half of total curative care expenditure.

A key question for user fee policy remains whether the community will be willing to pay for government health care, as estimation of cost recovery levels is dependent on the impact on utilization of levying fees. Most studies which have assessed the impact of fees on utilization have been quantitative, based on household surveys and often using econometric demand models (e.g. Akin *et al.* 1986, Heller 1982). Summarizing such studies, Wouters (1991) concluded that the quality proxies used were, at best, fragmentary and, at worst, did not allow the role of quality to be identified clearly. Where quality was considered, structural proxies were primarily used as *"information on patient perceptions, process of care or health outcomes...is non-existent"* (p.261).

In contrast this study has generated qualitative data which allows consideration of the complexity of community willingness to pay. Community discussions generally suggested that concerns about quality and about ability to pay probably undermine willingness to pay. These findings reflect a wide-ranging household survey undertaken in Tanzania at roughly the same time, which identified high levels of willingness to pay for health care at the hospital level if quality were to be increased (Abel-Smith and Rawall, forthcoming). Patients balance the costs to them of obtaining care against perceived needs and perceived quality, when deciding which of the available health resources to use. Important aspects of perceived quality include structure, in particular, drug availability, and also the attitudes/inter-personal skills of health workers. Experience from the Morogoro region indicates that the cost/quality balance differs from place to place, depending on the situation of the dispensary and the community: resource availability, current costs, current quality, personal circumstances.

A pre-requisite of the introduction of fees at any level of the health system is an improvement in perceived quality - tackling what the community called the *"disturbance"* costs of preferential treatment, delays in getting care, being short-dosed, having to make informal payments. Even at hospital level, where such disturbance may be less than at dispensary or health centre level and where the higher technology services are valued, the associated costs of transport and accommodation/food are already considerable (Abel-Smith and Rawall, forthcoming) and can be sufficient to deter use. Implementing cost increases without first addressing these issues seems likely only to deter use - with consequences for health as well as revenue raised.

Cost/quality links are, therefore, central to financing policy although the circular requirements of improving health care have tended to be overlooked in financing discussions. Raising revenue through the introduction of fees is dependent on maintaining utilization levels in order to generate the resources required to improve the quality of care, but maintaining utilization in the face of price increases is dependent on offsetting quality improvements. Although assessment of the cost/quality links in this study did not always provide definitive evidence, it is likely that quality improvements will require additional resources in Tanzania. Structural quality improvements were significantly associated with total cost increases. There appeared to be both a negative association between elements of process quality and total cost and a positive association with average costs. Finally, although no direct association between costs and satisfaction was apparent, the possibility of positive associations between satisfaction and both structural and process quality may also point to an indirect effect on costs. Implementing new financing strategies thus requires that they be preceded by the management action necessary to improve the efficiency of health care provision (raising quality and generating savings). Determination of the net revenue generated through fee increases must allow for the costs of appropriate quality improvements (including the costs of quality assurance mechanisms). Policies to address financing and provision weaknesses are intertwined.

This study also indicates that global (international/national) strategies are not appropriate: community perceptions of the cost/quality balance are dependent on location and the required improvements to the current system differ from place to place. Re-assessment of primary health care strategies must, therefore, include attention for its organizational context and the management flexibility that is possible (MOH/WHO 1989). If user fees cannot raise adequate revenue to finance quality improvements or lead to a reduction in utilization, they may still have value if they enhance the manager's power to manage. On the other hand if the organizational context constrains that power, user fees may only introduce a further complexity into that system.

9.4 The power of district managers to manage

District health managers in Tanzania work within a relatively decentralized government structure in which district administrative officers play a central role (Chapter 4). As one of the technical advisers at the district level, the DMO has responsibility for the daily operation of primary health units and the district hospital (e.g. supervision, provision of supplies), the determination of both development and recurrent budgets for the health sector and liaison with voluntary agencies. S/he reports to the District Executive Director in administrative matters and to the RMO in technical issues. At the regional level, the RMO is responsible for planning, managing and supervising the implementation of health activities in the region (and specifically the regional hospital); reporting to the Ministry of Health in technical matters and the Regional Development Director (RDD) on administrative issues.

	THE PARTY	CENTRAL GOVERNMENT				
CENTRE	CCM	PM's OFFICE	MIN. LOCAL GOVT.		EPI/ EDP	MOH
REGION		RDD				RMO
DISTRICT	DISTRICT SEC'RY.	DC	DED			DMO/ DHMT
						HOSPITAL
WARD	WARD SEC'RY.		HEALTH CENTRE			
VILLAGE	VILLAGE SEC'RY.		DISPENSARY			

KEY:
CCM = Chama Cha Mapinduzi, the Party
PM's OFFICE = prime minister's office
EPI/EDP = vertical health programmes
MOH = ministry of health
RDD = regional development director
RMO = regional medical officer
DC = district commissioner
DED = district executive director

—— line of responsibility
═══ line of primary resource flow
---- line of advisory responsibility

Figure 9.1: The view from the district, Tanzanian organization of health care 1988/89

The matrix of lines of responsibility/accountability at the time of this study are illustrated in Figure 9.1. It directly undermined the authority of DMOs because the key resource use decisions were taken by others. For example, rural health staff were employed by the District Council and their allocation was undertaken with the advice, only, of the DMO. The District Executive Director (DED) controlled the subventions received from central government for health care (expected to cover 70-80% of total expenditure) and, with the advice of the District Council, the allocation of locally-raised revenues. Funds

allocated for the district hospital were controlled by the District Administrative Officer (DAO), the district representative of the Prime Minister's Office. Review of 1988/89 expenditure patterns in each district highlighted the resulting chaos in the resource allocation process: substantial differences within districts between budgets, allocations and expenditure levels and a ten-fold difference between districts in expenditure per capita (excluding salaries) for rural health services (Gilson 1990b). Problems were caused by: the failure of the national level to pass to districts the full amount of approved allocations; the practice within districts of making expenditure against the health account for other sectors; and the considerable and arbitrary cut-backs from original request levels during the process of budgeting.

Recognizing some of these problems, a special district account (number six) for health funds subvented from the national level was established in 1990 with the DMO as a co-signatory of the DED. A government announcement in July 1991 indicated that similar arrangements would be established for funds channelled through the DAO. However, the continuing practical confusion caused by the multiple lines of authority is illustrated by an example from one district in the Morogoro region. In 1991, district supervision visits to rural health units could not be made because the DED refused to use 'his' funds pay for the allowances of district staff employed by central government (and so funded through the DAO's office), whilst the DAO claimed that 'his' allocation was already overspent. Despite the existence of account number six, the DMO had no power to counteract either claim or to ensure that supervision was undertaken.

Further changes in 1992 have sought to reduce some of the confusion. Since January 1992 the departments of Local Government and Regional Administration have both been located within the Prime Minister's Office, an organizational change intended to facilitate co-ordination between them. However, this change does not completely address the DMO's lack of power. For example, in addition to the horizontal line of accountability, DMOs are subjugated to vertical lines direct to the national level. The EDP and EPI are both vertical programmes for which planning and resource allocation decisions are taken by their national managers. DHMT power is limited to little more than suppliers of inputs to health units; DMOs may even feel that they have little authority over the programme representatives, such as District Cold Chain Officers responsible for EPI at the district level. Assessment of responsibility for structural failures points to the limited role of district authorities, and analysis of the sources of expenditure incurred in primary health units suggested that central government and donors contributed over 90% of dispensary expenditure (Gilson 1990c).

District managers have had little of the authority required to address performance weaknesses. Little resource allocation power and certainly not enough to trade manpower for other complementary resources. No authority to re-assess delivery strategies for vertical programmes or the primary health care package on the basis of their district's needs. The role of health centres is defined by national

planners and, at most, district officers might be able to re-allocate some staff; their responsibility for liaison with voluntary agencies is usually forgotten. Recent changes strengthening the regional level of the system may address some problems but do little to enhance district power - for example, since January 1992 health staff salaries have been paid by the RDD and not the DED in order to ensure their payment. The lack of power at the district level reflects experience with decentralization elsewhere (Mills *et al.* 1991, MOH/WHO 1989) and may also help to explain the Tanzanian failure to ensure accountability to the community for health care, despite the potential for such accountability provided by a decentralized structure.

Development of the regional level within the public administration structure may, however, facilitate more effective, decentralized management. For example, regional and district health managers might now be able to exert more influence over manpower allocations and to strengthen disciplinary/reward procedures. They should also be able to initiate some improvement in supervision practices. More effective management will also require improved managerial skills at both levels (Bossert *et al.* 1991, Cassels and Janovsky 1991, Newbrander *et al.* 1988). Most DMOs and many RMOs do not have either public health or management training, but rather learn on the job to address the crises that arise. Much donor support has been given to management training within Tanzania, but it little co-ordination or evaluation is undertaken to ensure appropriate development of skills. Improved skills are, anyway, not enough by themselves to address performance weaknesses. The organizational context must permit managers to use their skills effectively.

9.5   Conclusions and summary

The comprehensive evaluation of current primary level care undertaken in this study has enabled a thorough review of the management and policy actions required to address existing health care inefficiency, summarized in Table 9.8. Implementation of the recommended actions is crucially dependent on the power of managers to manage. The current organizational structure of Tanzania was initiated with the intention of giving that power to the district level, but actual practice is confusing. A key factor underlying performance weaknesses are the complex lines of authority and the consequent lack of accountability within the health system. Tackling these problems will address the root causes of inefficient care, and is fundamental in the development of effective planning and management.

Table 9.8: Actions to sustain primary health units

ACTION	POTENTIAL
1.Re-allocation of staff and drugs	tackles inefficiency and inequity associated with irrational staff allocations and addresses aspects of drug shortage problem
2.Re-assessing resource adequacy and the resource combination	altering resource combinations can tackle the quality and productivity weaknesses resulting from shortages in inputs other than manpower and drugs; altering the resource combination of maternal care may require additional inputs; community likely to welcome attempts to address current problems
3.Changing service delivery strategies	most relevant to preventive services e.g. immunization; tackles low productivity of staff/vaccines associated with low utilization and low catchment populations; could enhance community satisfaction by bringing service closer to population
4.Re-assessing the primary health care package	given current resource constraints can the full package of PHC continue to be delivered? re-assessment of service delivery strategies may suggest narrowing the service package in some units; the particular weaknesses of maternal care require attention
5.Improving supervision and monitoring	first step in tackling drug abuse, in addressing technical and attitudinal weaknesses, in providing training, in lifting staff morale, in addressing community criticisms
6.Re-assessing the role of health centres	health centres absorb considerable resources and so improving their effectiveness is an essential component of raising efficiency; can health centre staff be more supportive of dispensaries? what are the critical aspects of clinical support best provided by the health centre?
7.Re-assessing the role of non-government health providers	voluntary agencies provide a substantial proportion of primary health care however their care is not always better than government; strict regulation is essential to ensure that quality is safe-guarded; co-ordination at the district level is an essential element in effective district management
8.Re-assessing financing mechanisms	the introduction of user fees may raise considerable revenue which could facilitate the improvement of quality; the possible impact on equity requires prior review of mechanisms to protect the poorest; financing policy changes must also be considered as only one part of a package directed at raising the efficiency of health care provision, which may itself generate savings
9.Re-assessing organizational structure	sustaining health care requires more effective management that enhances the community accountability of health care and is flexible enough to address different local circumstances

CHAPTER TEN:
CONCLUSIONS

An analytical framework for evaluating efficiency in health care that gives due weight to the role of quality has been developed in this research. Alternative, but complementary, approaches to quality assessment have been tested and the use of the methods in monitoring and sustaining health care improvements has been considered. Finally, the research has shown how analysis of health care efficiency can generate conclusions relevant to policy and management concerning the twin aspects of sustainability: more effective planning and management, and resource generation.

In its development of multi-disciplinary evaluation and management tools within an economic framework of analysis, this study is unusual among health care evaluations to date; its methodology has international value. Moreover, given the common challenges facing primary health care internationally in the 1990s, the policy conclusions of this study have relevance beyond the country of assessment.

10.1   Methodology conclusions

1.   **Cost analysis** has been recommended by economists as a useful tool for health care planning but relatively few cost studies have considered its use for management. This study has indicated the potential of cost analysis in that it was undertaken primarily using available information, and the results have helped to identify aspects of the inefficiency of primary care.

From the perspective of *research methods*, this study's comparison of different sources of time-use data indicates that collecting such information through interviews has both reliability and cost advantages over more complicated methods. For example, time-use data collected through special surveys may ignore some elements of personnel wastage and so underestimate the full costs of providing care. Drug costs based only on prescription records have similar problems. Cost analysis methods must make full allowance for such wastage because of its importance to efficiency.

Despite the potential of cost analysis for *management* shown by this study, data collection required special efforts and additional manpower to facilitate the collation of data from many different sources. Therefore, in a complex system that suffers from shortages of management skills, as in Tanzania, regular cost data collection is unlikely. Periodic cost analysis would provide invaluable information for planning, but more regular monitoring of operating efficiency, the key issue of concern to district managers, requires alternative procedures. This study has illustrated the potential use of simple monitoring tools in regular review of resource productivity: for example, full- time staff equivalent

allocations, vaccine costs and wastage rates, drug costs and differences between stock record and patient register estimates. In most health care systems, as in Tanzania, some of this information is already available and. Other data could be collected during routine visits to health units for later collation and use in monitoring by a member of the district health management team.

2.   Formal **assessment of quality** using internationally accepted procedures is a recent development within sub-Saharan Africa and few relevant studies have been published. This study has indicated the potential of quality assessment in identifying health care weaknesses and has developed a range of tools that could be adapted for periodic evaluation elsewhere and for more regular monitoring: the structural checklist, the process quality checklists, the guidelines for community-based assessments.

From a *research perspective*, this study has also, and unusually, illustrated approaches for: assessing both technical and inter-personal skills within process quality; complementing professional assessments of quality with review of community perceptions. The problems of defining quality require such multi-dimensional perspectives.

Study tools, such as checklists, have been found to be reliable; ways of reducing their length have been suggested and their use for *management* during regular supervision visits has been discussed. Scoring methods have also been assessed and some limitations identified: although they facilitate inter-unit comparison they contain value judgements which must be clarified. However, explicit assessment methods do have the potential to be more open, clear and easy to use than implicit methods. The methods of community assessment could also be adapted for use within supervision visits, to broaden the focus of visits and encourage accountability to the community. Overall, this study has demonstrated how techniques regarded as valuable only for periodic research can also be developed for regular use.

3.   The **combination of different methods** within an economic framework in this research is unusual and represents a methodological advance in health care *evaluation research*. The methods may not be replicable in their entirety for monitoring purposes but together have value for use in periodic assessments. They illustrate that multi-disciplinary evaluation approaches are compatible and re-enforcing.

For *managers*, the use of multi-disciplinary monitoring and evaluation tools allows them to combine, in this instance, the languages of economics and medicine. Such a combination represents a powerful voice in national policy debates, and this study has provided the tools and approaches that can be used at district level to generate relevant information.

4.   Assessment of **community perceptions** has, in particular, strengthened the policy and management insights of the study by showing the complex inter-linkages between, for example, cost and quality perceptions and the multi-factor influences on willingness to pay for health care. Qualitative methods enable greater understanding of the complexity of community opinions than quantitative approaches. Directly quoting community views in discussions with senior managers was also found to be a powerful presentation approach. The complementarity of the data collection techniques used in this study has allowed full review of community opinions.

10.2   International policy conclusions

1.   Re-assessment of **management potential** is vitally important in ensuring the long-term dynamism of primary health care. Better management must identify and address health care weaknesses and in this way ensure the development of health care.

Improving health care requires that management intervention is flexible, based on the needs of different health units and communities and responding to changes in those needs. The theoretical arguments in favour of decentralization stress that at the district level central management functions can be integrated with the needs of local communities. In practice, however, decentralization may be a compromise between this ideal and what is politically and administratively feasible. Although the Tanzanian administrative system is more decentralized than many in Africa, health managers have only limited power. Instead, they are pushed by central planning both for vertical and other programmes and pulled by the available resource flows. Management is neither rational nor developmental, it is simply crisis control. Tanzania illustrates the dangers of the local government form of decentralization, requiring horizontal linkages between departments/ministries that may not work, as opposed to deconcentration within a vertical line of authority.

2.   The **organizational changes** required to facilitate more effective management should allow: greater district health manager control over resources; stronger employment, disciplinary and reward systems; more responsibility for communities in relation to primary health care units; greater involvement of health workers in management. At the minimum, district health managers must be able to bring about better resource use through their own actions.

Implementing such changes may require developments in organizational structure and adjustments in the current balance of power. They may also require new systems and procedures, stronger support for districts from higher levels of the health system, the development of management skills at all levels, and stronger motivation and reward systems. Such changes may be possible as countries, like Tanzania, move to address resource constraints through the introduction of new/additional resource

generation mechanisms, which themselves require or allow organizational and management development.

Change may develop according to district or regional needs (e.g. management systems developments), or may be initiated by central government (e.g. organizational developments). Ideally, any such changes would occur within a pre-established framework that ensures that they are developmental and coherent, that they are directed towards national goals. In practice, change is likely to be more piecemeal, and so the role of research in identifying the necessary changes and monitoring their implementation and impact is especially important.

3.   As public health care organizations and systems evolve in response to economic and international pressure, **the co-ordinating role of the national level** remains crucial in guiding change. National health policy should set guidelines, for example, concerning: the expected primary health care package and acceptable procedures for different health care interventions (such as ante-natal care, child growth monitoring); and the extent to which adjustments to meet local needs are acceptable.

Two specific issues of concern to Tanzania and internationally are the role of health centres and the potential of non-government health care providers. Evidence of the inefficiency of the first referral level indicates the need to consider radical revisions of their role in ways that enhance the overall efficiency of the health system. This study's evidence of the inefficiency of non-government providers is unusual. It points to the need for realistic re-assessment of their existing performance in considering their future place within national health systems.

Guidelines on all these issues are required to promote greater efficiency and improved quality, protect equity and support health managers at all levels.

4.   A major health policy issue is that of **health financing**; Tanzania has been slower to explore alternative financing options than some countries but the introduction of user fees for some aspects of hospital care is now likely.

New financing mechanisms may help to lessen resource constraints, may facilitate quality improvements, may even promote better management - but not by themselves. Unless the organizational and management problems indicated by this study's findings are addressed, the introduction of fees may only represent a regressive tax on the most vulnerable. Developing simple, effective administrative procedures for fee systems is a first step. It must be accompanied by systems that allow: the resources collected to be used for health care; that ensure that resource use is controlled by the district managers responsible for health care provision; that protect the sick from

double-charging (one official and the second, informal); that promote the rights of the patient; that ensure accountability both for the 'new' resources and for health care in general.

Policy developments concerning organizational structure, primary health care expectations and the role of different health unit levels and health providers must also accompany financing changes, to ensure overall improvements in health care performance. The potential efficiency savings of such developments represent an important source of additional resources at the margin.

5.   The development of appropriate **support mechanisms and procedures** for district managers is essential to the effective implementation of new organizational structures and other policies.

Regional managers in Tanzania, for example, have the role of co-ordinating district-level action, promoting change and supporting management interventions. They also act as a two-way bridge between the district and the national level. Both regional and district managers require management skills development, and the national level must support, co-ordinate and monitor action at lower levels. Basic management skills should also be included in the curricula of all cadres likely to enter management positions.

Although training programmes are not enough by themselves to address the identified weaknesses, they are an essential ingredient in the wide-ranging strategy required to respond to the challenges facing primary health care.

6.   Policy changes must be accompanied by **practical steps** to address primary care weaknesses: for example, in Tanzania, improved supervision and monitoring practices and re-assessment of staff and drug allocations are required.

10.3   Research priorities for the future

1.   This study has considered the **links between costs and quality** in relation to efficiency. Future research might build on this approach by more detailed exploration of cost functions, which include quality variables based on specific quality assessment and permit further review of efficiency at different levels of the health system and for different providers. Such developments would facilitate further consideration of the role of quality in health care efficiency and the possibilities of reducing costs without undermining quality.

2.   Economic analyses are fundamentally strengthened by **multi-disciplinary research**. Future economic research concerning efficiency and financing must, in particular, recognise the crucial

importance of community perspectives when developing appropriate models and generating policy advice.

3.   Further research concerning **cost analysis methods** might focus on the aspects of cost analysis most immediately helpful to planners and managers: the assessment of productivity and the development of appropriate tools; assessment of the marginal costs of altering service patterns and their planning implications. For the long-term, issues of research include the organizational and system changes required to allow more complete and regular monitoring of costs.

4.   Further development of **quality assessment methods** might build on the multi-perspective approach of this study, refining tools for the assessment of both technical and inter-personal skills and of both professional and community perceptions in order that their regular use is promoted. Validation of these tools in relation to outcomes is important.

5.   At the primary level, in particular, structural factors, the physical infrastructure, and health care organization are the crucial influences over quality and efficiency. Further research is required to consider the **influence of organizational structure on management practice** and organizational developments that will foster better management practice. Of particular importance are the factors influencing the **motivation of health providers and managers.** Quality assurance must, therefore, begin with consideration of the constraints imposed by the health system structure and the potential for improvement inherent in it.

6.   Further research must also consider the **role of health centres and non-government providers** within the health system; both evaluating current practice and testing alternative roles and ways of monitoring their performance.

7.   Research must also support the development of **stronger management practices.** For example, through the development of supervision practice and tools, monitoring and information systems, and information analysis procedures. These topics are of international relevance but require context-specific research. Although the results generated may be of limited international relevance, the approaches and methods will be of wider importance.

8.   All research with policy or management relevance must be undertaken through a **process that ensures partnership** between researchers, policy-makers and managers. Such partnership allows a transfer of skills and ensures the validity of the research.

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APPENDIX 2A: DETAILS OF COST STUDIES

Table 1: Methodological details of small-scale health unit studies

Reference	Basic details	Capital costing	Principles of allocation
Alexander *et al.* 1972 - India	* based on illness/preventive functions (incl. environmental sanitation) related to direct and support services, and non-productive activities * annual costs * detailed observation of time allocations * results divided between work in centre and work in "field"	* maintenance estimated as 1.5% of capital cost * capital costs depreciated by 1.5% (buildings) & 10% (furniture, equipment and vehicles)	* depreciation costs allocated to functions by floor space/time (whichever appropriate) * vehicle costs split by mileage records/time (whichever available) * drug costs split by records and use * salaries split by time
Berman 1986 - Indonesia	* annual costs * operating and maintenance costs estimated as % of annualized capital and personnel costs * utilization data from unit monthly (based on daily patient register, shown to be accurate reflection)	* annualized capital costs, based on present value of cost and allowing for opportunity cost based on average interest rate on savings * 15% interest rate	* capital costs allocated by space and equipment use * work time (logs) to allocate personnel costs * unallocated and support resources assigned according to proportion of value of direct service time associated with each programme
Broomberg and Rees, 1991 - South Africa	* monthly costs calculated (March 1990) * one health centre (variety of services) considered * 1990 Rand * information from available sources (supplies records, vehicle log books, drug distribution data, daily/monthly utilization data etc) * costs to health services only * capital versus recurrent costs	* building costs based on 1990 replacement costs, using straight-line depreciation over 50 years * equipment based on inventories based on actual costs, inflated to 1990 wherever possible, or 1990 replacement costs; using straight-line depreciation over 10 years for furniture and 5 years for equipment	* great detail on allocation principles given, both of central administration to clinic and clinic administration between clinical service departments (CSDs) * central admin allocation reflecting likely use of sub-departments by centre under examination * within centre allocations generally based on detailed consideration of use by CSDs, based on relevant factors (time, space, distance etc) * time use allocations based on staff rosters and estimates between areas

Reference	Basic details	Capital costing	Principles of allocation
Hussain 1983 - Bangladesh	* split services into "general" (support), "intermediate" (lab) & "final" * exclude training/ supervision costs * sample studies to assess work statements * costs for 1979	* annual depreciation plus 10% interest on investment * market value of furniture estimated	* three stages: first - buildings by area used; staff lodgings by area occupied by resident staff working in each site; equip/furniture by site in which employed; vehicle costs by mileage attributed to each site/activity * second stage: "general" costs split to final activities by space occupied/paper (admin) work produced * third stage: lab costs splits by tests requested by service; OPD costs partly allocated to other services

Table two: Methodological details of large-scale health unit studies

Reference	Basic details	Capital costing	Principles of allocation
Department of Health/University of Indonesia/Johns Hopkins University 1987 - Indonesia also reported in Berman *et al.* 1991	* national sample across 168 units and 5 provinces * five programmes to which costs allocated (curative, MCH, family planning, immunization, other) and unit costs estimated for four of them * allows for fixed, semi-variable (salaries, supervision, special expenditure) and variable costs * excludes community or staff donated resource costs and basic training costs * all data collected for one month period; time use period may not match other input periods * monthly costs used to estimate annual costs * time use information collected from daily logs * supervision costed from sub-district to regency, based on budget data * drug costs estimated from patient records because monthly reports inaccurate and average OP drug costs initially calculated per sub-district; MCH/FP drug costs more difficult to estimate eg. vaccine costs based on available records or estimated from output * time and travel costs of users, basic training costs and admin costs excluded * using investment, semi-variable and variable cost break-down	* based on replacement cost of each item for budget year of study * monthly costs determined on basis of straight line depreciation and use-lives of 20 years for buildings and 5 years for equipment & vehicles, with added opportunity cost of 15% * sq.metre building cost obtained from MOH * equipment costs based on inventories and observation * equipment assessed on basis of standard kits and proportion of kit present in unit, proportion applied to standard cost; items over US$60 costed separately * vehicles costed as usual but excluded if not working	* all joint costs (inc.buildings, equipment etc) split on basis of direct service time; overall proportions used for wholly support costs, and other proportions for resources used to provide directly more than one service * building costs initially split by space use, determined from staff interview

Gomez (ed) 1987 - Ecuador also reported in Robertson *et al.* 1991	* 1986 study * 15 units (8 government, 7 social security) * recurrent costs from provincial and unit records * overhead costs based on estimates of respective proportions that should be allocated to each unit's level of service delivery (eg.health centres vs. hospitals), divided by number of relevant health units * staff time estimated through interviews, review of staff functions & some observations * annual costs calculated	* buildings & equipment costs based on current replacement costs, annualized with reference to their useful life-spans * some centres assigned costs based on rental values	* used simplified version of step-down hospital cost analysis method to allocate system-wide overhead & indirect service costs to level of PHC centres * certain costs allocated wholly to final services (eg.food & vaccinations) * shared costs allocated to final services proportional to staff time use for each service * personnel costs split on basis of standard times required to produce various services (observation and interviews)
Heller 1975 - Malaysia	* annual costs * examined hospitals and rural health units in six states * drew on a variety of data including expenditure records * staff time estimated through interview * drug costs estimated from estimated averages for set of common diagnoses	* based on government standard costs by unit type * annual costs calculated using 4% depreciation rate and foregone return rate of 10% * cost of basic training considered for inclusion but rejected because assumed to be negligible	* personnel costs split by time-use patterns
Mitchell *et al.* 1988 - Papua New Guinea also reported in Mitchell *et al.* 1991	* annual costs * consider expenditure and full costs (incl. donations, unpaid staff etc) * allocation of time using staff recall of current patterns * drug costs from requisition forms by unit * output information from facility and provincial health office	* area used by services measured * standard sq.metre building cost applied allowing for differences in access * equipment costs estimated on based cost for each type of unit (new cost of full equipment) and adding for extra items of equipment * straight-line depreciation and varying lives depending on building materials (20 yr for permanent building) and value of equipment (5 & 10 years)	* time from staff interviews (patterns last 5 working days) and staff roster * supply and equipment via primary use * maintenance and depreciation via proportion of space used for service * drug costs split IP/OP based on volume of IP days and OP visits

Table 3: Methodological details of other studies

Reference	Basic details	Capital costing	Principles of allocation
Horton and Claquin 1983 - Bangladesh - CEA clinic diarrhoeal services	* exclude private costs to patients * apparently annual costs (annual user info) * info obtained from financial, supply, worker time use and equipment use records * based on quantities used (& prices), not financial records * sensitivity analysis with shadow exchange rate * shadow wage rates difficult to estimate, so not used but implications discussed	* imputed where no financial transaction eg.rent for buildings * amortize current replacement costs of all equipment, using straight line depreciation over estimate lifetime	* salary costs split by time allocations, based on staff reports * costs estimated from quantity/price records, to ease allocation of joint costs
Kasongo Project Team 1984 - Zaire	* one urban and one rural health centre * no specific year * costing of fixed (incl. salaries) & variable costs * central budget variable costs based on standard treatment costs & numbers of patients; fixed costs on estimated actual costs * health unit-supported variable costs from drug use and accounts records; fixed costs from actual expenditure	* straight line depreciation of replacement values * 5 year vehicle life * ?3 year equipment life	* hardly relevant, some staff time allocation on basis of direct use for supervision
Lerman, Shephard & Cash 1985 - Indonesia - treatment costs of diarrhoea - simple cost analysis	* drug use determined from household survey * hospital costs from general rec cost/day, multiplied by no.of hospital days taken up by children with diarrhoea * private expenditures from household surveys and unit records * costs converted to US$ * social costs not measured	* annualized (not clear how)	* shared unit-based costs and personnel training costs allocated to diarrhoea programme in proportion to the share of total health centre visits made by children with diarrhoea * higher level admin costs shared between all health units within an admin area, and then allocated on basis of share of total unit visits

Parkinson *et al.*, 1983 - Swaziland - cost analysis of OP visits at government clinic and hospital OPD	* prospective observation of clinic cases, retrospective examination of OPD case notes * assume recurrent cost analysis only (though not stated) * focus on staff, medical supplies and drugs costs * drugs prices using standard price list, but those supplies free of charge excluded * cost of x-rays etc calculated from hospital expenditure	* not relevant	* ?not relevant
Robertson *et al.* 1984 - The Gambia - immunization	* annual costs * national costs estimated from sample of sites * include all resources used, local and external (with & without expatriates) * costs allocated from central and local levels * consider variable/ fixed costs	* details not given	* details not given
Rees *et al.* 1978 - Kenya - hospital costing	* prospective audit of general medical ward, intensive care unit and adult observation ward * 28 day study period * averaged to determine annual costs * determination of effectiveness factor to value admission and treatment	* unclear	* unclear

Shepherd et al. 1989 - Ecuador - CEA routine vs campaign immunization strategies	* all costs reported constant 1985 US$ * routine immunization costs extrapolated from 1986 study of costs of health units, using representative but non-random sample of units (7 subcentres, 8 health posts, 7 hospitals) * routine costs include national and provincial or regional administration costs * average costs per dose for each type of unit based on weighting each unit studied according to their number of doses; national average cost per dose also based on weighting the average cost of each type of unit by each's estimated proportion of total doses provided nationally 1985 * direct labour cost for vaccinations based on estimated time for giving one dose (5 mins) * for campaign costs representative but non-random sample of 30 health units used, costs collected during one round and extrapolated to all three rounds of 1986 * campaign costs included preparatory activities as well as costs of three day "round" * campaign costs used similar price scales to value personnel and vaccines as that for routine services; volunteer time valued at entry level salaries for MOH personnel	* not clear if capital costs included or, if are there, how valued	* apportionment only relevant to routine services * where possible costs assigned directly to type of service incurring them * eg.administration costs were allocated among services based on each service's proportion of directly assigned costs * immunization charged for a share of unknown use of time/slack time
Tangcharoensathien et al. 1990 - Thailand - IUCD service comparison hospital and health centre	* six months prospective data on labour and material costs * user costs obtained from interviews (transport and fees)	* depreciated using straight line depreciation with 20 yrs (buildings) and 5 yr (other) lifetimes	* allocation to FP clinic based on proportion of scheduled FP clinics out full working week * allocation to IUCD cost based on percentage of time spent on this vs other methods (IUCD/FP factor) * IUCD cost only added to per acceptor cost after other costs allocated, as not shared with other parts of FP programme

Ugalde 1984 - the Dominican republic - broad costing of 1 rural health unit, in context of utilization issues	* monthly expenditures * exclude some supplies distributed from the MOH * exclude depreciation of equipment	* include rental of building and maintenance of motorbike	* ?not relevant
Vogel et al. 1976 - Kenya - hospital OPD	* costs over 5 day period, extrapolated to annual; * exclude capital, admin, transport, telephone etc costs	* not included	* time allocations to OPD used for salaries
Vos, Borgdorff and Kachidza 1990 - Zimbabwe - mobile clinics	* consideration of opportunity costs, requiring review of staff time use and total (MOH/private) transport costs	* not considered	* not relevant

APPENDIX 3A: A SUMMARY OF PROCESS QUALITY ASSESSMENTS

STUDY	CONCEPTUAL EMPHASIS	FOCUS	SOURCE OF STANDARDS	CRITERIA	METHODS	ASSESSMENT OF VALIDITY AND RELIABILITY	SAMPLE	RESULTS/ANALYSIS PRESENTATION
AFYA/ UNICEF/ AMREF 1985	technical skills, including patient instructions; with structural assessment	curative care	unclear, ?international experience	criteria related to history, examination, prescribing, treatment, patient education	implicit, observation	unclear	cluster sampling of 39 health units; sampling of 520 patients unclear	frequencies yes/no by criteria over all observations, by cadre & by district
Amonoo-Lartson & de Vries 1981	technical skills	case management of 3 curative tracer conditions: cough, diarrhoea, fever	external evaluators/ local experts	2 each for: history, examination, treatment & prescription	explicit using scoring system, observation,	preceded by pilot study with observers to ensure reliability; validity assessed by additional review with 6 doctors & 6 medical auxiliaries	purposive sample of 15/30 community clinic attendants from villages with highest workloads; 4 days observation per worker	over all observations calculated: performance levels for each aspect of case management (against 100% expected level) & frequencies of correct performance by indicator

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Bryce *et al.* 1992	technical skills	curative & preventive child survival services	external evaluators/ local experts	e.g. curative: history, examination, diagnosis, education of mother	explicit with implicit assessment of diagnosis; also exit interviews of mothers, interviews of health workers, record review & inventory of equipment/ supplies	little discussed; careful interviewer training, combination of methods allows validation	mostly stratified random sampling, by type of unit & location	frequency by criteria, cross-tabulation & some graphs
Centre for Health Policy 1991	technical & inter-personal skills; part of wider system review	child health, maternal care, curative care, chronic disease care, health education, management of clinics	evaluators	specific criteria concerning: general organisation, health eduction, screening procedures & consultation,	implicit using 3 point scale for observation; also record reviews, exit interviews; explicit using scoring system for OSCE[1]	some procedures preceded by pilot study; validity confirmed through common findings of different teams & discussion with local staff; OSCE validity limited by exam situation	stratified random sampling of 19/46 clinics (considering location & supervisors' assessment of quality); 1 day's observation/unit; systematic sample of 10-15 attenders at each clinic	mostly qualitative information & summarised into themes; some frequencies determined; OSCE scores analyzed by qualification & years of experience

Cutts et al. 1988	technical skills	child diarrhoea case management	not stated	history, examination & education messages	explicit using scoring system, observation; exit interviews of guardians & follow-up visits in homes	use of interviews & home follow-up as outcome validation; biases of evaluation (e.g. observer's presence) suggests that evaluation was of 'best practice' only (but even so showed weaknesses of case management)	purposive sample of 25 health units; selection of 218 observations unclear	across all observations: mean scores, frequencies correct performance by some criteria; also qualitative review against interview findings
Fadhil 1987	technical skills, with structural and user satisfaction evaluation	ante-natal, post-natal & child care	evaluator, using international experience, national guidelines & consultation with local experts	specific criteria by registration, history, physical examination, laboratory investigation & management of care	explicit, using scoring system, observation; also attender interviews & household survey	preceded by pilot test; other validation not discussed	systematic sample of 6 units in study area; systematic sample of attenders for some clinics and complete sample for others; systematic selection of 365 attenders for interview	total scores by observation for quality of care & recording practice
Figueroa undated	technical skills, with structural assessment	delivery care	WHO guidelines, evaluation team	mother given baby to hold, putting baby to breast, delivery, person in attendance	explicit, observation	comparison with outcome data (morbidity & mortality)	random sample of 78 midwives; practice in selected institutions assessed on 5 randomly selected days during study period; up to 20 deliveries observed per institution	frequencies correct performance by criteria

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Gomez (ed) 1987	technical skills, in addition to cost analysis	curative and MCH care	published norms of health care practice	unclear	staff interview	not discussed	all staff in 15 purposively selected health units (government and social security)	% of correctly answered questions; comparison of social security and government workers
Habicht 1979	technical skills	immunization and curative patient management	training protocols	immunization coverage, steps of management (history, examination, diagnosis & therapy)	explicit, observation	validation through review of referred patients, leading to changes in task descriptions & quality criteria	sample different number of patients at different steps, greater samples sizes for inexperienced personnel & steps liable to error	percent adequate management by step of process & by health worker
Kanji et al. 1990	technical skills	curative diagnosis & treatment, with specific prescribing practice assessment	national EDP guidelines	history, examination, diagnosis, treatment, patient education	implicit, observation; prescription record review	unclear	purposive sample of 28 health units; 539 observations, selection process unclear	frequencies adequate, inadequate or doubtful by criteria & category of worker/training history; frequencies against prescribing indicators
Malone 1980a	technical skills	case management of sick children	evaluators' training manual, local agreement	history, examination, use of x-ray & laboratory, diagnosis, referral, prescription	explicit & implicit, record review	cross-check by evaluator (explicit); comparison of explicit & implicit assessments	systematic sample of 205 children over 7 days of study	overall scores (explicit); review of differences evaluator/actual (explicit); % adequate (implicit)
Malone 1980b	technical skills	ante-natal care	local practice, training syllabus	referral practice, aspects of care process	explicit & implicit, record review	cross-check by evaluator (explicit); comparison of explicit & implicit assessments	unclear	overall scores (explicit); review of differences evaluator/actual (explicit); % adequate (implicit)

Nicholas et al. 1991	technical skills, as part of wider systems analysis	case management of ARI, diarrhoea & malaria; immunization, growth monitoring, maternal health and child spacing	WHO guidelines, in-country 'expert consensus'	relevant criteria for each aspect of each procedure	explicit, observations; also interviews of health workers & users, and household interviews	reliability proven through use in several countries; validity assumed because based on international standards	purposive sample of fixed proportion of best & worst performing units; selection of observations unclear; numbers varied by country	% correct performance by criterion
Peters and Becker 1991	structure and technical skills	immunizations, case management of diarrhoea and ARI	international standards	structure and practice criteria	explicit, observations & record audit; interviews around case management practice	validity assumed, reliability not tested	100% sample in one area	% correct performance by criterion; comparison public/private providers
Pust and Burrell 1986	technical skills	diagnosis and therapy, curative care	hospital practice & national therapy manual	appropriateness of diagnosis & therapy	implicit, record review	validity assumed because based on cross-check, but validity of hospital practice not assessed	random sample of 102 patients referred to 1 hospital	% agreed/not agreed for diagnosis, % adequacy of therapy, assessment of implications of incorrect practice
Srinivasa et al. 1982	technical skills	ante-natal care	consensus among local experts	history, examination, laboratory tests, tetanus toxoid administration, health education, prescription & recording	explicit using scoring system, observation	preceded by pilot test	systematic sample of ante-natal visits on 25 days, 1 health unit	mean, median and range of scores (% of max possible) for each component of process

MOH/WHO 1989	systems analysis with mainly technical skills focus	MCH services	external evaluators/ local experts	e.g. for ANC: examination, counselling	implicit; also record review, equipment inventory, staff interview	not discussed; pilot tested	multistage random sampling	frequencies and qualitative review

NOTE: 1.OSCE=objective structured clinical evaluation

APPENDIX 4A:
DETAILS OF COST ANALYSIS METHODOLOGY

COST ITEM	HEALTH UNIT/ACTIVITY
BUILDING	Area by programme of main use plus percentage of shared space, allocated on basis of overall unit-based time factors (i.e. excluding allocations to outreach etc)
	Prices reflect condition of building (poor vs.average/good); based on monthly rental values from district town within region
EQUIPMENT FURNITURE	Items available and in working condition by programme of main use plus percentage of shared items, allocated on basis of appropriate unit time factors (overall, MCH only)
	Lifetimes estimated as 8 years, based on local advice/ experience
	Equipment replacement costs from 1988/89 UNICEF/UNIPAC and EPI Tanzania and ECHO (charity) catalogues and EPI Tanzania; included 25% to allow for freight and insurance costs (EPI Tanzania figures)
	Furniture replacement costs from 1988/89 local market/artisan prices (beds included as furniture, assumed bought locally)
	Annual costs estimated on basis of straight line depreciation
TRANSPORT	Relevant to health centres only, and included because vehicles were said to be operating over the major part of the year of assessment
	Cost based on the 1988/89 replacement costs of a Landrover (the vehicle of all centres), annualized by straight line depreciation over an 8 year lifetime chosen on the basis of Tanzanian experience
	Cost allocated 45% to IP, 15% to DEL, 40% to all programmes (including IP and DEL), reflecting the vehicles primary use for referrals and secondary use for administrative issues affecting all programmes provided by the centres; the 40% allocated to all programmes was split between them on the basis of total unit time factors, assuming these best reflected the workload pattern of administration
	Other transport costs concern transport allowances given to staff travelling on duty - these were generally too small to justify a separate category for dispensaries and so were included under personnel for all units; bicycles included as equipment
PERSONNEL	Staff records of daily/weekly time allocations, calculated over working year and allowing for absence cover, months of reported immunizations only, outreach/other travel only if frequent, FP only considered separately from ANC/CW if regular/frequent, lab services, health assistant time allocation to environmental sanitation activities; excludes TB/leprosy time (covered within CC) and sometimes lab use (although included under CC); difficulties of splitting ante-natal and child welfare time allocations in some units led to joint costing of these services (ANC/CW); health assistant time allocations are partly to the relevant MCH services and partly to OTH
	For dispensaries without IP beds, DEL (delivery) time allocations are based on an estimated average time per delivery (6 hours, determined from discussions with staff in health units) multiplied by the unit's recorded annual number of deliveries - allocated to staff identified as assisting with them
	For diocesan dispensaries with IP beds, IP time assumed to be overnight only and based on reported duration (hours) of night duties; split IP/DEL on basis of patient numbers (assuming 1IP=1DEL, given that although IPs have longer lengths of stay generally, deliveries require greater intensity of staff time use)
	For health centres, same assumptions apply to overnight duty hours; in addition daytime hours of IP duty also split on similar basis to IP and DEL

PERSONNEL cont.	Watchman (and other general support staff) time was split between programmes on the basis of unit space allocations

Time allocation data used to determine individual and health unit time factor allocations across the programmes; in these allocations all time not directly used in the delivery of care (eg.administrative, preparation/cleaning and rest time) is implicitly allocated between programmes on the basis of each's share of total direct care time

Personnel salaries/allowances (employer provident fund contribution) obtained from official government sources (at district level) or from parish expenditure records/ personal discussions for each individual, and split between programmes on the basis of time factors; travel allowances also included where relevant

Volunteers/community watchmen costed using unskilled labourer's wage rate; parish sisters costed at salary level appropriate for their job

Personnel costs include rental value of housing provided to staff - split between programmes on the basis of the time use of the occupants |
| DRUGS/ MEDICAL SUPPLIES | General drug use for government health units determined from monthly stock report form (EDP form D3) and, for dispensaries, primarily allocated to CC except for:
- folic acid use allocated to CC/ANC on the basis of patient numbers for anaemia/ante-natal care
-ergometrine use wholly allocated to DEL
-medical supplies (syringes, needles, cotton wool etc) allocated to CC, DEL and IP on the basis of unit time allocations to these factors (assuming that time use reflects intensity of medical requirements)

TB/leprosy drug use was estimated on the basis of number of contacts (obtained from unit records) multiplied by standard prescription; for units where number of contacts not known, estimated on basis of known number of unit-registered patients and average district attendance rates; for Morogoro Rural district no estimates possible

EDP drug use costed based on actual price paid by essential drugs programme (Aug 1988 - some bulk purchase savings over normal EDP prices) plus Tanzanian EDP estimate of 7% for insurance/freight; other drug use was costed using the 1988 UNICEF/UNIPAC catalogue or charity suppliers catalogues

Diocesan general drug costs determined on basis of any information about EDP drug use available plus consideration of available drug expenditure estimates; costs split between CC/DEL on the basis of the average proportional allocation within government units (CC 97%, DEL 3%)

IP drug costs for health centres were based on detailed prescription drug use information; as such information was usually only available for a sample of patients, the average drug cost per patient day was calculated for each centre and then applied to estimated total patient days to determine total IP drug costs (total patient days estimated from known number of admissions and estimated ALOS based on what detailed information was available); this total was itself deducted from the total CC drug cost to prevent double-counting

IP drug costs for diocesan units were determined in a similar way; but as detailed prescription and length of stay information was not always available, costs had to be estimated for some units from the information obtained from others (numbers of IPs always available)

TB/leprosy drug costs based on drug use multiplied by appropriate prices obtained from national TB/leprosy unit; and allocated wholly to CC |

DRUGS/ MEDICAL SUPPLIES cont	MCH supply use (eg.condoms, FP pills) was estimated from district/diocesan records of distribution, adjusted for actual use given supply availability during health unit visits and discussion with unit staff
	MCH supplies were costed using prices obtained from UNFPA and charity suppliers; and allocated to the MCH programme of use
	Vaccine use was estimated for all units from district held monthly records of vaccine distribution, which is equivalent to use in the previous month
	Vaccine costs were calculated using Tanzania EPI prices for Jan 89, including their figure of 37% for insurance and freight; all costs allocated to IMM
	Internal EDP drug distribution costs for government units were considered in two parts: distribution from zone to districts, for which costs were directly estimated and then split between programmes on the basis of their share of total drug costs; and distribution from district to unit, which was assumed to be subsumed within the 'supervision' cost (given that distribution is a minor element in supervision visits)
	Internal general drug distribution costs for diocesan units were based on expenditure records (each unit responsible)
	Vaccine distribution costs were estimated in three stages: distribution from centre to region were ignored; distribution from region to district for which costs were directly estimated; distribution from district to unit, which were assumed to be one quarter of the supervision cost of the District Cold Chain Operator (given that the DCCO vists for both distribution and supervision purposes)
	TB/leprosy drug and MCH supply distribution costs were assumed to be subsumed within the relevant 'supervision' costs (given that distribution is a minor element in supervision visits)
OTHER SUPPLIES	Use of items supplied through the EDP kits (eg.soap, pens, record forms) was determined from monthly stock report forms and allocated between curative and MCH services on a 50/50 basis, given the basic division between the provision of these services within units
	Other supplies' use was determined from district MCH distribution records (eg.albustix, Hb paper)
	EDP items were costed using EDP prices, and other items using the price lists of charity suppliers
	Additional expenditure was determined from district/parish expenditure records (eg.for health units' food costs), or from experience in other units (eg.matches)
	Standard costs were used for antiseptic (2500/-) and laboratory reagents (5000/- or 2500/-), where available
	Some community contributions were estimated following discussions with staff and community members, and allocated to the appropriate programmes (using arbitrary splits across programmes, where necessary); food costs were not estimated for IPs in diocesan dispensaries
	All costs were allocated to appropriate programmes where possible or were shared between programmes on the basis of appropriate time use factors (assuming time use reflects patient numbers)
	Food costs in health centres were split between IP and DEL on the basis of patient days (ALOS for both IPs and DELs were calculated for two centres and their average applied to the remaining two centres' IP/DEL patient numbers)

OPERATING AND MAIN-TENANCE	EPI kerosene use was determined from district distribution records, for months of reported immunisations only but assuming that all delivered was used, and allocated wholly to IMM

Kerosene costs were calculated on the basis of actual prices in each district

For government units, other costs were determined on the basis of knowledge that a certain item was used (eg.charcoal), the experience of units where more detailed information could be obtained and individual units' patient numbers

For diocesan units, expenditure records were used, or costs were estimated on the basis of known expenditure levels in other diocesan units relative to patient numbers

Community contributions were estimated following discussion with staff and community members - in some units a charge per patient was said to be levied; in others the contribution was estimated on the basis of experiences in other units

For health centres, costs were based on district expenditure records: kerosene/charcoal/firewood costs were split arbitrarily between CC, IP and DEL unless clearly used for a specific purpose (eg.cooking fuel split IP/DEL only); petrol costs were split between programmes on the same basis as vehicle costs

Where costs were shared between programmes, they were allocated on the basis of building use factors

Kerosene distribution costs were determined as 25% of the total DCCO 'supervision' cost |
| IN-SERVICE TRAINING | Staff reported number and type of training sessions attended during 1988/89

Government and diocesan average training costs per participant were calculated on the basis of actual practice (diocesan - 2280/-) and estimation (government - 5000/-, reflecting both diocesan and donor programme experience); these costs were assumed to be the same for courses of all durations except those of one day only for which a standard rate (1000/-) was applied; where staff employed by one organisation attended a training session of the other, it was costed at the organisation's rate

Costs were allocated to programmes where specific training was identified or allocated across programmes on the basis of the individual's total time allocations |
| SUPER-VISION | Information on supervision visits received by each unit was obtained from its visitor's book, supplemented by information from the DCCO (assuming that he visits sufficiently frequently to forget to sign the visitor's book each time)

Visits from nearby health centres were ignored because they were both infrequent and likely to be inexpensive (due to type of transport or sharing with district visitors); regional/national visits were also ignored because of difficulties in identifying the precise proportion that should be allocated to the unit (and likely low expense) given that most such visits may be more for the purpose of supervising district officials

The total number of district visits per programme was determined by identifying the visits mainly directed at each programme and then adding a proportion of those visits directed at two or more programmes (allocating joint visits on the basis of relevant total unit time factors)

A transport cost per visit was determined for each unit, based on a standard per km cost covering both petrol and maintenance (55/- for vehicles, based on actual figures for a donor project within the region and allowing for the import of spare parts) and the known distance of each unit from the district capital; it was assumed that in any one visit two health units would be visited and so the per km cost was applied to half the round trip distance to determine the transport cost per supervision visit; this cost per visit was then multiplied by the estimated total number of visits for each programme to determine the total transport cost by programme

An allowance cost per visit (1000/-) was also determined - based on standard government rates, and assuming that each visit required one night out, involved two people and was split between two units |

SUPER-VISION cont.	The District TB/leprosy co-ordinators travel by motorbike and, usually, alone; their costs were thus based on a standard per km transport cost of 25/- and a standard allowance cost of 500/- per visit per unit
	Diocesan supervision costs were based on actual expenditure figures for 1988/89 (covering both transport and allowances), revised upwards to allow for the higher per km cost used in these calculations (given donations of spare parts etc., this is not an unreasonable assumption); as diocesan supervision visits consist of relatively long 'safaris' during which a group of health units are visited, the actual supervision schedule for the year was used to determine the total supervision safari distance and the percentage of it that should be allocated to each unit (based on the km contribution of each unit to that total); these proportions were then used to split the total diocesan supervision expenditure across all units visits; and within units, the share of total visits by programme determined the allocation of unit supervision cost

APPENDIX 4B:
DATA SOURCES AND DATA RELIABILITY

DATA REQUIRED	SOURCE	COMMENT
1. Utilization data	District records based on unit-submitted data; missing data collected from units whenever possible	Records fairly regularly submitted to district level; curative records' accuracy variable because of incentive to falsify in order to prevent drug abuse detection, but heavy emphasis placed on record compilation by supervisors may have offset this problem; unrecorded curative utilization associated with drug use outside health units; accuracy better for MCH service records
2. Time use data	Informal interviews with staff; followed by time log completion (1 week supervised and 1 week unsupervised)	Especially important for MCH nursing staff in dispensaries, and for all nursing staff in health centres, because of the variety of services in which they are involved; recall may not be good in interviews but allows overview of all periods (including holiday times, farming seasons etc); time logs may be carelessly/fraudulently completed and are limited to specific time which may not reflect 'normal' patterns; especial problems in both cases in estimating time use for deliveries and IPs; doubly important because of use in splitting other joint costs
3. Drug and medical supplies use data	Monthly drug stock records submitted by units; followed by review of patient register prescription data; MCH supplies data	Drug stock reports fairly regularly completed; accuracy undermined by carelessness and fraudulent completion; existing regular checks may counteract inaccuracies; need to estimate use of some items by different programmes, but usually not large associated costs; patient registers also liable to tampering and ignore substantial drug use outside health unit; large problem anyway in estimating in-patient drug use because of limited, relevant data from some units; also general problems for diocesan units because of failure to record drug use or expenditures (fall outside general EDP system); MCH supplies' data detailed, apparently in response to pressure of 'vertical' distribution system

Distribution costs were estimated from realistic assumptions about distribution patterns |
| 4. EPI vaccine and kerosene use | District records of distribution by District EPI Officer (district cold chain officer) | Emphasis of vertical programme safeguards accuracy, although some problems where units were inaccessible (did they actually get supplies left at nearby unit and recorded as allocated to them?); some kerosene diverted to use for other programmes, but difficult to estimate quantities and differences between units

Distribution costs were estimated from realistic assumptions about distribution patterns |
| 5. Other supplies/ other operating and maintenance | Distribution records of eg. district MCH Co-ordinators; accounts data; staff/community discussions | Other than MCH records of supplies distributed, all sources had problems; some fairly arbitrary assumptions made for items representing only small proportion of total costs

Community contributions were estimated, based on evidence of charging levels |
6. Buildings and equipment	Observations within units of availability and allocation between programmes	Space allocations were fairly easy to estimate, with a tape measure; allocation of joint space required information about a relevant factor (in this study, time); observation of equipment availability and use
7. In-service training	Reported training sessions	Reasonable recall as so few opportunities
8. Supervision	Visitors' books	Reasonable reflection of numbers of visits, given standard practice of using visitors books and given cross-checking with other information; allocations between activities also based on reasonable assumptions

9. Price data	Different sources for different inputs, but usually based on official and <u>relevant</u> records	Official sources for eg. drugs from EDP, vaccines from EPI, salaries from District Treasurers; use of UNIPAC (UNICEF) prices reasonable as main source of equipment in Tanzania; actual kerosene prices used, differing between districts; rental prices for buildings an average from different sources in one district town, but may have overestimated costs in a village; furniture prices taken from an average over local artisan prices in a district town and so may have overestimated village prices, but common estimation difficult as likely to differ substantially; in-service training 'price' a reasonable estimation, although insensitive to duration and organiser of courses; supervision 'price' a reasonable estimation, although insensitive to some differences between units/trips (number of people in one car, number of days taken over whole trip); official exchange rates used to convert foreign prices to T shillings; lifetimes used in determination of equipment/building annual costs were based on the judgements of Tanzanian health managers

APPENDIX 4C: SELF-COMPLETED TIME LOG

ZAHANATI:_____ JINA:_____ CHEO:_____ TAREHE:_____

KUIJAZA, WEKA ALAMA YA __ NDANI YA KISANDUKU KUONYESHA KAZI UNAYOFANYA KWA KILA SAA

	(1) MAHALI PA KAZI		(2) KAZI YA TIBA				(3) KAZI YA MCH		uzazi wa		labour/	(4) KAZI NYINGINE		kufanya		kutembelea	(5) KUPUMZIKA
	zahanati	nje	kuandika daw	sindano	vidonda	kutoa dawa	wakinamama	watoto	majira	chanjo	delivery	kusafisha	kutayarisha	repoti	kusafiri	nyumba	
KUFIKA - 2.30																	
2.30 - 3.30																	
3.30 - 4.30																	
4.30 - 5.30																	
5.30 - 6.30																	
6.30 - 7.30																	
7.30 - 8.30																	
8.30 - KUONDOKA																	

KWA SIKU HII:

UMEFIKA SAA NGAPI LEO?_____

UMEONDOKA SAA NGAPI LEO?_____

WAGONJWA WANGAPI UMEONA? _____

WAKINAMA WANGAPI UMEONA? _____

WATOTO WANGAPI UMEONA? _____

CHANJO NGAPI UMETOA? _____

NYUMBA NGAPI UMETEMBELEA? _____

AKINAMAMA WANGAPI WA UZAZI
WA MAJIRA UMEONA? _____

UCHUNGU NGAPI? _____

KAMA UMEFANYA KAZI NJE YA ZAHANATI LEO, ILIKUWA
KAZI GANI:?

_____

MENGINEYO:_____

_____

APPENDIX 4D: CRITERIA FOR STRUCTURAL QUALITY ASSESSMENT

__MOROGORO HEALTH SYSTEMS RESEARCH STUDY__

__STRUCTURAL PERFORMANCE ASSESSMENT: CRITERIA AND EXPLANATIONS__

SCORING PATTERN: GOOD = 2, ADEQUATE = 1, POOR = 0

1. Facility located

- good: near to population concentration and close to road/bus routes

- adequate: one or other

- poor: neither

2. Buildings in

- good condition: made of bricks/blocks, no roof leaks, floor whole, walls whole

- adequate: made of bricks/blocks but problems in any one of three specified areas

- poor condition: constructed of any other material (eg. wood or mud) and/or problems in more than one of three specified areas

3. Pest infestation

- good: no existing pest infestation

- poor: some form of pest infestation (eg. bats)

4. Building security

- good: doors/windows secure, and watchman (2 watchmen for RHC)

- adequate: either watchman or doors/windows secure

- poor: no watchman (less than 2 watchmen for RHC)

5. Water facilities

- good: available year round in/outside building from a protected source (eg. protected spring, well)

- poor: irregularly available or available only from an unprotected source (eg. river, unprotected spring)

6. Distance to water source

- good: no more than 10 minutes walk

- poor: over 10 minutes walk

7. Sanitation facilities

- good: pit latrine provided, maintained (depth/fabric condition) and clean (smell/use) for both male and female
       patients

- adequate: pit latrine provided and maintained, but needs cleaning; and/or only one latrine available

- poor: not provided, not maintained

8. Curative care space available

- good: consultation room, dressing/injection room/areas, prescribing station, waiting area

      also for health centres: in-patient wards, laboratory, dental clinic, kitchen. laundry

- poor: any one of the above missing

9. MCH space available

- good: waiting area/health education, at least one consultation room for antenatal care, family planning and
       deliveries, area for mother/child clinic

- poor: any one of the above missing

10. Waiting area

- good: protected area with seating space for 20 people

- poor: unprotected area and/or inadequate seating space

11. Facility environmental cleanliness

- good: facility swept, tidy, no rubbish in or around the building

- poor: two out of three problems (unswept, untidy, rubbish in or around the building)

12. Qualified staff working in facility:

Dispensary

- adequate : at least RMA, MCHaider, Nurse Auxilliary, Health Assistant

- inadequate: any shortfall below this range/level

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Health Centre

- adequate: at least 2 MA, 2 RMA, 1 Nurse Midwife, 2 MCHa, 1 Lab Asst, 4 Nurse Auxilliary, 4 Nurse Attendants, 1 Health
    Assistant, 1 Medical Record Asst (2 Cooks, 2 Laundry, 1 Driver)

- inadequate: any shortfall

For dispensaries only

13. Staff availability for emergency services

- good: at least 1 member of staff lives nearby to make provision of emergency services after hours easier

- poor: no member of staff living nearby

14. Light for evening emergencies

- good: lamp and fuel available within facility over last 3 months

- poor: one or other irregularly/never available in facility over last 3 months

15. Average time in unspecified activities per member of staff:CC

- acceptable: max of 3 hours per day

- unacceptable: time exceeding this limit

16. Average time in unspecified activities per member of staff:MCH

- acceptable: max of 3 hours per day

- unacceptable: time exceeding this limit

17. Staff absences from work

- acceptable: max of 2 days per qualified staff member (eg. dispensary = RMA, MCHaide, HA) last month (excluding
    holidays)

- unacceptable: time exceeding this limit

18. Time allocation to preventive activities

- good: 50% of total staff time available

- poor: under 50% of total staff time available

19. Services regularly provided:

- good: OPD, ANC, FP, Child Welfare, Immunizations, Health Education, Env San, TB/Leprosy care, Mental Health care, Laboratory services

    in addition for Health Centres: Dental care, IP

- adequate: OPD, ANC, Child Welfare, Immunizations, Health Education,

    in addition for Health Centres: IP

- poor: any less than the adequate range

For Health Centres only
20. Car Availability

- good: car regularly available last year

- poor: care irregularly/never available last year

21. Staff housing availability

for dispensary:

- good: available for 2 or more staff members

- adequate: available for at least 1 staff member

- poor: not available

for health centre:

- good: available for at least 4 staff members

- poor: available for less than 4 staff members

22. Uniforms

- good: uniforms worn (and not torn, obviously dirty) by nursing staff

- poor: uniforms not worn by any member of nursing staff staff or uniforms worn but torn and dirty

23. Access for supervision

- good: accessible for at least 9/12 months

- bad: inaccessible more than 3/12 months

24. Distance to referral facility

- good: usual referral facility within 25KM (around 4hrs travel)

- poor: usual referral facility over 25km (around 4hrs travel)

For dispensaries only

25. Transport availability for referrals

- good: easily/regularly available (either own vehicle or daily bus)

- poor: rely on patients' efforts in using local transport

26. Referral practice

- good: patients sent with referral letter/member of staff

- poor: neither

27. Contact with DHMT

- good: at least 2 visits in last month by members of DHMT

- poor: less than this frequency

28. Supervision for outpatient services

- good: at least 1 supervision inspection in last 3 months by the DMO/DNO and DTBLC (where relevant) (staying at least 1 hour)

- poor: a lower frequency and/or visits only to drop supplies or in passing so staying less than 1 hour

29. Supervision for MCH services

- good: at least 1 supervision inspection in last 3 months by the MCHCo/EPI mama (staying at least 1 hour)

- poor: a lower frequency and/or visits only to drop supplies or in passing so staying less than 1 hour

For dispensaries only

30. Supervision by RHC

- good: at least 1 visit in the last month by the MA in-charge of the nearest RHC, to teach staff and discuss concerns

- poor: any less frequency and/or visits of less than 1 hour

31. Feed-back from DHMT to unit staff for curative concerns

- good: received feed-back from DHMT to most recent requests for assistance related to general curative and, where relevant, TBL service problems

- poor: no feed-back

32. Feed-back from DHMT to unit staff for MCH concerns

- good: received feed-back from DHMT to most recent requests for assistance related to MCH services

- poor: no feed-back

33. Continuing education curative services

- good: at least 1 member of curative staff (RMAs, N/Aux, N/Atts) have received any form of in-service training in the last 6 months

- poor: anything less than this level (numbers or frequency)

34. Continuing education MCH services

- good: at least 1 member of MCH staff staff (MCHa, HAs, N/Aux, N/Atts) have received any form of in-service training in the last 6 months

- poor: anything less than this level (numbers or frequency)

35. Upgrading training

- good: at least 1 member of staff has received upgrading training in the last 2 years

- poor: as anything less this level (numbers of staff or frequency)

For RHCs only
36. Annual report distribution
   Health Centres only

- good: receipt of most recent district annual report

- poor: not received

37. Consultation room furniture

- good: 1 table, 2 chairs in usable condition

- poor: less than this level

38. Equipment inventory

- good: current inventory available in rooms   .

- poor: current inventory not available

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39. Diagnostic equipment available

- good: 1 stethoscope, 1 BP machine, 1 thermometer, 1 exam bed, 1 spatula; all in good condition

- adequate: without spatula

- poor: any other item(s) missing

40. Treatment manuals

- good: readily available (eg. EDP) in consultation room

- poor: not available

41. Consultation privacy

- good: available for OP consultations

- poor: not available

42. Availability of chloroquine

- good: two forms of chloroquine (tablets, injections, syrup) available throughout each month   (1988/89)

- poor: availability of two forms for less than whole month (1988/89)

43. Availability of painkillers

- good: acetylsalicylic acid or paracetamol available throughout each month (1988/89)

- poor: availability of either item for less than whole month (1988/89)

44. Availability of penicillin

- good: Benzathine benzyl, PPF or phenoxmethyl penicillin tabs available throughout each month (1988/89)

- poor: availability of either item for less than whole month 1988/89

45. Availability of diazepam

- good: available throughout each month 1988/89

- poor: available for less than whole month 1988/89

46. Regularity of EDP supply

- good: new kit (necessary supplies) available in facility every month last year

- poor: any problem with monthly supply last year

For government only
47. Timeliness of EDP supply

- good: kit available within first 5 days of every month last year

- poor: kit not available within this time last year

48. Drug storage of unopened kit

- good: kept in secure, weather proof room

- poor: kept in insecure room where possible to be damaged eg. by rain

49. Drug storage of opened kit

- good: secure storage, special cupboard, with oldest drugs separate

- poor: insecure storage, with other items and with no order in terms of oldest/newest drugs

50. Expiry date of drugs

- good: no drugs available for use beyond expiry date

- poor: drugs available for use beyond expiry date

51. Dressing room/area furniture

- good: 1 table, 1(2) chairs, 1 rubbish container

- poor: any item less

52. Dressing room/area equipment

- good: 2 kidney dishes/metal pots, 2 gallipots (4 metal bowls), 2 clamping forceps, 2 dressing/dissecting forceps, 1 pair scissors, 1 blade, 1 needle holder, 1 cheatle forceps suturing needles

- adequate A: 2 metal bowls (kidney dish/gallipot), 2 clamping forceps, 1 dressing/dissecting forceps, blade, 1 cheatle/large forceps, 1 pair scissors, suturing needles

- poor: any item less

53. Cleanliness of dressing equipment

- good: equipment boiled and kept in antispetic

- adequate: either boiled or kept in antiseptic

- poor: neither

54. Cleanliness of dressing room/area

- good: room/area shows signs of recent attempts to clean (walls and floor clean/scrubbed, rubbish put in bin/pile)

- poor: no such signs

55. Additional antiseptic

- good: antiseptic additional to EDP kit regularly available last year

- poor: antiseptic additional to EDP irregularly or rarely available last year

56. Wound dressing supplies

- good: never run out of stocks of gauze, cotton wool, bandages, gentian violet, catgut for basic wound dressing last year

- poor: supply shortages at any time last year

57. Injection room/area furniture

- good: 1 table, 1 chair

- poor: any item less

58. Injection room/area equipment

- good: syringes/needles (as per kit), 2 metal kidney dishes/bowls, sterilizer bowl, 1 pair
  cheatle forceps (shared with dressing), 1 pair dissecting forceps

- poor: any item less

59. Cleanliness of injection equipment

- good: equipment boiled after use

- poor: equipment not boiled

60. Sterilization facilities

- good: stove and fuel all available, in working condition last 3 months

- adequate: use MCH sterilization facilities

- poor: any problem of availability, condition last 3 months

61. Hand washing facilities

- good: water and soap ready and easily accessible for staff doing dressings and injections

- poor: not ready/accessible

62. Gloves

- good: available within injection/dressing room

- poor: not available

63. Staff task allocation

- good: injections being given by trained/experienced (1 year) personnel

- poor: injections being given by nurse attendants or nurse auxilliaries with no training and/or less than 1 year experience

64. Physical flow for OP clinic

- good: loop flow, separate stations in right order (consultation/registration, laboratory, treatment, drugs, exit)

- poor: any failure in flow

Only for those units with laboratories
65. Laboratory space

- good: separate area for laboratory activities available

- poor: no separate area available

66. Staff availability

- good: 1 appropriately trained member of staff assigned to undertake laboratory activities

- poor: untrained staff member undertaking laboratory tasks

67. Laboratory furniture

- good: 1 table, 1 cupboard/shelves, 1 chair

- poor: any item less

68. Laboratory equipment availability

- good: microscope, slides and cover slips available over last 3 months

- poor: any item less over last 3 months

69. Equipment cleanliness

- good: slides and cover slips clean

- poor: slides and cover slips dirty

70. Reagents available

- good: Giemsa, ZN stain, Sodium chloride saline, Lysol concentration, alcahol, immersion oil
  available last 3 months

- adequate: Giemsa, alcahol available

- poor: any item less last 3 months

71. Disinfectant

- good: available for laboratory purposes last 3 months

- poor: not available last 3 months

72. Laboratory records

- good: available and up-to-date last 3 months

- poor: unavailable or not up-to-date last 3 months

73. Laboratory activities

- good: regularly undertaking tests for stool, urine, Hb, sputum for AFB, blood slide last 3 months

- adequate: regularly undertaking tests for Hb, bloodslide last 3 months

- poor: notundertaking either Hb or blood slide last 3 months

74. Activities undertaken/reagent availability

- good: undertaking tests for which equipment/reagents available

- poor: undertaking tests for which equipment/reagents not available or
       not undertaking tests for which equipment and reagents available.

75. Furniture available

- good: 2 tables, 4 chairs, 4 benches

- poor: any item less

76. MCH equipment inventory

- good: available

- poor: unavailable

77. MCH general equipment

- good: exam bed, BP machine, stethoscope

- poor: any other item missing

78. ANC equipment

- good: adult scale, foetoscope, albustix, Hb paper, mother's card available
        and in working condition last 3 months

- adequate: adult scale, foetoscope available and in working condition last 3 months

- poor: either adult scale/foetoscope not in working condition last 3 months

79. FP equipment/supplies

- good: 2-4 speculum, pills and condoms available last 3 months

- adequate: pills and condoms available last 3 months

- poor: either pills or condoms not available last 3 months (even if speculum available)

80. Child weighing equipment

- good: child scale in good condition and growth card available last 3 months

- poor: either missing

81. Delivery area

- good: well lit/lighting available

- poor: poorly lit/no light available

82. Delivery equipment

- good: 1 delivery bed, 2 forceps, 1 scissors, 1 mucus extractor, sterile thread, needles, gloves, plastic sheeting available

- poor: any item missing

83. Equipment storage

- good: delivery equipment boiled and stored in antiseptic/disinfectant

- poor: not stored in sterile conditions

84. Emergency deliveries

- good: oxytocics available whole month each month (1988/89)

- poor: not available whole month

85. EPI equipment

- good: syringes, needles, fridge, fridge thermometer, jerrican, chalk board, constantly available last year

- poor: any problems with availability

86. Fridge temperature recording

- good: recorded constantly whilst vaccines available last month

- poor: not recorded throughout time of vaccine availability last month

87. Fridge maintenance

- good: clean now and right temp (4-8°) last month

- poor: not clean, wrong temperature for more than 2 days last month

88. Vaccine availability

- good: unexpired vaccines (BCG, DPT, measles, polio, TT) regularly available last year

- poor: problem of supply or expiry date last year

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89. Sterilization facilities

- good: sterilizer, stove available in working condition last 3 months

- poor: any problems with availability

90. Kerosene availability

- good: kerosene constantly available last year

- poor: kerosene sometimes not available last year

91. Health education timetable

- good: available

- poor: not available

92. Health education materials available

- good: available

- poor: not available

93. Health education provision

- good: talks provided daily before clinic sessions

- poor: less frequent/no talks

94. Availability of weekly activity schedule

- good: current week's schedule available

- poor: current week's schedule unavailable

95. Privacy

- good: available for AN/PP consultations

- poor: not available

96. Physical flow

- good: loop flow, stations available and in right order (registration (and weighing), health education, weighing, advice/nutrition education, immunization (some days), exit)

- poor: any failure in flow

97. Staff task allocation

- good: immunizations conducted by MCHs, HA, N/Aux with training or more than 1 year experience

- poor: N/Att or Nurse Auxilliary with no training/less than 1 year experience doing immunizations

98. Bicycle availability

- good: at least 2 bikes in working condition

- adequate: 1 bike in working condition

- poor: no bikes available or in working condition

99. Outreach equipment

- good: vaccine carriers and ice packs available

- poor: not available

100. Immunization outreach sessions

- good: sessions held monthly in nearby villages

- poor: sessions held less frequently or not at all

101. Reason for home visits

- good: clear reasons for f/up mother&children

- poor: no reason for doing hvs

102. MCH home-visiting .

- good: undertaken weekly

- poor: undertaken less frequently

103. Home visit records

- good: available

- poor: not available

104. Other home-visiting

- good: undertaken regularly by staff other than MCHs/nurse in-charge MCH

- poor: less frequently or not at all

105. School health activities

- good: visit to at least 1 school in last 2 months

- poor: less frequently

For RHCs only
106. Supervision of dispensaries

- good: undertaken monthly for all dispensaries in catchment area

- poor: any less frequency

107. OP record form supply

- good: always available (tally sheets)

- poor: irregularly/not available

108. MCH record form supply

- good: always available (MCH 2,3,5,6)

- poor: irregularly/not available

109. Catchment population details

- good: current figures (1988) displayed

- adequate: earlier figures displayed

- poor: not displayed

110. Activity records: curative care

- good: OP summary, TB/L register (where relevant) available and up-to-date

- poor: any problem of availability

111. Activity records: MCH

- good: AN, immunization (by type), PP and delivery records available and up to date

- poor: any problem of availability

For RHCs only
112. In-patient register

- good: patient register available and up-to-date

- poor: not available/up-to-date

For RHCs only
113. In-patient records

- good: details of diagnosis, treatment and length of stay available for each in-patient
        last 6 months

- poor: detailed records available for less time, or incomplete records available

114. Record use

* good/42/4 signs of recent record use (eg.list of high ranking problems for recent year are displayed, recent
       immunization coverage figures displayed, trend of recent utilization levels displayed, indications that
       records used to identify follow-up visits required)

- poor: 1 or no signs of recent record use

115. EDP utilization reporting regularity

- good: 10/12 months reports available at DHMT or health unit

- poor: less availability of reports

For government only
116. EDP drug stock record reporting regularity

- good: 10/12 months reports available at DHMT or health unit

- poor: less availability of reports

117. MCH utilization reporting regularity

- good: 10/12 months reports available at DHMT or health unit

- poor: less availability of reports

IN-PATIENT CARE

1. Wards condition

- good condition: made of bricks/blocks, no roof leaks, floor whole, walls whole

- poor condition: constructed of any other material (eg. wood or mud), roof leaks, floor broken and crumbling, walls
        cracked and crumbling

2. Water facilities

- good: available year round in/outside building from a protected source (eg. protected spring, well)

- poor: irregularly available or available only from an unprotected source (eg. river, unprotected spring)

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3. Sanitation facilities

- good: pit latrine/water borne system provided, maintained (depth/fabric condition) and clean (smell/use) for both male and female patients

- adequate: pit latrine provided and maintained, but needs cleaning; and/or only one latrine available

- poor: not provided, not maintained

4. Facility environmental cleanliness

- good: facility swept, tidy, no rubbish in or around the building

- poor: two out of three problems (unswept, untidy, rubbish lying in or around the building)

5. Nurse availability

- good: at least 2 nurses available in wards (day and night)

- adequate: at least 1 nurse available in wards (day and night)

- poor: nurse not constantly available

6. Ward rounds

- good: MA does daily check

- poor: less frequency

7. Beds and matresses

- good: at least 50% of bed complement, with matresses, available and in good condition

- poor: full complement, with matresses, not available or not in good condition

8. Bed linen

- good: linen available for every patient

- poor: linen not available for every patient

9. Medical equipment

- good: available on wards/in good condition - blood pressure machine, stethoscope, thermometer, weighing scale, bed pans/urinal bottles, catheters

- adeuqte: BP machine, stethoscope, thermometer available

- poor: any item less available/in good condition

10. Emergency equipment

- good: IV drip equipment and infusions available

- poor: any item missing

11.Emergency obstetric equipment

- good: speculum, uterine sound, forceps, catheter, curretage available

- poor: any item missing

12. Furniture

- good: available/in good condition cupboard, table, chair, screen,

- poor: any item missing

13. Basic food supplies

- good: regularly available provided by RHC

- poor: irregularly/not available

14. Patient clothes

- good: available

- poor: not available

APPENDIX 4E:
STRUCTURAL QUALITY ASSESSMENT, CRITERIA GROUPS

GROUP	CRITERIA
Curative care	space, time in unspecified duties, furniture, inventory, diagnostic equipment & cleanliness, treatment manual, privacy, drug regularity, drug timeliness, availability of: chloroquine, painkillers, penicillin, diazepam, storage unopened kit, storage open kit, dressing area furniture, dressing equipment & cleanliness, dressing area cleanliness, availability of: disinfectant availability, dressing supplies, injection furniture, injection equipment & cleanliness, sterilization facilities, washing facilities, gloves, staff task allocation, patient flow
equipment	diagnostic, dressing, injection & sterilization
drugs	drug regularity & timeliness, availability of: chloroquine, painkiler, penicillin, diazepam, disinfectant & dressing supplies
dressings	furniture, equipment & cleanliness, area cleanliness, disinfectant and supplies' availability, washing facilities
injections	furniture, equipment & cleanliness, sterilization facilities, washing facilities, gloves
laboratory	space, staff, furniture, equipment & cleanliness, reagent availability, disinfectant availability, records, activities undertaken, tests versus reagents
MCH care	space, time in unspecified activities, furniture, inventory, equipment: general, ante-natal, family planning, child welfare, delivery, immunisation, delivery lighting, delivery equipment cleanliness, oxytocics availability, fridge temperature & maintenance, vaccine availability, sterilization facilities, kerosene availability, education time-table available, education materials available, education regularly provided, weekly activity schedule available, privacy, patient flow, staff task allocation
equipment	general, ante-natal, family planning, child welfare, immunisation, delivery, sterilization, bicycle, outreach
ante-natal care	general and ante-natal equipment, privacy
family planning	general and family planning equipment, privacy
immunisation	immunisation equipment, fridge temperature & maintenance, vaccine availability, sterilization facilities, kerosene, outreach equipment, staff task allocation
child welfare	general & child welfare equipment
deliveries	general & delivery equipment, delivery lighting, equipment cleanliness, oxytocics availability
health education	timetable, materials, regular provision
In-patient care	building condition, water & sanitation facilities, cleanliness, nurse availability, ward rounds, bed mattress availability, linen availability, equipment availability, emergency general & obstetric equipment availability, furniture, food availability, patient clothes, register and cards available,
equipment	general, emergency general & obstetric
staff	nurse availability, ward rounds
General: staff	staff available generally & in emergency, time in unspecified activities, absence from work, time allocation to preventive activities, staff task allocations

infrastructure	location, building condition, pest infestation, security, water availability & distance from water source, sanitation facilities, space available, waiting area, cleanliness, emergency lighting, housing availability, uniforms, access for supervision, distance to referral unit, transport for referrals
support	contact with district management team, frequency of district support, support from health centre, feed-back, continuing education & in-service education
Outreach	bicycle, outreach equipment, outreach frequency, home-visiting frequency, reason for home visits, home visit records, other hom-visiting, school visits

APPENDIX 4F:
PROCESS QUALITY ASSESSMENT, SAMPLE SIZES

UNIT	GEN. CONS.	CHILD FEVER CONS.	STER' TION[1]	DISP. CL' NESS[1]	INJ' TION	DISP' SING[2]	AN CONS.	AN RECORD REVIEW
DS2	100	16	2	4	50		30	30
DS5	101	27			50		8	18
DS6	100	30			37		30	30
DS7	100	20			47		33	37
DS20	90	25			50		8	37
DS24	40	15		5	0		0	7
DS26	97	30			39		26	40
DS27	84	10	2		35		18	30
DS30	100	30	5	5	49		25	22
DS32	82	15			46		14	18
DS35	100	8			37		0	29
DS39	86	22	1		26		6	21
DS42	100	32			50		7	23
DS46	100	30					18	38
MS11	98	30			50		16	36
MS14	80	22			13		0	40
MS51	59	30			30	48	33	38
MS55	48	11			24	28	7	13
HC58	118	6			50		33	44
HC59	110	20			50		15	38

KEY: CONS.= consultation
         DISP. CL/NESS = dispensing cleanliness

NOTES: 1. Six observations per unit, except where noted
        2. Fifty observations per unit, except where noted

APPENDIX 4G:
PROCESS QUALITY ASSESSMENT CHECKLISTS

```
MOROGORO HEALTH SYSTEMS RESEARCH STUDY                UNIT:___

CONSULTATION PROCESS: OBSERVATION CHECKLIST           NO.OF OBSERVATION____
-----------------------------------------------

Date:_____  Observer:_____
```

		CODE (circle)

```
1.  Cadre of person observed: (write one number) ____

    [1] RMA   [2] MCHA/TRAINED NURSE   [3] UNTRAINED NURSE          1  2  3


2.  Time start:_____  Time end:_____  Length of consultation:  0-3 mins |___|     1
    (patient enters)    (talk ends)          (tick one) 3-5 mins |___|            2
                                                        5-10 mins|___|            3
                                                        10+mins |___|             4


3.  Making the patient comfortable/giving confidence       YES  NO
    --------------------------------------------------     (tick)

3.1  Is the health worker wearing a white coat or uniform?   |__|__|       y=2  n=0

3.2  Is the health worker wearing clean/tidy clothes?        |__|__|       y=2  n=0

3.3  Does the health worker welcome the patient?             |__|__|       y=1  n=0

3.4  Does the health worker greet the patient?               |__|__|       y=1  n=0

3.5  Does the patient have a chair to sit on?                |__|__|       y=2  n=0
     or, if child, sits with mother (ie. not made to stand)

3.6  Does the health worker look at the patient whilst talking?  |__|__|   y=2  n=0


4.  Registration
    ----------------------

4.1  Does the health worker record all the following in OP register?:  |__|__|   y=2  n=0
     name, age, sex, village,

4.2  Does the health worker record also make records on OPD card?      |__|__|   y=2  n=0

ANSWER THESE ONLY IF PATIENT IS A CHILD (under 5); FOR ADULTS SKIP TO Q5.

4.3  does the health worker check if already seen MCHa?               |__|__|   y=2  n=0

4.4  does the health worker check the child's card to ensure that     |__|__|   y=2  n=0
     immunizations are up-to-date and, if not, take child to MCHa?
```

5. Taking the history

FOR REATTENDANCES ONLY; FOR FIRST VISITS SKIP TO 5.9

    does the health worker
5.1 ask if any improvement since last visit? |_|_| y=2 n=0

5.2 ask if completed treatment given on first visit? |_|_| y=2 n=0

5.3 if there has been improvement, continue/renew treatment? |_|_| N/A   y=2 n=0 NA=9

FOR REATTENDANCE WITH NO IMPROVEMENT

    does the health worker
5.4 ask questions to clarify main complaint stated by patient? |_|_| y=2 n=0

5.5 ask duration of main complaint? |_|_| y=2 n=0

5.6 ask if there are other, associated symptoms |_|_| y=2 n=0

5.7 ask duration of symptoms? |_|_| y=2 n=0

5.8 ask if received any other treatment elsewhere AND, if has |_|_| y=2 n=0
    received treatment, asks what treatment received?

FOR FIRST VISITS ONLY; FOR REATTENDANCES SKIP TO 5.14

    does the health worker
5.9 ask questions to clarify main complaint stated by patient? |_|_| y=2 n=0

5.10 ask duration of main complaint? |_|_| y=2 n=0

5.11 ask if there are other, associated symptoms |_|_| y=2 n=0

5.12 ask duration of symptoms? |_|_| y=2 n=0

5.13 ask if already received treatment elsewhere AND, if has received |_|_| y=2 n=0
    treatment, asks what treatment received?

FOR ALL VISITS

    does the health worker
5.14 allow patient to explain problem without interruptions? |_|_| y=2 n=0

5.15 ask questions to ensure his/her own understanding? |_|_| y=2 n=0

5.16 notes findings on OP card? |_|_| y=2 n=0

6. Making a Physical Examination

Does the health worker:

6.1 obviously observe the patient for physical signs/symptoms? |__|__| y=3 n=0
    (looks closely at patient to observe respiration/other signs)

6.2 makes sure room is private? |__|__| y=3 n=0
    (eg. closes door, shuts windows, puts screen around patient etc.)

6.3 explain what s/he is doing? |__|__| y=3 n=0

6.4 helps patient to prepare for examination? |__|__| y=1 n=0
    (eg.if old, sick, uncertain, mother with child)

6.5 checks pulse |__|__| y=1 n=0

6.6 checks temperature (use thermometer) |__|__| y=2 n=0

6.7 checks BP |__|__| y=1 n=0

6.8 checks eyes |__|__| y=2 n=0

6.9 checks chest |__|__| y=1 n=0

6.10 for child, also checks weight |__|__| N/A   y=1 n=0 NA=9
     (by looking at mostly recently recorded weight on MCH card
     and, if no card/no recent weight actually weighing child)

6.11 continue to ask questions during examination?
                                                                  |__|__| y=1 n=0

6.12 note findings on OP card?
                                                                  |__|__| y=1 n=0

7. Other investigations (whether/not hâs lab)

Does the health worker

7.1 order a lab test? |__|__| y=1 n=0

7.2 check Hb? |__|__| y=1 n=0

7.3 use the findings of the investigation to determine treatment? |__|__| y=1 n=0
    (does not give treatment until results known)

FOR ALL PATIENTS

8. Diagnosis/Treatment

8.1 Does the health worker explain the diagnosis to the patient?
                                                                  |__|__| y=4 n=0

LOOKING AT OPD CARD

*   What diagnosis is determined?_____

*   What treatment is given?_____

    _____

    (NB.drug(s), dosage, duration)

8.2 Is the treatment appropriate for the diagnosis?

|__|__| y=6 n=0

8.3 Does the health worker note details on OP card?

|__|__| y=1 n=0

8.4 Does the health worker note details in OP register?

|__|__| y=1 n=0

9.   Treatment Explanation
     ----

*   Does the health worker explain the treatment?

|__|__| no code
                                         if n, record
IF YES, CONTINUE; IF NO, SKIP TO Q10.   0 for all below

    Does the health worker explain:

9.1 what drugs? |__|__| y=2 n=0

9.2 how often they should be taken and for how long? |__|__| y=1 n=0

9.3 how and when to be taken? |__|__| N/A (eg.dressi   y=1 n=0 NA=9

9.4 need to take the whole course? |__|__| N/A (eg.dressi   y=2 n=0 NA=9

9.5 Does the health worker ask the patient to repeat the |__|__| y=4 n=0
     instructions and, if necessary, correct any misunderstandings?

10. Referral - if referred (IF NOT REFERRED IGNORE AND CODE AS NA=9)

    Does the health worker:

    10.1 explain to the patient why they are being referred and when they
         must reach the referral centre? |__|__| N/A   y=1 n=0 NA=9

    10.2 send staff member or arrange transport? |__|__| N/A   y=1 n=0 NA=9

    10.3 write details in separate referral letter? |__|__| N/A   y=2 n=0 NA=9
         (eg.who is s/he, where does s/he come from, why is s/he being
         referred, what treatment has s/he already received)

    10.4 note referral on OP card and/or OP register? |__|__| N/A   y=1 n=0 NA=9

11. Ending

    Does the health worker:

    11.1 give health education related to the main complaint? |__|__| y=3 n=0

    11.2 explain whether/not to return for further treatment and, if
         necessary, check the patient knows when to return? |__|__| y=2 n=0

    11.3 end consultation politely? |__|__| y=1 n=0
         (eg.pole sana, nende chukua dawa n.k.)

12. Recording

    Does the health worker:

    12.1 check details recorded on OP card/in OP register? |__|__| y=3 n=0

    12.2 immediately record diagnosis on tally sheet? |__|__| y=3 n=0

    POST-OBSERVATION NOTE: tick one answer for each question

    13. Was patient: adult _____   1
                                                  child
                                                  (under 5)_____   2

    14. Was patient: first visit_____   1
                                                  reattendance
                                                  with improvement_____   2
                                                  reattendance
                                                  without improvment____   3

    15. Was patient referred?   no ___   1
                                                  yes ___   2

CONSULTATION PROCESS: FEVER IN CHILDREN MANAGEMENT CHECKLIST

Date:_____ Observer:_____

	CODE (circle one)

1. Cadre of person observed: (write one number) _____

    [1] RMA   [2] MCHa/trained nurse   [3] untrained nurse [4] MA   1 2 3 4

2. TIME START:_____ TIME END:_____ LENGTH OF CONSULTATION:
                                                    (tick one)   0-2 mins |___| 1
                                                                        3-5 mins |___| 2
                                                                        6-10 mins|___| 3
                                                                        10+mins |___| 4

3. History taking   YES NO
--------------------   (tick)
    Did the Health Worker ask:

3.1 how long has the fever been present? |__|__| y=5 n=0
3.2 has he had convulsions? |__|__| y=5 n=0
3.3 was the child exposed to measles? |__|__| y=5 n=0
3.4 has the child a cough or sore throat, difficulties in eating? |__|__| y=5 n=0
3.5 has he had diarrhoea or vomiting? |__|__| y=5 n=0
3.6 has he had ear pain, discharge, or pulling at the ears? |__|__| y=5 n=0

4. Physical Assessment

4.1 Did the health worker make any physical examination? |__|__| y=0 n=-2

    In particular, did the health worker:

4.2 take the temperature? (with thermometer) |__|__| y=2 n=0
4.3 check the weight? |__|__| y=2 n=0
4.4 check the respiration rate (hand on chest, check watch) |__|__| y=2 n=0
4.5 check the skin? (by touching, looking) |__|__| y=2 n=0
4.6 check the skin's tugour? (by pinching) |__|__| y=2 n=0
4.7 check the fontanelle? (by looking, touching) |__|__| y=2 n=0
4.8 check the ears? (by pulling) |__|__| y=2 n=0
4.9 check the mouth and throat? (by looking inside/down) |__|__| y=2 n=0
4.10 check the neck? (by touching) |__|__| y=2 n=0
4.11 check the chest? (by touching, stethoscope) |__|__| y=2 n=0
4.12 check the axillae and groin? (by touching) |__|__| y=2 n=0
4.13 check the spleen? (by touching) |__|__| y=2 n=0
4.14 check the eyes? (by obviously looking) |__|__| y=2 n=0
4.15 examine a blood slide? (by lab test) |__|__| y=2 n=0

5. What diagnosis did the health worker determine? (tick one)
----

    measles   1
    sore throat/tonsillitis   2
    otitis media   3
    pneumonia   4
    meningitis   5
    acute diarrheal disease   6
    URI   7
    malaria   8
    fever   9

    other_____

6. Appropriateness of management

    For all diagnoses, did the health worker give instructions to mother on: YES / NO

6.1 importance of fluids   y=2 n=0
6.2 importance of food   y=2 n=0
6.3 sponging for high fever   y=2 n=0
6.4 not overdressing   y=2 n=0
6.5 follow up   y=2 n=0

6.6 What treatment did the health worker prescribe?

    _____

    _____

    _____

    (drug, dosage, duration; referral; other actions)

COMPLETE LATER
7. Diagnosis process

    If the diagnosis was: Did the health worker observe/examine: YES / NO

    pneumonia   chest (or respiration); and temperature   N/A   y=30 n=0 N/A=99

    diarrheal disease   fontanelle (under 1s) or skin tugour or mouth   N/A   y=30 n=0 N/A=99

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URI (otitis media,acute tonsillitis)	all of: neck, ears, throat and temperature	|__|__| N/A	y=30 n=0 N/A=99
meningitis	neck; and fontanelle (under 1) or legs (over 1)	|__|__| N/A	y=30 n=0 N/A=99
measles	all of: mouth, eyes, chest and skin	|__|__| N/A	y=30 n=0 N/A=99
malaria/ fever	all areas/items (of Q4)	|__|__| N/A	y=30 n=0 N/A=99

COMPLETE LATER

8. Appropriateness of treatment

8.1 Did the health worker prescribe chloroquine? |__|__| y=1 n=2

8.2 If the diagnosis was: Did the health worker prescribe the correct drug:
(check drug type and other action only; not dosage/duration)

pneumonia - severe	benzyl pen inj (250.000 units IM 2or4 times/24 hr) OR refer and benzyl pen inj	|__|__| N/A \n |__|__| N/A	y=30 n=0 N/A=99 \n y=30 n=0 N/A=99
pneumonia - mild	PPF (under 1 yr - 0.2MU IM daily/5 days) (over 1 yr - 0.4MU IM daily/5 days)	|__|__| N/A	y=30 n=0 N/A=99
diarrhoeal disease	ORS \n any other drugs	|__|__| N/A \n |__|__| N/A	y=30 n=0 N/A=99 \n y=-30n=0 N/A=99
malaria	chloroquine tabs for 3 days (eg.1.5/1.5/0.5 tabs for 20kg bodyweight)	|__|__| N/A	y=30 n=0 N/A=99
	chloroquine syrup for children (5/5/2.5 mls 5kg bodyweight; 20/20/10 20kg bodyweight)	|__|__| N/A	y=30 n=0 N/A=99
	chloroquine injection for unconscious/vomiting patient (5mg per kg bodyweight)	|__|__| N/A	y=30 n=0 N/A=99
	chloroquine injection for other patients	|__|__| N/A	y=-15n=0 N/A=99

| otitis media | penicillin tablets for 7-10 days (125mg q.1.d) | | N/A | y=30 n=0 N/A=99 |
| | ear syringe/cotton wool wadding for ear | | N/A | y=15n=0 N/A=99 |

| acute tonsillitis | PPF (under 1 yr - 0.2MU IM daily/7 days) (over 1 yr - 0.4MU IM daily/7 days) OR | | N/A | y=30 n=0 N/A=99 |
| | acetysallic acid tablets (0.25,0.5 or 1 tab. 6 hourly) | | N/A | y=30 n=0 N/A=99 |

| meningitis | Refer | | N/A | y=30 n=0 N/A=99 |

measles				
- mild	Vit A (1-2 years, 2/2/2;over 1 year 4/4/4; third dose after 14 days) AND check vaccination status		N/A	y=30 n=0 N/A=99
- severe	Vit A, refer AND check vaccination status		N/A	y=30 n=0 N/A=99

8.3 was the dose and duration of drugs prescribed, correct according to the above guidelines? | | N/A | y=0 n=-15N/A=99

FOR OBSERVER TO ANSWER LATER
9. Do you agree with the diagnosis? If not. why not?

FOR OBSERVER TO ANSWER LATER
10. Do you agree with the prescription? If not. why not?

NURSING PROCEDURE: INJECTION CHECKLIST

Date:_____   Observer:_____

1. CADRE OF PERSON OBSERVED:_____ (write number)

    [1] UNTRAINED NURSE   [2] TRAINED NURSE   [3] RMA   CODE
                                                              (circle)

2. Time start:_____ Time end:_____ Total length: 0-10mins___   1
                                                    10-15mns____   2
                                                    over 1mins____   3
    STERILIZATION PROCEDURE - DAILY CHECK

3. What sort of sterilizer is used?   kerosene___   1
    (tick one)   charcoal___   2
                                              wood_____   3

                                              other_____

                                              YES / NO

4. Does the nurse collect all the instruments together |__|__| y=1 n=0
    before sterilizing?
    (cheatle forceps, 2 large kidney dishes, 1 gallipot,
    syringes and needles, dissecting forceps)

5. Does the nurse test the needles for sharpness and |__|__| y=1 n=0
    blockage?

6. Does the nurse wash the equipment in soapy water? |__|__| y=1 n=0
7. Does the nurse rinse the equipment in clean water? |__|__| y=1 n=0

8. Is enough water put in to completely cover all |__|__| y=1 n=0
    instruments?

9. Are the instruments kept in boiling water for 20 |__|__| y=1 n=0
    minutes?
    (NB: 20 mins AFTER brought to boiling point)

10. Are the instruments extracted from the sterilizer with |__|__| y=1 n=0
    sterile forceps?
    (previously boiled or sterilized with solution)

11. Is the equipment kept in sterile containers during |__|__| y=1 n=0
    use?
12. Is the equipment kept covered with sterile coverings |__|__| y=1 n=0
    during use?

13. If sterile equipment all used before end of day, is the |__|__| y=1 n=0
    equipment re-washed?
14. If sterile equipment all used before end of day, is the |__|__| y=1 n=0
    equipment re-boiled for 20 mins?

15. Is epinephrine available in the injection room? |__|__| y=1 n=0

MOROGORO HEALTH SYSTEMS RESEARCH STUDY   HEALTH UNIT_____

NURSING PROCEDURE: DISPENSING CHECKLIST

Date:_____   Observer:_____

1. CADRE OF PERSON OBSERVED:_____ (write number)   CODE
                                                                    (circle)
    [1] UNTRAINED NURSE   [2] TRAINED NURSE   [3] RMA

2. Time start:_____ Time end:_____ Total length:

    DISPENSING AREA - DAILY CHECK   YES/ NO
                                                     (tick)

3. Is the area swept each morning? |__|__| y=1 n=0

4. Is the area mopped each morning? |__|__| y=1 n=0

5. Is the area dusted each morning? |__|__| y=1 n=0

6. Do container labels correctly reflect their contents? |__|__| y=1 n=0

7. Do the drug containers have tightly fitting lids? |__|__| y=1 n=0

8. Are the drug containers arranged in groups: |__|__| y=2 n=0
    liquids, tablets, powders?

9. Are drinking water and cups available for the patient |__|__| y=2 n=0
    to take the first dose?

10. Are there cups/something for the consumption of liquid |__|__| y=1 n=0
    medicines?

11. Are soapy water, clean water and a dry towel available |__|__| y=2 n=0
    to wash the cups after use?

12. Is there a clean surface onto which to put the cup |__|__| y=1 n=0
    between use?

13. Are there plastic bags into which to place the drugs? |__|__| y=1 n=0

14. Does the nurse have a pen with which to write |__|__| y=1 n=0
    treatment information on the bags?

15. Are clean water, soap and a hand towel available for |__|__| y=1 n=0
    washing hands?

16. Are the containers kept in good order during the day? |__|__| y=2 n=0

```
MOROGORO HEALTH SYSTEMS RESEARCH STUDY          HEALTH UNIT____

NURSING PROCEDURE: DISPENSING CHECKLIST          NO. OF OBSERVER:___
-------------------------------------


Date:_____   Observer:_____ ʼ


1.  CADRE OF PERSON OBSERVED:_____ (write number)

    [1] UNTRAINED NURSE   [2] TRAINED NURSE   [3] RMA        |   CODE
                                                             |   (circle)
                                                             |
2.  TIME START:_____ TIME END:_____ TOTAL LENGTH:  0-3 mins_____  |    0
    (card given to nurse) (talk ends)                  3-5 mins_____   |    1
                                                       over 5 mins____  |    2
                                                             |
    DOES THE DISPENSER:                           YES/ NO    |
    ------------------                            (tick)     |
                                                             |
3.  GREET THE PATIENT WITH RESPECT?                |__|__|   |  y=1 n=0
    (eg. abari/shikamoo)                                     |
                                                             |
4.  CHECK THE PRESCRIPTION IS FOR THE RIGHT PATIENT? |__|__|  |  y=2 n=0
    (by asking name of patient and checking against name     |
    on prescription)                                         |
                                                             |
5.  ENSURE RIGHT MEDICINE FOR RIGHT PATIENT                  |
                                                             |
5.1 take time to read prescription, if necessary ask |__|__| |  y=1 n=0
    prescriber for clarification?                            |
                                                             |
if the right drug is NOT available -                        |
                                                             |
5.2 ask the prescriber for an alternative or tell the |__|__| N/A | y=2 N/A
    patient where they can buy the drugs?                    |
5.3 give nothing and give no advice?            |__|__| N/A   |  y=-2 N/A
                                                             |
if the right drug or an alternative is available:           |
                                                             |
5.4 ask if the patient has used the drug before and if |__|__| N/A | y=1 n=0 N/A
    there were any side effects? and, if necessary, inform   |
    prescriber?                                              |
                                                             |
checking against chetti                                     |
                                                             |
5.5 give the correct drug to the patient?       |__|__|      |  y=2 n=0
                                                             |
5.6 count the dose out correctly?               |__|__|      |  y=2 n=0
    (number of pills, mg of liquid)                          |
                                                             |
6.  ENSURE PROPER USE OF DRUG?                               |
                                                             |
6.1 ensure that the first dose is taken?        |__|__|      |  y=2 n=0
```

NURSING PROCEDURE: INJECTION CHECKLIST

Date:_____ Observer:_____

		CODE (circle)

1. CADRE OF PERSON OBSERVED:_____ (write number)

    [1] UNTRAINED NURSE   [2] TRAINED NURSE   [3] RMA   1 2 3⁻

2. TIME START:_____ TIME END:_____ TOTAL LENGTH: 0-3 mins_____   1
    (card given to nurse) (talk ends)   (tick one)   3-5 mins_____   2
                                                        over 5 mins_____   3

    DOES THE NURSE: YES/ NO
    ----------------   (tick)

3. GREET THE PATIENT WITH RESPECT? |__|__| y=1 n=0
    (eg.shikamoo for elder)

4. CHECK THE PRESCRIPTION IS FOR THE RIGHT PATIENT? |__|__| y=1 n=0
    (check name)

5. ENSURE RIGHT INJECTION FOR RIGHT PATIENT?

5.1 check the prescription to ensure own understanding? |__|__| y=1 n=0
    (eg.read first, ask the prescriber for clarification)

IF THE RIGHT DRUG IS NOT AVAILABLE,
5.2 ask the prescriber for an alternative or tell the |__|__| y=2 n=0
    patient where they can buy the drugs?
5.3 give nothing and give no advice? |__|__| y=minus2n=0

IF THE RIGHT DRUG OR AN ALTERNATIVE IS AVAILABLE:
5.4 ask if the patient has used the drug before and if |__|__| y=1 n=0
    there were any side effects? and, if necessary, inform
    prescriber?

5.5 give the correct drug to the patient? |__|__| y=2 n=0

6. FOLLOW CORRECT INJECTION PROCEDURE?

6.1 ensure patient's privacy? |__|__| y=1 n=0
    (eg.close doors, close shutters, put screen around
    patient)

6.2 wash hands before injecting? |__|__| y=1 n=0

6.3 check sterile needle and clean syringe are ready? |__|__| y=2 n=0

6.4 explain what s/he is about to do? |__|__| y=1 n=0

6.5 reassure patients? |__|__| y=1 n=0
    (re-explain, give time to be quiet)
    help mother to quiten child gently?

6.6 ensures no air in syringe? |__|__| y=1 n=0

6.7 draws the correct amount of the drug? |__|__| y=1 n=0

6.8 chooses the correct injection site? |__|__| | y=2 n=0
    (measures with fingers upper, outer, quadrant of buttock) |

6.9 cleans the injection site with antiseptic or boiled |__|__| | y=1 n=0
    water? |

6.10 IF AMINOPHYLINE, plunges slowly? |__|__| N/A | y=2 n=0

7. ENSURE ADEQUATE CLEANLINESS?

7.1 puts needle for re-cleaning and re-sterilization? |__|__| | y=1 n=0

7.2 puts syringe for re-cleaning and not immediate re-use? |__|__| | y=1 n=0

7.3 puts dirty swabs in dustbin for later disposal? |__|__| | y=1 n=0

MOROGORO HEALTH SYSTEMS RESEARCH STUDY   UNIT:____

ANTENATAL CONSULTATION CHECKLIST   NO. OF OBSERVATION:_____

                                                MOTHER'S NAME_____

DATE:_____   OBSERVER:_____

                                                                | CODE
                                                                | (circle)
1. Cadre of person observed: (write number)_____ |
                                                                |
    [1] MCHa [2] Nurse Midwife [3] Untrained nurse |
                                                                |
    Consultation |
2. Time start:____ Time end:_____ Total length:_____ 0-15 mins_____ | 1
                                          (tick one)15-30 mins_____ | 2
                                                     over 30 mins____ | 3
                                                                |
                                                                |
    Visit |
3. Time start:____ Time end:_____ Total length:_____ 0-60 mins_____ | 1
                                          (tick one)1-2hr_____ | 2
                                                    over 2 hr____ | 3
                                                                |
                                                                |
4. Is this: first visit____[0] reattendance____[1] |
    (tick one) | 1   2
                                                                |
                                          YES / NO |
                                          (tick) |
5. Making the mother comfortable |
    -------------------------------- |
    does the health worker: |
                                                                |
5.1 greet the mother respectfully? |__|__| | y=1 n=0
    (eg.shikamoo) |
                                                                |
5.2 offer mother chair to sit on? |__|__| | y=1 n=0
                                                                |
5.3 smile at the mother? |__|__| | y=1 n=0
                                                                |
5.4 look at mother whilst talking? |__|__| | y=1 n=0
                                                                |
6. History taking |
    ----------------- |
                                                                |
FOR FIRST VISITS ONLY; FOR REATTENDANCES SKIP TO Q5.16 |
                                                                |
    does the health worker ask about: |
6.1 amenorrhea |__|__| | y=1 n=0
6.2 morning sickness? |__|__| | y=1 n=0
6.3 swelling of feet? |__|__| | y=1 n=0
                                                                |
6.4 does the health worker ask date of last menstrual |__|__| | y=1 n=0
    period? |

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does the health worker ask about:

6.5 parity? |__|__| y=1 n=0
6.6 no.of live children? |__|__| y=1 n=0
6.7 H/O abortion,stillbirth,prematurity or neonatal deaths? |__|__| y=1 n=0
6.8 details of each delivery (when,where,attendant)? |__|__| y=1 n=0
6.9 H/O complications during labour? |__|__| y=1 n=0

6.10 does the health worker ask about family history of |__|__| y=1 n=0
     chronic illness?

     does the health worker ask about:
6.11 diet history? |__|__| y=1 n=0
6.12 appetite? |__|__| y=1 n=0

6.13 does the health worker discuss family planning methods |__|__| y=1 n=0
     used?

6.14 does the health worker discuss history of STDs? |__|__| y=1 n=0

6.15 does the health worker ask the mother to estimate the |__|__| y=1 n=0
     current length of pregnancy?

6.16 does the health worker give the mother time to explain? |__|__| y=1 n=0

FOR REATTENDANCES ONLY; FOR FIRST VISITS SKIP TO Q6.

     does the health worker ask about:

6.17 morning sickness? |__|__| y=1 n=0
6.18 swelling of feet? |__|__| y=1 n=0
6.19 discharge/bleeding? |__|__| y=1 n=0
6.20 appetite? |__|__| y=1 n=0

6.21 does the health worker ask the mother to estimate the |__|__| y=1 n=0
     current length of pregnancy?

6.22 does the health worker allow the mother time to explain? |__|__| y=1 n=0

7.   Height and Weight Measurement

7.1 does the health worker check the weighing machine? |__|__| y=1 n=0

7.2 does the health worker correct the machine? |__|__| y=1 n=0

7.3 is the exact weight recorded? |__|__| y=1 n=0

7.4 is the mother informed of her weight? |__|__| y=1 n=0

7.5 is weight measurement discussed with mother, in terms
     of weight gain/loss since previous visit and/or weight
     compared to period of gestation, and implications? |__|__| y=1 n=0

7.6 is height recorded? |__|__| y=1 n=0
     (once during pregnancy - check records for reattandance)

8. Is BP checked/recorded? |__|__| | y=1 n=0
----------------------------- |

9. General Physical Examination |
---------------------------------- |
9.1 is a full head to toe examination done? |__|__| | y=1 n=0

    are the following specifically checked: |

9.2 eyes? |__|__| |
9.3 mucous membranes? |__|__| | y=1 n=0
9.4 pedal oedema? |__|__| | y=1 n=0
9.5 pulse? |__|__| | y=1 n=0

9.6 does the health worker help the mother to get on to |__|__| | y=1 n=0
    the examination bed/undress as necessary? |

9.7 does the health worker explain what she is doing to |__|__| | y=1 n=0
    the mother, why she is doing it and what she finds? |

10. Obstetrical Examination |
------------------------------ |

    are the following done: |

10.1 inspection? |__|__| | y=1 n=0
10.2 palpation? |__|__| | y=1 n=0
10.3 auscultation for foetal heart sounds? |__|__| | y=1 n=0

10.4 does the health worker explain what she is doing to |__|__| | y=1 n=0
    the mother, why she is doing it and what she finds? |

11. Is Hb estimated? |__|__| | y=1 n=0
---------------------- |

12. Is urine tested for albumin? |__|__| | y=1 n=0
-------------------------------------- |

CHECK CARD TO SEE IF STILL DUE TO COMPLETE COURSE; CODE 9 IF NOT |

13. Tetanus Toxoid Administration |
---------------------------------- |

13.1 does the health worker discuss the importance of TT? |__|__| N/A | y=1 n=0 NA=9

13.2 is the immunisation status checked and given if.due? |__|__| N/A | y=2 n=0 NA=9

13.3 does the health worker check if mother knows when next |__|__| N/A | y=1 n=0 NA=9
    dose due?

14. Is any individual health education given to the mother? |__|__| | y=1 n=0
--- |

15. Recording |
---------------- |

15.1 are notes correctly recorded on mother's card? |__|__| | y=1 n=0
15.2 is tally sheet completed at same time? |__|__| | y=1 n=0

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16. **Prescription and Dispensing**

16.1 is the treatment explained to the mother? |__|__| N/A   y=1 n=0 NA=9
     (how often to be taken and for how long, how and when
     to be taken, possible side-effects)

16.2 does the health worker ask the mother to repeat the |__|__| N/A   y=1 n=0 NA=9
     instructions and correct any misunderstandings?

17. **Next Visit/Ending**

17.1 does the health worker inform the mother of the next |__|__| y=1 n=0
     visit?

17.2 does the health worker check that the mother knows |__|__| y=1 n=0
     when the next visit is and correct any
     misunderstandings?

17.3 does the health worker end the visit politely? |__|__| y=1 n=0

MOROGORO HEALTH SYSTEMS RESEARCH STUDY   UNIT:

ANTENATAL RECORDS REVIEW

Date:_____ Reviewer/Interviewer:_____

1. Record available is proper card_____[1]exercise book_____[2] both____[3]
   (tick one)

CODE (circle)
1
2
3

2. History

    (ask the mother the following questions and note her answers, check whether records correctly completed)

	MOTHER RESPONSE	RECORD CORRECT?	CODE (circle)
	YES / NO	YES / NO	
2.1 no.of previous deliveries? (write number)	__	|__|__|	y=1 n=0
2.2 children now alive? (write number)	__	|__|__|	y=1 n=0
2.3 how old is mother: under 16?	|__|__| |	|__|__|	y=2 n=0
2.4 how old is mother: over 35?	|__|__| |	|__|__|	y=2 n=0
2.5 have you had any leg problems?	|__|__| |	|__|__|	y=2 n=0
2.6 (how many other pregnancies?) ...over 8?	|__|__| |	|__|__|	y=2 n=0
2.7 any problems of last delivery?	|__|__| |	|__|__|	y=2 n=0
2.8 any problem in third stage of last labour?	|__|__| |	|__|__|	y=2 n=0
2.9 date of last menstrual period? (write date)	_____	|__|__|	y=1 n=0
2.10 (when was the last delivery?)...over 10 years ago?	|__|__| |	|__|__|	y=2 n=0
2.11 was your last delivery by Caesarian section?	|__|__| |	|__|__|	y=2 n=0
2.12 was your last pregnancy a stillbirth?	|__|__| |	|__|__|	y=2 n=0
2.13 (how many abortions have you had)...more than 3?	|__|__| |	|__|__|	y=2 n=0
2.14 any problems this pregnancy? (eg.bleeding)	|__|__| |	|__|__|	y=2 n=0
2.15 have you been told that baby very large or very small?	|__|__| |	|__|__|	y=2 n=0
2.16 do you have any history of heart, diabetes etc.problems?	|__|__| |	|__|__|	y=2 n=0

3. At how many weeks was first visit?____

less than 12 weeks___ | 1
12-16weeks ___ | 2
16-20 weeks ___ | 3
over 20 weeks ___ | 4

4. IF LATER THAN 16 WEEKS, ASK: why did you not come sooner?

---

5. Do records show that mother has regularly attended since first visit? |__|__| y=1 n=0

(AT LEAST, once per month 16-32 weeks, twice per month 32-36 weeks, every week 36-40 weeks)

6. IF NOT, ASK: why have you not come each month?

---

7. Is height recorded? |__|__| y=1 n=0

8. IF LESS THAN 150 CM is height recorded as risk factor? |__|__| N/A   y=2 n=0 NA=9

9. Is expected date of delivery recorded? |__|__| y=1 n=0

10. Does mother give correct answers? (CHECK ANSWERS AGAINST CARD)   YES / NO

10.1 is your weight ok? (static/increasing or falling) |__|__| y=1 n=0

10.2 is your BP ok? (too high or ok) |__|__| y=1 n=0

10.3 is your Hb ok? (too low or ok) |__|__| y=1 n=0

10.4 do you need another TT dose and,if so, when? |__|__| y=2 n=0

10.5 when should you come again? |__|__| y=2 n=0

10.6 do you have any problems with this pregnancy and, if so, what? |__|__| y=2 n=0

10.7 do you know your expected date of delivery? (month) |__|__| y=1 n=0

11. What factors will influence whether mothers
    deliver in this dispensary?

    _____

    _____

12. Are the following recorded for every visit?
    --   YES / NO

12.1 weight |__|__| y=1 n=0

12.2 BP |__|__| y=1 n=0

12.3 Hb estimation |__|__| y=1 n=0

12.4 albumin |__|__| y=1 n=0

12.5 swelling of legs |__|__| y=1 n=0

12.6 mother's estimate of weeks |__|__| y=1 n=0

12.7 health worker's estimate of weeks |__|__| y=1 n=0

12.7 position of foetus |__|__| y=1 n=0

12.9 foetal heart heard after 16 weeks |__|__| y=1 n=0

13. If Hb fell below 60% at any visit, was iron or |__|__| N/A   y=1 n=0 NA=9
    folic acid given?
    ----

14. Is Tetanus Toxoid immunisation up-to-date? |__|__| y=2 n=0

         (ie.first dose at first visit, second dose 4
         weeks after 1st visit, third dose 4 weeks after
         2nd dose; OR 1 booster dose only)

15. Have these risk factors been identified and
    recorded from regular visits?

15.1 BP above 140/90 |__|__| N/A   y=2 n=0 NA=9

15.2 Hb below 60% |__|__| N/A   y=2 n=0 NA=9

15.3 albumin and sugar |__|__| N/A   y=2 n=0 NA=9

15.4 swelling of legs |__|__| N/A   y=2 n=0 NA=9

15.5 over 40 weeks of pregnancy |__|__| N/A   y=2 n=0 NA=9

15.6 twins/abnormal lie (at 38 weeks or later) |__|__| N/A   y=2 n=0 NA=9

16. Has family planning been discussed with mother? |__|__| | y=1 n=0
-- |
                                                                      |
17. Have dates of "next visit" been recorded at |__|__| | y=1 n=0
    each visit? |
-- . |
                                                                      |
18. Has health worker noted any comments on the card? |__|__| | y=2 n=0
-- |

*   What comments are noted?

_____

_____

APPENDIX 4H: PROCESS QUALITY ASSESSMENT, CRITERIA GROUPINGS

PROCEDURE	MINIMUM CARE	PROCESS ASPECTS	CARE ASPECTS
General consultation	wearing clean clothes, greeting the patient politely, completing the OPD card, checking if a child has attended the MCH clinic and if their immunizations are up-to-date, the full range of history questions, aspects of the examination, checking Hb and using the result for diagnosis, the full range of diagnosis criteria, aspects of explaining the prescription to the patient (and of referral practice), explaining if and when necessary to return, checking the patient register is correctly completed.	introduction and initial/final recording = wearing clean clothes and white coat, welcoming and greeting patient, giving patient seat, looking at patient whilst talking, recording relevant details in OP register and on OP card at start and end of consultation; for a child, checking if child has been taken to MCH clinic, checking child's card to see if immunizations up-to-date and if child needs to return to clinic history-taking = asking relevant questions politely, with different questions for first visits, re-attendances who have improved since last visit and re-attendances who have not improved, ensuring own understanding and recording details examination = undertaking, with politeness, a range of examinations to allow appropriate diagnosis eg.respiration, pulse, temperature, BP, eyes and ordering relevant laboratory tests (eg.Hb), and recording details diagnosis = explaining the diagnosis to the patient and recording it in OP register and on OP card, and prescribing correctly (according to EDP guidelines) for the identified diagnosis drugs = explaining drugs given: giving full explanation of drugs prescribed and ensuring patient's understanding referral = explaining the need for the referral to the patient, giving assistance in getting transport, writing a full referral letter and recording details correctly end = giving personal health education, explaining if and when to return again, saying goodbye politely	technical = all parts of the consultation process excluding issues of recording and attitudes recording = all parts of the consultation process where notes should be made either on the OP card or in the OP register attitudes = all parts of the consultation process where the provider should show politeness, explain things to the patient or be helpful to her/him

Child fever consultation	not applicable	history-taking = specific areas of history relevant to the complaint "fever" for children that should be asked in any consultation physical assessment = a range of examinations that should be undertaken to allow correct diagnosis management = areas of non-drug management that should be advised to parents diagnosis = process for each diagnosis, an assessment of whether the physical examination undertaken was sufficient to permit that diagnosis to be clearly determined treatment = an assessment of whether the treatment given was correct according to EDP guidelines for the diagnosis recorded.	not applicable
Sterilization	washing equipment with clean water, boiling equipment for 20 mins, using sterile forceps to take equipment out of the water, epinephrine available in the injection room	not applicable	not applicable
Dispensing cleanliness	good arrangement of drug containers at start and maintained throughout the day, drinking water and cups available, water and soap to wash drinking cups available	not applicable	not applicable
Injections	checking the prescription is for the right patient, reading the prescription carefully, giving the right drug to the patient, checking the syringe and needle are clean, checking no air in syringe, taking the right amount of the drug, choosing the right injection site, cleaning the injection site, explaining if and when necessary to return	politeness = saying hello and goodbye politely preparation = checking the prescription is for the right patient and that the right drug is prepared for the patient injection = the process of actually administering the injection - ensuring privacy, ensuring use of clean needle and syringe, explaining to and helping the patient, checking no air in the syringe, taking the right amount of the drug, choosing the right injection site and washing it before injecting cleanliness = putting syringe and needle for adequate cleaning, throwing away swab explanation = explaining if necessary to come again, what side effects might be seen, getting patient to repeat the instructions and correcting where necessary	technical = technical aspects of preparation, cleanliness and explanation attitudes = saying hello and goodbye politely, ensuring privacy, explaining to and helping patient

Dispensing	checking prescription matches patient, reading prescriptions carefully, giving the right drug, counting dose out correctly, making sure takes first dose at dispensary, telling how much of drug to take, how many times per day to take it, and over how many days to take it.	politeness = saying hello and goodbye politely preparation = checking the prescription is for the right patient and that the right drug is prepared for the patient explanation = ensuring the first dose is taken, explaining the details of how to take the rest of the drug course, repeats explanation if necessary, and ensuring the patient knows not to give the drug to another person repetition = getting the patient to repeat the instructions	technical = preparation, explanation and repetition attitudes = politeness
Ante-natal consultation	history-taking, measuring height and weight, level checking BP, general physical and obstetrical examination, administering tetanus toxoid, recording on card and tally sheet, explaining how to use any drugs given (generally excluding points of good attitude, and activities known to be in general difficult to do eg.testing Hb and urine)	introduction = greeting the mother, giving her a chair, listening to her and looking at her when she talks history = taking a complete history at first visit, with a shorter list of questions to be asked at repeat visits measurements = height, weight, BP, Hb and urine examination = full general physical and obstetrical examination tetanus toxoid = explaining the importance of TT, giving it during consultation when necessary and reminding mother when she next needs to get TT education = giving personal health education, reminding mother when to return and the importance of doing so records = filling mother's card and tally sheet correctly drug = where drugs are give, making full explanation to mother of how to use them and ensuring that mother understands the instructions	technical = measurements, examinations, Hb and urine testing, giving TT, personal health education, explaining drug use and ensuring mother knows when to return records = filling mother's card and tally sheet correctly attitudes = greeting, listening and giving time to mothers, explaining examinations to mother, helping her, saying good-bye politely

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Ante-natal record review	recording of history, height, estimated date of delivery, regular measurements (eg.BP, weight - except Hb and urine), noted that folic acid given if Hb less than 60%, TT up-to-date, risk factors identified correctly (except those associated with measuring Hb or urine)	history = all relevant items of history recorded correctly examination = height recorded and elements of examination regularly recorded (eg.weight, BP etc) knowledge = mother's knowledge of child size, weight, BP, Hb, need for TT, date of return, date of expected delivery matches the information recorded drug = iron given when necessary <u>and</u> TT up-to-date record = risk factors identified correctly, as indicated from other information recorded	technical = history recorded correctly, height recorded, frequent measurements regularly undertaken, folic acid given when necessary, TT up-to-date, records = expected date of delivery recorded, risk factors correctly identified, date of next visit recorded, nurse made other comments attitudes = areas where mother's knowledge assessed

APPENDIX 4I:
COMMUNITY SATISFACTION ASSESSMENT, GUIDELINES AND QUESTIONNAIRE

FOCUS GROUP DISCUSSIONS

1.Preparation

* invite participants a few days in advance
* explain briefly the nature of the meeting
* confirm the date, time and place of the meeting

2.The Facilitator

* responsible for guiding and encouraging discussion by all participants of research issues
* use outline of issues to keep session focussed, but be flexible in its use (eg.not sticking to its order)
* adopt a lively, interested manner - friendly and sensitive
* introduce each topic with questions to provoke discussion
* do not express your own views on an issue but rather encourage participants to agree/disagree with what each other is saying
* if asked a direct question, try not to answer but rather ask it of other participants
* watch all participants and try and ensure that each person joins in
* observe the way people sit or make gestures in order to see what they are thinking but not saying (eg.bored, angry etc), and act on that in encouraging discussion
* turn discussion away from people who are dominating, by asking direct questions of others or gently suggesting that others also have something to say
* link comments of different participants so as to show things in common or differences between them
* summarize discussions from time to time to check your understanding and to provoke further discussion
* be flexible - pick up issues as they come in the discussion rather than in the order of the guide
* move discussion along from issue to issue and avoid spending too long on any one point
* use a quiet but interested tone of voice, show understanding of their views, develop their trust in you
* as you sense their acceptance of you, probe issues more deeply
* try and reach the situation where they are discussing amongst themselves and take no notice of you.

3.The Recorder

* mostly an observer, recording the discussions in a way that is helpful for later analysis
* note date of meeting; time began, time ended; name of community; place

where meeting held and whether likely to influence dsicussions (comfortable, private etc); number and description of participants
* observe and note all discussions (identifying words of participants themselves in quotation marks); who agrees and disagrees; do not add your opinions on the issues but do give your impressions of the discussions, clearly identifying them as your ideas and not part of the discussion
* observe and note whether people are participating or not, what interruptions or distractions there are, when they laugh, when they seem reluctant to answer etc.
* observe and note when the facilitator is not in control of the meeting (and, if possible, why)
* operate the tape recorder
* support the facilitator by identifying where someone's comment has not been heard
* if an issue has been forgotten, point it out
* if a related issue seems relevant, point it out.

3. Opening the discussion - facilitator

* introduce self and recorder, explain what each will do
* explain tape recorder
* ask each person's name; try to remember and use them
* explain purpose of meeting (ie.to get their views about health and health care, in order to better understand their views, to develop ideas about how to improve health care, to feed-back to district, regional and national levels)
* explain nature of meeting ie.discussion in which everyone has important contribution to make
* ask that people should stick to one issue at a time and that one person at a time should speak
* start discussion by an "easy-to-answer" question that everyone should answer (eg.how many children, how long lived in village).

4. Ending the meeting - the facilitator

* explain that meeting is about to end and ask each person in turn whether they have any additional comments
* thank participants, stress again purpose of meeting and to whom summary of their discussions will be directed
* listen for additional comments as meeting breaks up.

5. Note taking - the recorder

* note basic information about meeting at start
* have separate pages for each issue of discussion and note on that page only
* divide page into three columns: in first note specific question of guideline to which discussion related; in second note discussions, including words of participants, summaries of opinions etc; in third note observations about the way discussions are going
* after meeting write up notes more fully - use tape recorder to help remember points raised, ensure that notes are based on discussion outline, clearly identify interesting comments and things that happened during the meeting, clearly identify what was actually said or done during the meeting and what are your impressions
* in full notes try to use English, if possible (mixed with Swahili is ok!!).

DETAILED INTERVIEW AND CONVERSATION TECHNIQUES

1. Preparation

* briefly outline purpose of interview
* arrange convenient time for interview, when not necessary to rush discussion

2. Introduction

* introduce yourself and the purpose of the study (find out about how health system is working)
* ask for assistance in understanding community views about health and health care, as important to knowing whether health system is addressing their needs
* explain nature of interview (flexible, not question and answer only, various topics to cover etc)
* explain need to make some notes during interview
* explain purpose of tape recorder

3. Approach

* ask questions to guide or prompt discussion
* use interview outline to ensure that relevant topics are covered, but do not let its use prevent the discussion moving as naturally as possible - like a conversation
* do not comment on any discussions held with anyone else in the village
* be neutral in your response to direct questions, turn the question back to the interviewee wherever possible
* do not ask questions in a form which will influence the answer given (eg. why is the dispensary bad?)
* do not move too quickly from issue to issue, try to probe the interviewee even if s/he is reluctant to discuss something (use phrases like "why?", "how did you feel about that?")
* where someone is very reluctant to discuss an issue do not push too hard
* try not to allow the interviewee to give general answers only, but rather encourage specific examples (eg.of good or bad experiences)
* repeat questions in different forms if you're not sure whether you understood the answer
* summarize discussion from time to time to check you have understood correctly and to re-direct conversation
* be patient: do not rush the interviewee and, if necessary, allow him/her to deal with urgent needs (eg. a mother responding to her children)
* use a quiet tone of voice and a natural approach to the interviewee

4. Ending

* indicate that drawing to a close and ask for any final comments
* thank person and re-state purpose of study and use of information

5. Notes

* note person, place, time start and time end
* during discussion note important or particularly interesting points raised - relative to issues of interest and as perceived by interviewee (eg.important problem/strength of dispensary)

* note interesting phrases, words used by interveiwee to describe relvant issues
* if asked, explain what and why writing (may encourage further discussion)
* if relevant, note issues where some reluctance to answer
* later same day (preferably immediately) write up full notes, using tape recorder to help memory
* write notes up by dividing each page used into three columns: in first note specific question of guideline to which discussion related; in second note discussions, including words of person, what she/he thought was especially important; in third note observations/impressions of the discussions, how person reponded, where reluctant to answer (consider why), interruptions of interview
* clearly identify what was said as part of the interview and what your impressions of it are
* if possible, translate into English (mixed English/Swahili ok!!).

DETAILED GUIDELINES FOR FOCUS GROUP DISCUSSIONS AND FOR IN DEPTH INTERVIEWS

1. Introductory remarks

> (It is very important to spend a period of time in general conversation/"small talk" and in introducing yourselves and the study before the actual interview or group discussion takes place)

2. Main health problems

   a. Please say something about what the main health problems are in this village.

   b. Please comment on what people do (where do they go) to solve their health problems.

   c. Do people use different health resources to solve different types of health problems?

3. Beliefs on disease causation

   a. Please say something about how diseases are caused.

   b. Are there different types of causes for different diseases (or for any one disease)? What are they?

   c. Can one disease have more than one cause? Please explain

   d. Can the action of other people be a cause of disease? (Or: Do you agree with the following statement:"Illness is caused by other people")

   e. Can your own actions (misdeeds, sins etc) cause disease? Please say something about this. (Or: Do you agree with the following statement: "Illness is caused by your own misdeeds.")

   f. Do you agree with the statement: "Illness is caused by God."

   g. Please say something about the connection between what is believed to be a disease cause and the use of health resources (Do different disease causations motivate use of different health resources?)

   h. Are different types of health resources (dispensary traditional healer) used to resolve the same health problem? Please explain.

4. Comments on _____ dispensary

   a. Would you please make some general comments about

this dispensary?

b.   What are the services provided at this dispensary?

c.   What is good about this dispensary?

d.   What is not good about it?

e.   How can the dispensary be improved?

f.   Please say something about the capabilities of the dispensary staff.

g.   Please say something about the attitude of the dispensary staff.

h.   Do you know about any outreach services provided by the _____dispensary? (For example, immunization services in the village) Please explain.

i.   Does the dispensary provide services in case of an emergency? Please explain.

5.   Comments on the _____health centre.

a.   Please say something about the services at the _____health centre (including the OPD, the IPD and MCH services)

b.   How are the services at the HC different from those at the dispensary?

c.   Do people go directly to the HC or do they only go when they are referred there by the dispensary? Please discuss.

d.   What is good about the health centre?

e.   What is not good about the health centre?

f.   How can the health centre be improved?

6.   The use of other health resources.

a.   In addition to home remedies and the_____ dispensary, what other resources do people use to solve their health problems? (for example, shop medicine, traditional healers, mission facilities, etc) Please explain.

b.   Do you use some of these other resources? Why, why not, please explain.

c.   Are these resources better than (how are they different from) the _____ dispensary. Please explain.

d.   What are some of the reasons why villagers will go elsewhere than to the _____ dispensary?

e.   What are the main factors which influence people in using one health resource rather than another? (for example, does the type and seriousness of an illness influence the tzpe of health resource used?)

f.   Please say something about the differences between mission and government health facilities.

g.   Do people sometimes go directly to the hospital without first having been referred there? Please explain.

7.   Preventive services

a.   Would you please say something about how diseases can be prevented.

b.   What are some of the things people do here to prevent diseases and to protect themselves and their children from harm?

c.   Would you please say something about the use of charms/amulets.

d.   Please say something about the importance of preventive services.

e.   What are some of the of the most important preventive services provided at the dispensary?

f.   Is special care important during pregnancy? (why)

g.   Would you please say something about the ante-natal services offered at the dispensary.

h.   What do you like/what do you not like about the ante-natal services?

8.   Traditional healers/TBAs

a.   Please say something about the different types of traditional healers people use here.

b.   What are some of the main reasons people use traditional healers? (specific problems/convenience/familiarity, etc.)

c.   Can you say something about people's use of both traditional healers and government health services for the same problem.

9.   Drug consumption

     a.   Please say something about the drugs available at the _____ dispensary.

     b.   Do people have to pay for drugs obtained at the dispensary?

     c.   Other than at the dispensary where else do people get their drugs? Please say something about this. (cost/access/availability/source, etc)

10.   Ante natal services and child birth

     a.   Please say something about the ante-natal services available to pregnant women in the village.

     b.   Who helps women deliver their babies here? Please say something about the capabilities and work of the TBAs (or older women) who help in child birth.

     c.   Please say something about where most of the children in this village are born (at home/dispensary/hospital)

     d.   What are some of the reasons people use/ do not want to use government (or mission) health facilities for delivery?

11.   Cost and access to health services

     a.   Please say something about the cost of health services at government and at mission facilities, as well as at traditional healers and for shop medicine (more now than before/drug costs/travel costs)

     b.   Are people discouraged from using a facility because of the cost involved? (Are people attracted to a facility where the cost is very low or to one where they have to pay?)

     c.   Do people have any difficulties in getting to (making use of) the _____ dispensary? Please discuss.

     d.   Do you feel that the waiting time at the _____ dispensary is too long? (Waiting for the RMA/waiting for treatment)

12. Village contributions to improving the dispensary

    a. Is there an active PHC committee in this village? Please discuss the actual or potential work of the PHC committee.

    b. How does the village now contribute to the functioning/running of the ____ dispensary?

    c. Under what conditions/circumstances might villagers want to contribute (more) to improve the functioning of the disensary? (repairing/building/making furniture etc) please explain.

    d. Would villagers pay (more) for personal health services at the government dispensary?

13. Other comments

    Remember to engage in some general "small talk" at the end of the discussion/interview, about local events, children etc. Often, very important information is obtained almost by accident during these concluding informal discussions.

<p align="center">***************</p>

(Whenever possible try to have respondents give you examples of what they are saying, eg: "For example, last week my neighbour's daughter was sick and they...")

GUIDELINE FOR NOTES ON INFORMAL CONVERSATIONS AND
OBSERVATIONS

Fieldworkers should be attentive to making observations and to
talking informally with people on matters relating to perceptions and utilization of the
dispensary and health centre

Indicate in the notes what you observed, when and were, or with whom you spoke
where and when. In considering what to include in these notes you should remind
yourself of the general objectives of the study and of the guidelines and questions
raised for the focus group discussions, the in-depth interviews and the household
interviews.

Keep these notes on informal conversations and observations in a separate
notebook for each village.

The following are examples of the type of issues and questions about which notes
should be made (any one set of notes may only include one or a few of these
points and may also include other issues relative to health, illness and health care
resources):

People's perception of the dispensary and health centre
   What are the positive points
   What are the negative points
   Reasons for these perceptions

People's use of the dispensary and health centre
   Do they use them frequently--why
   Do they use them seldom--why
   How do they compare with other health resources

What do people usually do when they have an illness? Why.

Information about drugs and drug use.

Information about costs of different types of health care.

What do people think causes illnesses?

The use of ante-natal and other preventive health services (why)

The role of traditional healers and TBAs

GUIDELINES TO BE USED BY GROUP OF YOUNG MOTHERS AND STANDARD SEVEN PUPILS IN THEIR PARTICIPATORY RESEARCH ACTIVITIES.

After their first focus group discussion one group of young mothers (about 8 in umber), each having a different balozi, should be asked to have a discussion with at least 3 of their women neighbors about some of the things discussed in this first FGD. They should then return after 2 or 3 days to have another FGD with the fieldworkers when the results of their research will be discussed.

Be sure to spend time discussing the proposed work with the group of mothers after the FGD so that it is clear what they are asked to do and what questions they are asked to discuss with the neighbour. Also reaffirm once again that they are willing to do this and that they understand what is to be done and when and where to return to discuss the results of their work.

Also ask a group of standard seven pupils to discuss health issues with their own families and a few neighbours, according the the following guidelines, and ask them to write the answers on sheets of paper provided by the fieldworkers and hand back in two days time. Be certain to spend sufficient time explaining this work and also to have a discussion with the pupils once they have completed the task.

The following list of issues should guide the mothers and the standard 7 pupils in their discussion with their neighbours:

1.   What are the different ways that diseases are caused?

        (What causes disease? Please discuss)

2.   Please comment on the positive and negative aspects of
        both the _____ dispensary and the _____
        health centre.

3.   Please comment on why people use one rather than
        another of the different health resources available to
        them (such as dispensary, health   centre, hospital,
        mission, traditional healers, etc. What are the
        important factors which influence their choice?)

4.   Please comment on the reason for and the value of
        antenatal services

        (Please also discuss child birth practices)

5.   What costs are involved in getting to the dispensary?
        What is the costs of using the dispensary?

COMMUNITY PERCEPTIONS AND HEALTH RESOURCE UTILIZATION:

HOUSEHOLD QUESTIONNAIRE   KISWAHILI VERSION

IDO____IDD____IDU____/IDO____IDD____IDU____/IDO___IDD___IDU____

(MAAGIZO:
--KWA AJILI YA WATU WAZIMA WENYE WATOTO WA UMRI CHINI YA MIAKA MITANO
--MWELEZE YULE UNAYEZUNGUMZA NAYE KWAMBA SIYO LAZIMA ATAJE JINA LAKE NA KWAMBA MAJIBU ATAYOTOA YATAKUWA NI SIRI, NA HAKUNA MTU ATAKAYE WEZA KUYAFUATILIA)

I

I.   Muda na kuanza_____ Muda wa kumaliza_____
         time start   *time end*

2.   Karatasi ya mahojiano namba_____
         number of questionnaire

3.   Jina la amayehoji_____
         interviewer

4.   Tarehe ya mahojiano_____
         date of interview

5.   Jina la kijiji_____
         name of village

6.   Jina la mkuu wa familia_____
         name of head of household

(MAAGIZO:
--USIMTAJIE YULE UNAYEMUHOJI MAJIBU YEYOTE, NA KAMA NI LAZIMA KUFANYA HIVYO ONYESHA SEHEMU AMBAKO ULIMTAJIA MAJIBU YA KUCHAGUA
--ZUNGUSHIA JIBU SAHIHI KILA INAPOBIDI)

II   MAELEZO KAMILI YA MUHUSIKA/BASIC INFORMATION

7.   Jina lako nani?_____
         name of respondent

8.   Je unauhisiano gani na mkuu wa kaya hii?
         what relationship to household head?

              1 baba   2 mke   3 mama   4 mtoto
              5
wangineo_____

9.   Kazi yako ni nini?
        occupation
                1 mkulima 2 mama wa ndani 3 mtumishi wa serikali
                4 mfanya biashara
                5 kazi
zingine_____

10.   Je umeoa/umeolewa?
        marital status

                1 hajaoa/hajaolewa 2 ameoa/ameolewa 3 mjane 4 ni ndugu

11.   Umeishi hapa kijijini kwa muda gani?
        how long have you lived here?

                1 0-2yrs 2 2-5yrs 3 5-10yrs 4 zaidi ya miaka 10

12   Je una kiwango gani cha elimu?
        education
                1 elimu ya msingi 2 sekondari 3 elimu ya watu wazima
                4 elimu ya juu
                5
nyingineo_____

13.   Dini yako ni ipi?
        faith
                1 Mkristo 2 Uislamu 3 dini nyingine_____
                4 hana dini

14.   Wewe ni kabila gani?_____
        tribe?

15.   Je we umejiunga na jumuiya yoyote?
        belong to any community groups

                1 ndiyo 2 hapana

16.   Kama ndiyo, jumuiya gani_____
                99 haihusiki
        if so, which?

17.   Kuna watu wangapi katika kaya yenu?
                Wakubwa wako wangapi_____ Watoto chini ya miaka 5_____
                Watoto wengine (5-16 yrs)_____

        (MAAGIZO: JAZA BAADAYE KAMA NI LAZIMA)
                wakubwa   1 mmoja 2 2-5 3 zaidi ya 5
                watoto   1 mmoja 2 2-6 3 zaidi ya 6
                Chini ya5yrs   1 mmoja 2 2-5 3 zaidi ya 5

        how many people in household?

18.   Ni mambo gani tofauti yanayosababisha maradhi kwa watu?
       (MAAGIZO: ORODHESHA MATANO KAMA ANAVYOTAJA)
       what causes illness?

_____

_____

_____

_____

_____

       (MAAGIZO: ULIZA TU KAMA HAKUTAJA UGONJWA/MARADHI YEYOTE
       VINGINEVYO
       NENDA SWALI LA 20)

19.   Nimagonjwa gani yanayosumbua zaidi watu katika kijiji hiki?
       what health problems are there in the village?

_____

_____

_____

       Unakubaliana na semi zifuatazo? (fafanua)
       do you agree with the following statements

20.   "Maradhi yanasababishwa na wadudu"
       illness is caused by insects/germs?

       1 ndiyo kabisa 2 ndiyo & hapana 3 anakataa kabisa 4 hajui

21.   "Maradhi yanasababishwa na watu wengine"
       illness is caused by other people

       1 ndiyo kabisa 2 ndiyo & hapana 3 anakataa kabisa 4 hajui

22.   "Maradhi yanasababishwa na matendo maovu"
       illness is caused by bad deeds

       1 ndiyo kabisa 2 ndiyo & hapana 3 sio kweli 4 hajui

23.   "Maradhi yanasababishwa na Mungu"

illness is caused by God

1 ndiyo kabisa 2 ndiyo & hapana 3 sio kweli 4 hajui

24.   Je ugonjwa mmoja unaweza kuletwa na sababu mbalimbali?
        can one illness had several causes?

        (MAAGIZO: KAMA HAKUNA JIBU, MPE MFANO "MBU NA MAPEPO
WABAYA")

        1 ndio 2 hapana 3 hajui

25.
Eleza/explain_____
        1 hajui

26.   Je chanzo fulani cha ugonjwa kinaweza kufanya watu watafute
        msaada wa tiba sehemu fulani na kuiacha nyingine?
        *can the cause of illness lead people to look for particular types of health
        care*

        1 ndio 2 hapana 3 hajui

27.   Eleza_____

        1 hajui

28.   Inawezekana kuzuia maradhi/magonjwa?
        is it possible to prevent illness

        1 ndio 2 hapana 3 hajui

29.   Tafadhali fafanua_____

        _____

        1 hajui

IV.   HUDUMA ZILIZOPO/SERVICES AVAILABLE

30.   Je ni huduma gani za afya zilizopo kijijini hapa?
        what health care is there in the village

        (MAAGIZO: ZUNGUSHIA ZILE ZILIZOTAJWA)

        1 zahanati ya serikali 2 zahanati ya mission
        3 mhudumu wa afya kijijini   4 waganga wa jadi
        5 muuza madawa 6 zinginezo_____

        (MAAGIZO: MTAJIE MOJAMOJA KAMA HAKUTAJA YEYOTE KISHA
        ZUNGUSHIA ANAYOKABALI)

31.   1 zahanati ya serikali 2 zahanati ya mission

3 mhudumu wa afya kijijini 4 waganga wa jadi
5 muuza madawa 6 zinginezo_____

32. Watu wanapohitaji matibabu, ni mambo gani hasa yanawafanya
     kutafuta msaada kutoka sehemu fulani na kuacha sehemu nyingine?
     when people want health care, what things lead them to look for care from
     some places and not others

_____

_____

33. Hali ya maradhi/ugonjwa (kama mtu anaumwa sana, au kiasi) inakuwa

     kigezo/sababu ya tiba mtu anayochagua?
     does the severity of illness lead people to choose particular sources of
     health care

     1 ndio 2 hapana 3 hajui

34. Fafanua zaidi_____

_____

     1 hajui

35. Aina ya maradhi huwa ni kigezo/sababu ya kuchagua matibabu ya aina
fulani?
     does the type of illness lead people to choose particular sources of health
     care

     1 ndio 2 hapana 3 hajui

36. Tafadhali, elezea zaidi_____

_____

     1 hajui

37. Je ni huduma gani zinazopatikana katika zahanati ya_____?
     what health services are there at the local dispensary

     (MAAGIZO: ZUNGUSHIA ZILE ZANAZOTAJWA)

     1 kutibiwa 2 watoto 3 akina mama 4 chanjo

     5 elimu ya afya 6 usafi wa mazingira

     7 nyinginezo_____

     (MAAGIZO: MTAJIE MOJAMOJA KAMA HAKUTAJA YEYOTE KISHA
     ZUNGUSHIA ANAYOKABALI)

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38.   1 kutibiwa 2 watoto 3 akina mama 4 chanjo

        5 elimu ya afya 6 usafi wa mazingira

        7 nyinginezo_____   99 haihusiki

39.   Je kuna dawa za kutosha zahanati?
        are drugs enough

        1 ndio   2 hapana   3 sijui

40.   Kama hakuna dawa za kutosha kwanini kuna upungufu?
        if drugs are not enough, why is there a shortfall

        _____

        _____

        99 haihusiki

41.   Watoto wengi katika kijiji hiki wamezaliwa wapi?
        where are most children in this village born

        1 nyumbani/kijijini 2 zahanati ya serikali

        3 zahanati ya mission 4 zahanati za mashirika 5 kituo cha afya

        5 hospitali 6 sehemu nyingine_____

        (MAAGIZO: KAMA HAKUTAJA ZAHANATI YA _____ MUULIZE:)

42.   Kwanini kinamama hawajifunguli katika zahanati ya kijiji?
        why don't mothers deliver at the village dispensary

        1 mbali sana 2 hakuwahi kufika pale

        3 huduma mbaya

        4 mengineyo_____

        99 haihusiki

        (MAAGIZO: KAMA KITUO CHA AFYA HAKIKUTAJWA MUULIZE:)

43.   Kwanini kinamama hawajifunguliia katika kituo cha afya
        cha_____?
        why don't mothers deliver at the local health centre

        1 mbali sana 2 hakuwahi kufika pale

        3 huduma mbaya

        4 mengineyo_____

99 haihusiki

44.   Kama mbaya, kwa nini?_____

_____

if bad, why

99 haihusiki

45.   Ni nani atoae msaada kwa akinamama wazaliao kijijini wakati wa kuzaa?
        who helps mothers who deliver in the village

        1 mkunga wa jadi 2 wahudumu wa afya vijijini

        3 muguuzi 4 mama mzee

        5 wangineo_____

        6 hajui   99 haihusiki

46.   Kuna mtu ambaye hutafutwa kutoa msaada kwa mama ambaye
        anapata matatizo wakati wa kuzaa?
        is there someone to give help if mothers have problems at delivery time

        1 ndio 2 hapana 3 hajui

        (MAAGIZO: KAMA NDIO)
47.   Huwa ni nani:
        who is this

        1 mkunga wa jadi mwingine 2 hudumu wa afya vijijini

        3 muguuzi 4 mama mzee

        5 wangineo_____

        6 hajui

        99 haihusiki

48.   Je ni huduma gani zilizopo katika kituo cha afya cha_____ ambazo hazipo
        katika zahanati ya_____?
        *what services does the health centre have that the dispensary does not
        have*

        (MAAGIZO: USIMTAJIE MAJIBU)

        1 kulaza 2 dawa nyingi 3 watumishi wenye ujuzi zaidi

        4 mengineyo_____ 5 sijui

49.   Je wafanya kazi wa afya hutembelea kijiji hiki mara kwa mara?
        do health workers visit this village from time to time

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1 ndiyo 2 hapana 3 sijui

(MAAGIZO: KAMA HAPANA NENDA SWALI LA 52)

50.   Kama diyo, wanatoka wapi?
if yes, where do they come from

1 zahanti ya serikali 2 zahanati ya mission

3 kituo cha afya 4 ofisi ya wilaya

5 penginepo_____

99 hahusiki

51.   Kama ndiyo, wanakuja kufanya nini?
if yes, what do they come to do

1 chanjo 2 klinik ya watoto 3 maji 4 vyoo 5 elimu ya afya

6 kutembelea wati nyumbani 7 mikutano ya vijiji

8 usafi wa mazingira 9 klinik ya wajawazito

9 sababu nyingine_____

99 haihusiki

52.   Kama ndiyo, walikuja lini mara ya mwisho?
if yes, when did they come last

1 wiki iliyopita 2 mwezi uliopita 3 miezi sita iliyopita

4 zaidi ya miezi sita 5 sijui

99 haihusiki

(MAAGIZO: KAMA KUFIKA MAJUMBANI HAKUKUTAJWA KATIKA JIBU
LA SWALI LA 51, MUULIZE:)

53.   Je wafanya kazi wa afya huwatembelea wanakijiji majumbani
kwao mara kwa mara?
do health workers make household visits from time to time

1 ndiyo 2 hapana 3 hajui

(MAAGIZO: KAMA HAPANA NENDA SWALI LA 57)

54.   Kwa kawaida wanatoka wapi?
usually where do they come from

1 zahanati ya serikali 2 zahanti ya mission

3 kituo cha afya 4 ofisi ya wilaya

5 nyinginezo_____

(99) haihusiki

55.   Kama ndiyo, wanakuja kufanya nini?
       if yes, what do they come to do

       (MAAGIZO: USIMTAJIE MAJIBU)

       1 elimu ya afya 2 kuangalia kadi za watoto

       3 kufuatilia watoto wenye utapiamlo   4 kuja kumwagalia mgonjwa

       5 kuwaona wagonjwa wa kifua kikuu au ukoma

       6 sababi nyingine_____

       (99) haihusiki

56.   Kama wanakuja, kwa mara ya mwisho walikuja lini hapa nyumbani?
       if they come, when was the last time that they came

       1 wiki iliyopita 2 mwezi uliopita 3 miezi sita iliyopita

       4 zaidi ya miezi sita 5 sijui 99 haihusiki

V.   ATTITUDES

57.   Ni mambo gani yanakufurahisha/kuridhisha katika zahanati
       ya_____?
       what things please you about the local dispensary

       1 madawa 2 ujuzi wa waganga 3 huruma ya waganga 4 ukaribu

       5 vifaa vya kutosha 6 saa wanazofungua

       7 muda mfupi wa kuongoja kumwona mganga na huduma

       8 sababu nyingine_____

       9 hakuna

58.   Ni kitu gani usichokipenda katika zahanati hiyo?
       what things do not please you about the local dispensary

       1 madawa 2 ujuzi wa waganga 3 huruma ya waganga 4 ukaribu

       5 vifaa vya kutosha 6 saa wanazofungua

       7 muda mrefu wa kungoja kumwona mganga na huduma

       8 sababu nyingine_____

       9 hakuna

59.   Je unaimani na ujuzi wa waganga/wahudumu wa zahanati ya
       _____?

do you think the health workers of the dispensary are skilled

1 ndio 2 wakati mwingine 3 hapana 4 sijui

60. Tafadhali fafanua_____

99 haihusiki

61. Unakubaliana na usemi huu:
do you agree with the statement

"Wafanyakazi wa zahanati ya _____hawana upendo kwa wagonjwa."
health workers have no kindness for patients

1 Ndiyo 2 wakati mwingine 3 hapana 4 sijui

62. Eleza tafadhali_____

99 haihusiki

63. Je, huduma za afya katika zahanati ya ____zinaweza kufanywa bora?
can the health services of the dispensary be improved

1 ndiyo 2 hapana 3 hajui

64. Kama ndiyo, kwavipi?
if yes, how

1 madawa 2 wafanya kazi wengi zaidi 3 kubadilisha wafanyakazi

4 kuongeza vifaa 5 kukarabati majengo

6 sababu nyingine_____

99 haihusiki

65. Unafikiri wana kijiji wanaweza kufanya chochote katika zahanati
ili itoe huduma bora zaidi?
do you think that the villagers can do anything to ensure better services

1 ndiyo 2 hapana 3 hajui 99 haihusiki

66. Kama ndiyo nini?_____

99 haihusiki

67. Ni kitu gani ulichokipenda katika kituo cha afya cha _____?
what things please you about the health centre

1 dawa 2 wafanyakazi wenye ujuzi 3 upole wa wafanya kazi

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4 vifaa vya kutosha 5 muda wa kufungua

6 muda wa kusubiri matibabu

7 sababau
nyingine_____

8 hakuna

99 haihusiki

68. Ni kitu gani hukukipenda katika kituo hicho cha afya cha_____?
what things do not please you about the health centre

1 dawa 2 wafanyakazi wenye ujuzi 3 upole wa wafanya kazi

4 vifaa vya kutosha 5 muda wa kufungua

6 muda wa kusubiri matibabu

7 sababau
nyingine_____

8 hakuna

99 haihusiki

69. Huduma katika kituo cha afya cha_____ zinaweza zikafanyawa
kuwa bora zaidi?
can the health services of the health centre be improved

1 ndiyo 2 hapana 3 hajui

70. Kama ndiyo, eleza tafadhali_____

99 haihusiki

71. Unafikiri wanakijiji wanahiyari kutoa mchango wao katika kufanya
huduma za zahanati kuwa bora zaidi?
*can villagers make a contribution to ensure better service provision at the
dispensary*

1 ndiyo 2 hapana 3 hajui

72. Kwa nini/kwa nini hapana?_____

73. Unakubaliana na huu usemi:
do you agree with the statement

"ukilipia huduma za afya, utapata huduma bora"
if you pay for health care you get better services

1 ndio 2 ndio na hapana 3 hapana 4 sijui

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74. Tafadhali, fafanua zaidi_____

99 haihusiki

75. Ikiwa wagonjwa humlipa mganga wa kienyeji, au zahanati ya
mission/na nyinginezo je uko tayari kulipia huduma za afya
zinazotolewa serikali?
*as sick people pay for traditional medicine or mission care are you ready to
pay for government health care*

1 ndio   2 ndio na hapana   3 hapana   4 sijui

76. Tafadhali fafanua_____

VI.   PRACTICE

77. Kuna mtu aliyeugua katika kipindi wiki nne zilizopita katika nyumba   hii?
has anyone in the household been sick in the last month

1 ndiyo   2 hapana

(MAAGIZO: KAMA HAPANA NENDA SWALI LA 88)

78. Kama ndiyo, tatizo lilikuwa nini?
if yes, with what problem

(MAAGIZO: KAMA KULIKUWA NA ZAIDI YA MMOJA, ULIAUZIA
ALIENGUA KARIBUNI)

_____

79. Mgonjwa alipata huduma gani?
what services did the sick person get

_____
_____

99 haihusiki

(MAAGIZO: YULE ANAYEHOJI LAZIMA AJIBU SWALI 80 MPAKA 82
KUFUATANA NA MAJIBU ANAYOPATA KWA SWALI 79: KAMA
IKIWEZEKANA MTAJIE MAJIBU YALIYOPO KWA MASWALI
YUNAYOFUATA)

80. Matibabu ya kwanza yalitoka wapi?
where did the first treatment come from

1 ndugu/rafiki   2 nganga wa jadi   3 muuza madawa

4 zahanati (serikali)   5 zahanati (mission)

6 zahanati za mashirika   7 kituo cha afya   8 hospitali

nyinginezo_____

81. Matibabu ya pili yalitoka wapi?
where did the second treatment come from

1 ndugu/rafiki   2 nganga wa jadi   3 muuza madawa

4 zahanati (serikali)   5 zahanati (mission)

6 zahanati za mashirika   7 kituo cha afya   8 hospitali

nyinginezo_____

99 hahusiki

82. Matibabu ya tatu yalitoka wapi?
where did the third treatment come from

1 ndugu/rafiki   2 nganga wa jadi   3 muuza madawa

4 zahanati (serikali)   5 zahanati (mission)

6 zahanati za mashirika   7 kituo cha afya   8 hospitali

nyinginezo_____

99 haihusiki

83. Baada ya kupata ugonjwa, msaada ulipatikana lini
how long after becoming ill did you seek health care

1 mapema sana   2 siku chache baadaye   3 wiki moja baadaye

4 muda mrefu

84. Kama msaada ulichelewa kupatiakana, kwa nini?
if you delayed getting care, why

_____

_____

99 haihusiki

85. Nani aliyeamua kutafuta msaada wa kwanza sehemu itakayotajwa?
who advised you to get help from the first source used

1 mwenye nyumba   2 mama wa mgonjwa   3 mzazi wa huyo anayejibu

4 jirani   5 mwenyewe

6 nyinginezo_____

86. Nani aliyeamua kutafuta msaada wa pili sehemu itakayotajwa?
who advised you to get help from the second source used

1 mwenye nyumba   2 mama na mgonjwa   3 mzazi wa huyo anayejibu

4 jirani 5 mwenyewe

6 nyinginzo_____

99 haihusiki

87.   Nani aliyeamua kutafuta msaada wa tatu sehemu itakayotajwa?
      who advised you to get help from the third source used

      1 mwenye nyumba 2 mama na mgonjwa 3 mzazi wa huyo anayejibu

      4 jirani 5 mwenyewe

      5 nyinginzo_____
      99 haihusiki

      (MAAGIZO: KAMA ZAHANATI YA____ IMETAJWA MWANZO NENDA
      SWALI LA 90; KAMA ZAHANATI YA ____ HAIHUTAJWA KATIKA SWALI
      LILITANGULIA ULIZA MASWALI 88 NA 89:)

88.   Ni lini kwa mara ya mwisho mmoja wenu alifika zahanati ya _____?
      when was the last time you visited the local dispensary

      1 wiki iliyopita 2 mwezi uliopita 3 miezi sita iliyopita

      4 muda mrefu uliopita 5 hajui

      99 haihusiki

89.   Kwa tatizo gani?_____
      for what problem

      99 haihusiki

90.   Uliridhika na huduma uliyopata ulipokwenda safari ya mwisho huko zahanati
ya ____?
      *were you satisfied with the care received the last time you visited the
      dispensary*

      1 ndiyo 2 ndio na hapana 3 hapana 4 sijui

91.   Ndiyo kwa nini/hapana kwa nini
      why/why not

      _____

      99 haihusiki

92.   Wakati fulani unatumia dawa nyumbani?
      do you sometome use drugs in your home

      1 ndiyo 2 hapana

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93. Kama ndiyo, unazipata kutoka wapi?
if yes, where do you get them from

1 jirani yako 2 dukani 3 mganga wa jadi

4 zahanati ya mission   5 daktari binafsi

6 zahanati ya serikali/kituo cha afya

7 nyinginezo_____

99 haihusiki

94. Unanunua dawa wakati mwingine?
do you sometimes buy drugs

1 ndiyo 2 hapana

95. Kama ndiyo, unanunua wapi?
if yes, where do you buy them from

1 jirani yako 2 dukani 3 mganga wa jadi

4 zahanati ya mission   5 daktari binafsi

6 zahanati ya serikali/kituo cha afya

7 nyinginezo_____

99 haihusiki

(MAAGIZO: KAMA ZAHANATI YA SERIKALI HAZIKUTAJWA MUULIZE:)

96. Unaweza kununua kutoka zahanati ya serikali?
can you buy them from the government dispensary

1 ndiyo 2 hapana 3 hajui

97. Kwa nini mara nyingine huamua kununwa dawa badala ya kwenda kuzitafuta zahanati?
why do you sometime buy drugs after going to get them from the government dispensary

_____

99 haihusiki

98. Dawa aina gani unadhani huponyesha zaidi magonjwa?
which type of drug is most effective in treating illness

1 dawa ya kienyeji (mizizi) 2 sindano

3 vidonge 4 nyingenezo_____

5 sijui

99.   Unadhani sindano inatibu zaidi magonjwa kulika dawa za vidonge?
      do you think injections are more effective than tablets

      1 ndiyo 2 hapana 3 ziko sawa 4 sijui

100. Tafadhali, fafanua_____

      99 haihusiki

101. Kuna mtoto yeyote katika kaya hii ambaye amefariki katika pindi
      cha miezi mitano toka azaliwe?
      has any child in the household died within five months of birth

      1 ndiyo 2 hapana

102. Kama ndiyo, kwanini?_____

      99 haihusiki

103. Kama ndiyo, alizaliwa wapi?
      is yes, where was the child born

      1 nyumbani 2 zahanati ya serikali 3 zahanati ya mission

      4 kituo cha afya 5 hospitali 6 njiani

      7 sehemu nyingine_____

      99 haihusiki

104. Mtoto mdogo kabisa hapa alizaliwa wapi?
      where was the youngest child in the house born

      1 nyumbani 2 zahanati (serikali) 3 zahanati (mission)

      4 kutuo cha afya 5 hospitali

      6 nyingineo_____

(MAAGIZO: KAMA SIYO KATIKA ZAHANATI YA _____, MUULIZE:)

105. Kwa nini mtoto hakuzaliwa zahanati ya _____?
      why wasn't the youngest child born in the local dispensary

      1 mbali sana 2 hakupata muda wa kufika

      3 huduma mbaya 4 nyingineo_____

      99 haihusiki

106. Mama alisaidiwa na nani kujifungua
who helped the mother to deliver

1 mkunga wa jadi 2 mhudumu wa afya 3 muuguzi

4 mama mzee 5 daktari/mganga

6 wengineo_____

107. Wewe/Wazazi mlifurahia uangalizi uliopata mzazi?
were you pleased with the help you got at the time of delivery

1 ndiyo 2 hapana

108. Tafadhali,fafanua_____

109. Kulikuwa na matatizo yoyote wakati wa kuzaa?
were there any problems with the delivery

1 ndiyo 2 hapana 3 hajui

110. Kama ndiyo, mlifanya nini?_____

99 haihusiki

111. Matatizo hayo yangeweza kuepukwa?
could the problems have been prevented

1 Ndiyo 2 hapana 3 hajui

99 haihusiki

112. Kama ndiyo, eleza tafadhali_____

99 haihusiki

113. Je unaudhuria/ulihudhuria kliniki ya waja wazito zahanati?
have you ever attended the ante-natal clinic

1 ndiyo 2 hapana 3 hajui

114. Kwa nini hapana; kama ndiyo kwanini?_____

99 haihusiki

115. Kama ndiyo, anaridhika na huduma za kliniki?
if yes, were you satisfied with the services

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1 ndiyo 2 hapana 3 kiasi fulani 4 sijui 99 hahusiki

116.   Ndiyo/hapana kwanini?_____

_____

99 haihusiki

117.   Unakubaliana na usemu huu:
        do you agree with the statement

        "kinamama hawaendi kliniki ya wajawazito kwa sababu ya kauli mbaya za
        wauguzi"
        mothers don't go to the ante-natal clinic because the nurses are unkind

        1 ndiyo 2 ndiyo/hapana 3 hapana 4 hajui

118.   Unakubaliana na usemu huu:
        do you agree with the statement

        "kinamama hawaendi kliniki ya wajawazito kwa sababu hawana imani na
        ujuzi wa wauguzi"
        mothers don't go to the ante-natal clinic because the nurses are unskilled

        1 ndiyo 2 ndiyo/hapana 3 hapana 4 hajui

119.   Watoto wako wamechanjwa?
        are your children immunized

        1 ndio 2 hapana 3 hajui

        (MAAGIZO: ANGALIA KADI YA CHANJO NA KLINIKI ALIYOKWENDA KILA
        MTOTO CHINI YA MIAKA 5 NA UNAJIBU SWALI LA 120 MPAKA SWALI
        LA 125 (KWA WATOTO WALIOHAI TU))

        *LOOK AT THE IMMUNNIZATION CARD OF EVERY CHILD AND CHECK
        WHETHER/NOT IMMUNIZAED AND, IF RELEVANT, WHICH
        IMMUNIZATIONS MISSING*

120.   Mtoto 1

        1 chanjo zote sawa 2 chanjo si kamili/zote

121.   Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG

122.   Mtoto 2

        1 chanjo zote sawa 2 chanjo si kamili/zote

123.   Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG 99 haihusiki

124.   Mtoto 3

        1 chanjo zote sawa 2 chajo si kamili/zote

125.   Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG 99 haihusiki

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126. Mtoto 4

1 chanjo zote sawa   2 chanjo si kamili/zote

127. Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG 99 haihusiki

128. Mtoto 5

1 chanjo zote sawa   2 chanjo si kamili/zote

129. Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG 99 haihusiki

130. Mtoto 6

1 chanjo zote sawa   2 chanjo si kamili/zote

131. Chanjo zipi si kamili? 1 polio 2 DPT 3 surua 4 BCG 99 haihusiki

(MAAGIZO: KAMA NI LAZIMA MUULIZE:)

132. Kwanini watoto hawa_____ hawakupata chanjo zote?
    why did these children not get immunized

_____

_____

    99 haihusiki

133. Kutokana na kadi angalia kama watoto wote walichanjwa katika
    zahanati ya_____ ?
    were all children immunized at the local dispensary

    1 ndiyo 2 hapana

    (MAAGIZO: KAMA NI LAZIMA MUULIZE:)

134. Kwanini watoto hawa_____ hawakupata chanjo katika zahanati ya
    _____?
    why were these children not immunized at the local dispensary

_____

_____

    99 haihusiki

    (MAAGIZO: KAMA KUNA ZAHANATI NYINGINE AU KITUO CHA AFYA
    KIJIJINI MUULIZE:)

135. Zahanati/Kituo ipi/kipi inapendwa zaidi na kwanini?
    if there are two dispensaries in the village, which do you prefer and why

_____

99 haihusiki

(MAAGIZO: KUTOKANA NA KADI ANGALIA LINI KILA MTOTO ALIPOACHA
KUUDHURIA KLINIK NA UNAJIBU SWALI LA 130 MPAKA SWALI LA 135
KWA WATOTO WALIOHAI TU)

*CHECK CHILD CARDS TO SEE IF UNDER FIVES HAVE ATTENDED
GROWTH MONITORING CLINICS
REGULARLY*

136.   mtoto 1

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana

137.   mtoto 2

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana 99 haihusiki

138.   mtoto 3

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana 99 haihusiki

139.   mtoto 4

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana 99 haihusiki

140.   mtoto 5

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana 99 haihusiki

141. mtoto 6

Je mtoto alihudhuria mara kwa mara, mpaka wakati huu?

1 ndiyo 2 hapana 99 haihusiki

(MAAGIZO: KAMA NI LAZIMA MUULIZE:)

142.   Kwanini watoto hawa_____ hawakuudhuria klinik mara kwa mara
mpaka wakati huu?
why did these children not attend regularly

99 haihusiki

VII.GHARAMA/COSTS

143. Unapofika zahanati ya_____ kwa kawaida unalipa kiasi
gani kwa ajili ya nauli?
how much do you normally pay to travel to the dispensary

1 0 shs 2 1-100shs 3 101-200shs 4 hajui

144. Inabidi kusibiri kwa muda mrefu kabla ya kumwona mganga zahanti ya___?
is is necessary to wait a long time to see the RMA at the dispensary

1 siyo sana 2 muda mrefu sana

145. Muda gani?
how long

1 dk 0-15 2 dk 16-30 3 dk 30-saa moja 4 saa 1-1 1/2

5 1 1/2-2 6 zaidi ya saa mbili

146. Je unasubiri muda gani kabla ya kupata matibabu zahanati ya___?
(MAAGIZO: HAKIKISHA UNAPATA MUDA KAMILI)
how long do you wait before getting drugs

1 dk 0-15 2 dk 16-30 3 dk 30-saa moja 4 saa 1-1 1/2

5 1 1/2-2 6 zaidi ya saa mbili

KAMA INAWEZEKANA ULIZA:
147. Je unasubiri zaidi kwenye zahanati ya serikali au ya mission?
do you wait longer at the government or the mission dispensary

1 karibu sawa 2 zaidi zahanati ya serikali

3 zaidi zahanati ya mission 4 hajui 99 haihusiki

Ni kiasi gani hulipa (unapokwenda) kwa mara moja katika vituo
vya afya tofauti, vitumiavyo na wanakijiji?
how much do you usually pay for one visit to the following health providers

148. waganga wa jadi: chini_____ juu_____

mengineo_____

zahanati ya mission: chini_____juu_____

mengineo_____

149. daktari binafsi: chini_____juu_____

mengineo_____

150. muuza madawa: chini_____juu_____

151. zahanati ya serikali: chini_____juu_____

   mengineo:_____

152. kituo cha afya: chini_____juu_____

   mengineo:_____

153. nyinginezo: chini_____juu_____

   mengineo:_____

MSHUKURU YULE ULIYEZUNGUMZA NAYE, KWA KUJIBU MASWALI,
JADILIANA NAYE KUHUSU MAMBO MENGINE KWA JUMLA, MSIKILIZE KAMA
ANA MAONI YA ZIADA, NA BAADAYE UONDOKE.

ONGEZEA MAONI YEYOTE YA MHOJIWA AU MWENYE KUHOJI:

_____

_____

_____

****

VII1.UCHUNGUZI (OBSERVATIONS)

154. Nyumba na mazingira: 1 safi sana 2 safi kiasi 3 si safi
   cleanliness of environment

155. Choo: 1 ndio 2 hapana
   pit latrine

156. Umbali na maji: 1 panaohekana 2 mwendo wa 0-15 dakika
               3 zaidi ya mwendo wa 15 dakika

   distance to water source

157. Hali ya nyumba ukiilinganisha na nyingine kijijini
   (Angalia vitu alivyo navyo kama nguo, baiskeli, n.k.)
   condition of house

   1 chini ya wastani   2 wastani   3 zaidi ya wastani

APPENDIX 5A:
COST ANALYSIS, RESULTS

Table 1: Median[1] total expenditure overall and by activity, by unit group (1988/89 Tsh)[2]

ACTIVITY	GOVERNMENT DISPENSARY n=40		DIOCESAN DISPENSARY n=14		HEALTH CENTRE n=4	
	Tsh	%[3]	Tsh	%[3]	Tsh	%[3]
unit total	748,865		535,108		3,257,561	
curative care	475,311	63.0 (58.3-67.0)	319,862	54.5 (45.5-64.8)	1,424,384	43.5 (43.0-44.8)
ante-natal/ child welfare[4]	66,570	8.0 (6.0-10.8)	30,603	6.5 (3.8-9.3)	255,380	7.0 (5.5-12.3)
immunization[4]	156,995	21.0 (15.3-24.8)	99,895	18.5 (13.4-20.0)	266,543	8.0 (7.0-10.5)
delivery[4]	28,229	4.0 (1.0-6.0)	51,348	10.0 (5.5-13.8)	425,747	13.0 (7.3-18.8)
other[4]	28,895	3.0 (0-6.0)	0	0	82,347	2.5 (0.5-4.5)
in-patient[4]	0	0	0	0 (0-18.3)	833,802	23.5 (19.8-28.0)

NOTES: 1. Use of group medians prevents total expenditure across activities summing to unit total median expenditure
2. 1US$= 125.73 Tsh (average of 1988/89 exchange rates : University of Dar es Salaam 1990)
3. Use of group medians by activity prevents each column summing to 100%; inter-quartile range=
4. Median determined across all government/mission dispensaries, including some not providing service

Table 2: Percent of total expenditure by input item, unit group medians and inter-quartile ranges

INPUT ITEM	GOVERNMENT DISPENSARIES n=40	DICOESAN DISPENSARIES n=14	HEALTH CENTRES n=4
building	4.0 (3.0-7.0)	11.5 (7.0-15.0)	8.5 (5.0-9.8)
equipment	4.0 (3.0-5.0)	6.5 (4.0-9.3)	2.5 (2.0-3.8)
furniture	1.0 (1.0-1.0)	4.0 (3.0-5.0)	1.0 (1.0-1.0)
car	0	0	11.5 (9.5-12.8)
total capital	9.5 (7.3-12.8)	23 (15.5-30.5)	21 (20.0-26.5)
personnel	28.5 (23.0-32.8)	31.5 (21.0-36.8)	39.0 (36.0-42.8)
drugs	46.0 (41.5-50.0)	33.5 (27.3-39.0)	27.5 (20.3-30.3)
other supplies	2.0 (2.0-2.8)	1.0 (1.0-2.0)	4.5 (2.5-9.0)
operating & maintenance	4.0 (3.0-5.0)	4.0 (2.0-5.3)	3.5 (3.0-5.5)
supervision	7.0 (4.0-8.8)	5.0 (3.0-7.25)	2.5 (2.0-3.0)
training	1.0 (1.0-2.0)	2.0 (1.0-3.3)	1.0 (0.3-1.0)
total support	8.0 (5.0-3.8)	8.0 (6.0-10.0)	3.0 (3.0-3.8)
total recurrent	90.5 (87.3-92.8)	77 (69.5-84.5)	79 (73.5-80.0)

Table 3: Percent of total activity expenditure by input item, unit group[1] medians

INPUT ITEM	Curative care			ANC/CW			Immunization			Delivery			Other programmes			In-patient	
	GOVT	D'SEN	HC	GOVT	D'SEN	HC	GOVT	D'SEN	HC	GOVT	D'SEN	HC	GOVT	D'SEN	HC	D'SEN	HC
build	3.0	9.0	8.5	12.0	16.0	11.0	1.0	2.0	2.0	7.5	27.0	10.5	0	0	0	25.5	5.0
equip	1.0	4.5	2.5	7.0	10.0	2.5	8.0	12.0	5.5	23.0	14.5	4.0	0	0	0	0	0
furn	1.0	3.0	1.0	1.0	7.0	1.0	0	0	0	1.0	8.0	1.0	0	5.0	0	7.5	1.0
car	0	0	3.5	0	0	6.0	0	0	1.0	0	0	18.0	0	0	7.0	0	25.0
person	29.0	37.5	35.5	58.5	42.0	62.5	9.0	2.5	6.0	35.5	27.0	41.5	24.0	0	54.5	33.0	42.5
drugs	55.0	36.0	44.5	1.0	0	1.0	47.0	50.5	61.0	13.0	6.0	3.0	15.0	0	4.5	24.0	10.0
otsup	3.0	2.0	3.0	2.0	2.0	1.5	1.0	0	1.0	0	0	4.0	0	0	0	0.5	10.5
op&ma	1.0	1.0	1.5	0	1.0	1.5	15.0	16.0	13.5	0	1.5	4.5	0	0	1.0	1.5	5.5
super	3.0	3.0	1.0	12.0	4.0	1.5	13.5	12.0	9.5	7.5	3.5	3.0	6.0	0	24.0	2.0	0.5
train	0	2.5	0.5	2.5	4.0	3.0	3.0	0	1.5	1.0	1.5	1.0	0	0	2.0	1.0	0

NOTES: 1.Govt=government dispensaries; D'sen=diocesan dispensaries; HC=health centre

Table 4: Average personnel and drug costs, median and minimum to maximum range by unit group (1988/89 Tsh)

ACTIVITY	INPUT	GOVERNMENT DISPENSARY	DIOCESAN DISPENSARY	HEALTH CENTRE
Curative	* personnel	8 (1-35)	14 (6-28)	17 (6-22)
	* drugs	14 (6-26)	12 (3-29)	15 (9-28)
ANC/CW	* personnel	7 (0-38)	4 (1-23)	12 (3-26)
Immunization	* personnel	8 (1-63)	3 (1-8)	3 (0-6)
	* vaccines	39 (13-146)	44 (20-380)	30 (10-42)
Delivery	* personnel	247 (129-612)	281 (103-827)	758 (299,1256)
	* drug	99 (20-627)	55 (4-790)	61 (20-133)
In-patient admissions	* personnel		361 (86-787)	361 (100-1088)
	* drug		309 (120-449)	62 (27-124)
In-patient days	* personnel		5 (22-199)	145 (51-294)
	* drug		77 (34-83)	25 (14-40)

Table 5: Diocesan dispensary cost function

variable	coefficient	t-statistic (p value)
U		1.65 (0.13)
Q	17651	2.87 (0.014)
T	n/a	
constant	-289527	-0.97 (0.352)
O	n/a	
D	n/a	
U²		1.46 (0.173)
	adjR² = 0.36	n=14

Table 6: Government dispensary cost function

variable	coefficient	t-statistic (p value)
U	23	3.86 (0.000)
Q	15604	4.01 (0.000)
T	n/a	
constant	-291637	-1.43 (0.160)
O	n/a	
D		0.22 (0.830)
U²		-0.78 (0.441)
	adjR² = 0.44	n=40

APPENDIX 5B:
TIME USE ANALYSIS

Table 1: Staff allocations per unit by cadre and unit group (median, minimum and maximum), interview data

CADRE	GOVERNMENT DISPENSARY	DIOCESAN DISPENSARY	HEALTH CENTRE
RMA	2 (1-4)	1 (all units)	3 (2-4)
MCHa	1 (0-5)	0 (only 3 units with 1 MCHA)	1 (1-2)
HA/HO	1 (0-3)	0 (only 1 unit with 1 HA)	1 (1-3)
Nurse	3/4 (1-20)	4 (2-7)	9 (9-14)
Senior medical/ nursing staff	0 (1 unit with 4, 3 units with 1)	0	4.5 (2-8)
Support staff/ volunteers	0 (1 unit with 2, 2 units with 1)	0 (0-2)	1.5[1] (0-4)

NOTE: 1. Excluding ancillary support staff

Table 2: Median allocations of time by cadre and activity for dispensary-based staff (% of total hours worked), interview data

CADRE	CURATIVE	ANC/ CW	IMM	DEL	IP	OTHER	TWSA[2]
RMA	100	0	0	0	0	0	53
MCHA	0	53	14	12	0	0	57
HA/HO[1]	0	61	40	0	0	0	88
NURSE	81	0	0	0	0	0	54
MA	100	0	0	0	0	0	54
TRAINED NURSE	77	15	6	2	0	0	75
SUPPORT STAFF	100	0	0	0	0	0	54
VOLUNTEER/ TRAINEE	100	0	0	0	0	0	58

NOTE: 1. Environmental sanitation officers: any work undertaken outside the health unit is ignored in these calculations.
2. The difference between total hours worked (excluding deliveries) and total daytime expected working hours in a year calculated as a percent of total daytime expected working hours.

Table 3: Differences in time allocations by cadre between government and mission staff (median values %), interview data

CADRE/ACTIVITY		GOVERNMENT	DIOCESAN	SIGNIFICANCE
MCHA	- ANC/CW	55	0	p=0.005
	- immunisations	15	0	p=0.006
	- curative care	0	36	p=0.004
	- in-patient care	0	47	p=0.000
Nurses	- curative care	91	36	p=0.000
	- other programmes	0	0	p=0.001
	- immunisations	0	0	p=0.050
	- delivery care	0	16	p=0.000
	- in-patient care	0	0	p=0.000

Table 4: Staff allocations by cadre and unit group, time log data[1] (median, minimum and maximum)

CADRE	GOVERNMENT DISPENSARIES (n=13)	DIOCESAN DISPENSARIES (n=4)
RMA	1 (0-2)	1 (no range)
MCHa	1 (0-2)	0 (0-1)
HA/HO	0.5 (0-2)	0 (0-1)
Nurse	2 (0-3)	2.5 (2-4)

NOTE: 1.Health centres excluded because only sample of staff completed time log forms
2.Using data only from week during supervision

Table 5: Median full time staff equivalent allocations by activity and unit group, time log data

ACTIVITY	GOVERNMENT DISPENSARIES (n=13)	DIOCESAN DISPENSARIES (n=4)
Curative care	2.94	2.44
Ante-natal/child welfare care	0.57	0.89
Immunisations	0.19	0.07
Delivery	0.00	0.13
Other programmes	0.20	0.02

Table 6: Median allocations of time by cadre and activity, time log data (% of total hours worked, dispensaries and health centres[1])

CADRE	CUR-ATIVE	ANC/CW	IMM	DELS	IP	OTHER	TWSA[2]
RMA	93 (98)	5 (0)	1 (0)	0 (0)	1 (1)	1 (1)	41 (34)
MCHA	8 (0)	72 (70)	7 (1)	7 (23)	0 (0)	8 (5)	15 (14)
HA/HO [2]	4 (0)	11 (40)	17 (25)	0 (0)	0 (0)	69 (34)	31 (13)
NURSE	69 (45)	11 (7)	2 (0)	4 (0)	14 (47)	1 (1)	35 (18)
MA	100 (54)	0 (0)	0 (0)	0 (24)	0 (21)	0 (2)	18 (19)
TRAINED NURSE	50 (100)	34 (0)	4 (0)	0 (0)	0 (0)	13 (0)	36 (57)
SUPPORT STAFF	100 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	16 (35)

NOTES: 1. Health centre figures in brackets
2. Environmental sanitation officers

Table 7: Median and full range, time allocations by activity and unit group (% of total working time), time log data

ACTIVITY	GOVERNMENT DISPENSARIES (n=13)	DIOCESAN DISPENSARIES (n=4)
Curative care	67 (43-98)	62.5 (45-69)
Ante-natal/child welfare care	12 (0-35)	20 (3-30)
Immunisations	4 (0-19)	2.5 (0-11)
Delivery care	0 (0-13)	3 (0-7)
Other programmes	0 (0-28)	0 (0-24)
In-patient care	0	0.5 (0-37)
TWSA[1]	35 (2-51)	50 (15-57)

NOTE: 1. TWSA=time without specific activity

APPENDIX 5C:
DRUG COST VALIDATION ANALYSIS

Table 1: Comparing drug costs estimates based on different sources of data, government dispensaries[1]

GROUP/ DISPENSARY	88/89 COSTS VS. 89/90 STOCK ESTIMATES	88/89 COSTS VS. 89/90 REGISTER ESTIMATES	89/90 STOCK VS. REGISTER ESTIMATES
HIGH COST			
* DS2	per contact costs same; 88/89 total cost 10% lt 89/90 cost	88/89 total cost 60% gt 89/90 cost; 88/89 per contact cost 50% lt 89/90 cost	stock costs 100% gt register costs
* DS7	costs approx. same	per contact costs same; 88/89 total cost 10% lt 89/90 cost	stock costs 10% lt register estimates
* DS24	per contact costs same; 88/89 cost 20% gt 89/90 cost	88/89 costs over 100% gt 89/90 costs	stock costs around 100% gt register costs
* DS32	total costs same; 88/89 per contact cost 50% gt 89/90 cost	total costs same; 88/89 per contact cost 20% lt 89/90 cost	stock costs lt register cost, by 10% for total costs & 70% for per contact costs
* DS35	total costs same; 88/89 per contact cost 10% lt 89/90 cost	88/89 costs gt 89/90, by 70% for total costs & 20% for per contact costs	stock costs gt register costs, by 60% for total costs & 40% for per contact costs
* DS39	88/89 total cost 50% gt 89/90 cost; but per contact costs same	88/89 costs gt 89/90 costs, by 700% for total costs & 100% per contact costs	stock costs gt register costs, by 500% for total costs & 100% for per contact costs
* DS42	88/89 total cost 50% gt 89/90; but per contact cost 10% lt 89/90	88/89 total cost 60% gt 89/90; but per contact cost same	stock costs 10% gt register costs

GROUP/ DISPENSARY	88/89 COSTS VS. 89/90 STOCK ESTIMATES	88/89 COSTS VS. 89/90 REGISTER ESTIMATES	89/90 STOCK VS. REGISTER ESTIMATES
LOW COST * DS5	total costs same; 88/89 per contact cost 70% lt 89/90 cost	total costs same; 88/89 per contact cost 70% lt 89/90 cost	costs same
* DS6	88/89 total cost 40% lt 89/90; but per contact cost 50% gt 89/90 cost	88/89 costs gt 89/90, by 10% for per contact costs & 100% for total costs	stock costs nearly 50% gt register estimates
* DS20	per contact costs same; 88/89 cost 10% lt 89/90 cost	88/89 costs around 100% gt 89/90 costs	stock costs 100% gt register costs
* DS26	88/89 costs about 10% lt 89/90 costs	88/89 costs about 50% gt 89/90 costs	stock costs 70% gt register costs
* DS27	88/89 costs gt 89/90 costs, by 20% for per contact costs & 37% for total costs	88/89 costs gt 89/90 costs, by 35% for per contact costs & 200% for total costs	stock costs gt register costs, by 100% for total costs & 10% for per contact costs
* DS30	costs approx. same	total costs same; 88/89 per contact cost 20% lt 89/90 cost	total costs same; stock per contact cost 25% lt register cost
* DS46	88/89 costs 30% lt 89/90 costs	88/89 total cost 100% greater; but 10% gt per contact cost	stock costs gt register costs, by 60% total cost & 60% for per contact cost

NOTES: 1.gt=greater than; lt=less than

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APPENDIX 6A: STRUCTURAL QUALITY CRITERIA, ALLOCATION BY SUB-GROUP

MOROGORO HEALTH SYSTEMS RESEARCH STUDY

CRITERIA	OP	MC	OUT	INF	STAFF	SUPP	REC	OPEQ	OPDG	OPDSG	OPINJ
1.Facility location				X							
2.Building condition				X							
3.Pest infestation				X							
4.Building security				X							
5.Water available				X							
6.Water distance				X							
7.Sanitation facilities				X							
8.OPspace available	X			X							
9.MCHspace available		X		X							
10.Waiting area				X							
11.Facility cleanliness				X							
12.Staff available				X	X						
13.Emergency staff											
14.Emergency light				X							
15.OP unspecified time	X				X						
16.MCH unspecified time		X			X						
17.Staff absences					X						
18.Time to preventive acts					X						
19.Services available											
21.Car available				X							
22.Housing available				X							
23.Uniforms				X							
24.Access to facility				X							
25.Distance to referralfac				X							
26.Transport for referrals				X							
27.Referral practice											
28.Contact with DHMT						X					
29.OP supervision						X					
30.MCH supervision						X					
31.Supervision by RHC						X					
32.OP DHMT feedback						X					
33.MCH DHMT feedback						X					
34.OP ContEd						X					
35.MCH ContEd						X					
36.Upgrading Tg						X					
37.Annual report											
38.ConsRm furniture	X										
39.OP Equip Invent	X										
40.Diagnostic Equip	X							X			
41.Diag equip cleanliness	X										
42.Treatment manuals	X										
43.Consultation privacy	X										
44.EDP supply regularity	X								X		
45.EDP supply timeliness	X								X		
46.Chloro availability	X								X		
47.Painkiller availability	X								X		
48.Penicillin availability	X								X		
49.Diazepam availability	X								X		
50.Storage of unopened kit	X										
51.Storage of opened kit	X										

CRITERIA	OP	MC	OUT	INF	STAFF	SUPP	REC	OPEQ	OPDG	OPDSG	OPINJ
52.Expired drugs available	x										
53.DressingRm furniture	x									x	
54.Dressing Equip	x							x		x	
55.Dssg Equip cleanliness	x									x	
56.Dssg Rm cleanliness	x									x	
57.Wound medical supplies	x								x	x	
58.Additional antispetic	x								x	x	
59.InjectionRm furniture	x										x
60.Injection equip	x							x			x
61.Inj Equip cleanliness	x										x
62.OPSterilization facs	x							x			x
63.Handwashing facs	x									x	x
64.Glove availability	x										x
65.OP staff task alloc	x			x							
66.OP clinic flow	x										
67.Lab space											
68.Lab trained staff											
69.Lab furniture											
70.lab equip											
71.Lab Equip cleanliness											
72.Reagents available											
73.Lab disinfectant											
74.Lab records							x				
75.Lab activities											
76.Lab acts vs reagents											
77.MCH furniture		x									
78.MCH equip invent		x									
79.MCH equipment		x									
80.ANC equip/supplies		x									
81.FP equip/supplies		x									
82.CW equipment		x									
83.Delivery area light		x									
84.Delivery equip		x									
85.Del equip storage		x									
86.Oxytocics availability		x									
87.EPI equipment		x									
88.Fridge temp recording		x									
89.Fridge maintenance		x									
90.Vaccine availability		x									
91.EPI sterilization facs		x									
92.Kerosene availability		x									
93.Health Ed timetable		x									
94.Health Ed materials		x									
95.Health Ed provision		x									
96.MCH weekly schedule		x									
97.ANC/FP privacy		x									
98.MCH clinic flow		x									
99.Imm staff task alloc		x		x							
100.Bicycle availability			x								
101.Outreach equip			x								
102.Imm outreach sessions			x								
103.Reasons for home visits			x								
104.Regularity of home visits			x								
105.Home visit records			x				x				
106.Other home visiting			x								
107.School health acts			x								
108.S/vision of dispensaries			x								
109.OP record supply							x				
110.MCH record supply							x				
111.Catchment pop							x				

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CRITERIA	OP	MC	OUT	INF	STAFF	SUPP	REC	OPEQ	OPDG	OPDSG	OPINJ
112.OP records available											
113.MCH records available							x				
114.IP register available							x				
115.IP cards available							x				
116.Record use							x				
117.Utiliz rep regularity							x				
118.Drug rep regularity							x				
119.MCH rep regularity							x				
1.IP building condition											
2.IP water facs											
3.IP sanitation											
4.IP cleanliness											
5.IP nurse availability											
6.Ward rounds											
7.Beds and mattresses											
8.Bed linen											
9.IP equipment											
10.Emergency equipment											
11.Emergency Obs equip											
12.IP furniture											
13.Food supplies											
14.Patient clothes											

CRITERIA	AN	DEL	CW	EPI	LAB	IP	IPSTAFF	IPEQ	FAC	FAC/DIS	DIS	DIS/EXT	F/D/E
1.Facility location										x			
2.Building condition											x		
3.Pest infestation										x			
4.Building security										x			
5.Water available											x		
6.Water distance											x		
7.Sanitation facilities								x					
8.OPspace available											x		
9.MCHpsace available											x		
10.Waiting area											x		
11.Facility cleanliness							x						
12.Staff available											x		
13.Emergency staff							x						
14.Emergency light									x				
15.OP unspecified time							x						
16.MCH unspecified time							x						
17.Staff absences								x					
18.Time to preventive acts								x					
19.Services available								x					
21.Car available											x		
22.Housing available											x		
23.Uniforas									x				
24.Access to facility											x		
25.Distance to referralfac											x		
26.Transport for referrals											x		
27.Referral practice							x						
28.Contact with DHMT									x				
29.OP supervision									x				
30.MCH supervision									x				
31.Supervision by RHC									x				
32.OP DHMT feedback									x				
33.MCH DHMT feedback									x				
34.OP ContEd											x		
35.MCH ContEd											x		
36.Upgrading Tg											x		
37.Annual report									x				
38.ConsRm furniture									x				
39.OP Equip Invent							x						
40.Diagnostic Equip											x		
41.Diag equip cleanliness							x						
42.Treatment manuals											x		
43.Consultation privacy								x					
44.EDP supply regularity									x				
45.EDP supply timeliness									x				
46.Chloro availability													x
47.Painkiller availability													x
48.Penicillin availability													x
49.Diazepam availability													x
50.Storage of unopened kit							x						
51.Storage of opened kit							x						

CRITERIA	AN	DEL	CW	EPI	LAB	IP	IPSTAFF	IPEQ	FAC	FAC/DIS	DIS	DIS/EXT	F/D/E
52.Expired drugs available									X				
53.DressingRm furniture										X			
54.Dressing Equip												X	
55.Dssg Equip cleanliness								X					
56.Dssg Rm cleanliness								X					
57.Wound medical supplies											X		
58.Additional antiseptic													X
59.InjectionRm furniture										X			
60.Injection equip											X		
61.Inj Equip cleanliness								X					
62.OPSterilization facs										X			
63.Handwashing facs								X					
64.Glove availability								X					
65.OP staff task alloc									X				
66.OP clinic flow								X					
67.Lab space					X						X		
68.Lab trained staff					X						X		
69.Lab furniture					X					X			
70.lab equip					X						X		
71.Lab Equip cleanliness					X			X					
72.Reagents available					X					X			
73.Lab disinfectant					X					X			
74.Lab records					X			X					
75.Lab activities					X					X			
76.Lab acts vs reagents					X			X					
77.MCH furniture										X			
78.MCH equip invent								X					
79.MCH equipment	X	X	X								X		
80.ANC equip/supplies	X										X		
81.FP equip/supplies			X								X		
82.CW equipment											X		
83.Delivery area light	X								X				
84.Delivery equip	X										X		
85.Del equip storage	X							X					
86.Oxytocics availability	X												X
87.EPI equipment				X							X		
88.Fridge temp recording				X				X					
89.Fridge maintenance				X						X			
90.Vaccine availability				X							X		
91.EPI sterilization facs				X							X		
92.Kerosene availability				X							X		
93.Health Ed timetable								X					
94.Health Ed materials											X		
95.Health Ed provision								X					
96.MCH weekly schedule								X					
97.ANC/FP privacy	X									X			
98.MCH clinic flow								X					
99.Imm staff task alloc				X						X			
100.Bicycle availability											X		
101.Outreach equip											X		
102.Imm outreach sessions								X					
103.Reasons for home visits								X					
104.Regularity of home visits								X					
105.Home visit records								X					
106.Other home visiting								X					
107.School health acts								X					
108.S/vision of dispensaries								X					
109.OP record supply											X		
110.MCH record supply											X		
111.Catchment pop								X					

CRITERIA	AN	DEL	CW	EPI	LAB	IP	IPSTAFF	IPEQ	FAC	FAC/DIS	DIS	DIS/EXT	F/D/E
112.OP records available													
113.MCH records available									X				
114.IP register available						X			X				
115.IP cards available						X			X				
116.Record use									X				
117.Utiliz rep regularity									X				
118.Drug rep regularity									X				
119.MCH rep regularity									X				
1.IP building condition						X						X	
2.IP water facs						X						X	
3.IP sanitation						X				X			
4.IP cleanliness						X			X				
5.IP nurse availability						X	X			X			
6.Ward rounds						X	X		X				
7.Beds and mattresses						X					X		
8.Bed linen						X					X		
9.IP equipment						X		X				X	
10.Emergency equipment						X		X				X	
11.Emergency Obs equip						X		X				X	
12.IP furniture						X					X		
13.Food supplies						X					X		
14.Patient clothes						X					X		

APPENDIX 7A: PROCESS QUALITY ASSESSMENT SCORES

Table 1: Ante-natal consultation, unit median scores overall, by process and care aspects (%) and assessment against professional standards

| GROUP | UNIT | TOTAL | PROCESS ASPECTS | | | | | | | | CARE ASPECTS | | |
			INT	HIST	MEAS	EXAM	TT	ED	REC	DRUG	TEC	REC	ATT
high cost govt disp-ensaries	DS2	32	100	50	33	64	100	75	100	100	61	75	64
	DS7	50	50	33	56	64	0	25	100	-	52	75	36
	DS24	-	.	-	-	-	-	-	-	-	-	-	-
	DS32	61	100	56	56	52	75	50	100	100	63	100	46
	DS35	-	.	.	-	-	-	-	-	.	-	-	-
	DS39	45	75	41	44	27	75	25	100	50	44	75	36
	DS42	35	25	17	56	27	25	25	100	-	32	100	18
low cost govt disp-ensaries	DS5	50	100	0	56	77	0	25	100	0	52	75	50
	DS6	52	75	33	22	73	50	50	100	.	49	75	55
	DS20	43	25	33	39	64	25	25	100	50	49	75	18
	DS26	35	25	17	44	36	25	25	100	50	36	75	18
	DS27	57	75	50	33	64	75	50	100	-	60	75	46
	DS30	63	75	63	33	64	100	50	100	100	63	75	55
	DS46	32	50	17	33	27	25	25	100	-	28	75	27
diocesan disp-ensaries	MS11	42	75	50	22	55	0	13	50	-	41	50	45
	MS14	-	-	-	-	-	-	-	-	-	-	-	-
	MS51	32	50	0	44	36	0	25	100	75	32	75	18
	MS55	50	100	0	33	64	0	50	100	-	46	75	50
health centres	HC58	82	75	50	67	91	100	100	100	-	76	100	91
	HC59	47	75	17	33	64	75	25	100	50	46	75	36

KEY: For definitions of process and care aspects see Appendix 4I
Shaded cells = adequate or good performance against professional standards
- = missing value

Table 2: Ante-natal record review, unit median scores overall, by process and care aspects (%) and assessment against professional standards

GROUP	UNIT	TOTAL	PROCESS ASPECTS					CARE ASPECTS		
			HIST	EXAM	KNOW	DRUG	REC	TEC	REC	ATT
high cost government dispensaries	DS2	73	100	60	63	50	20	86	20	64
	DS7	71	96	58	46	50	50	80	50	50
	DS24	68	96	58	54	50	30	80	30	55
	DS32	75	100	58	54	50	33	82	33	55
	DS35	58	89	50	46	50	30	68	30	55
	DS39	28	11	60	27	50	25	29	25	27
	DS42	72	96	80	39	40	40	86	40	36
low cost government dispensaries	DS5	82	96	67	77	50	67	82	67	82
	DS6	71	96	73	54	50	28	86	28	55
	DS20	27	19	42	54	50	10	25	10	55
	DS26	29	22	42	39	50	20	30	20	36
	DS27	73	96	58	71	50	25	80	25	71
	DS30	63	80	50	62	50	28	68	28	60
	DS46	59	94	50	39	50	10	75	10	36
diocesan dispensaries	MS11	73	96	70	46	50	32	86	32	50
	MS14	76	96	67	54	50	50	81	50	55
	MS51	73	96	58	54	50	50	80	50	55
	MS55	73	96	70	54	50	50	79	50	55
health centres	HC58	67	100	50	67	50	40	68	40	36
	HC59	54	59	50	67	50	30	32	30	38

KEY: For definitions of process and care aspects see Appendix 4I
        Shaded cells = adequate or good performance against professional standards
        - = missing value

Table 3: General consultation, unit median scores overall, by process and care aspects (%) and assessment against professional standards

| GROUP | UNIT | TOTAL | PROCESS ASPECTS | | | | | | | CARE ASPECTS | | |
			INT	HIST	EXAM	DIAG	DRUG	REF	END	TEC	REC	ATT
high cost government disp-ensaries	DS2	58	90	100	15	67	0	20	67	43	94	65
	DS7	48	85	71	25	67	0	50	17	31	92	57
	DS24	41	80	64	23	67	0	-	0	32	100	38
	DS32	55	90	91	14	50	0	60	50	40	95	65
	DS35	57	80	78	28	67	0	40	84	42	100	70
	DS39	45	75	84	14	17	0	-	0	32	94	57
	DS42	37	70	53	25	67	0	40	0	23	100	29
low cost government disp-ensaries	DS5	46	80	77	15	50	0	50	67	30	94	48
	DS6	51	65	90	15	67	0	-	100	42	74	57
	DS20	47	80	65	29	67	0	-	17	31	100	42
	DS26	43	70	64	23	67	0	80	0	31	100	33
	DS27	48	85	76	14	67	0	20	17	33	60	70
	DS30	55	90	92	16	50	0	80	17	37	95	70
	DS46	44	80	64	23	67	0	-	17	31	100	38
diocesan disp-ensaries	MS11	44	92	50	18	58	0	80	0	25	100	54
	MS14	45	70	49	14	67	0	-	17	29	62	58
	MS51	41	71	78	26	17	0	-	0	25	83	50
	MS55	53	86	77	37	17	0	-	9	33	92	73
health centres	HC58	79	100	100	50	67	60	-	100	68	100	91
	HC59	44	80	64	19	67	0	-	17	32	100	42

KEY: For definitions of process and care aspects see Appendix 4I
Shaded cells = adequate or good performance against professional standards
- = missing value

Table 4: Child fever consultation, unit median scores overall, by process and care aspects (%) and assessment against professional standards

GROUP	UNIT	TOTAL	PROCESS ASPECTS				
			HISTORY	EXAM	MANAGE-MENT	DIAG-NOSIS	TREAT-MENT
high cost government disp-ensaries	DS2	33	33	18	0	0	100
	DS7	37	50	21	0	0	100
	DS24	34	17	7	0	0	100
	DS32	30	33	0	0	0	100
	DS35	33	50	25	0	0	50
	DS39	6	33	0	0	0	0
	DS42	28	33	11	0	0	50
low cost government disp-ensaries	DS5	36	50	21	0	0	100
	DS6	34	50	14	0	0	50
	DS20	34	33	14	0	0	75
	DS26	16	25	7	0	0	50
	DS27	28	33	0	0	0	100
	DS30	23	33	7	0	0	50
	DS46	22	33	4	0	0	50
diocesan disp-ensaries	MS11	37	50	14	0	0	50
	MS14	27	50	14	0	0	50
	MS51	29	50	14	0	0	50
	MS55	38	50	29	0	50	50
health centres	HC58	50	50	47	0	100	0
	HC59	26	17	4	0	0	100

KEY: For definitions of process and care aspects see Appendix 41
Shaded cells = adequate or good performance against professional standards

Table 5: Injection, unit median scores overall, by process and care aspects (%) and assessment against professional standards

GROUP	UNIT	TOTAL	PROCESS ASPECTS					CARE ASPECTS	
			POL	PREP	INJ	CLE-AN	EXP-LAN	TECH-NICAL	ATT-ITUDE
high cost government dispensaries	DS2	71	50	80	82	100	0	79	20
	DS7	63	0	80	73	100	0	79	0
	DS24	-	-	—	-	-	0	-	-
	DS32	58	50	80	64	67	0	68	40
	DS35	58	0	80	64	100	0	74	0
	DS39	40	0	80	46	33	0	47	20
	DS42	71	0	80	82	100	0	84	20
low cost government dispensaries	DS5	54	0	80	55	100	0	68	0
	DS6	46	50	80	36	67	0	47	20
	DS20	67	0	80	82	100	0	79	20
	DS26	67	0	80	82	100	0	79	20
	DS27	58	100	80	55	33	0	53	40
	DS30	63	0	80	73	100	0	63	20
	DS46	67	0	80	82	100	0	79	20
diocesan dispensaries	MS11	71	0	80	82	100	0	79	20
	MS14	58	0	60	64	100	0	68	0
	MS51	54	0	80	64	67	0	68	0
	MS55	54	0	60	64	100	0	68	0
health centres	HC58	58	0	80	32	100	0	74	0
	HC59	67	50	80	36	67	33	58	40

KEY: For definition of process and care aspects see Appendix 4I
              Shaded cells = adequate or good performance against professional standards
              - = missing

Table 6: Dispensing, unit median scores overall, by process and care aspects (%) and assessment against professional standards

GROUP	UNIT	TOTAL	PROCESS ASPECTS				CARE ASPECTS	
			POLITE-NESS	PREPAR-ATION	EXPLAN-ATION	REPET-ITION	TECH-NICAL	ATT-ITUDE
high cost government disp-ensaries	DS2	44	0	88	36	0	48	0
	DS7	40	0	88	27	0	43	0
	DS24	40	0	88	27	0	43	0
	DS32	52	50	88	36	0	48	50
	DS35	36	0	63	36	0	39	0
	DS39	38	0	88	18	0	39	0
	DS42	40	0	88	27	0	43	0
low cost government disp-ensaries	DS5	32	0	63	27	0	35	0
	DS6	40	0	88	23	0	41	0
	DS20	40	0	88	27	0	43	0
	DS26	40	0	88	27	0	43	0
	DS27	48	100	88	27	0	43	100
	DS30	40	0	88	27	0	43	0
	DS46	40	0	88	27	0	43	0
diocesan disp-ensaries	MS11	40	0	88	27	0	43	0
	MS14	32	0	63	27	0	35	0
	MS51	44	0	88	36	0	48	0
	MS55	36	0	63	36	0	39	0
health centres	HC58	42	0	88	32	0	46	0
	HC59	54	50	88	36	25	53	53

KEY: For definition of process and care aspects see Appendix 4I
       Shaded cells = adequate or good performance against professional standards

APPENDIX 7B:
PROCESS QUALITY ASSESSMENT, PERFORMANCE BY CRITERIA

Strengths are defined as criteria for which 70% and over of the total number of observations made across all health units were judged as good, and weaknesses, those for which 70% and over were judged as poor. Percent in brackets = % total observations good/bad, except where indicated.

1.   The general consultation

STRENGTHS

WEAKNESSES

1.Introduction/ records
- wearing clean clothes (98.2%)
- offer the patient a chair (71%)
- look at patient whilst talking (99.1%)
- complete patient register (95.2%)
- complete patient card (98.9%)
- check patient register at end (95%)
- complete tally sheet at end (84%)

1.Introduction/ records
- wearing white coat (81%)
- check child vaccination status (78.2%)

2.History taking
- over 80 or 90% good for most criteria

2.History taking
- asking if treatment obtained elsewhere previously (first visits, 84.2%; repeat visits, 77.7%)

3.Examination
- ensure privacy (88.7% of 1st and reattendances without improvement)
- use lab test results for diagnosis (79% of those ordered)

3.Examination
- respiration, pulse, temperature, BP (all over 80% of 1st and reattendances without improvement)
- eyes and respiration (both over 90% of 1st and reattendances without improvement)
- explanation given to patient (79.4% of 1st and reattendances without improvement)
- order lab test (88.4% of 1st and reattendances without improvement)
- check Hb (95.7% of 1st and reattendances without improvement)

4.Diagnosis
- details written on card (97.7%)
- details written in register (94.9%)

4.Diagnosis
- explained to patient (77.8%)

5.Drugs (prescription explained)
- all criteria 85% or more

6.Referral practice
- explain why necessary (92.3% of referrals)
- write in register (79.5% of referrals)

6.Referral practice
- assist in finding transport (97.4% of referrals)

7.Ending
- personal health education given (74.1%)

In addition, there were a number of criteria the performance of which was mixed ie. less than 70% and more than 50% good, or less than 70% and more than 50% poor:

1.Introduction/records
- remind mothers to use MCH clinic (56.8% = 'good')

2.History-taking
- not interrupting patient whilst talking (64% = 'good')
- ask extra question to understand complaint (61.4% = 'poor')

3.Examination
- check child's weight (50.5% of child observations = 'poor')
- make notes on patient card during examination (60.3% of first and reattendances without improvement = 'good')

4.Diagnosis
- prescription correct for diagnosis (54.2% = 'good')

6.Referral practice
- write full referral letter (51.3% of referrals = 'good')

7.Ending
- patient told if and when to return (67.2% = 'poor')
- health worker said goodbye politely (66.6% = 'good').

2.   The child fever consultation

STRENGTHS   WEAKNESSES

1.History-taking   **1.History-taking**
- ask duration of fever (96.1%)   - ask had convulsions, been exposed to
                                                measles, had ear pain or discharge (over 90%
                                                each)

                                                2.Physical examination
                                                - touched the patient at all/whilst examining
                                                (71.5%)
                                                - all items except eyes and temperature (74%
                                                to over 90% each)

                                                3.Management (non-drug)
                                                - all criteria (over 90% each)

                                                4.Process of diagnosis

In addition, there were a number of criteria the performance of which was 'mixed' ie. less than 70% and more than 50% 'good', or less than 70% and more than 50% 'poor':

1.History-taking
- asking about history of diarrhoea or vomiting (62% = 'good)
- asking about cough/sore throat (57.6% = 'good')

2.Physical examination
- checking eyes (63.2% = 'poor')
- checking temperature (66.3% = 'poor')

3.Treatment
- prescription correct for diagnosis (52.2%)

3.   Sterilization

*   *performance strengths:*
        •   boiling for 20 mins (88.6%)
        •   gathering together equipment before sterilizing (83.3%)
        •   fully covering all equipment with water (83.3%)
        •   rinsing equipment with clean water (77.2%)

* *performance weaknesses:*
    - covering equipment with sterile cloth (86%)
    - re-boiling such equipment (71.1%)
    - re-cleaning used sterile equipment if all used before day over (71.1%) (but note that in three of the total 19 units, this criterion was always scored good)

In addition, some criteria were subject to mixed performance, where general weaknesses were sometimes contradicted by the pattern within some health units:

% total observations good or poor	unit-specific patterns
testing sharpness of needles - 50% = "poor"	7/19 units always good, 4/19 always poor
washing equipment with soap and water before boiling - 55.3% = "good"	6/19 units always good, 4/19 always poor
using sterile forceps to remove equipment from boiling water - 55.3% = "good"	7/19 units always good, 6/19 always poor
having epinephrine available - 54.4% = "poor"	7/19 units always good, 8/19 always poor.

4. Dispensing area cleanliness

* *performance strengths* included:
    - containers with tight-fitting lids (95%),
    - right names for drugs written on containers (94.2%),
    - having dispensing plastic bags (91.7%),
    - sweeping the area (83.3%),
    - wiping with wet cloth (84.2%),
    - nurse having pen (80.8%)

* *performance weaknesses* included:
    - soapy water, clean water and towel to clean cups after use (priority question) (93.3%) (note 1 unit scored good across all their observations)
    - clean place to put cups after use (85.8%)
    - clean water, soap and towel to wash hands (76.7%) (note 2 units scored good across all their observations)

Mixed performance was noted for the following criteria (percentages represent percent of total number of observations scored good or poor):
- dusting (65% = good)
- drugs arranged in good order (priority question) (52.5% = good)
- cups for liquid medicine (65% = poor)
- cup and water to take first dose available (priority question) (59.2% = poor)
- containers kept in good order all day (priority question) (55% = poor)

5. Injection

STRENGTHS

WEAKNESSES

1.Politeness
- politely saying hello (79.7%)
- politely saying goodbye (73.8%) (note that in 5 units over 50% of their observations were scored good)

2.Preparation
- checking the patient is really the one for whom the prescription is written (95.8%)
- checking understanding of the prescription (99.6%),
- giving the correct drug to the patient (a priority question) (99.5%)

3.Injection
- checking that syringe and needle are clean (a priority question) (78.7%)
- checking there is no air in the syringe (92.7%),
- taking the correct amount of the drug (99.7%),

- choosing the correct site for injection (a priority question) (92.2%)
- cleaning the site before injection (96.7%)

4.Cleanliness
- putting the needle to be re-boiled (94%)
- putting the syringe to be re-cleaned and not used again (73.2%)
- putting used swab into rubbish bin (95.5%)

2.Preparation
- asking the patient if s/he has previously used the drug and had any problems (99.5%),

3.Injection
- explaining to the patient what s/he is going to do during the injection (90.9%)
- helping the patient to prepare for the injection (88.8%)

5.Explanation
- explaining possible side-effects of drugs (100%)
- explaining if necessary to return again (82.1%)
- checking the patient understands by getting him/her to repeat instructions (97.4%),

Mixed performance was noted for the following criteria:

3.Injection
- ensuring privacy (65.5% = good)
- washing hands before injection (51.5% = poor)

6.   Dispensing

STRENGTHS

WEAKNESSES

1.Politeness
- greeting politely (81.8%)
- say goodbye politely (81.2%)

2.Preparation
- checking the right prescription for the right patient (81.8%),
- taking time to read and understand the prescription (99.7%)
- giving the right drug to the patient (priority question) (99.9%),
- counting out the correct dose (priority question) (99.9%),

3.Explanation
- explain how much per dose (100%),
- explain how many times per day (99.8%),

3.Explanation
- ensuring first dose is taken (priority question) (88.4%)

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- explain how many days of treatment (72.5%)
- if no drugs, give other drugs or advice (85.3%),
- if no drug, ask doctor to - change prescription or explain to patient where to buy drug (82.4%),

- explain can be side-effects (96.2%),
- encourage patient to complete course even if are side-effects (99.9%),
- instruct to return if get side-effects (99.8%),
- instruct not to give drugs to other people (97.8%),
- correctly write instructions on plastic bag (62.6%)

4.Repetition
- patient repeats instructions (all over 90%)

7.   Ante-natal consultation

STRENGTHS

1.Introduction
- chair to sit on (75%)
- looked at mother whilst talking (97.8%)

2.History-taking during first visit
(note small numbers, first visits only)
- ask about amenorrhea (72.9%)
- ask date of last period (74%)
- ask how many previous pregnancies (94.8%)
- ask number of living children (82.3%)
- ask if previous childbirth problems (78.1%)
- ask mother's estimate of gestation period
- giving mother time to explain (92.7%)

3.History-taking, repeat visits
(note percentage of repeat visits)
- giving mother time to explain (82.5%)

4.Height and weight measurement
- look at weighing scale before use (83.1%)
- write correct weight on cards (91.8%)

6.Physical examination
- check eyes (72.3%)
- check mucous membranes (72.8%)
- check legs (80.2%)

7.Obstetrical examination
- inspection (100%)
- palpation (100%)
- listen to child's pulse (98.8%)

9.Administration of TT
- mother told when to return for next dose

11.Recording
- mother's card filled (94%)
- tally sheet filed (92.9%)

12.Drugs given
in 26.9% of observations
- treatment explained (92.9%)

WEAKNESSES

1.Introduction
- greet mother appropriately eg.shikamoo (75%)

2.History-taking during first visit
(note small numbers, first visits only)
- ask about morning sickness (89.6%)
- ask about family history of chronic disease (76%)
- ask about dietary patterns (95.8%)
- ask about appetite (94.8%)
- ask about use of family planning (71.9%)
- ask about STDs (77.1%)

3.History-taking, repeat visits
(note percentage of repeat visits)
- ask about morning sickness (98.1%)
- ask about diet (94%)
- ask about appetite (92.9%)

4.Height and weight measurement
- explain weight measurement to mother (91.2%)
- height recorded at first visit (73.9%)

6.Physical examination
- check pulse (97.8%)
- explain to mother (84.1%)
- help mother prepare (71.4%)

7.Obstetrical examination
- explain to mother (87.6%)

8.Laboratory tests
- Hb (92.9%)
- albumin (99.2%)

9.Administration of TT
- mother told importance of TT (72.3%)

13.Ending
- mother told when to return (96.4%)

13.Ending
- mother's knowledge of return date checked (88.5%)

In addition, there were a number of criteria the performance of which was mixed ie. less than 70% and more than 50% good, or less than 70% and more than 50% poor:

1.Introduction
- smiled at mother (63.2% = good)

2.History-taking during first visit
- ask about leg swelling (66.7% = poor)
- ask last delivered where (59.4% = poor)
- ask any problems during last delivery (54.2% = good)

3.History-taking during repeat visits
- ask mother estimate of gestation period (51.5% = good)

4.Height and weight measurement
- correct weighing scale if necessary (68.4%)
- tell mother her weight (69.5%)

5.BP taken (60.7% = good)

6.Physical examination
- full head to toe examination (50% = poor)

9.TT Administration
- give to mother when required (53.3% = poor)

10.Personal health education (64.3% = poor)

12.Drugs given
- mother's understanding checked (61.2% = poor)

13.Ending
- polite farewell (64.3% = poor)

<u>8.</u>   <u>Ante-natal record review</u>

STRENGTHS   WEAKNESSES

1.History-taking
cards correctly recorded:
- number of previous deliveries (85.4%)
- how many living children the mother had (83.5%)
- if mother's age under 16 (88.5%)
- if mother's age over 35 (86.9%)
- if mother had had any leg problems (72.7%)
- how many pregnancies the mother had had, and if it over 8 (74.5%)
- if mother had any problems with her last delivery (72%)
- if mother had had any problems in last stages of last delivery (eg.need to use vacuum) (72.5%)
- date of last pregnancy and if it was more than 10 years ago (72.8%)
- if mother had had any caesarian sections in the past (72.2%)
- if last child was stillborn (71.5%)
- if mother had had 3 or more aborted pregnancies (71.6%)
- if mother had had any problems with this

pregnancy (71%)

2.Height measurement
- any record (83.5%)
- identification if less than 150cm (70.5%)

3.Expected date of delivery (73.5%)

4.Mother's knowledge
- of weight status (78.6%)
- if need another TT dose (83.2%)
- when to return (95.1%)

4.Mother's knowledge
- child unusually large/small (76.7%)
- Hb status (79.3%)
- expected date of delivery (74.4%)

5.Received family planning advice
(71.8%)

6.Regular measurements
- weight (94.9%)
- BP (64%)
- legs (84.9%)
- gestation (84.9%)
- fundal height (93.4%)
- lie of child (88.4%)
- foetal heart beat (87.9%)

6.Regular measurements
- Hb (80.1%)
- urine/albumin (92.5%)

7.Folic acid/iron supplementation
- got at all (94.1%)

8.TT up-to-date (80.3%)

10.Risk factor based on Hb
- 95% incorrect or not regularly measured

11.Risk factor related to foetal position
- no problems

12.Risk factor related to age over 40
- no problems

13.Other
- date of next visit recorded (98.8%)

In addition, there were a number of criteria the performance of which was mixed ie. less than 70% and more than 50% good, or less than 70% and more than 50% poor:

1.History-taking
- date of last period recorded (65.2% = poor)

4.Mother's knowledge
- of BP status (53.1% = poor)

6.Regular measurements
- BP (64% = good)

7.Folic Acid/iron supplementation
- of those checked regularly for Hb 38.5% did not need iron
- of those checked regularly for Hb 27.4% got it when required
- of those checked regularly for Hb 38.5% did not get it when required

9.Risk factor based on BP, leg, albumin
- incorrect or not regularly measured (56.5% = poor)

13.Other
- nurse written comment (54.8% = good)

APPENDIX 7C:
PROCESS QUALITY ASSESSMENT, ANALYSIS OF PERFORMANCE VARIATION BETWEEEN UNITS

Table 1: Variables used in assessing performance variation between health units

FACTOR GROUP	VARIABLES USED	DATA SOURCES
1. Health unit factors	1.1 total person minutes of staff time allocated to contact; two variables for each activity: one for specific procedure and one, for general curative/MCH care (to allow for staff involvement in several activities)	calculated using data from time logs about time allocations and workloads for the week of observation; data were not available from three health units
	1.2 health unit workloads: weekly and annual	weekly data collected during observations; annual data for July 1988-June 1989, the costing period; for nursing procedures, used total number of outpatients
2. District practice factors	2.1 supervision: two variables - ante-natal care, number for procedure & for overall MCH services; curative/nursing care, number of general visits & for MCH services (few made for curative care only)	determined from data used in the costing study (July 88 - June 89), assuming current performance would reflect previous supervision
	2.2 ante-natal card type (assuming district responsibility for its provision)	observations (65.2% of mothers had a special card, 34% had only paper/exercise book and 0.8% had both
3. Structural factors	general infrastructure, equipment availability and staff structure (availability and practices)	drawn from structural assessment
4. Staff availability	two variable groups: general and trained (RMAs, MCHAs) staff availability; for ante-natal & nursing care, procedure-specific staff & total MCH/curative care staff (the pressure of general MCH/ curative activities may have impact on work)	collected during the week of observations (numbers of staff present not official allocation)

Table 2: Correlations between performance and factors of health unit practice

ACTIVITY/ PROCEDURE	CORRELATIONS WITH TIME ALLOCATIONS		CORRELATION WITH WORKLOAD	
	CORRELATIONS: variable/aspect	$r_{\bullet}$	CORRELATIONS: variable/aspect	$r_{\bullet}$
1.ANTE-NATAL CARE * consultations	PERSON MIN/AN ATTENDER & attitude PERSON MIN/MCH ATTENDER & overall & attitude	0.40 0.31 0.43	MCH WEEKLY & overall & attitude AN ANNUAL & record	0.36 0.32 -0.45
* record cards	no correlation over 0.3		MCH ANNUAL & overall	0.34
2. CURATIVE CONSULTATIONS * general	no correlation over 0.3		CC WEEKLY & records	0.37
* child fever	no correlation over 0.3		no correlation over 0.3	
3. NURSING CARE * injection procedure	INJ MINS/ATT & attitude NURS MINS/ATT & attitude	-0.51 -0.55	CC ANNUAL WORKLOAD & overall & attitudes CC WEEKLY WORKLOAD & overall	0.31 0.36 0.43
* dispensing procedure	DISP MINS/ATT & attitude NURS MINS/ATT & attitude	-0.39 -0.39	CC WEEKLY WORKLOAD & technical CC ANNUAL WORKLOAD & technical	0.53 0.44
* sterilization	no corelation over 0.3		ANNUAL WORKLOAD WEEKLY WORKLOAD	0.51 0.63
* dispensing cleanliness	DISP MIN/ATT NURS MIN/ATT	0.54 0.52	no correlation over 0.3	

KEY: AN= ante-natal
        ATT = attender
        CC= curative care
        DISP = dispensing
        INJ= injection
        MIN= minute
        NURS = nurse

Table 3: Correlations between performance and supervision frequency

| ACTIVITY/PROCEDURE	CORRELATIONS: variable/aspect	r_s
1.ANTE-NATAL CARE * consultations	GENERAL SUPERVISION & attitudes	-0.30
* record cards	MCH VISITS & attitudes & technical GENERAL SUPERVISION & attitudes	-0.31 -0.30 0.36
2. CURATIVE CARE * general consultations	GENERAL VISITS & overall & technical & records MCH VISITS & record & attitudes	0.38 0.40 0.30 0.38 -0.50
* child fever consultations	no correlation over 0.3	
3. NURSING CARE	GENERAL & injection attitudes GENERAL & dispensing technical	-0.35 -0.36

Table 4: Correlation between performance and structural factors

ACTIVITY/PROCEDURE	CORRELATIONS: variable/aspect	r_s
1.ANTE-NATAL CARE * consultations	ANTE-NATAL EQUIPMENT & record	0.54
	STAFF AVAILABLE & overall	-0.30
	& technical	-0.34
* record cards	MCH OVERALL & records	-0.31
	ANTE-NATAL EQUIPMENT & technical	0.34
	STAFF AVAILABLE & attitudes	-0.33
2. CURATIVE CARE * general consultations	GENERAL INFRASTRUCTURE & attitudes	0.30
	STAFF AVAILABLE & overall	0.49
	& attitudes	-0.39
* child fever consultations	GENERAL INFRASTRUCTURE & overall	0.37
	CURATIVE OVERALL & overall	0.40
	STAFF AVAILABLE & overall	-0.42
3. NURSING CARE * injection procedure	NURSING EQUIPMENT & overall	0.33
	& technical	0.61
	& attitudes	-0.38
	INJECTION OVERALL & technical	0.41
	& attitudes	-0.48
	CURATIVE OVERALL & technical	0.34
	& attitudes	-0.34
* dispensing procedure	NURSING EQUIPMENT & attitude	-0.53
	STAFF AVAILABLE & overall	-0.38
	CURATIVE OVERALL & attitudes	-0.40
* dispensing cleanliness	NURSING EQUIPMENT	0.55
	CURATIVE OVERALL	0.50
	STAFF AVAILABLE	-0.32

Table 5. Assessment of association between performance and staff availability

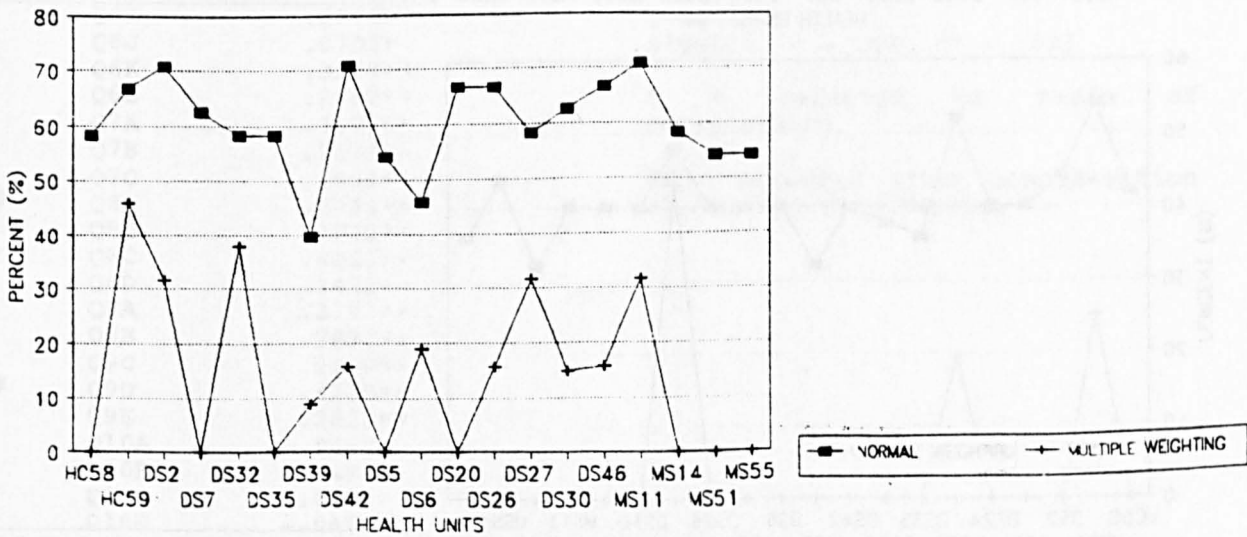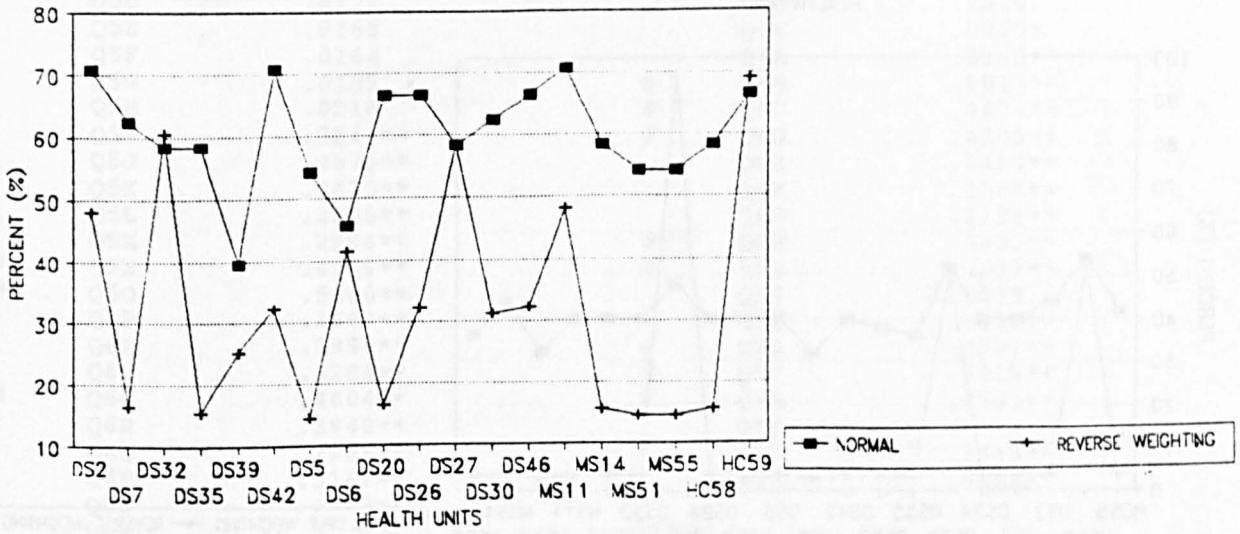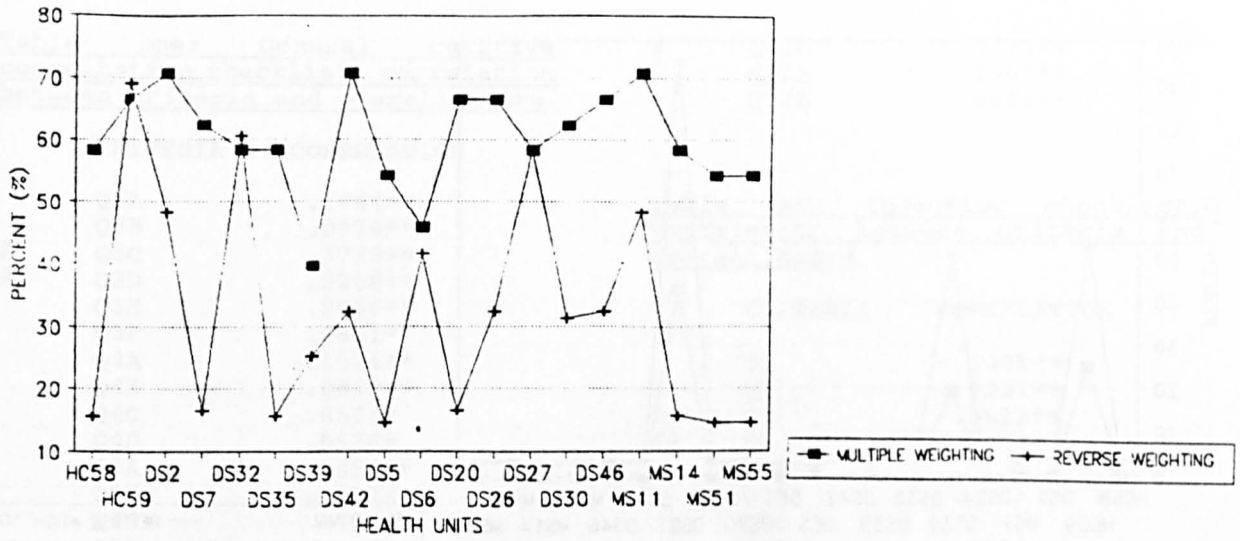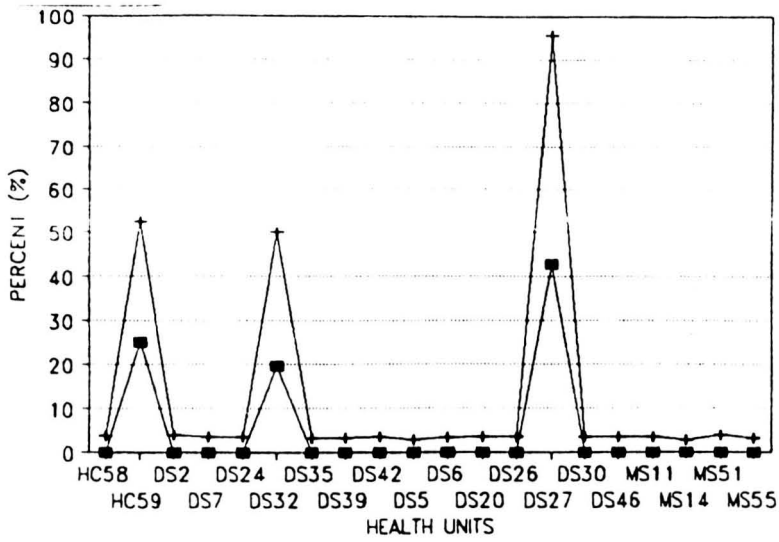| ACTIVITY/ PROCEDURE	CORRELATIONS WITH ALL STAFF		CORRELATIONS WITH TRAINED STAFF	
	CORRELATIONS: variable/aspect	r_s	CORRELATIONS: variable/aspect	r_s
1.ANTE-NATAL CARE * consultations	ANTE-NATAL STAFF & overall & attitude & records MCH STAFF & attitudes	0.30 0.45 -0.32 0.35	& overall & attitude	0.39 0.60
* record cards	not applicable		not applicable	
2. CURATIVE CARE * general consultations	CURATIVE CARE STAFF & technical	0.51	& overall & technical & attitudes	0.62 0.69 0.32
* child fever consultations	CURATIVE CARE & overall	0.32	& overall	0.42
3. NURSING CARE * injection	no correlation over 0.3		no correlation over 0.3	
* dispensing	NURSING STAFF & technical	0.5	& overall & technical	0.31 0.44
* dispensing cleanliness	no correlation over 0.3		no correlation over 0.3	
* sterilization	ALL CURATIVE STAFF NURSING CURATIVE STAFF	0.42 0.39	& overall	0.62

APPENDIX 7D: PROCESS QUALITY, ALTERNATIVE SCORE WEIGHTING SYSTEMS

Ante-Natal Consultation

General Curative Consultation
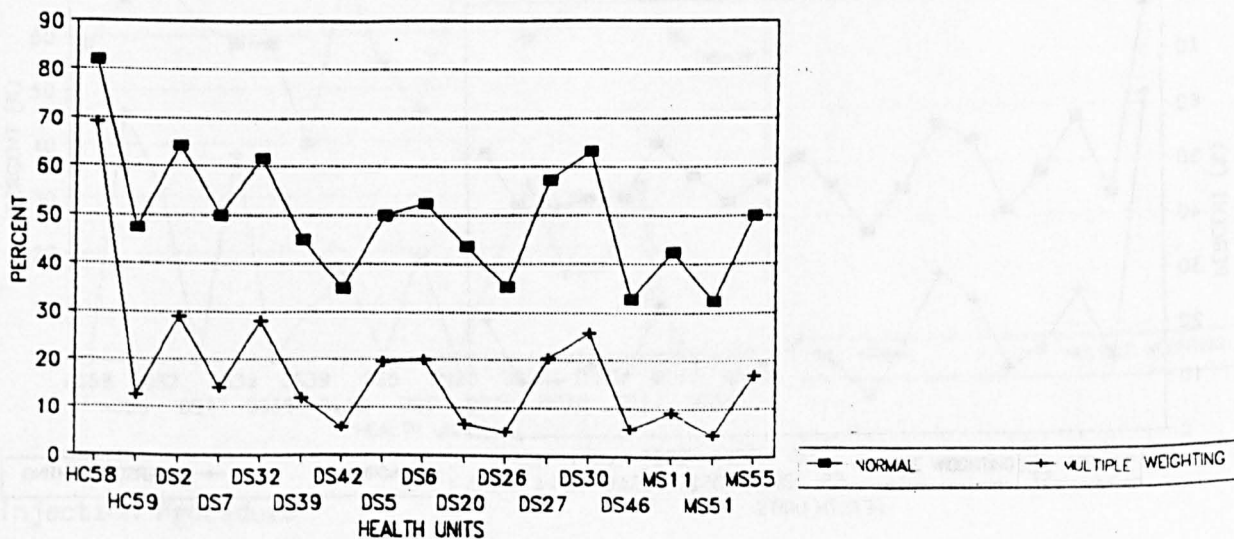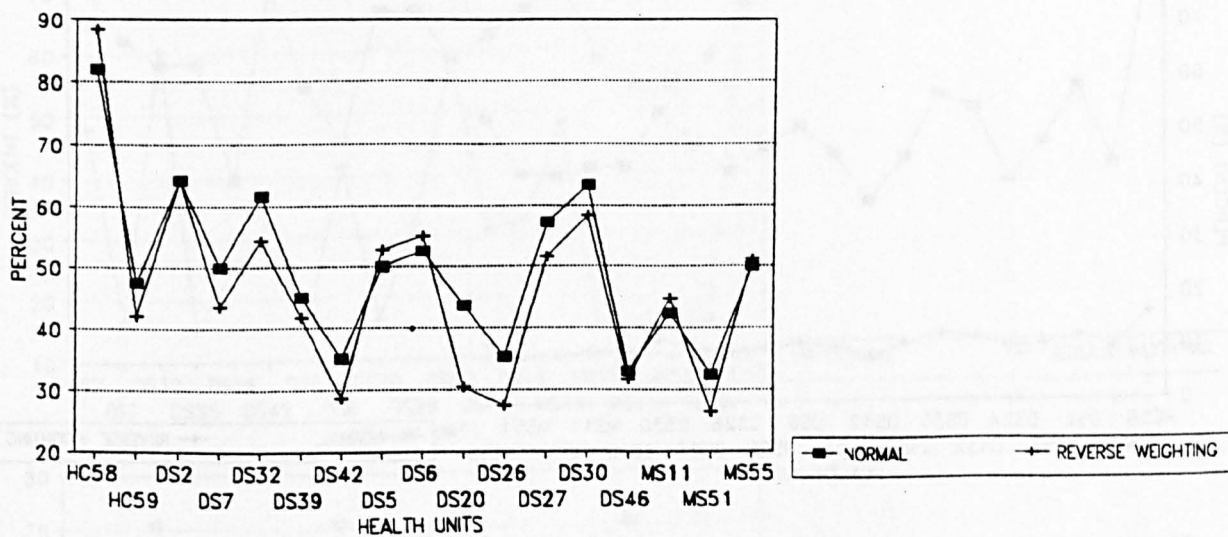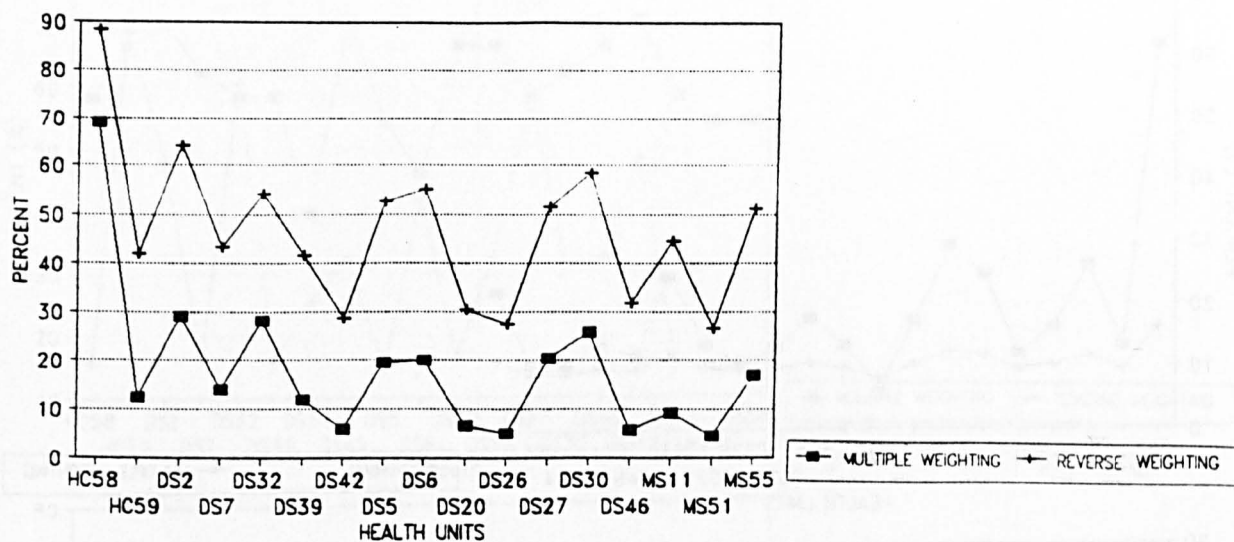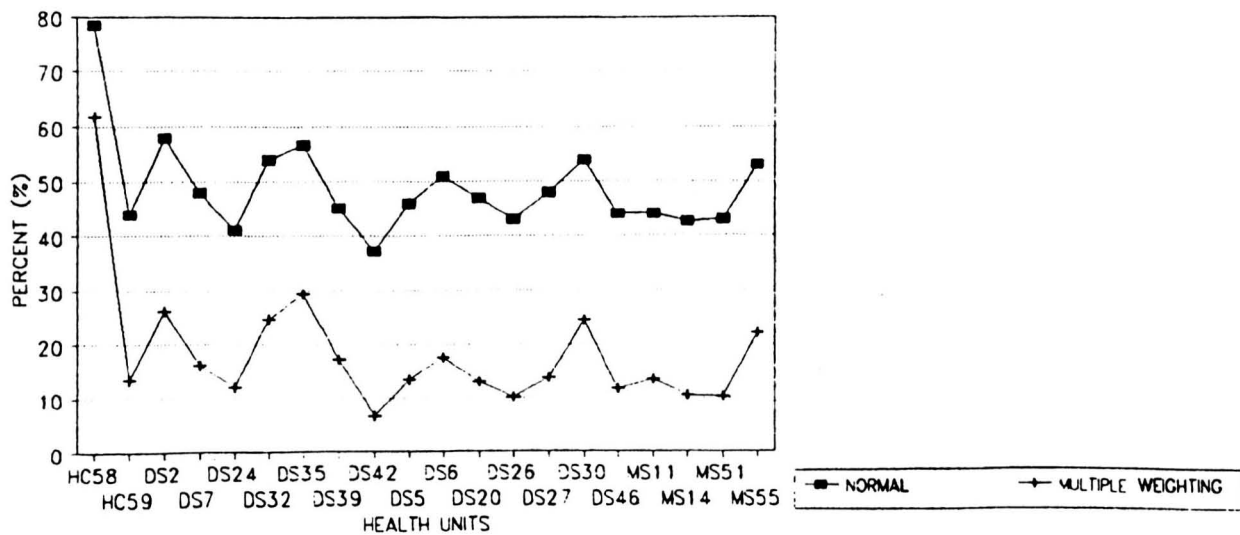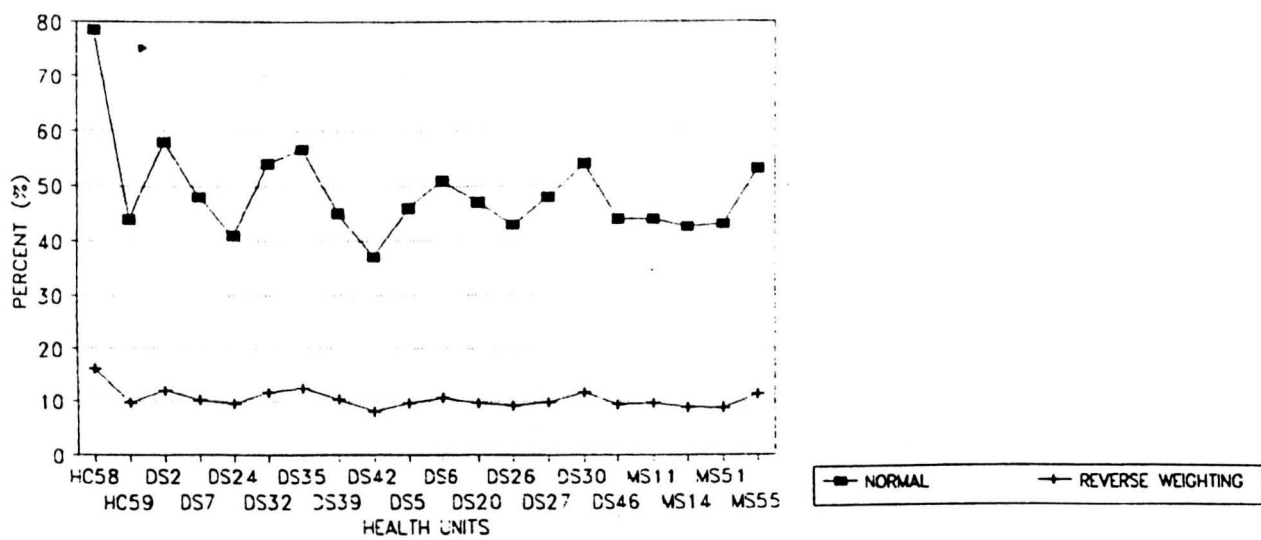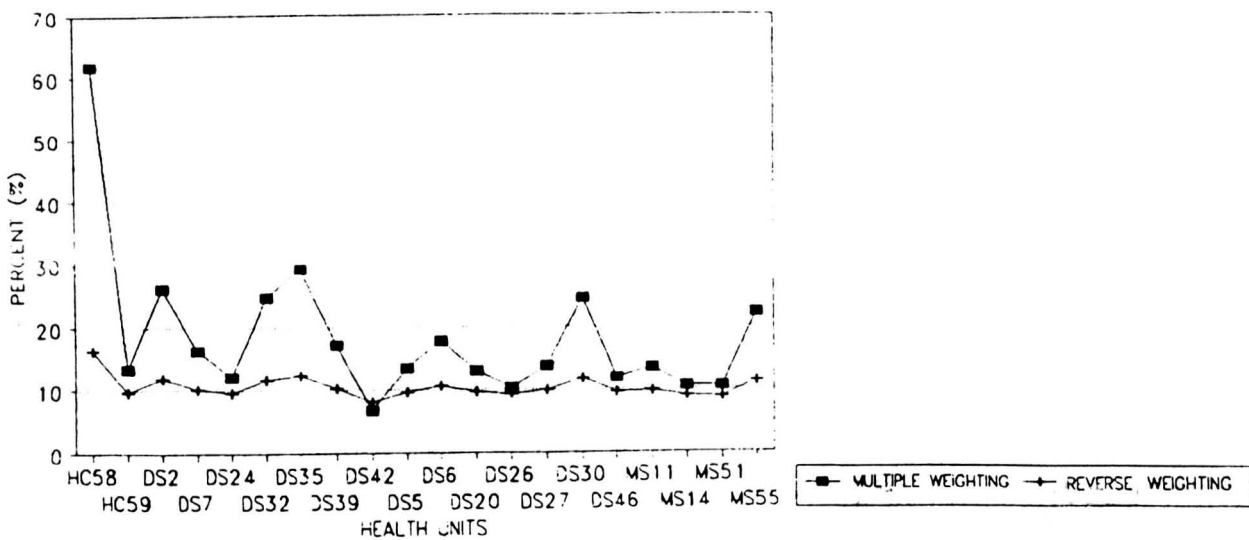
Injection Procedure

Dispensing Procedure

APPENDIX 7E: PROCESS QUALITY CHECKLIST REDUCTION

#	Q11C	.4171**
	Q12A	.1504**
	Q12B	.0888**

Table one: General curative consultation checklist, correlation between criteria and overall score

	CRITERIA	CORRELATION
	Q3A	.1654**
	Q3B	.0974**
#	Q3C	.4720**
#	Q3D	.5268**
	Q3E	.2556**
	Q3F	.0611*
	Q4A	.1626**
	Q4B	.0818**
	Q4C	.0574*
	Q4D	.0634*
	Q5A	-.2450**
	Q5B	-.2327**
	Q5C	-.2884**
	Q5D	.0138
	Q5E	.0168
	Q5F	.0164
	Q5G	.0185
	Q5H	.0218
	Q5I	.2518**
	Q5J	.2576**
	Q5K	.2835**
	Q5L	.2888**
	Q5M	.2998**
#	Q5N	.4219**
#	Q5O	.5600**
	Q5P	.1689**
	Q6A	.2998**
	Q6B	.3284**
#	Q6C	.4404**
	Q6D	.3940**
	Q6E	.2925**
	Q6F	.3167**
	Q6G	.2926**
	Q6H	.3344**
	Q6I	.2978**
	Q6J	.0702*
	Q6K	.3279**
	Q6L	.2992**
	Q7A	.3661**
	Q7B	.3578**
	Q7C	.3669**
#	Q8A	.5784**
	Q8B	.1842**
	Q8C	.0863**
	Q8D	.1432**
	Q9A	.3167**
	Q9B	.2893**
	Q9C	.2839**
#	Q9D	.4225**
	Q9E	.2623**
	Q10A	-.0487
	Q10B	-.0494
	Q10C	-.0439
	Q10D	-.0478
#	Q11A	.6217**
#	Q11B	.6038**

Table two: Injection checklist, correlation between criteria and overall score

	CRITERIA	CORRELATION
	Q1	-.1409**
	Q2	-.1332**
##	Q3	.3623**
##	Q4	.1403**
	Q5A	.0591
	Q5B	.
	Q5C	.
	Q5D	.0336
	Q5E	.0963*
	Q6A	.3156**
#	Q6B	.6813**
#	Q6C	.4434**
#	Q6D	.4209**
	Q6E	.3494**
	Q6F	.2586**
	Q6G	.2136**
##	Q6H	.3905**
#	Q6I	.4299**
	Q6J	-.0015
	Q7A	.3058**
#	Q7B	.4282**
#	Q7C	.4415**
#	Q8A	.4501**
	Q8B	.
	Q8C	.1863**
	Q9	.3408**

NOTE:
1-tailed
Signif: * - .01   ** - .001

\# = selected on basis of correlation;

\## = selected after consideration of process requirements

APPENDIX 8A: SUMMARY OF COMMUNITY SATISFACTION, BY DISPENSARY

Table 1: Mission focus dispensaries

DISPENSARY	STRUCTURAL ISSUES	CURATIVE CARE ISSUES	NURSING CARE ISSUES	MCH CARE ISSUES
KISAWASAWA second village slightly worse views	generally good - some concern at shortage of trained staff	generally good - although concern about high, unclear prices & their influence on prescribing	little said - except concern about untrained staff	generally good - but concern about paying for lab tests & delivery, and about vaccines being kept at Mangu'la HC
MOFU only one village uses	generally good - concern about lack of effective lab equipment	generally poor - attitudes, lack of lab equipment, prescribing practices; suggestion that drugs may be sold outside the dispensary; story of patient death due to nurse carelessness	generally poor - training, skills, attitudes	generally poor - attitudes, skills, delivery "horror" stories, unjustified "contributions"
SOFI second village less use & detail	generally good - few comments	mixed - attitudes good but skills poor, high fees, & prices influence prescribing	little said - attitudes good	mostly good - atttitudes, delivery care; but poor ANC skills & expensive deliveries

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Table 2: Government focus dispensaries

HEALTH UNIT	STRUCTURAL ISSUES	CURATIVE CARE ISSUES	NURSING CARE ISSUES	MCH CARE ISSUES
MSIMBA same views both villages	mostly good - but access poor from Mfuruni, & no lab equipment	good atttitudes & skills; but drugs not available whole months (not suggested that sold), no lab equipment & some prescribing problems, segregation between workers & peasants	poor atttitudes & skills suggested	generally good - few say problem of no lab equipment for ANC
MAHARAKA only one village visited new RMA criticised in comparison to predecessor	mixed - good MCH building; lack of staff houses, no lab equipment	mixed - attitudes mostly good, but some criticisms of skills, prescribing practices	little said - some suggestion that water drugs	mixed/good - no MCHA & some concern about skills, but mostly good attitudes
IRAGUA similar views both villages	generally poor - space & supplies' problems, no lab equipment	mostly poor - drugs short & sold, attitudes poor & preferential treatment for some, diagnosing & prescribing poor; but percevied good skills (which fail to use!)	little said - some concerns about attitudes	mostly poor - skills, attitudes, few delivery-related services, punish home deliveries, ANC "horror" story, ANC/CW cards sold

HEALTH UNIT	STRUCTURAL ISSUES	CURATIVE CARE ISSUES	NURSING CARE ISSUES	MCH CARE ISSUES
MNGETA similar views both villages	quite poor - some space problems, no nearby staff house for MCHA, no lab equipment	generally poor - drugs short & sold, poor attitudes & preferential treatment for some, poor diagnostic & prescribing practices; but perceived good skills (which fail to use!)	generally poor - attitudes, dispensing practice, untrained	generally poor - skills, ANC content, lack of delivery-related services; limited use of delivery services; attitudes mostly good
RUBEHO Kisitwi worse views	generally poor - lack of MCH space, lack of staff houses, supplies' problems, no lab equipment	mixed to good - drugs not available whole month, some suggest sold, no lab equipment, Kisitwi criticism of preferential treatment & prescribing practices; but perceived good atttitudes and skills, positive views of referral practices	mixed to poor - untrained, poor dispensing practices & attitudes	mixed/poor - limited ANC content, poor delivery-related services & care; mixed attitudes and skills
KISAKI similar views both villages	generally poor - space & supplies' problems, lack of lab equiipment	generally poor - drugs sold, preferential treatment for some, poor prescribing practices; but perceived good skills	generally poor - attitudes, dispensing & injection practice	bad - attitudes, skills, lack of delivery-realted services, delivery "horror" stories
SOFI MAJIJI similar views three villages	mixed to poor - lack of space for MCH, supplies' problems, no lab equipment	bad - drugs sold, attitudes bad, skills weak, diagnostic & prescribing practice poor	generally poor - limited discussion	bad - attitudes, skills, lack of delivery-realted services, delivery "horror" stories

APPENDIX 8B: ANALYSIS OF HOUSEHOLD QUESTIONNAIRE RESULTS

This appendix summarises the results of the household survey by question, giving response frequencies and details of interesting findings and cross-tabulation analysis. Cross-tabulations compared findings between villages (vill=with/without own dispensary), between health units (unit/IDU), between government and diocesan dispensaries (owner), between educational groups within villages (ED=none/primary/above primary) and, sometimes, between villages with difference referral units (referral unit=hospital/health centre). Responses are underlined and differences between groups of over 5% are reported. All answers are rounded to 1%; n= valid answers ie.excluding 'not applicable' responses; further details calculated over all answers (ie.including 99s).

1. Services available

QUESTION	RESPONSES	FURTHER DETAILS
What health providers are there in this village? (n=369)	trad healers 56% drug sellers 18% mobile clinic 6% shops 5% all other responses frequency under 20	traditional healers 10-15% in all villages; drug seller 0-16% (12% vill 8 & 16% vill 14; 0 vills 2,7,9,15,16)
What things influence people to choose a particular health provider? (n=489)	search for drugs 14% trust in health provider 13% search for higher level care 12% whether get better after treatment 12% severity 11% looking for better care 11% mis-answered 3% all other responses under 10%	
Does the severity of the condition cause people to select health providers? (n=344)	yes 69% no 19% don't know 3% mis-answered 9%	vills 14 & 15 no: 10/15% (elsewhere max 4%);
Explain answer to previous question (n=382)	each disease has own treatment 31% mis-answered 15% all other responses under 10%	
Does the kind of illness lead people to select certain health providers? (n=342)	yes 78% no 14% don't know 5% mis-answered 3%	vill 10 no 59%, vills 4,15&17 no=30-35% (elsewhere 0-15%)

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Explain answer to previous question (n=362)	specific diseases require trad. treatment 31% each disease has own treatment 16% specific diseases require modern treatment 14% mis-answered 6% all other responses under 10%	
What services are available at the local dispensary?		
Are drugs enough at the dispensary? (n=345)	no 69%; yes 27% don't know 3% mis-answered 2%	unit: highest yes: IDU11 (diocesan) 80%, IDU55(diocesan) 45% IDU32(govt) 35%, IDU24(govt) 34%, others 1-5%; highest no: IDU46(govt) 93% & IDU14(diocesan) 91%, others mostly 85-90%
If not, why is there a shortage? (n=276)	too few drugs for population 37% can't explain 25% staff create/sell drugs 25% mis-answered 5% other responses under 10%	unit: too few drugs: govt only; staff problems: max IDU6, 30, 39, 46(govt) 10-20%; can't explain: max IDU14(diocesan) 41%, IDU30(govt) 19%, IDU46(govt) 13% vill: too few drugs: without 12% vs with 17%; staff problems: without=17% vs with=6%
Where are most children in this village born? (n=422)	at home/village 37% govt dispensary 32% ngo dispensary 26% h.centre/hosp 4%	most home births in vills 3 (20%), 5(20%), 6 (23%), 9 (18%), 11 (25%), 12 (25%), 14 (23%), 16 (25%); most h.centre/hosp births vill 3 (10/13 responses); most home births IDU6 (21%) & IDU26 (25%) (others 0-13%); most govt dispensary births IDU32 (23%) & IDU39 (21%) (others 11-16%); ngo dispensary births 24-5%; max h.centre/hosp births IDU11 (diocesan)
Why do mothers not deliver at the local dispensary? (n=158)	too far 39% not used to 14%?? bad services 13% code 9 12% other responses under 10%	vill: too far: without 45% vs with 19%; never been: without 17% vs with 5%; transport problems: with 22% vs without 4% low response numbers for some units (eg.14) makes comparing dispensaries difficult
Why do mothers not deliver at health centres? (n=347)	too far 74% never been 17% mis-answered 2% other responses under 10%	

Who gives help to mothers who deliver in the village? (n=377)	trad nurse 53% old woman 32% other reponses under 10%		
Is there someone else who helps if there are problems? (n=345)	yes 73% no 20% don't know 6%		
Who is she? (n=260)	nurse 52% another traditional nurse 36% other responses under 10		
What services does a h.centre/hospital have that a dispensary does not? (n=542)	delivery 29% transport 26% more skilled staff 18% many drugs 14% other responses under 10%		
Do health workers visit this village from time to time? (n=346)	yes 59% no 39% don't know 2%	unit:	high no answers: IDU 6(govt), 14(diocesan), 26(govt), 32(govt, 39(govt), 55(diocesan) 40-85%; high yes answers: IDU 11(diocesan), 24(govt), 30(govt), 32(govt), 39(govt), 46(govt), 55(diocesan) 45-98%
If yes, where do they come from? (n=218)	govt disp 65% health centre 21% other responses under 10%		
What do they come to do? (n=508)	sanitation 21% environmental cleanliness 18% immunisation 15% home visiting 14% child clinic 12% other responses under 10%		
When was the last time that they came? (n=346)	six months plus 28% last month 36% last week 7%	unit:	high last week answers: IDU6(govt) 30%; high last month answers: IDU46(govt) 78%, IDU30(govt) 52%
Do health workers visit you at home from time to time? (n=346)	no 50% yes 38% don't know 2% mis-answered 10%	highest yes answer: vill14 85% (IDU30); highest no answer vill6 95% (IDU6)	
Normally where do they come from? (n=166)	govt disp 58% vill authorities 13% health centre 10% mis-answered 10% other responses under 10%		

If yes, what do they come to do? (n=254)	environmental hygiene 35% sanitation 24% health education 14% mis-answered 19% other responses under 10%	
If they come, when was the last time they came to your house? (n=159)	six months plus 49% last month 33% last week 6% mis-answered 11%	

QUESTION	RESPONSES	FURTHER DETAILS	
What things please you about the local dispensary? (n=681)	welcome 22% drugs 20% skills 15% staff attitudes 12% mis-answered 4% other responses under 10%	units:	high drugs: IDU11 (diocesan) 18%; low skills: IDU14(diocesan) 0%; 55(diocesan) 4% & 39(govt) 4%; high welcome: IDU32(govt), 11(diocesan), 14(diocesan) 18-16%
		owner:	drugs: diocesan 12% vs govt 7%; welcome: diocesan 13% vs govt 7%
		vill:	welcome: with 13% vs without 3%
What things do not please you about the dispensary? (n=720)	drugs 21% equipment 17% long wait 16% mis-answered 4% other responses under 10%	unit:	low drugs: IDU11(diocesan) 1%; low equip: IDU14(diocesan) 1%; high long wait: IDU46(govt) 8%;
		owner:	equip: govt 7% vs diocesan 2%;
Do you have confidence in the skills of staff at the local dispensary? (n=345)	yes 63% sometimes 18% no 15% mis-answered 2%	unit:	lowest yes: IDU14(diocesan) 5%; highest no: IDU6(govt) 25%
		owner:	yes: govt 67% vs diocesan 50%;
		vill:	no: without 20% vs yes 12%
		ED:	yes: above primary 47% vs others 63-9%
Explain (n=?? 99s??)			
Do you agree that "staff of the local dispensary have no kindness for the patients"? (n=345)	no 44% yes 28% sometimes 22% don't know 3% mis-answered 2%	unit:	highest yes: IDU30/46 (govt) 41%; highest no: IDU32(govt) 75%;
		owner:	no: govt 45% vs diocesan 40% (diocesan DKs impt);
		vill:	yes: without 41% vs with 20%;
		ED:	yes: none 31% vs above primary 25% (primary 28%); no: above primary 28% vs others 46%
Explain answer to previous question (n=362)	no, respect to patients 28% no, people get well 21% non-specific 9% yes, no skills or knowledge 8% yes, bad attitudes 8% mis-answered 5% other responses under 5%	unit:	high no skills: IDU14 (diocesan) 11% high bad attitude: IDU14 11%; high respect: IDU32(govt) 30%, 24(govt) 22%; low people get well: IDU14(diocesan) 2%, IDU46(govt) 4% vs others 10-18%

Can the dispensary services be provided better? (n=345)	yes 75% no 8% don't know 15% mis-answered 1%	unit: owner: ED:	highest no: IDU11/14/55(diocesan) 20-23% no: govt 45% vs diocesan 40% don't know: above primary 31% vs others 11-14%;
If yes, how? (n=745)	drugs 25% equipment 24% repairs 16% more staff 13% change staff 10% mis-answered 3% other responses under 10%	unit: owner: vill: check ed	low drugs: IDU11/14(diocesan) 1%; high more staff: IDU32(govt) 18%; high change staff: IDU30/46(govt) 10%; lowest equip & repair: IDU14(diocesan) 1% drugs, more staff, equip, repair: govt 13-7% vs diocesan 2-3%; not applicable govt 50% vs diocesan 79% not applicable: without 61% vs 54% with
Can villagers do anything to improve the services at the local dispensary? (n=345)	yes 55% no 34% don't know 9% mis-answered 1%	unit: owner: vill: ED:	high no: IDU11/14/55(diocesan) 60-72%; yes: govt 67% vs diocesan 20%; yes: with 60% vs without 49%; no: none 16% vs others 8/9%
Explain (n=302)	yes, building more rooms 25% yes, contributions 23% no, it belongs to ngoion 11% mis-answered 3% other responses under 10%		
Which things please you about the h.centre/hosp? (n=677)	staff skills 20% equipment 16% drugs 15% don't know 22% mis-answered 3% other responses under 10%	referral unit:	hosp drugs, skills & equipment 9-12% vs h.centre 4-6%;
Which things do you dislike about the h.centre/hosp? (n=429)	dirty 15% drugs 12% don't know 35% mis-answered 5% other responses under 10%	referral unit:	don't know h.centre 10% vs hosp 2%, dirty hosp 9% vs h.centre 3%
Can the services of the h.centre/hospital be provided better? (n=345)	don't know 51% yes 41% no 8% mis-answered 1/345	referral unit: ED:	no: hosp 26% vs h.centre 5% no: over primary 0% vs others 8-10%, over primary 59% vs others 48/52%

Explain (n=156)	yes, give higher levels of care (more equip) 33% yes, more rooms 22% yes, more drugs & proper management 9% mis-answered 1% other responses under 5%		
Do you think that villagers would be willing to contribute to improving the local dispensary? (n=345)	yes 57% no 28% don't know 13% mis-answered 2%	owner: HH: vill: ED:	yes: govt 67% vs diocesan 26% yes: high 62% vs others 52-3%; yes: with 61% vs without 52%; don't know: over primary 31% vs others 10-11%;
Explain (n=353)	yes, to get high care 19% yes, already contribute 17% yes, non-specific 10% no, belongs to ngo 8% mis-answered 11% other responses under 5%	unit:	high already contribute: IDU30(govt) 24%; high to get higher level care: IDU26(govt) 18%
Do you agree with the statement that "if you pay for health care you get better services"? (n=345)	yes 53% no 25% yes&no 19% don't know 4%	unit: owner: vill: ED:	low no: IDU6/24(govt) &11(diocesan) 10-15%; yes: govt 54% vs diocesan 48%; sometimes: with 23% vs without 13%; yes: primary 59% vs others 40-44%, sometimes: none 33% vs 2 25% vs 1 6%; no: above primary 38% vs others 20-24%
Explain answer to previous question (344)	yes, better care (drugs, attitudes) 46% no, money can't help 15% no, can't afford 11% other reponses under 10%	unit: vill: owner: ED:	high better care: IDU6,24(govt) 73-78%; high can't afford IDU 26, 30(govt) 20-26%; high already pay: IDU14(diocesan) 27%; high money can't help: IDU 32(govt) 45% better care: with 40% vs without 53% better care: govt 51% vs diocesan 29%; already pay diocesan 12% vs govt 3% better care: primary 52% vs others 31-6%; can't afford: code 1 19% vs othes 9-10%; money can't help: code 3 20% vs others 13-14%

As you already pay for traditional healers or ngo services are you ready to pay for government care? (n=345)	yes 44% no 43% yes&no 12% don't know 1% mis-answered 1/345	unit:	low yes: IDU14(diocesan) 18%; high no: IDU32(govt) 85%, IDU 30(govt) 62%;
		owner:	yes&no: govt 10% vs diocesan 20%;
		vill:	yes: with 46% vs without 40%;
		ED:	yes: primary 51% vs others 28-31%
Explain (n=348)	no, can't all afford 33% yes, better care/more drugs 27% no, supposed to be free 8% all other responses under 5% yes/no, difficult for some 6% yes, already pay 6%	unit:	high better care: IDU24(govt) 32%; high all can't afford: IDU32(govt) 45%; high supposed to be free: IDU55(diocesan) 13%
		owner:	better care: govt 15% vs diocesan 8%
		ED:	better care: above primary 6% vs others 12-15%; can't all afford: none 22% vs primary 14% (above primary 19%)

3.Practice

QUESTION	RESPONSE	FURTHER DETAILS	
Has anyone in the household been ill in the last month? (n=345)	yes 54% no 46%		
if yes, what was the problem? (n=247)	fever 34% diarrhoea 14% general body pain 13% cough/respiratory 12% stomach pain 5% eye infection 5% vomiting 3% others under 5/247 responses		
Where did you go first? (n=183)	govt disp 43% ngo disp 22% other 11% trad healer 10% drug seller 7% friend 4% hospital 3%	vill: ED:	trad healer: with 3% vs without 21%; govt disp: with 51% vs without 31%; ngo disp: with 27% vs without 16% trad healer: primary 6% vs none 15% vs above primary 21%; drug seller: above primary 11% vs primary 8% vs none 2%; govt disp: none 56% vs others 37-39%; ngo disp: none 8% vs others 26-28%

Where did you go second? (n=110)		govt disp 40% ngo disp 35% trad healer 10% hospital 8% other reponses under 1%	vill:	trad healer: with 6% vs without 18%; ngo disp: with 37% vs without 30% ED:	trad healer: none 4% vs others 11-18%; govt disp: none 54% vs primary 37% vs above primary 27%; ngo disp: none 14% vs others 41-45%
Where did you go third? (n=51)		ngo disp 31% govt disp 29% trad healer 18% hospital 8% others under 5%	vill:	trad healer: without 29% vs with 14%; govt disp: with 38% vs without 7% ED:	trad healer: none 23% vs primary 14%; govt disp: none 54% vs primary 22%; ngo disp: primary 39% vs none 8% ED comparisons with above primary not possible
How soon after becoming ill did you look for help? (n183)		very quickly 81% few days later 13% other responses under 5%	
If you delayed getting help, why? (n=32)		looking for money 38% no drugs in dispensary 16% no transport 13% other responses under 10%	
Who decided to go the first source? (n=182)		mother of patient 43% respondent 23% HH head 20% other responses under 10%	
Who decided to go to second source? (n=110)		mother of patient 32% HH head 28% respondent 26% other responses under 10%	
Who decided to go to third source? (n=51)		HH head 31% respondent 31% mother of paitent 26% other responses under 10%	
When was the last time one of your household went to the local dispensary? (n=344)		last month 42% last week 21% six months 15% long time ago 13% mis-answered 9%	vill:	last week: with 26% vs without 18%; last month: without 53% vs with 41% ED:	last week: over primary 33% vs others 22-23%; last month: over primary 59% vs primary 48% vs none 38%
For what service? (n=345)		curative care 66% ANC/CW 19% mis-answered 11% other responses under 10%	
Were you satisfied with the service given? (n=345)		yes 65% no 17% yes&no 7% mis-answered 11%	vill:	yes: with 75% vs without 68% ED:	yes: over primary 66% vs primary 73% (none 70%)

Why/why not? (n=345)	yes, got well/drugs 45% yes, was examined 13% no, no service/drugs 8% mis-answered 10% other responses under 5%	vill: ED:	ANC/CW: without 28% vs with 17%; curative: with 76% vs without 70% ANC/CW: primary 26% vs others 12-15%; curative: none 83% vs over primary 78% vs primary 69%
Do you use drugs at home sometimes? (n=345)	yes 90% no 10%	vill: ED:	of no: with 89% of no: middle 53%
If yes, where get from? (n=309)	shops 40% trad healer 22% ngo disp 17% govt disp 15% other responses under 10%		
Do you buy drugs sometimes? (n=345)	yes 86% no 15%	vill: ED:	of no: with 74% of no: over primary only 6%
If yes, where do you buy them? (n=398)	shops 56% ngo disp 33% other responses under 5%	vill: ED:	ngo disp: without 17% vs with 10% ngo disp: none 7% vs others 15-16%
Can you buy drugs from the government dispensary? (n=345)	no 84% yes 39% don't know 5%	unit: vill: ED:	of yes: IDU46 41% of yes: without 67% of yes: primary 74%
Why do you sometimes choose to buy drugs rather than going to the dispensary to get them? (n=294)	no drugs at dispensary 57% keep stock in time of need 14% cheaper in shops 11% other reponses under 10%	ED:	no drugs in dispensary: none 21% vs others 25-26%; n/a: none 61% vs others 52-53%
Which type of drug do you think is most likely to cure illness? (n=345)	injections 37% tablets 26% other 18% both same 17% trad medicine 2%	vill: ED:	injections: without 42% vs with 35%; other: with 25% vs without 9% injections: primary 42% vs other 25-30%; tablets: none 32% vs other 23-25%; both same: above primary 34% vs other 15-17%
Do you think injections are more effective than tablets? (n=345)	yes 50% the same 28% no 17% don't know 5%	vill: ED:	yes: without 56% vs with 46% yes: primary 55% vs none 43% vs above primary 34%; the same: middle 25% vs none 33% vs above primary 34%
Has any child from this household died within first month of delivery? (n=345)	no 91% yes 9% given low yes reponse, skipped next two questions		

Where was the youngest child of this household born? (n=345)	home 38% govt disp 26% ngo disp 23% hospital 8% other responses under 5%	vill:	home: without 65% vs with 20%; govt disp: with 36% vs without 11%; ngo disp: with 30% vs without 14%
		ED:	home: none 47% vs others 34-5%; ngo disp: none 15% vs primary 25% vs above primary 31%
Why wasn't the child born at the local dispensary? (n=211)	no time to reach 31% too far 24% referral case 10% other responses under 10%	vill:	too far: without 14% vs with 3%; no time: without 12% vs with 7%
Who helped mother to deliver? (n=345)	nurse 56% trad nurse 21% old woman 13% other responses under 5%	vill:	trad nurse: without 39% vs with 10%; nurse: with 76% vs without 28%; old woman: without 21% vs with 8%
		ED:	nurse: none 45% vs above primary 56% vs primary 61%; old woman: primary 11% vs other 16-19%
Was she satsified with services? (n=345)	yes 94%		
Why? (n=345)	good attitudes/practice 53% delivered safely 36% mis-answered 5% other responses under 5%		
Any problems at delivery time? (n=345)	no 88% because few yes answeres skip next questions		
Do you go to the ante-natal clinic? (n=345)	yes 99%		
Why? (n=380)	check-up 42% for immunisation/other services 26% see how child is lying 13% otherwise no help later 5% other reponses under 5%		
Are you satisfied with the clinic? (n=350)	yes 84% mis-answered 2%		
Explain (n=350)	yes, some procedures done 61% yes, got advice 9% no, no procedures 7% mis-answered 2% other responses under 5%		
Do you agree with the statement "mothers don't attend ante-natal clinics because of the poor attitude of nurses"? (n=345)	no 72% yes 19%	ED:	yes: above primary 31% vs others 18-20% no diffs over 5% between vills

Are your children vaccinated? (n=345) q118	code 3 80%	
119?		
Child one:complete? (n=340) Child two:complete? (n=165) Child three: complete? (n=38)	yes 89% yes 90% yes 79%	
Child one: incomplete? (n=35) Child two: incomplete? (n=9)	polio 74% polio 56%	
Why aren't some children fuly immunised? (n=40)	no services 38% mis-answered 10% other responses under 5%	
Were all your children immunised at the local dispensary? (n=345)	yes 83% mis-answered 4%	
Why were some not? (n=45)	born elsewhere 60%	
If both ngo and government dispensaries nearby, which dispensary do you prefer and why? (n=211)	ngo enough drugs 16% mision have to pay 13% mis-answered 42% other responses under 5%	
Child one: regularly attended till now? (n=335) Child two: (n=181) Child three: (n=41)	yes 83% yes 86% yes 88%	
Why haven't some children attended the CW clinic regularly? (n=68)	can't take all/ not like to go 37% lost card 19% other responses under 10%	

QUESTION	RESPONSE	FURTHER DETAILS	
How much do you normally pay for transport to the local dispensary? (n=345)	nothing 91%		
How long do you have to wait before seeing health worker? (n=345)	not long 55% very long 45%	unit: vill: ED:	high long: IDU30,32,39,46(govt) 50%+ not long: with 61% vs without 45% not long: above primary 63% vs other 51-55%
How long? (n=345)	less than 30mins 29% over 30mins 71%		
How long before getting drugs? (n=345)	less than 15mins 33% less than 30mins 52%		
Do you wait longer in ngo or govt? (n=335)	govt 49% ngo 14% same 13% don't know 22%		

APPENDIX 8C:
SOURCES OF HEALTH CARE, BY VILLAGE

Village (district)	Dispensary	TH	TM/ TBA	Shop	Herb self	Informal sellers	Referral unit(s)
Ichonde (Kmbo)	KisMiss otherGov	yes	yes	yes	yes	no	IfakaraHosp/ Mangu'laHC
Kisawasawa (Kmbo)	KisMiss otherGov	yes	yes used?	yes	yes	no	IfakaraHosp
Mkangawalo (Kmbo)	MngetaGov MchombeMiss other	yes	yes	yes	yes	tabs/injs	IfakaraHosp
Mngeta (Kmbo)	MngetaGov MchombeMiss	yes	yes	yes	yes	no	IfakaraHosp
Mofu (Kmbo)	MofuMiss	yes	yes used?	no	?	injection	IfakaraHosp
Kisitwi (Ksa)	RubehoGov (GairoMiss)	yes	yes	yes	yes	injection	GairoHC/ BeregaHosp
Rubeho (Ksa)	RubehoGov (GairoMiss)	yes	yes	yes	?	no	GairoHC/ BeregaHosp
Msimba (Ksa)	MsimbaGov (IlongaMiss)	few	no	yes	?	yes	KsaHosp (KimambaHC)
Mfuruni (Ksa)	MsimbaGov (IlongaHosp)	yes	yes	yes	yes	injection	KsaHosp

- also has VHW

Village (district)	Dispensary	TH	TM/ TBA	Shop	Herb self	Informal sellers	Referral unit(s)
Gomelo (Moro)	KisakiGov	yes	yes	yes	?	yes	Ifa&DSMHosp (DuthumiHC)
Nyarutanga (Moro)	KisakiGov	yes	yes	yes	yes	no	Ifa&DSMHosp (DuthumiHC)

Village (district)	Dispensary	TH	TM/ TBA	Shop	Herb self	Informal sellers	Referral unit(s)
Maharaka (Moro)	MahGov	yes	yes	yes	yes	no	MoroHosp
Iragua (Ulan)	IraguaGov IraguaMiss	few	yes used?	no	yes	no	Ifa&MahHosp
Kidugalo (Ulan)	IraguaGov IraguaMiss	yes	yes	no	?	no	Ifa&MahHosp
Kiswago (Ulan)	SofiGov SofiMiss	yes	yes	yes	yes	injection	LugalaHosp (MtimbiraHC)
SofiMajiji (Ulan)	SofiGov SofiMiss	yes	yes	yes	?	no	LugalaHosp (MtimbiraHC)
SofiMission (Ulan)	SofiMiss SofiGov	yes	yes used?	no	yes	no	LugalaHosp (MtimbiraHC)

Abbreviations:
TH   = traditional healer
TM   = traditional midwife
TBA   = traditional birth attendant (trained)
HC   = health centre
Hosp   = hospital
inj   = injection
Kmbo   = Kilombero district
Ksa   = Kilosa district
Moro   = Morogoro Rural district
Ulan   = Ulanga district
gov   = government
miss   = mision
?   = unclear response