Exploring the complex remuneration of health workers in Sierra Leone

MARIA PAOLA BERTONE

Thesis submitted in accordance with the requirements for

the degree of Doctor of Philosophy

University of London

JANUARY 2017

Department of Global Health and Development

Faculty of Public Health and Policy

LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

Funded by the Fondation AEDES (PhD scholarship)
and ReBUILD research consortium (fieldwork and dissemination)

Declaration

I, Maria Paola Bertone, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed:  June, 2016

Full name: Maria Paola Bertone

Abstract

The financial remuneration of health workers (HWs) is a key concern to address human resources challenges in many low-income countries. Analyzing the entire set of payments available to HWs is critical to understand the incentives they face, their motivation and performance, and ultimately to devise effective health workforce reforms. In this thesis, I investigate these issues by exploring the complex remuneration of HWs in Sierra Leone, defined as all income sources, both formal (salary, allowances, performance bonus) and informal (per diems, top-ups, private practice, non-health activities and illegal incomes).

The study adopts a mixed-method approach. At central level, 23 key informants were conducted along with a stakeholder mapping workshop and a documentary review. At district level, 18 key informants were interviewed. Quantitative data were collected through a cross-sectional survey of 266 public HWs at primary healthcare level in three districts. Additionally, HWs were given a logbook to daily record their activities and incomes. Quantitative data at individual level were complemented with 39 in-depth interviews with a sub-sample of the same HWs.

The analysis carried out in this thesis, first, sets the background to the complex remuneration by describing the incentive environment available to HWs as it developed during the post-conflict period, through policy-making processes at macro (central) level. It then investigates how the political economy dynamics between District Health Teams and NGOs at meso (district) level contribute to re-shape the incentive package. Moving to the micro (HW) level, I estimate the absolute and relative contribution of each income and I find that, while earnings from salary represent the largest share, HWs' income is fragmented and composed of a variety of payments. Further data analysis shows that the determinants of the incomes are not in line with policies defined at national level and are influenced by the district of posting. Furthermore, the HWs' narratives reveal the relevance of the features of each of their incomes (e.g., amount, regularity, reliability, ease of access, etc.) and the income use strategies through which HWs 'manage'. Finally, I investigate whether the complex remuneration affects what HWs do or if there are other factors which constrain and/or influence HWs' activities and service delivery.

Findings from this research have important implications for how we go about (re)thinking financial incentive strategies. HWs' income comes from a variety of sources, which they use differently. This questions the assumption of the fungibility of payments and highlights the potential consequences of increasing one rather than another of HWs' incomes. Moreover, it is shown that the alignment of policies and incentive packages at central level may not be sufficient as dynamics at district level play a key role in influencing both HWs' incomes as well as the activities they perform, thus effectively modifying incentive package and service delivery. From a methodological perspective, this thesis contributes to developing data collection and analysis techniques on the complex remuneration of HWs, which are relevant for a potential cross-country research agenda.

Acknowledgements

Over the last 4 years, many of those with whom I have discussed my research work and progress told me that the PhD is a journey. As I move on towards the possible end of it, I do recognize that this research has been both an academic as well as a personal journey -- long, complicated, challenging and yet rewarding.

The journey started much earlier than the PhD process itself, almost 10 years ago, when I was working with the Ministry of Health in Burundi and I began witnessing first-hand some issues that are (at least in part) dealt with here: why is the office empty in the afternoons? Why is everyone so keen on workshops? How can we at the Ministry of Health implement PBF programs without knowing how much health workers are really making? and so on, even as I left Burundi and discovered similar issues in other contexts. The genesis of the central research question of this work is therefore more of an operational than an purely theoretical one, which reflects my approach to research and the reasons why I keep trying to do it. While I lucky to be able to continue working as technical assistant in different countries (Laos, DR Congo, Benin) during my PhD, the work carried out for this thesis allowed me to wear a new 'hat' and take a different perspective from the central-level posts I previously held. Interestingly, I had the opportunity to move from macro level questions and processes and look more closely to what happens in the districts, facilities and for the individual health workers – the perspectives which are often overlooked by central-level 'happy planners' (as Enrico would say) who don't have the time and resources to get 'upline'.
During this journey, I also had the change to discover the fascinating country that is Sierra Leone. The Ebola epidemic hit Sierra Leone right after my fieldwork there and half-way through the preparation of this thesis. It has proven yet another daunting challenge for Salone and another test to the incredible resilience of its people.

Despite the challenges, the journey has been extremely rich and formative. I would like to thank my supervisor, Mylene Lagarde, for her academic support which dates back since my MSc days in 2006, as well as the members of my PhD advisory committee: Gill Walt, Neil Spicer, Egbert Sondorp and, in particular, Sophie Witter who provided invaluable advice for this work and to me personally, and taught me much. Thanks also to Sassy Molyneux, Christophe Lemiere and Fred Martineau who took the time to discuss my and their work with me and provide constructive insights at the initial stages of the research.

I am grateful to acknowledge the funders of this research: the Fondation AEDES, which supported my PhD scholarship and ReBUILD Consortium, which funded fieldwork activities and research dissemination. And thanks to everyone at AEDES in Brussels for sharing their offices with me over the last year.

This work would have not been possible without the tireless efforts of my team of enumerators out there, in the 'jungle'. Thanks to Abdulrahman Kuyateh, Alimu Kamara, Christiana Jengo, Fatmata Bah, Edrissa Kabba, James Polit, John Terry, Michael Tpewa, Precious Mansarey, Sajallieu Bah and Mr Bah, and to David Pelletier and Salim Kamara at the NGO Solthis in Freetown for logistic support.

I cannot think of the health workers, and also DHMT, MoHS and NGO staff, who participated in this study without emotion. Soon after this research, many were at the forefront of the fight against the Ebola outbreak, and the disease did not spare some of them. I am grateful for the time they took to participate to this study and share their insights with me, which allowed my attempt to bring a piece of their daily lives and work into writing.

Beyond this thesis, I am thankful for the encounters I was very lucky to make through my personal and academic journey from its beginning to more recent times, with a number of remarkable individuals and mentors who inspired, and continue to inspire me, in the work-path I have chosen: Enrica Chiappero-Martinetti, Nicolas de Borman, Bruno Meessen, Sophie Witter, Jean-Pierre d'Altilia, Enrico Pavignani.

My 'academic buddies' provided endless support and encouragement, answers to research doubts and existential questioning in equal measure, excuses for transcontinental skype calls, African trips, frequent coffee breaks, and unending friendship: Laura Anselmi, Jean-Benoit Falisse, Grégoire Lurton, and also Matthieu Antony, Giulia Greco, Haja Wurie, Luisa Enria, Arianna Cowling.

Though at times rather lost in the jargon and acronyms that populate my research, many friends shared the ups and downs of putting this work together. Thanks to my friends of a lifetime: Eva, Silvia, Serena and Anna, Daniela, Elisa, Erika, Giulia, Mariachiara, Sara, Wanda; as well as to those I met along the way: Lukas, Katha, Silvia, David, Lidia & Luca, Francesca, Tom, François, Seb & C. A special thanks to JP who brought the champagne to celebrate the last word of the thesis, and each day brings his sensible smile and contagious enthusiasm into my life.

Thanks to Mom for her wholehearted participation and constant encouragement, and for sharing, with Dad, Francesco & Sara, JP & I, the beauty of a November trip together, as well as the steep climb of the ensuing journey.
I am profoundly indebted to my Father, il mio vecchio dad pG, for his essential support during this thesis which I would have been so proud to show him finished, for teaching me the importance of a rigorous intellectual quest coupled with adventurous discovery in the pursuit of knowledge, and providing me with the best example of it through his work and life. His passion and interests on all subjects, and our discussions bringing his literary and philosophic perspective into my own work, are and always will be a source of inspiration.

Table of Contents

List of figures

List of tables

Acronyms

ANC	Antenatal care
CHC	Community Health Centre
CHO	Community Health Officer
CHA	Community Health Assistant
CHW	Community Health Worker
CHP	Community Health Post
CMO	Chief Medical Officer
CNO	Chief Nursing Officer
COMAHS	College of Medicine and Allied Health Sciences
D Fin Res	Directorate of Financial Resources (Ministry of Finance)
DfID	Department for International Development (UK)
DHMT	District Health Medical Team
D-HR(H)	Department of Human Resources for Health (Ministry of Health)
DHS	Demographic and Health Survey
DMO	District Medical Officer
DPI	Department of Planning and Information (Ministry of Health)
DR Congo	Democratic Republic of the Congo
DSA	Daily Subsistence Allowance
EVD	Ebola Virus Disease
FBO	Faith Based Organization
FHCI	Free Health Care Initiative
GNI	Gross National Income
HAC	Health for All Coalition
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HLM	Health Labor Market
HRH	Human Resources for Health
HRMO	Human Resources Management Office
HSC	Health Service Commission
HW	Health worker
HWIS	Health Worker Incentive Survey
IDI	In-depth Interview
IDP	Internally Displaced People
IGA	Income Generating Activities
KII	Key Informant Interviews
Le.	Leones (Sierra Leone's currency)

LMIC	Low and Middle Income Country
LSHTM	London School of Hygiene and Tropical Medicine
MCH	Maternal and Child Health
MCHP	Maternal and Child Health Post
MoE	Ministry of Education
MoF	Ministry of Finance
MoH/MoHS	Ministry of Health (and Sanitation)
MoL	Ministry of Labour
NGO	Non-governmental Organization
NHP	National Health Policy
OPD	Outpatient Department
OTP	Outpatient Therapeutic Programme
PBF	Performance Based Financing
PHU	Peripheral Health Unit
pp	private practice
PS	Permanent Secretary
PSC	Public Service Commission
RRT	Randomized Response Technique
SAQ	Self-administered Questionnaire
SECHN	State Enrolled Community Health Nurse
SFP	Supplementary Feeding Programme
SM	Stakeholder Meeting
(S)RN	(State) Registered Nurse
TA	Technical Assistant
TBA	Traditional Birth Attendant
TB	Tuberculosis
THE	Total Health Expenditure
TM	Time and motion
UF	User Fees
UN	United Nations
USD	United States Dollar
WHO	World Health Organization

PART I - INTRODUCTION AND METHODS

1. Introduction

1.1 Rationale of the thesis

Human resources for health (HRH) represent an essential component for the functioning of health systems (Chen *et al.*, 2004; WHO, 2006). Training, motivating and retaining human resources is crucial for the improvement of health outcomes, especially in low-income countries where poor human resources availability and management have been recognized as key health system barriers (Campbell *et al.*, 2013; McPake *et al.*, 2013; Sales *et al.*, 2013). Despite the efforts to address the HRH issues, many low-income countries continue to face acute challenges concerning the recruitment, retention and motivation of an adequate health workforce, and such challenges hamper the improvement of health outcomes of their populations and the progress towards universal health coverage (WHO, 2006; Campbell, 2013).

Given this context, ensuring the financial motivation of health workers (HWs) remains a key concern, both as a precondition for motivation (Franco *et al.*, 2002; Chandler *et al.*, 2009), as well as one of the core elements of effective HRH retention and motivation strategies (Buchan *et al.*, 2000; Lehmann *et al.*, 2008; Willis-Shattuck *et al.*, 2008). The financial incentives in place for HWs should motivate them to enter the (public) health workforce, remain in it, be deployed where needs are, including in rural and underserved areas, and perform at their best (Sousa *et al.*, 2013). In this sense, effective financial incentives are to be set both at a sufficient level, as well as in a way that is aligned with a country's health needs and priorities (McPake *et al.*, 2013). To complicate the task of devising financial incentive packages in many low-income countries is the fact that there is evidence that the remuneration of HWs is not composed of a single type of payment (e.g., salary), but includes different combinations of payment mechanisms, sources of funding, contractual agreements and task requirements.

So far, most of the empirical literature on HWs remunerations has tended to be limited to the analysis of certain incomes or to the separate study of each revenue (such as informal incomes, top-ups, or per diems in the examples above), and there is a dearth of research looking to the entire set of HWs' remuneration simultaneously, exploring the dynamics and consequences of their interaction. Additionally, little quantitative data exists to estimate the total remuneration of HWs in Africa (Macq and Van Lerberghe, 2000; Witter *et al.*, 2007; McCoy *et al.*, 2008), beyond qualitative evidence and anecdotal reports (Roenen *et al.*, 1997; Smith, 2003; Muula and Maseko, 2006; Vian and Bukuluki, 2011). However, there is a growing recognition that such complex remuneration may affect in several ways the recruitment, retention and motivation of HWs. From a policy perspective, a better understanding of the HWs complex remuneration is essential in order to devise effective incentive packages to address HRH challenges and improve the performance of health systems. The body of work carried out for this thesis aims to provide a new look to the issues related to the multiple remuneration of

HWs, considering them simultaneously and looking at the causes and consequences of the complex remuneration of HWs.

1.2 Structure of the thesis

Part I of this thesis provides an introduction to the topic, by review the existing literature and outlining a research agenda on the issue of the complex remuneration of the HWs (Chapter 2). It then defines the specific research questions addressed in this work through empirical research in Sierra Leone (Chapter 3), and provides details about the research context and the study setting (Chapter 4). Chapter 5 focuses on the study design and methods adopted for quantitative and qualitative data collection and analysis.

Part II presents the empirical analysis carried out for this thesis which moves from macro (central) to meso (district) and then micro (individual HWs) level. Chapter 6 sets the background of HRH remuneration in Sierra Leone. Chapter 7 looks at how the HRH remuneration policies are implemented in practice and explores how dynamics at district level shape the incentives for HWs. Finally, Chapters 8 to 10 move the focus to the individual HW level. Firstly, the remuneration of the sampled HWs is estimated, which will be needed in order to assess the existence and extent of their complex remuneration (Chapter 8). Secondly, the complex remuneration is further explored, by analyzing the individual and facility-level determinants of HWs' income, and by investigating the financial and non-financial features of the different payments, and how they affect the income use and HWs motivation (Chapter 9). Thirdly, I explore the potential of the complex remuneration to influence the activities that HWs do and, thus, service delivery (Chapter 10).

Finally, Part III provides an overall discussion of the thesis, by highlighting the main findings of the research, pointing to the limitations and drawing conclusions in terms of the methodological and knowledge contribution of the thesis as well as its implications for policy (Chapter 11).

1.3 References

Buchan J, Thompson M, O'May F. 2000. *Health workforce incentive and remuneration strategies. A research review*. World Health Organization: Geneva.

Campbell J. 2013. Towards universal health coverage: a health workforce fit for purpose and practice. *Bulletin of the World Health Organization* **91**: 886–7.

Campbell J, Buchan J, Cometto G, *et al.* 2013. Human resources for health and universal health coverage: fostering equity and effective coverage. *Bulletin of the World Health Organization* **91**: 853–63.

Chandler CIR, Chonya S, Mtei F, Reyburn H, Whitty CJM. 2009. Motivation, money and respect: a mixed-method study of Tanzanian non-physician clinicians. *Social Science & Medicine* **68**: 2078–88.

Chen L, Evans T, Anand S, *et al.* 2004. Human resources for health: overcoming the crisis. *Lancet* **364**: 1984–90.

Franco LM, Bennett S, Kanfer R. 2002. Health sector reform and public sector health worker motivation: a conceptual framework. *Social science & medicine* **54**: 1255–66.

Lehmann U, Dieleman M, Martineau T. 2008. Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. *BMC Health Services Research* **8**: 19.

Macq J, Van Lerberghe W. 2000. Managing health services in developing countries: moonlighting to serve the public? In: Ferrinho P, Van Lerberghe W (eds). *Providing health care under adverse conditions: Health personnel performance & individual coping strategies*. Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16: Anwerp, 171–80.

McCoy D, Bennett S, Witter S, *et al.* 2008. Salaries and incomes of health workers in sub-Saharan Africa. *Lancet* **371**: 675–81.

McPake B, Maeda A, Araújo C, Lemiere C, El Maghraby A, Cometto G. 2013. Why do health labour market forces matter ? *Bulletin of the World Health Organization* **91**: 841–6.

Muula AS, Maseko FC. 2006. How are health professionals earning their living in Malawi? *BMC Health Services Research* **6**: 97.

Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W. 1997. How African doctors make ends meet: an exploration. *Tropical Medicine & International Health* **2**: 127–35.

Sales M, Kieny M-P, Krech R, Etienne C. 2013. Human resources for universal health coverage: from evidence to policy and action. *Bulletin of the World Health Organization* **91**: 798–798A.

Smith DJ. 2003. Patronage, Per Diems and the 'Workshop Mentality': The Practice of Family Planning Programs in Southeastern Nigeria. *World Development* **31**: 703–15.

Sousa A, Scheffler RM, Nyoni J, Boerma T. 2013. A comprehensive health labour market framework for universal

health coverage. *Bulletin of the World Health Organization* **91**: 892–4.

Vian T, Bukuluki P. 2011. Perceptions of per diems in the health sector: Evidence and implications. *U4 Anti-corruption Resource Centre*.

WHO. 2006. *World Health Report 2006 - Working together for health*. World Health Organization: Geneva.

Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P. 2008. Motivation and retention of health workers in developing countries: a systematic review. *BMC Health Services Research* **8**: 247.

Witter S, Kusi A, Aikins M. 2007. Working practices and incomes of health workers: evidence from an evaluation of a delivery fee exemption scheme in Ghana. *Human Resources for Health* **5**: 2.

2. Setting the research agenda on HWs' complex remuneration

2.1 Preface

The first research paper included in the thesis expands the points raised in the introductory chapter and clarifies hypotheses, objectives and implications of a research agenda on the complex remuneration of HWs. The article provides an overview of the literature which critically discusses the evidence available on the issue of the remuneration of HWs and highlights the gaps, in particular with reference to the comprehensive and simultaneous analysis of all of the HWs' remunerations. The publications reviewed for this article include broad bodies of work, both referring to relevant theory, such as agency, as well as applied to HWs in low and middle-income countries: health economics literature on provider payments mechanisms, including Performance Based Financing, work on HWs' incomes and financial coping strategies, also in relation with corruption, illegal activities, moonlighting and dual practice, and literature on system-wide effects of global health initiatives (with a focus on the effects on HWs). The literature was not systematically search, but starting from seminal work in each area, the key relevant references were explored. Secondly, the paper identifies a series of hypotheses concerning the HWs' complex remuneration, its causes and consequences, at different levels of the health system and both within and across countries, and it proposes the corresponding research questions on which further research is necessary. Importantly, the paper not only sets a novel research agenda on the complex remuneration of HWs, but it also seeks to highlight the key policy implications and applications of this agenda.

2.2 Cover sheet for research paper

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
www.lshtm.ac.uk

Registry
T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

RESEARCH PAPER COVER SHEET

PLEASE NOTE THAT A COVER SHEET MUST BE COMPLETED FOR EACH RESEARCH PAPER INCLUDED IN A THESIS

SECTION A – Student Details

Student	Maria Paola Bertone
Principal Supervisor	Dr Mylene Lagarde
Thesis Title	Exploring the complex remuneration of health workers in Sierra Leone

If the research paper has previously been published please complete Section B. If not, please move to section C

SECTION B – Paper already published

Where was the work published?	Human Resources for Health		
When was the work published?	July 2015		
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion	N/A		
Have you retained the copyright for the work?*	Yes (see © on article)	Was the work subject to academic peer review?	Yes

** If yes, please attach evidence of retention. If no, or if the work is being included in its published format, please attach evidence of permission from the copyright holder (publisher or other author) to include this work.*

SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	
Please list the paper's authors in the intended authorship order:	
Stage of publication	

SECTION D – Multi-authored work

For a multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary).	As detailed in the published paper, I have developed the research ideas and hypotheses proposed in the article which form the cornerstone of the theoretical and empirical research worked carried out in the rest of the thesis. I prepared the manuscript and later revised the manuscripts following comments from the journal's reviewers.

Student signature:  **Date:** _____17/06/2016_____

Supervisor signature: _____  _____ **Date:** _____17/06/2016_____

Bertone and Witter *Human Resources for Health* (2015) 13:62
DOI 10.1186/s12960-015-0058-7

HUMAN RESOURCES FOR HEALTH

RESEARCH Open Access

The complex remuneration of human resources for health in low-income settings: policy implications and a research agenda for designing effective financial incentives

Maria Paola Bertone[1,2*] and Sophie Witter[2]

Abstract

Background: Human resources for health represent an essential component of health systems and play a key role to accelerate progress towards universal health coverage. Many countries in sub-Saharan Africa face challenges regarding the availability, distribution and performance of health workers, which could be in part addressed by providing effective financial incentives.

Methods: Based on an overview of the existing literature, the paper highlights the gaps in the existing research in low-income countries exploring the different components of health workers' incomes. It then proposes a novel approach to the analysis of financial incentives and delineates a research agenda, which could contribute to shed light on this topic.

Findings: The article finds that, while there is ample research that investigates separately each of the incomes health workers may earn (for example, salary, fee-for-service payments, informal incomes, "top-ups" and per diems, dual practice and non-health activities), there is a dearth of studies which look at the health workers' "complex remuneration", that is, the whole of the financial incentives available. Little research exists which analyses simultaneously all revenues of health workers, quantifies the overall remuneration and explores its complexity, its multiple components and their features, as well as the possible interaction between income components. However, such a comprehensive approach is essential to fully comprehend health workers' incentives, by investigating the *causes* (at individual and system level) of the fragmentation in the income structure and the variability in income levels, as well as the *consequences* of the "complex remuneration" on motivation and performance. This proposition has important policy implications in terms of devising effective incentive packages as it calls for an active consideration of the role that "complex remuneration" plays in determining recruitment, retention and motivation patterns, as well as, more broadly, the performance of health systems.

Conclusions: This paper argues that research focusing on the health workers' "complex remuneration" is critical to address some of the most challenging issues affecting human resources for health. An empirical research agenda is proposed to fill the gap in our understanding.

Keywords: Human resources for health, Low-income countries, Financial incentives, Complex remuneration, Pay

* Correspondence: maria.bertone@lshtm.ac.uk
[1]ReBUILD consortium, Department of Global Health and Development, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London WC1H 9SH, UK
[2]ReBUILD Consortium, IIHD, Queen Margaret University, Edinburgh, UK

Introduction

Human resources for health (HRH) represent an essential component for the functioning of health systems [1] and play a key role to accelerate progress towards universal health coverage [2-4]. However, many low-income countries face challenges with reference to availability of health workers, which is the supply of qualified workers; distribution, that is, recruitment and retention of health workers where they are needed; and performance, which is the productivity and the quality of their work [5]. Theoretical research has explored the factors underlying health workers' motivation [6,7], and empirical studies and systematic reviews have looked extensively at the factors (or combination of factors) that improve recruitment and retention and enhance motivation. They find that the possible strategies are multiple and include financial benefits (pay and other benefits, such as pension, insurance, accommodation), indirect benefits (subsidized transport, food, child care) and non-financial benefits (access to training, social recognition, supervision, etc.) [6]. While some studies suggest that a payment or salary is an essential precondition for the motivation of health workers [8], others argue that non-financial incentives can be highly effective, especially for the attraction and retention in rural areas [9,10]. Yet, most scholars agree that "bundles of interventions" addressing multiple factors and combining financial and non-financial incentives work better than interventions limited to one single type of incentive [10-13].

In this article, we focus exclusively on the financial component of incentive packages provided to health workers and specifically on health workers' remunerations and revenues. We argue that, while there are various bodies of literature in health economics and health policy and systems research in low-income settings that look separately at some of the incomes and examine the effect of each on health workers' motivation, there has been a general lack of attention to the "complex remuneration" of health workers in a comprehensive way, including the whole of the financial incentives and revenue sources available, and to how the different incomes may interact. Indeed, in most low-income settings, the remuneration of health workers is not composed of a single type of payment but includes combinations of payment mechanisms, which differ by source of funding, contract agreements, features such as regularity and inclusion of "deferred" compensation (pensions), and task requirements. The thorough understanding of the entire remuneration of health workers and each of its components, as well as the acknowledgement of its complexity by researchers and policy-makers, is extremely relevant in order to devise effective overall incentive packages.

This article first describes the perspectives taken by the existing economics and health system literature on HRH remuneration in low-income settings and then introduces a broader approach to the study of health workers' financial incentive environment which has thus far been little explored. The article concludes with some reflections on the policy and research implications of our proposition.

Perspectives on HRH remuneration in the existing literature

The remuneration of workers, along with the related issues of incentives and motivation, have been discussed and analysed by different bodies of literature, both theoretical and empirical – the latter focused mostly on high-income settings. One of the most broadly adopted conceptual frameworks to explore the role of remuneration and incentives in defining behaviour in work relationships is "agency theory". Agency theory studies a setting where a "principal" delegates authority to an "agent" who is working on behalf of the principal to perform a task. Because of her imperfect information on the agent's effort and skills, the principal devises contracts that include rewards or sanctions (usually in the form of a financial remuneration) to elicit the desired behaviour [14]. Mainstream economic models predict (under a series of assumptions, including that of "materialistic self-interest" of individuals) which type of incentives should be included in the "ideal" contract (for example, piece-rate payments, fixed salary or a mix), applying concepts from institutional economics, such as "high-powered" and "low-powered" incentives [15,16]. Most recently, economic work began expanding the microfoundations of agency theory to allow for non-rational behaviour and social preferences of individuals. Going beyond revenue and effort as the sole explanatory factors, behavioural models add psychological factors to the agent's utility maximization problem. These factors include inequality aversion, teamwork, and professional and identity norms and have been explored by theoretical and empirical literature [16,17]. The complex process of the motivation of health workers and the role of factors beyond the financial remuneration (including intrinsic determinants, the work context and the broader societal culture) has been acknowledged widely, and their study crosses many disciplinary boundaries, including economics, psychology, organizational development, human resource management and sociology [7]. While we do not aim to present a systematic review of the vast and varied research available, in order to provide a basis for our argument, we focus here on a selected portion of the health economics and health policy and system research literature, which looks at health workers' financial incentives in low-income settings.

In some of the health economics literature, health workers' remuneration arrangements are seen as "provider

payment mechanisms" targeting individuals, under which health workers could be receiving a salary, a fee-for-service payment, capitation or a payment based on their performance. The empirical literature on the incentives created by the different types of payment has been reviewed by many [18-23]. Its focus is found to be predominantly on high-income countries, as fewer, if any, economic analyses have been performed in low- and middle-income settings. It is generally implied that health workers in low- and middle-income countries receive a salary for their public sector activities and are paid a fee-for-service for their private ones [24].

Yet, the actual composition of their remuneration is much more complex, as shown by empirical work carried out in low-income countries. Indeed, these studies point out to the fact that the categories of income sources defined in the health economics literature, and their mutual exclusivity, are less relevant in those contexts. Roenen et al. [25] identified 8 categories (and 28 sub-categories) of medical and non-medical income-generating activities, ranging from agro-pastoral and commercial work to secondary jobs within the public sector (for example, teaching), per diems and premiums, private practice and informal incomes, such as gifts from patients, and appropriation of public resources. In practice, very few studies have quantified the overall remuneration of health workers presenting information on each of these components. These papers generally overlook the complex remuneration and its potential consequences on health workers' motivation as an issue in itself and focus on other questions, namely the impact of changes on HRH (including their income) with the introduction of a fee exemption scheme [26,27], the adequacy of health workers' income and the fiscal and macroeconomic aspects of health workers' remuneration [28] or the strategic tools available for policy-makers to control health workers' behaviour [29].

Other research has focused on the income of health workers in order to explore their individual "financial coping strategies", that is, the ways workers deal with their financial needs. This body of work aims at assessing the adequacy of the public health workforce salary in comparison to alternative work [30] or at investigating the consequences of the coping strategies on the public health system, in order to devise policies to reduce the need to adopt such strategies [31-33], or to put in place performance-based bonuses sufficiently high to incentivize health workers and compensate their increased efforts [34]. Along similar lines, a diverse body of literature focuses on those sources of income that are considered "informal" or downright "illegal", looking at dual practice and moonlighting [35-39] as well as activities within facilities, such as charging under-the-table fees and selling pharmaceuticals [31,40,41]. The main objective of these studies is to attempt the, obviously difficult, assessment of the level of each of those incomes and to discuss their implications in terms of the distortions they can create on the main public job (for example, competition for time and absenteeism) and on the governance of the health system.

Other studies have focused on the widespread practice of external organizations of paying salary supplementations ("top-ups") and "per diems" to health workers. Although meant to reimburse real expenses, per diems are usually paid well beyond the level necessary to cover the actual costs on the activities concerned, and they have attracted much criticisms because of the distortions and abuse to which they are subject and the increase in corruption that they may cause [42-46]. From their perspective, international donors are aware of the critical role they play by providing unofficial supplements to health workers' salaries. The open discussion held at the 1998 International Conference in Lisbon [47-51] is particularly useful in this respect. However, little empirical work exists to measure this impact and its consequences. An exception is the body of literature on the "system-wide effects" of Global Health Initiatives which looks at incentives created by such programmes when they include remuneration to health workers. It is found that, indeed, Global Health Initiatives have contributed substantially to salary top-ups and per diems paid mostly for in-service training [52-55]. The main concern is the evidence of their consequences in terms of "brain drain" from public posts to NGOs and bilateral agencies [56-58], as well as of additional workload, distortion from routine activities and absenteeism in public (usually policy-making) positions [59-61].

With the widespread introduction, in many countries of sub-Saharan Africa, of performance-based financing (PBF) schemes, which often entail a bonus for staff, another payment is available for health workers. The core concept of PBF schemes is to make use of incentives in order to promote better health service coverage and results, by linking financial incentives to desired outputs and encouraging increased effort [62,63]. Critics of the approach have suggested that PBF schemes may promote "gaming" practices, distortions in service delivery in favour of services included in the scheme and crowding-out the intrinsic motivation of health workers [64,65]. Empirical evidence from low-income countries on how PBF schemes affect health workers' motivation is still limited, but some preliminary results are available. The analysis of an early PBF scheme in Rwanda showed the sharp increase in staff productivity [66]. In Benin, with the introduction of two pilot PBF projects, health workers report being more professional and respectful of standards, but their motivation is limited by the perceived unfairness in bonus distribution [67]. A quantitative study

in the Haut-Katanga region of DR Congo finds that the PBF scheme led to more effort from health workers without crowding-out of non-targeted services, staff conflicts, gaming or free-riding. However, the scheme, because of the effect it had of reducing the overall remuneration of health workers, led to a decrease in their intrinsic motivation [68].

Most recently, research has explored HRH incentive issues from a labour market perspective [5,69-71]. This body of work argues that to address issues of maldistribution, low retention and poor performance of health workers, a shift of focus from health workforce planning to other factors, such as labour market dynamics and the behavioural responses and individual preferences, is needed. The proposed approach looks at the national and international market for health workers and at the competing alternatives to public employment, such as private practice and migration to other countries. Although this work allows for the possibility of dual practice, the "price" considered for the health labour market is represented by the "wage rate" and there is limited attention to the existence and consequences of simultaneous, multiple incomes.

The complex remuneration of health workers: policy implications

Although most of the studies reviewed above describe the remuneration of health workers or rather some components of it, with few exceptions [26,27,29,34], they do not adopt a comprehensive approach reflecting the overall financial incentives and encompassing all incomes available. Importantly, however, taken as a whole, this literature points out to the existence and relevance of the phenomenon that we call "complex remuneration", which is the fact that health workers earn their living from a variety of sources and activities. We believe that a broader and more integrated understanding of the financial incentive environment available for health workers is necessary and of high-policy relevance. While the work done so far tends to reflect on different incomes separately, further research is needed on all these elements simultaneously. Such research would allow describing and quantifying the overall income and each of its components, including their relative importance and their variation across individuals. Moreover, it could explore hypotheses (i) relating to the *causes* of differences in income structure and levels between individuals, as well as within and across countries and their linkages with the fragmentation of the health systems, and (ii) on the potential interactions between incomes, the incentives created by the complex remuneration structure and their *consequences* on health workers' motivation, behaviour and, more broadly, on the health system performance.

From a policy perspective, the issues raised by the complex remuneration pose numerous new challenges in order to establish rational and aligned financial incentive packages to recruit, retain and motivate the health workforce. While some guidance already exists for devising health workers' incentives and addressing attraction and retention issues [72,73], under the assumption that the overall income of health workers depends on various and interacting factors beyond the ones that are usually considered, such as individual education and type of posting, the design of financial incentives becomes increasingly difficult. Other elements and factors should now be considered, such as the opportunities for external payments or for medical and non-medical activities beyond the main employment. The need for broader consideration of revenue sources beyond the salary is valid for any type of financial payment or strategy that is to be introduced, from rural allowances to PBF bonuses which have to take into consideration the overall income of health workers in order to be sufficient to produce an impact on motivation and, at the same time, to avoid the "blurred" and ineffective incentives created by the accumulation of various payments [67]. Moreover, the complex remuneration of health workers in many low-income settings presents specific challenges in that multiple payers and lines of accountability exist, with potentially clashing agendas that influence the activities health workers perform. This is different from multiple payment systems in high-income countries, where a single principal is more able to align incentives [74].

Policy-makers and their partners at the national level are called to pay increased attention to the wider financial incentive environment, as well as to engage in reflections to inform HRH reforms going beyond the issue of salaries and governmental allowances. The policy-making processes must be supported by the collection of relevant data (including qualitative) and the creation of an information base on these issues. Additionally, the policy debate at the central level should be framed within the broader macrolevel context of HRH incentives (which includes issues such as caps on total wage bills) and should take into consideration how microlevel strategies for the motivation of health workers can be affected and at times constrained by macrolevel conditions. Finally, beyond the national level, it has to be acknowledged that some of the incomes are subject to and influenced by local-level dynamics (Bertone MP, Witter S: An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone, submitted). For example, private practice is usually more widespread in urban areas rather than in rural ones, and depending on the geographical distribution of donors and NGOs, per diems, top-ups or other payments may be more common or higher in certain areas of a country than in others.

An agenda for research on the health workers' complex remuneration

Further research is needed in order to support policy design and decisions, tailored to the specificity of the contexts. An innovative agenda of health policy and systems research would require exploring the complex remuneration of health workers and refining the necessary tools to capture it. The hypotheses that motivate such research agenda are multiple, and the main issues and research questions that could be explored under this proposition are described below and in Table 1.

First, a description of the level of fragmentation and complexity of the overall income in a country as well as across countries would be extremely useful to explore what are the revenues available to health workers, including their absolute and relative levels. Such work could focus on the causes and determinants of the incomes, looking at variables at the individual, facility and geographical level (for example, which health workers receive each income? Who receives more for each income?). Furthermore, hypotheses on the consequences of the fragmented and complex remuneration should also be investigated. Different sources, levels and features of each revenue – such as predictability, regularity, link with deferred compensation (that is, pension and increases with career progression), type of contract (for example, performance-based or fixed), source of payment and tasks required (for example, routine or disease-specific and within facility or outside) – may play a key role in affecting health workers' behaviour and motivation and therefore performance, in different ways. Moreover, specific requirements related to income component may affect time spent by health workers on different activities (for example, top-ups for disease/service-specific work may increase time spent on those) and the presence at work (for example, incomes earned outside of the facility, such as per diems or non-health-related work). These issues could be further researched with a comprehensive approach. Other key issues are the individual perceptions about the sufficiency, fairness and transparency in the allocation of the revenues [75,76], as well as social and cultural views over certain incomes, all of which are likely to affect the motivation of health workers. For example, it is possible that, in some contexts, the government salary may be a relatively limited and unreliable source of income but perceived as extremely important either because it is linked to pension benefits and job security [76,77] or because health workers assign a significance beyond its immediate monetary value. In the DR Congo, Fox et al. found that this was the case as receiving a salary is seen as a social recognition of the health worker's role [78]. Similarly, some revenues may be low in absolute terms but they could enable access to other "goods" (such as training or social status) or, because of their regularity and predictability, could act as income "stabilizers" and therefore be considered important by health workers. A further unexplored hypothesis relates to the potential interaction between income components. If we consider the possibility of earning simultaneously different revenues, some incomes could play a role either as a substitute for meagre official payments or as a complement to those, even when their level is sufficient. For example, are revenues for activities outside of the health sector, such as agriculture or business, earned to "make ends meet", or are those incomes available only to workers who earn enough from other sources and are therefore able to make further investments?

Turning to the overall revenue, it is likely that, given the fragmentation, the total income may differ for health workers even within the same cadre and level of education. In this case, it will be important to assess the level of income variability and investigate its causes. These differences could be a used as a motivation tool by incentivizing health workers to work in rural areas or ensuring their career progression, especially if remuneration is transparent and fragmentation reduced. On the other hand, these differences may be a possible source of inequity between individuals and demotivation. Research could explore by which income component(s) differences in total income are driven and/or whether these differences are related to characteristics at the individual level, such as gender, or at the facility level (rural or urban location) or at the geographical level (different districts or provinces). Based on answers to such questions, it is possible to reflect on the policy relevance of the income differences: are differences justifiable and used to address availability, distribution and retention issues, or do they cause unacceptable inequalities? Are inequalities avoidable and policy-amenable? If so, what are the policy tools to address them? For example, a study of doctors in Viet Nam found that the difference in opportunities for financial revenues between areas of posting favoured those in urban areas. The fact that these differences mostly originated outside official pay channels and were of large magnitude presented a considerable policy challenge to address distribution imbalances [29].

Another set of hypotheses concerns the difference in the complexity of income composition that there may be within and across countries. A question in this case is whether the fragmentation of revenue sources and the variation of total income for similar health workers have local determinants and/or mirror the fragmentation of the health system and increase in contexts where numerous (external) actors are involved, such as in fragile states/regions or where private practice is widespread.

The call for a novel approach focused on the overall remuneration and including sources of income that are both formal and informal also requires refining existing

Table 1 Main hypotheses of the proposed research agenda on HRH complex remuneration and possible research questions

Main issues/hypotheses	Possible research questions
Complexity/fragmentation of income sources	• What are the different incomes available for health workers and the level and relative importance of each income?
	• To which type of health workers is each source of income available – including health worker characteristics at the individual level (such as age, gender, level of education, years in the health sector and role within the facility) and at the facility level (type of facility, rural/urban, size, location within the country, etc.)?
	• What are the individual- and facility-level determinants that define the level (amount) of each income received/earned?
	• How do the different incomes interact with each other? Are certain incomes used as a substitute for the lack/low level of others or rather as complements?
	• How are the different incomes used by health workers?
Consequences of the complex remuneration	• What are the features of the different revenues (for example, present vs. deferred and stable vs. irregular, performance-based vs. fixed), and how do these affect motivation and performance?
	• How do health workers perceive their incomes, in terms of fairness, of being sufficient to motivate them, of transparency on what influences them, etc.? How do these perceptions affect their motivation and performance?
	• What are the consequences of the income fragmentation on the motivation and performance? (for example, does the accumulation of payments lead to "blurriness" and decrease effectiveness of incentives?)
	• How do different incomes and their fragmentation affect the time spent on different activities, levels of absenteeism and accountability links to different payers?
Differences in total income across health workers of the same cadre	• What is the measure of differences of income across similar health workers? (that is, same cadre/level of education and type of post and role within facility)
	• What are the drivers at the individual and facility level of these differences?
	• What are the consequences of the inequalities of total income? Are they justifiable and have a motivating effect (for example, incentivizing rural workers)? Or do they cause unacceptable inequalities and hamper availability, retention and distribution, as well as motivation (for example, urban workers or workers in some areas have more opportunities to earn some revenues from private practice or donors' support)?
Differences within countries	• Are there income differences (both overall and for each component) between health workers in different areas of the same country?
	• What are the causes of these differences? (for example, rural/urban divide, different socio-economic contexts, historical legacies, political economy dynamics at local level and presence of external actors)
Differences across countries	• Do health workers in some countries have more complex incomes than in others? Why? (for example, different health system architecture and health system fragmentation, role of private sector, existence of free health care policies, level of health funding and fragile/post-conflict settings)
	• Are individual differences for similar health workers more important in some countries than others? Why?
Designing financial incentive packages	• Which tools and methods are needed to produce context-specific evidence in order to design rational and effective incentive packages for health workers?
	• What is the role of governments and their development partners in reducing inequalities and fragmentation of health workers' income?
	• What are the policy implications of complex remuneration (for example, its effects on policy options and effectiveness), and what are the options for addressing it?
	• How are individual-level strategies for the motivation of health workers affected and constrained by macrolevel conditions (for example, wage bills caps)?

methods to elicit such information [79], as well as testing and defining new ones. Informal revenues are extremely difficult and perhaps impossible to precisely calculate because of the reticence of the health workers to openly declare them and the absence of records. However, some potentially useful techniques that allow rough estimates have been explored [34,40]. Revenues that are not harmonized but vary for each health worker, such as top-ups and per diems, are difficult to collect other than through individual surveys, given the difficulty of obtaining disaggregated data from donors' databases. Mixed method approaches have also been found

useful to better understand the level of each income and the perceptions and views of health workers on their different revenues [34]. Overall, it seems that the ideal approach would entail a combination of different methods, integrated into survey or interview tools that are practical and feasible to administer. Although collecting data on incomes routinely would be of high relevance for policy-makers, this possibility seems unlikely. As for the interpretation of results, while it may prove difficult to go beyond the context specificity of the findings of this type of research, cross-country comparisons may help to improve generalizability and find common patterns across contexts.

Conclusion

In this paper, we have argued for an increased attention to the wider financial incentive environment and a better understanding of the complex remuneration of health workers, its determinants and the factors that underlie it, as well as its wide-ranging consequences for behaviour and performance. As recognized in the introduction, our perspective is limited because of its exclusive focus on financial incentives. In fact, we recognize that effective HRH strategies consist of "bundles of interventions", which incorporate both financial and non-financial incentives, and our proposition does not aim to underestimate the importance of other non-financial motivation strategies. However, precisely because financial and non-financial incentives are complexly interrelated, remuneration is an essential element of any HRH strategy. It cannot be fully taken into consideration for policy-making without exploring and understanding the overall complex remuneration of health workers and the role it plays in determining recruitment, retention and motivation, as well as, more broadly, the performance of health systems and the progress towards universal health care.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

MPB developed the ideas and hypotheses proposed in this paper and carried out the review of the literature. SW contributed to the conceptualization of the proposition and to its operationalization through the research questions. MPB drafted the first version of the manuscript, to which SW provided comments. Both authors read and approved the final manuscript.

Acknowledgements

The authors would like to thank Mylene Lagarde, Grégoire Lurton and Nicolas de Borman for useful comments on earlier versions of this paper. We are also grateful to our three reviewers, Elisabeth Paul, Daudi Simba and Nils Gunnar Songstad, for their insights and suggestions to improve the manuscript. MPB acknowledges funding from the Fondation AEDES (http://www.fondation-aedes.org/) for her PhD scholarship and from ReBUILD (http://www.rebuildconsortium.com) for fieldwork activities in Sierra Leone.

Received: 18 March 2015 Accepted: 9 July 2015
Published online: 28 July 2015

References

1. WHO. World Health Report 2006 - working together for health. Geneva: World Health Organization; 2006.
2. Cometto G, Boerma T, Campbell J, Dare L, Evans T. The Third Global Forum: framing the health workforce agenda for universal health coverage. Lancet Glob Health. 2013;1:e324–5.
3. Campbell J, Buchan J, Cometto G, David B, Dussault G, Fogstad H, et al. Human resources for health and universal health coverage: fostering equity and effective coverage. Bull World Health Organ. 2013;91:853–63.
4. Sales M, Kieny M-P, Krech R, Etienne C. Human resources for universal health coverage: from evidence to policy and action. Bull World Health Organ. 2013;91:798–798A.
5. McPake B, Maeda A, Araújo C, Lemiere C, El Maghraby A, Cometto G. Why do health labour market forces matter? Bull World Health Organ. 2013;91:841–6.
6. Buchan J, Thompson M, O'May F. Health workforce incentive and remuneration strategies. A research review. Geneva: World Health Organization; 2000.
7. Franco LM, Bennett S, Kanfer R. Health sector reform and public sector health worker motivation: a conceptual framework. Soc Sci Med. 2002;54:1255–66.
8. Chandler CIR, Chonya S, Mtei F, Reyburn H, Whitty CJM. Motivation, money and respect: a mixed-method study of Tanzanian non-physician clinicians. Soc Sci Med. 2009;68:2078–88.
9. Lagarde M, Blaauw D. A review of the application and contribution of discrete choice experiments to inform human resources policy interventions. Hum Resour Health. 2009;7:62.
10. Lehmann U, Dieleman M, Martineau T. Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. BMC Health Serv Res. 2008;8:19.
11. Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P. Motivation and retention of health workers in developing countries: a systematic review. BMC Health Serv Res. 2008;8:247.
12. Dolea C, Stormont L, Braichet J-M. Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. Bull World Health Organ. 2010;88:379–85.
13. Buchan J, Couper ID, Tangcharoensathien V, Thepannya K, Jaskiewicz W. Early implementation of WHO recommendations for the retention of health workers in remote and rural areas. Bull World Health Organ. 2013;91:834–40.
14. Kiser E. Comparing varieties of agency theory in economics, political science, and sociology: an illustration from state policy implementation. Sociol Theory. 1999;17:146–70.
15. Burgess S, Ratto M. The role of incentives in the public sector: issues and evidence. Bristol, UK: The Leverhulme Centre for Market and Public Organisation - Working Paper No. 03/071; 2003.
16. Paul E, Robinson M. Performance budgeting, motivation, and incentives. In: Performance budgeting: linking funding and results. Washington, DC: International Monetary Fund & Palgrave/McMillan; 2007.
17. Rebitzer JB, Taylor LJ. Extrinsic rewards and intrinsic motives: standard and behavioral approaches to agency and labor markets. Annandale, NY: Levy Economics Institute of Bard College - Working Paper No. 607; 2010.
18. Gosden T, Pedersen L, Torgerson D. How should we pay doctors? A systematic review of salary payments and their effect on doctor behaviour. Q J Assoc Physicians. 1999;92:47–55.
19. Chaix-Couturier C, Durand-Zaleski I, Jolly D, Durieux P. Effects of financial incentives on medical practice: results from a systematic review of the literature and methodological issues. Int J Qual Heal Care. 2000;12:133–42.
20. Robinson JC. Theory and practice in the design of physician payment incentives. Milbank Q. 2001;79:149–77.
21. Lagarde M, Powell-Jackson T, Blaauw D. Managing incentives for health providers and patients in the move towards universal coverage. London: LSHTM & WHO; 2010.
22. Scott A, Sivey P, Ait Ouakrim D, Willenberg L, Naccarella L, Furler J, et al. The effect of financial incentives on the quality of health care provided by primary care physicians (review). Cochrane Database Syst Rev. 2011;7(9), CD008451.
23. Gosden T, Forland F, Kristiansen I, Sutton M, Leese B, Giuffrida A, et al. Capitation, salary, fee-for-service and mixed systems of payment: effects on the behaviour of primary care physicians (review). Cochrane Collab 2011(3):CD002215.

24. Hernandez-Pena P, Poullier JP, Van Mosseveld CJM, Van De Maele N, Cherilova V, Indikadahena C, et al. Health worker remuneration in WHO Member States. Bull World Health Organ. 2013;91:808–15.
25. Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W. How African doctors make ends meet: an exploration. Trop Med Int Health. 1997;2:127–35.
26. Witter S, Kusi A, Aikins M. Working practices and incomes of health workers: evidence from an evaluation of a delivery fee exemption scheme in Ghana. Hum Resour Health. 2007;5:2.
27. Witter S, Wurie H, Bertone MP. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? Health Policy Plan. 2015;(advanced access).
28. McCoy D, Bennett S, Witter S, Pond B, Baker B, Gow J, et al. Salaries and incomes of health workers in sub-Saharan Africa. Lancet. 2008;371:675–81.
29. Witter S, Thi Thu Ha B, Shengalia B, Vujicic M. Understanding the "four directions of travel": qualitative research into the factors affecting recruitment and retention of doctors in rural Vietnam. Hum Resour Health. 2011;9:20.
30. Macq J, Van Lerberghe W. Managing health services in developing countries: moonlighting to serve the public? In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 171–80.
31. Ferrinho P, Van Lerberghe W. Managing health professionals in the context of limited resources: a fine line between corruption and the need for moonlighting. Washington, DC: World Bank - Working Paper 26941; 2002.
32. Muula AS, Maseko FC. How are health professionals earning their living in Malawi? BMC Health Serv Res. 2006;6:97.
33. Van Lerberghe W, Conceicao C, Van Damme W, Ferrinho P. When staff is underpaid: dealing with the individual coping strategies of health personnel. Bull World Health Organ. 2002;80:581–4.
34. Akwataghibe N, Samaranayake D, Lemiere C, Dieleman M. Assessing health workers' revenues and coping strategies in Nigeria — a mixed-methods study. BMC Health Serv Res. 2013;13:387.
35. Ferrinho P, Van Lerberghe W, Fronteira I, Hipólito F, Biscaia A. Dual practice in the health sector: review of the evidence. Hum Resour Health. 2004;2:14.
36. Eggleston K, Bir A. Physician dual practice. Health Policy. 2006;78:157–66.
37. Garcia-Prado A, Gonzalez P. Whom do physicians work for? An analysis of dual practice in the health sector. J Health Polit Policy Law. 2011;36:265–94.
38. Socha KZ, Bech M. Physician dual practice: a review of literature. Health Policy. 2011;102:1–7.
39. McPake B, Russo G, Tseng F-M. How do dual practitioners divide their time? The cases of three African capital cities. Soc Sci Med. 2014;122:113–21.
40. McPake B, Asiimwe D, Mwesigye F, Ofumbi M, Ortenblad L, Streefland P, et al. Informal economic activities of public health workers in Uganda: implications for quality and accessibility of care. Soc Sci Med. 1999;49:849–65.
41. Stringhini S, Thomas S, Bidwell P, Mtui T, Mwisongo A. Understanding informal payments in health care: motivation of health workers in Tanzania. Hum Resour Health. 2009;7:53.
42. Chene M. Low salaries, the culture of per diems and corruption. Bergen: Chr. Michelsen Institute - U4 Anti-Corruption Resource Centre; 2009.
43. Vian T, Miller C, Themba Z, Bukuluki P. Perceptions of per diems in the health sector: evidence and implications. Health Policy Plan. 2013;28:237–46.
44. Ridde V. Per diems undermine health interventions, systems and research in Africa: burying our heads in the sand. Trop Med Int Heal. 2010;(online view).
45. Vian T. Benefits and drawbacks of per diems: do allowances distort good governance in the health sector? Bergen: Chr. Michelsen Institute - U4 Anti-Corruption Resource Centre; 2009.
46. Smith DJ. Patronage, per diems and the "workshop mentality": the practice of family planning programs in Southeastern Nigeria. World Dev. 2003;31:703–15.
47. Adams O. Internal brain-drain and income topping-up: policies and practices of the World Health Organisation. In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 197–200.
48. Lea R. Internal brain-drain and income topping-up: policies and practices of Norad. In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 201–4.
49. Dussault G. World Bank policies in relation to human resources development in health. In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 191–6.
50. Schmidt-Ehry B, Popp D. Internal brain-drain and income topping-up: policies and practices of GTZ. In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 205–9.
51. De Backer L. Internal brain-drain and income topping-up: policies and practices of the Belgian International Co-operation. In: Ferrinho P, Van Lerberghe W, editors. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16; 2000. p. 211–5.
52. Drager S, Gedik G, Dal Poz MR. Health workforce issues and the global fund to fight AIDS, tuberculosis and malaria: an analytical review. Hum Resour Health. 2006;4:23.
53. WHO Maximizing Positive Synergies Collaborative Group. An assessment of interactions between global health initiatives and country health systems. Lancet. 2009;373:2137–69.
54. Vujicic M, Weber SE, Nikolic IA, Atun R, Kumar R. An analysis of GAVI, the Global Fund and World Bank support for human resources for health in developing countries. Health Policy Plan. 2012;27:649–57.
55. Bowser D, Sparkes SP, Mitchell A, Bossert TJ, Bärnighausen T, Gedik G, et al. Global Fund investments in human resources for health: innovation and missed opportunities for health systems strengthening. Health Policy Plan. 2014;29:986–97.
56. Brugha R, Kadzandira J, Simbaya J, Dicker P, Mwapasa V, Walsh A. Health workforce responses to global health initiatives funding: a comparison of Malawi and Zambia. Hum Resour Health. 2010;8:19.
57. Mussa AH, Pfeiffer J, Gloyd SS, Sherr K. Vertical funding, non-governmental organizations, and health system strengthening: perspectives of public sector health workers in Mozambique. Hum Resour Health. 2013;11:26.
58. Yu D, Souteyrand Y, Banda MA, Kaufman J, Perriëns JH. Investment in HIV/AIDS programs: does it help strengthen health systems in developing countries? Global Health. 2008;4:8.
59. Biesma RG, Brugha R, Harmer A, Walsh A, Spicer N, Walt G. The effects of global health initiatives on country health systems: a review of the evidence from HIV/AIDS control. Health Policy Plan. 2009;24:239–52.
60. Stillman K, Bennett S, Gbangbade S, Smith O. Systemwide effects of the Global Fund: interim findings from three country studies. Bethesda, MD: PHRPlus, Abt Associates; 2005.
61. Oomman N, Wendt D, Droggitis C. Zeroing. In: AIDS donors and Africa's health workforce. Washington, DC: Center for Global Development; 2010.
62. Witter S, Toonen J, Meessen B, Kagubare J, Fritsche G, Vaughan K. Performance-based financing as a health system reform: mapping the key dimensions for monitoring and evaluation. BMC Health Serv Res. 2013;13:367.
63. Meessen B, Soucat A, Sekabaraga C. Performance-based financing: just a donor fad or a catalyst towards comprehensive health-care reform? Bull World Health Organ. 2011;89:153–6.
64. Kalk A, Paul FA, Grabosch E. "Paying for performance" in Rwanda: does it pay off? Trop Med Int Health. 2010;15:182–90.
65. Ireland M, Paul E, Dujardin B. Can performance-based financing be used to reform health systems in developing countries? Bull World Health Organ. 2011;89:695–8.
66. Meessen B, Kashala JPI, Musango L. Output-based payment to boost staff productivity in public health centres: contracting in Kabutare district, Rwanda. Bull World Health Organ. 2007;85:108–15.
67. Paul E, Sossouhounto N, Eclou DS. Local stakeholders' perceptions about the introduction of performance-based financing in Benin: a case study in two health districts. Int J Health Policy Manag. 2014;3:207–14.
68. Huillery E, Seban J. Financial incentives are counterproductive in non-profit sectors: evidence from a health experiment. Paris: Science Po, Department of Economics - Working Paper; 2015.

69. Soucat A, Scheffler RM, Ghebreyesus TA. The labor market for health workers in Africa. A new look at the crisis. Washington, DC: The World Bank; 2013.
70. McPake B, Scott A, Edoka I. Analyzing markets for health workers. Insights from labor and health economics. Washington, DC: The World Bank; 2014.
71. Sousa A, Scheffler RM, Nyoni J, Boerma T. A comprehensive health labour market framework for universal health coverage. Bull World Health Organ. 2013;91:892–4.
72. Jaskiewicz W, Deussom R, Wurts L, Mgomella G. Rapid retention survey toolkit: designing evidence-based incentives for health workers. Washington, DC: USAID and CapacityPlus; 2012.
73. WHO. Increasing access to health workers in remote and rural areas through improved retention. Geneva: World Health Organization; 2010.
74. Ensor T, Witter S. Health economics in low income countries: adapting to the reality of the unofficial economy. Health Policy. 2001;57:1–13.
75. Songstad NG, Rekdal OB, Massay DA, Blystad A. Perceived unfairness in working conditions: the case of public health services in Tanzania. BMC Health Serv Res. 2011;11:34.
76. Zinnen V, Paul E, Mwisongo A, Nyato D, Robert A. Motivation of human resources for health: a case study at rural district level in Tanzania. Int J Health Plann Manage. 2012;27:327–47.
77. Songstad NG, Moland KM, Massay DA, Blystad A. Why do health workers in rural Tanzania prefer public sector employment? BMC Health Serv Res. 2012;12:92.
78. Fox S, Witter S, Wylde E, Mafuta E, Lievens T. Paying health workers for performance in a fragmented, fragile state: reflections from Katanga Province, Democratic Republic of Congo. Health Policy Plan. 2014;29:96–105.
79. Immpact Project. Health Worker Incentives Survey (HWIS). Aberdeen: University of Aberdeen - Immpact Project Toolkit; 2007.

3. Research questions and institutional setting of the thesis

3.1 Research aim and objectives

This thesis aims to look into the issue of the complex remuneration of HWs, in line with the theoretical proposition advanced in Chapter 2. In particular, in this thesis, I fully explore a subset of the research questions outlined in the paper (Bertone and Witter, 2015a).

The primary aim of this research is to analyze the complex remuneration of primary HWs in Sierra Leone, explore its causes and drivers at different levels, as well as the consequences it has on the activities that HWs perform.

The specific research objectives, and the steps taken in the empirical work, are the following (Table 3.1):

1. Describe the official financial incentives available for HWs and how it developed overtime, by analyzing the HRH policies and policy-making processes at macro (central) level in Sierra Leone during the post-conflict period.
2. Investigate the factors and dynamics between key actors of the health system at meso (district) level which contribute to re-shape the financial incentive package for HWs.
3. At micro (individual HW) level, estimate the absolute and relative contribution of each income to the remuneration of HWs, by using and comparing different methods and tools.
4. Analyze the complex remuneration of HWs, by looking at the determinants of the differences in remuneration between HWs and by exploring the views and satisfaction of HWs with their remunerations.
5. Investigate the possible links between remunerations and activities performed.

In order to examine these issues, empirical work was carried out between October 2012 and May 2014 in Sierra Leone, and data collection at individual level focused specifically on public HWs working in primary healthcare centers in three districts in the southern part of the country. It is important to note that fieldwork for data collection for this thesis was carried before the Ebola Virus Disease (EVD) epidemic, which started in Sierra Leone in May 2014 and therefore reflects the situation as it was before the outbreak.

Table 3.1: Overview of the research objectives, questions and chapters' organization

	Research objectives	Chapter	Research paper (reference)	Research questions (HT: hypothesis testing) (EX: exploratory or descriptive)
Central level	Setting the background by describing the official HRH incentive package in Sierra Leone	Chapter 6	(Bertone *et al.*, 2014)	• What dynamics and processes at central level have led to the definition of the HRH incentive policies in Sierra Leone over the post-conflict period? (EX) • Was there a political 'window of opportunity' for reform in the immediate post-conflict period? (HT) • What type of financial incentive package for HWs emerged after the decade of post-conflict reforms? (EX)
District level	Exploring how HRH remuneration is re-shaped at district level	Chapter 7	(Bertone and Witter, 2015b)	• Which factors and dynamics between local-level actors contribute to re-shaping the financial incentives of HWs? (EX) • What is the impact of such influence on the actual financial incentives experienced by HWs? (EX)
Individual level	Estimating HWs' complex remuneration	Chapter 8	--	• What are the different estimates of HWs' incomes based on the three methods used (i.e., survey, indirect questioning, prospective daily logbook)? (EX) • How do results of income estimates compare to the hypotheses on biases that had been formulated initially? (HT) - Recall bias in survey responses lead to underestimation of income amounts - Indirect questioning reduces reticence in response to questions on sensitive (i.e. informal or illegal) incomes and address normative bias - Daily logbooks can help address the issue of recall bias and capture variation overtime, but suffer from low response rate.
	Analyzing the complex remuneration of HWs	Chapter 9	(Bertone and Lagarde, 2016) (Bertone *et al.*, 2016)	• What is the contribution of each income to the remuneration of HWs? (EX) • Which factors at individual, facility and district level drive the differences in the total remuneration and between components? (EX) • What are the views of the HWs on their incomes, and their satisfaction in relation with their livelihood strategies? (EX)
	Exploring the links between complex remuneration and HWs' productive activities	Chapter 10	--	• Is the choice of activities of HWs driven by their effort to maximize income and minimize effort (as hypothesized by agency theory)? (HT) • Which factors constrain the choice of activities of HWs and influence the patterns of service delivery at facility level? (EX)

3.2 Conceptual framework

In order to explore the questions and issues highlighted above, I developed a conceptual framework that delineates the potential causal pathways by which complex remuneration influences the allocation of time across different activities, and in turn affects health service delivery and use.

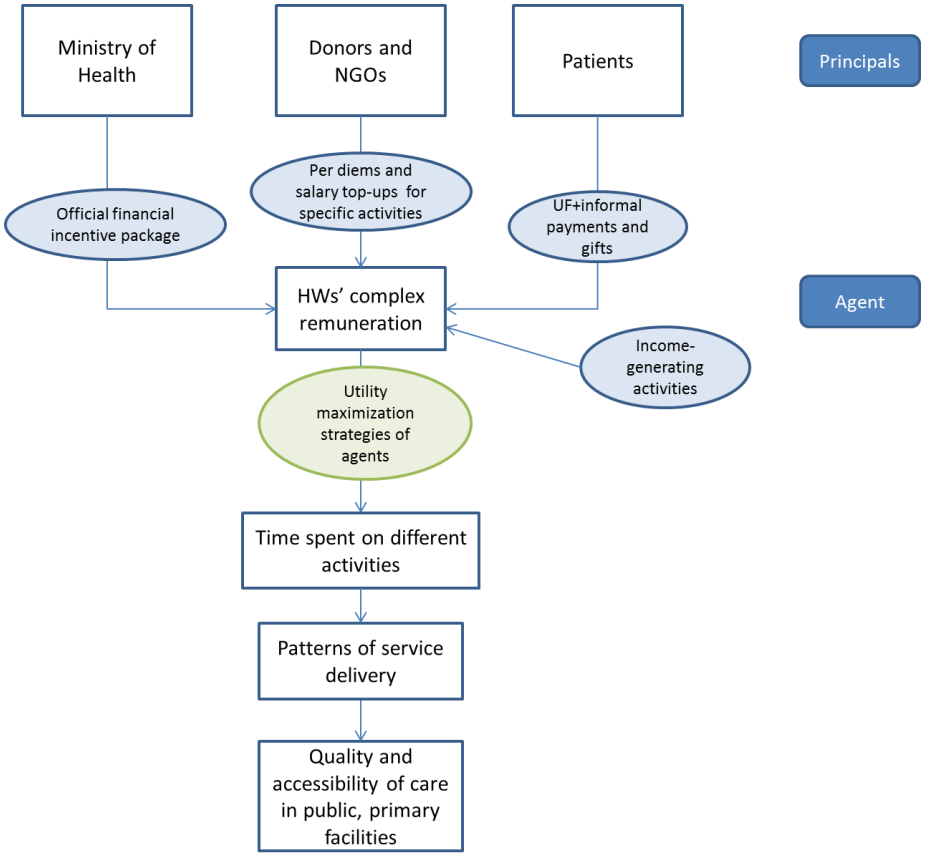
The conceptual framework embeds the issue of the remuneration of HWs into a model that is primarily founded upon agency theory. Agency refers to a situation where someone (a principal) needs a task to be performed, and delegates its performance to a second person (an agent). Problems typically arise as (i) the agent's interest may differ from her own and (ii) the agent has better information than the principal on her actions (Kiser, 1999). In the simple agency model, the utility–maximizer agent maximizes earnings while minimizing effort. Therefore, to elicit the desired behavior and obtain optimal effort levels, the principal needs to ensure that the agent's remuneration structure is in line with the principal's own objectives, by defining in the agent contract the appropriate 'power' of incentives (e.g., the extent to which the remuneration is linked to production). Theoretical models for particular cases of agency have been presented in the literature depicting the situations in which agents are multitasking or have multiple principals. In the first case (i.e., multitasking agents), if tasks are substitutes, which means that exerting more effort on one task increases the marginal cost of the other, stronger incentives to perform one task will drive the agent's effort away from the other task(s) . The second case (also called, 'common agency') arises when one agent is subject to the influence of multiple principals (Bernheim and Whinston, 1986; Dixit, 1996, 1997, 2002). In the absence of a single contract agreed upon by all principals (the case of a 'collective principal' (Nielson and Tierney, 2003)), each principal sets an incentive scheme that is optimal for her and the agent's rational response is to choose the optimal level of effort on each task, according to his private costs and benefits given the full set of contracts.

Agency theory was chosen as the underlying model of the conceptual framework because it provides a relatively simple and overarching structure which has been theoretically conceptualized and (at least partially) empirically tested in the literature. Additionally, it has been applied to workers in the public sector (Burgess and Ratto, 2003) as well as to the healthcare market (since Arrow, 1963). Moreover, while originally developed by economists, agency theory has been adopted in sociology and political sciences and have proved a useful conceptual tool for multidisciplinary analyses (Kiser, 1999; Shapiro, 2005).

The conceptual framework adopted for this research is sketched in the figure below. It shows how a set of principals, encompassing the Ministry of Health, but also donors, NGOs and patients, provide different streams of income to HWs (who act as their agents) in exchange for undertaking certain defined tasks (e.g., providing health services). These payments, alongside the earnings from individual income-generating activities, make up the complex remuneration of HWs. HWs are at the same time multitasking agents, because their job encompasses a series of activities –both clinical and administrative- related to healthcare delivery, and have multiple principals,

as they act as agents for their main employer (typically the Ministry of Health), their patients, and other principals who contribute to their remuneration, such as donors and NGOs. In the case of multitasking agents, agency theory predicts that HWs would aim to maximize their utility (i.e., maximize earnings and minimizing effort), by allocating their effort across different tasks according to the benefits and costs associated to each. For example, it could be hypothesized that HWs would choose to give preference to trainings and meetings outside their facility which allow them to earn per diems, or could focus the provision of services linked to PBF payments, which provide high earnings (although they do also require effort and payment is related to increased production). By doing so, they could neglect other activities which do not provide extra income. Such utility maximization strategies affect, in turn, the pattern of service delivery as some services may be preferred and provided more often than others or spending more time on them. Finally, this affects healthcare use for the patients, as some services may be more accessible (because provided more frequently) or of better quality (because more time is spent on them).

Figure 3.1: Conceptual framework for this research



3.2.1 Definition of key concepts

So far in the thesis, I have frequently used the term 'complex remuneration', and I will continue to do so in the following pages. The term is new to the literature and requires some definition. First of all, for what concerns the meaning of 'remuneration', I use it in this thesis as a general, overarching term to include all forms of present compensation, in-kind or in cash, that HWs receive or earn in exchange of work, activities or services produced. Such activities include both those carried out under their main job as public HWs for which they receive a salary, other allowances (in Sierra Leone, a remote allowance for working in rural areas and a PBF bonus related to the provision of six maternal and child health services; overtime may also be paid in other contexts), top-ups and per diems from external organization for specific tasks (such as training, workshops, or disease-specific activities), as well as those carried out alongside it, such as private practice or other income generating activities outside of the health sector (farming, business, small trade, etc.). However, the operational definition of 'remuneration' that I adopt does not include other benefits, such as housing, medical insurance or deferred compensation (e.g., pension). This is an important limitation of the research as those benefits are shown in the literature to be a relevant component of the motivation of HWs and a key reason to remain in public service (Songstad *et al.*, 2012; Zinnen *et al.*, 2012; Wurie *et al.*, 2016). However, the choice was made because the HWs are often not able to precisely quantify those benefits, and in particular those that they will be receive in the future or in case of particular events (such as the case of insurance). Moreover, because the entire sample of HWs included in the analysis (as described in Chapter 5) is composed of public HWs, there is little or no variation in those benefits between all of them.

Because I purposefully define 'remuneration' in a loose sense, I often use other terms such as 'income', 'revenue', 'payment', 'earning', 'financial incentive' (or 'incentive') as synonyms, simply to avoid repetitions in the text. In particular, it is important to stress that, as explained in Chapter 2, although I recognize the key role played by non-financial incentives in the motivation of HWs (Buchan *et al.*, 2000; Lehmann *et al.*, 2008; Willis-Shattuck *et al.*, 2008; Chandler *et al.*, 2009; Lagarde and Blaauw, 2009), for this research it was explicitly decided to not include the analysis of such non-financial incentives, as for example social recognition, supervision and supportive working environment. Therefore, unless otherwise specified or clear from the context, the term 'incentive' usually indicates financial incentives paid to HWs in cash or kind. Additionally, the use of the term 'financial incentive package' normally refers to the set of official payments (salary, allowances, performance bonus, etc.) established for public HWs by the central government or Ministry of Health.

The term 'complex' as referred to the HWs' remuneration also deserves an explanation. It is important to stress that its use in this thesis does not relate to complexity theory or the study of complex adaptive system, and the specific definition adopted in that literature. Instead, I draw from the seminal paper by McCoy et al. on incomes of HWs in Africa, which states that "pay structures are often *complex*, consisting of a mix of salary, various allowances, periodic bonuses, overtime payments, and other forms of remuneration such as per diems" (McCoy *et al.*, 2008: 675 - italics mine). The usage of 'complex' in this thesis is therefore in line with its first Oxford-

dictionary definition of “consisting of many different and connected parts”. Indeed, more than other terms (such as, ‘multiple’ or ‘fragmented’ remuneration) which could have been valid alternatives, the term ‘complex’ stresses not only the multiplicity and diversity of the components of the remuneration, but also their interconnectivity (see Chapter 9 for a discussion of this).

3.3 Funding and ethics approval

3.3.1 Funding and institutional setting of the thesis

I gratefully acknowledge the funding of the Fondation AEDES (www.fondation-aedes.org), which awarded me a PhD scholarship. In addition, fieldwork data collection in Sierra Leone and dissemination activities were funded as an affiliate project of the DfID-funded ReBUILD Consortium (http://www.rebuildconsortium.com).

This research was conducted in close collaboration with the ReBUILD's core project on HWs' incentives in Sierra Leone, led by Prof Sophie Witter. Particular care was taken to make sure that the two projects did not overlap, but complement each other. Overall, the work included in this thesis was carried out independently, under the affiliate project and for the purpose of this PhD thesis[1]. I was primarily responsible for all the stages of the research, from study design to data collection, analysis and writing up. Where publications are coauthored, co-authors have provided guidance in their roles as PhD supervisor (Dr Mylene Lagarde) and member of the PhD Advisory Committee (Prof. Sophie Witter). The only exception to this is the paper describing the HRH policy-making in the post-conflict period and setting the background to the remuneration of HWS, included in Chapter 6 (Bertone *et al.*, 2014). In this case, the research objectives concerning the background to the HRH policies in Sierra Leone and their development over the post-conflict period were the same for ReBUILD's core and affiliate projects, and it was decided to carry out the study jointly. I was responsible for data collection, with support from other researchers at the College of Medicine and Allied Health Sciences (COMAHS) in Freetown for a few key informant interviews, and was solely responsible for analysis and initial writing up of the article. Two COMAHS researchers, Dr Samai and Dr Edem-Hotah, also provided inputs into the final version of the report and, along with Prof. Witter, co-authored the journal article.

3.3.2 Ethics approval

Ethics approval for this research was granted by the London School of Hygiene and Tropical Medicine Ethics Committee on July 18th, 2013 and from the Sierra Leone Ethics and Scientific Review Committee on August 6th, 2013. ReBUILD's core project (under which the paper in Chapter 6 of this thesis was prepared) had also previously obtained ethics approval from the Research Ethics Committee of the Liverpool School of Tropical Medicine and from the Sierra Leone Ethics and Scientific Review Committee. Letters confirming ethics approval are attached in Appendix 1.

[1] Because I pursued this PhD as part-time student, I did contribute to work and publications of ReBUILD's core project as an independent consultant (Witter *et al.*, 2015, 2016).

Written consent was sought from all participants to the different components of this research. Participants were first presented an information sheet detailing the purpose of the research and the reasons why they were invited to participate, as well as explaining the clauses of confidentiality and anonymity of the research. Any further questions were answered by the interviewer. The participants who agreed to take part in the study were asked to sign a copy of the consent form in two copies, one to be kept (which also included contact details of the researcher, supervisor and ethics committee) and the second for the researcher. As detailed in Chapter 5, participants in this research include key informants interviewed at central and district level, HWs included in the quantitative data collection (cohort study) and HWs who participated to in-depth interviews. Information sheets and consent forms for these different types of participants are attached in Appendix 2.1, 2.2, 2.3 and 2.4, respectively.

3.4 References

Arrow KJ. 1963. Uncertainty and the Welfare Economics of Medical Care. *The American Economic Review* **53**: 941–73.

Bernheim DB, Whinston MD. 1986. Common Agency. *Econometrica* **54**: 923–42.

Bertone MP, Lagarde M. 2016. Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone. *Health Policy and Planning* **31**: 1010–9.

Bertone MP, Witter S. 2015a. The complex remuneration of Human Resources for Health in low-income settings: policy implications and a research agenda for designing effective financial incentives. *Human Resources for Health* **13**: 62.

Bertone MP, Witter S. 2015b. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine* **141**: 56–63.

Bertone MP, Lagarde M, Witter S. 2016. Performance-Based Financing in the context of the complex remuneration of health workers: findings from a mixed-method study in rural Sierra Leone. *BMC Health Services Research* **16**: 286.

Bertone MP, Samai M, Edem-Hotah J, Witter S. 2014. A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002-2012. *Conflict and Health* **8**: 11.

Buchan J, Thompson M, O'May F. 2000. *Health workforce incentive and remuneration strategies. A research review*. World Health Organization: Geneva.

Burgess S, Ratto M. 2003. *The Role of Incentives in the Public Sector: Issues and Evidence*. The Leverhulme Centre for Market and Public Organisation - Working Paper No. 03/071: Bristol, UK.

Chandler CIR, Chonya S, Mtei F, Reyburn H, Whitty CJM. 2009. Motivation, money and respect: a mixed-method study of Tanzanian non-physician clinicians. *Social Science & Medicine* **68**: 2078–88.

Dixit A. 1996. *The making of economic policy*. MIT Press: Cambridge, MA.

Dixit A. 1997. Power of Incentives in Private versus Public Organizations. *The American Economic Review* **87**: 378–82.

Dixit A. 2002. Incentives and Organizations in the Public Sector: An Interpretative Review. *The Journal of Human Resources* **37**: 696–727.

Holmstrom B, Milgrom P. 1991. Multitask Principal-Agent Analyses : Incentive Contracts, Asset Ownership, and Job Design. *Journal of Law, Economics and Organiazations* **7**: 24–52.

Kiser E. 1999. Comparing Varieties of Agency Theory in Economics, Political Science, and Sociology: An

Illustration from State Policy Implementation. *Sociological Theory* **17**: 146–170.

Lagarde M, Blaauw D. 2009. A review of the application and contribution of discrete choice experiments to inform human resources policy interventions. *Human resources for health* **7**: 62.

Lehmann U, Dieleman M, Martineau T. 2008. Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. *BMC Health Services Research* **8**: 19.

McCoy D, Bennett S, Witter S, *et al.* 2008. Salaries and incomes of health workers in sub-Saharan Africa. *Lancet* **371**: 675–81.

Nielson DL, Tierney MJ. 2003. Delegation to International Organizations: Agency Theory and World Bank Environmental Reform. *International Organization* **57**: 241–76.

Shapiro SP. 2005. Agency Theory. *Annual Review of Sociology* **31**: 263–84.

Songstad NG, Moland KM, Massay DA, Blystad A. 2012. Why do health workers in rural Tanzania prefer public sector employment? *BMC Health Services Research* **12**.

Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P. 2008. Motivation and retention of health workers in developing countries: a systematic review. *BMC health services research* **8**: 247.

Witter S, Falisse J-B, Bertone MP, *et al.* 2015. State-building and human resources for health in fragile and conflict-affected states: exploring the linkages. *Human Resources for Health* **13**: 33.

Witter S, Wurie H, Bertone MP. 2016. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? *Health Policy and Planning* **31**: 1–9.

Wurie HR, Samai M, Witter S. 2016. Retention of health workers in rural Sierra Leone: findings from life histories. *Human Resources for Health* **14**: 3.

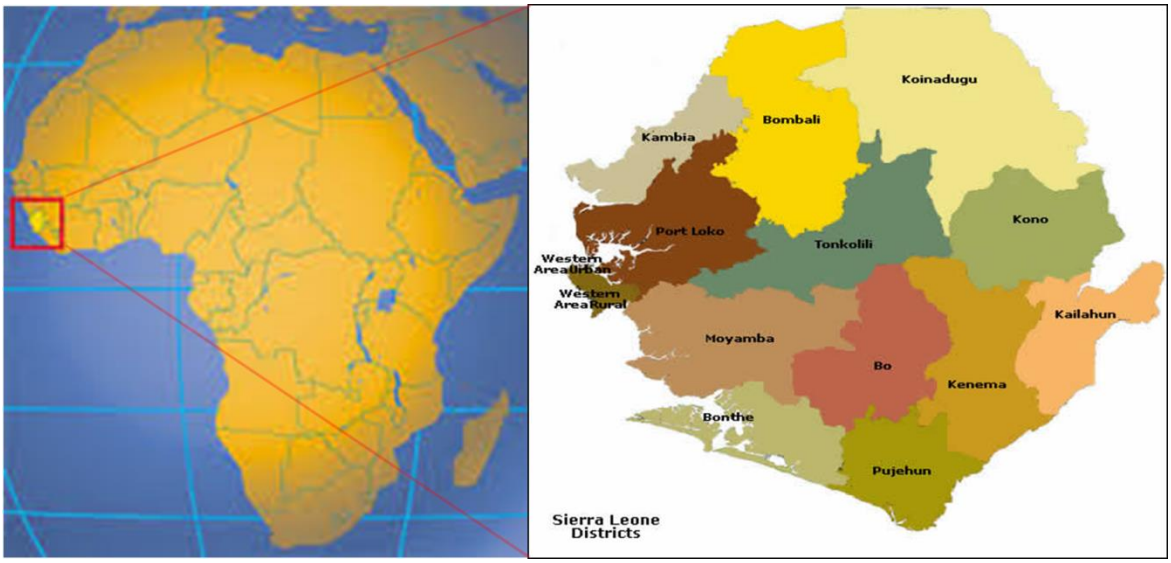
Zinnen V, Paul E, Mwisongo A, Nyato D, Robert A. 2012. Motivation of human resources for health: a case study at rural district level in Tanzania. *The International Journal of Health Planning and Management* **27**: 327–47.

4. Context and study setting

4.1 Socio-economic and demographic context

Sierra Leone is a small country of West Africa bordering with Guinea and Liberia (Figure 4.1). Its recent history is characterized by a prolonged civil war which ravaged the country between 1991 and 2002. During that time, about 50,000 people were killed and 2 million displaced, which amounted to almost half of the population at the time (Smillie and Minear, 2004). The conflict paralyzed the economy and the provision of public services, and caused the destruction of the infrastructures and governmental institutions throughout the country. Since 2002, the political situation has become more stable, and the country has begun a phase of reconstruction and economic recovery. In 2010, the Gross National Income (GNI) was of USD 340 per capita and growth rate in 2009 was estimated at 4.5% (World Bank, 2010).

Figure 4.1: Location of Sierra Leone in West Africa and map of Sierra Leone, detailing its districts



4.2 The health system in Sierra Leone

In the aftermath of the conflict, the public health system was practically collapsed, with only 16% of the health centers still functioning by 1996, mainly in Freetown (Gberie, 2005). Since the end of the war in 2002, Sierra Leone has been gradually rebuilding its health system. Although health indicators had been improving over the post-conflict period, recent data still paint a dire picture of the health situation in the country. Between 2008-2013 maternal mortality remained extremely high at 1,165 deaths per 100,000 live births, while under-five mortality was estimated at 156 per 1,000 live births and infant mortality at 92 (SSL and ICF International, 2014) (Table 4.1).

Table 4.1: Socio-economic and health indicators for Sierra Leone

General indicators	
Total population (2010)	5,868,000*
GNI per capita (2010) USD	340*
Total adult literacy rate (%) (2005-2010)	41*
Health indicators	
Life expectancy at birth (years) (2010)	47*
Under-5 mortality rate per 1000 live births (2010)	156**
Infant mortality rate per 1000 live births (2010)	92**
Maternal mortality per 100,000 live births (2008, adjusted)	1,165**
Estimated adult (15-49) HIV prevalence, (%) 2009	1.6*

Source: * Unicef (http://www.unicef.org/infobycountry/sierraleone_statistics.html)
** Demographic and Health Survey 2008-2013 (SSL and ICF International, 2014)

In order to improve the health status of the population, and in particular to address the high levels of maternal and child mortality and make health services financially accessible, in April 2010 the Government of Sierra Leone introduced the Free Health Care Initiative (FHCI), which abolished user fees for serviced provided to pregnant and lactating women and children under five years of age (GoSL, 2009; Donnelly, 2011). A series of accompanying measures and reforms was triggered by the introduction of the FHCI. These reforms played a critical role in shaping the health system, its financing as well as the health workforce in the following years. A recent external evaluation of the FHCI (Witter *et al.*, 2016a) stresses that, especially compared to other sub-Saharan countries having introduced fee exemptions, the FHCI in Sierra Leone was designed and implemented with a broad rather than 'vertical' approach in mind, which avoided focusing solely on health financing, but was based on the understanding that the whole health system had to be reformed and upgraded. The results in terms of health output, however, are more difficult to establish, given the lack of baseline data. Overall, though, an improvement, in particular in child mortality, has been noted (Witter *et al.*, 2016a).

The National Health Accounts of Sierra Leone for the years 2007 to 2010 show an increase in the per capita total health expenditure from 60 USD in 2007 to 80 USD in 2010. In the same period, government funding went from 5% to 7%, and donor funding from 12% to 25% (Table 4.2). This increase in expenditure was mostly driven by the run-up to and implementation of the FHCI. However, despite the introduction of fee exemptions, the direct

contribution of households to the total health expenditure, though decreased over the years, was still substantial in 2010 (67%) (MoHS, 2012).

Table 4.2: Contribution of different financing sources to the total health expenditure, 2007 to 2010

Financing Sources	Year 2007	Year 2008	Year 2009	Year 2010
Public	5%	5%	6%	7%
Private (households)	83%	82%	69%	67%
Private (others)	1%	1%	1%	1%
Donors	12%	13%	24%	25%
THE (Le. billions)	923.43	1,098.78	1,443.90	1,811.31
THE (USD)	309,389,595.62	368,174,927.11	423,343,489.38	454,185,205.96
THE per capita (Le.)	172,611	200,337	256,703	313,883
THE per capita (USD)	57.83	67.13	75.26	78.71

Source: (MoHS, 2012) – THE: Total Health Expenditure

Organization of the health system

The public health system in Sierra Leone is currently organized around three levels. At primary level (which is the focus of the analysis in this thesis), facilities are called Peripheral Health Units (PHUs). There are three types of PHUs: Maternal and Child Health Posts (MCHPs) are the lowest level of primary healthcare centers in the health system, and provide only services related to immunization and child health, delivery and maternal health, family planning and nutrition. They are staffed by one or two nursing aides (Maternal and Child Health/MCH Aides), who are the lowest cadre of qualified health professionals, with one and a half years of training. At a higher level are Community Health Posts (CHPs) and Community Health Centers (CHCs), which provide a broader range of curative services and are staffed by two cadres of non-physician clinicians (Community Health Officers/CHOs and the newly created cadre of Community Health Assistants/CHAs), nurses and midwives[1] (State Registered Nurses/RNs and State Enrolled Community Health Nurses/SECHNs). Community Health Centers are the largest health centers of all and usually headed by CHOs, who are also responsible for supervising the Maternal and Child Health Posts in their area (MoHS, 2010). District hospitals in each of the districts compose the secondary level of care and reference hospitals in Freetown the tertiary level. In total, there are about 1,040 PHUs in Sierra Leone and 40 secondary and tertiary hospitals, 23 which are government-owned and the rest privately, NGO or faith-based owned (MoHS, 2010).

Availability and distribution of health workers

There are extremely few qualified HWs in Sierra Leone. The WHO estimates that there are 0.2 doctors and 1.7 nurses and midwives every 10,000 people (WHO, 2012), while a recent study based on the Ministry of Health and Sanitation (MoHS) records indicates that there are 0.071 doctors and 0.631 nurses per 1,000 people in the public sector (Witter *et al.*, 2016b). To add to the low numbers of human resources available, other challenges for HRH

[1] Note that in Sierra Leone there is currently no specific training for midwives. Midwives train as nurses and later specialize in midwifery.

concern the inequitable geographical distribution with major imbalances between rural and urban areas, the difficult working conditions and weak management system, and the low morale and demotivation of HWs at all levels (MoHS, 2009).

The introduction of the FHCI and the accompanying measure represented an opportunity to address some of the HRH issues. HRH-related measures included a one-off fast-track recruitment and deployment of new HWs, a salary uplift for all clinical cadres of the MoHS and a payroll clean to ensure that 'ghost' workers were not include and paid. Later, in 2011-2012, a system of monitoring staff absences was introduced, as well as a performance-based financing (PBF) scheme with funding linked to facility productivity, but a portion of which could be used for staff incentive, and a remote allowance for those working in rural areas. The consequence of the FHCI-related reforms also extended to other aspects of the health workforce challenges, beyond their remuneration. In particular the effects include substantial increases in number of HWs, a reduction in absenteeism and in attrition, and an increase in workload and outputs per HW (Witter *et al.*, 2016b).

4.3 Study setting at district level

The analysis at district and individual level included in this thesis was carried out in three districts of southern Sierra Leone: Bo, Kenema and Moyamba. The three districts were purposefully chosen in order to capture different levels of urbanization, poverty and type of primary facilities, as well as include variation in the presence of NGOs at district level, as it will be further explained in Chapters 5 and 7.

Bo and Kenema towns, the main cities in each of the districts of the same name, are the second and third largest cities of Sierra Leone, with about 300,000 and 180,000 inhabitants, while Moyamba town is much smaller in size. However, it is important to note that all districts remain essentially rural, and the only urban district of Sierra Leone (Western Area, which includes Freetown) is not included in the analysis. The proportion of households living in rural areas varies from 55% in Bo, to 59% in Kenema and 92% in Moyamba (Table 4.3). Moyamba is also the poorest among the three districts. There is currently no paved road access and the bridge on the most direct road connection from Moyamba to Freetown collapsed shortly before fieldwork. While the district used to be crossed by the railway, since the destruction of the rail network, most of the district is cut off from trade and business. In contrast, Kenema and Bo are linked between them and to Freetown by one of the main highways of the country, which crosses Bo district and moves into Kenema until Kenema town. Both districts have more consistent economies than Moyamba, with diamond mining areas (in Kenema in particular) and other economic activities (logging, trade, agriculture).

Table 4.3: Summary of socio-economic and demographic information for the three districts

District	Area (Km^2)	Population (World Pop)*	Poverty headcount (WB and SSL, 2013)**	Rural HH (WB and SSL, 2013)**
Kenema	6,053	569,300	62%	59%
Bo	5,219	524,500	51%	55%
Moyamba	6,902	320,900	71%	92%

* Projections for 2010 based on 2004 census
** Data from Sierra Leone Integrated Household Survey 2011

The public health system is much less developed in Moyamba compared to Kenema and Bo. Although this is not reflected in the number of primary facilities available (which is lower in Moyamba but in line with the smallest population), the contrast between districts is quite stark with reference to the available health workforce. Public HWs working at the different levels of the health systems are three times fewer in Moyamba compared to the other districts. In terms of health indicators, assisted deliveries are very low in Moyamba (33%) and lower than in the other districts. The prevalence of stunting among children under 5 is also high in all three districts, ranging between 34% in Moyamba to 45% in Bo. Finally, under-5 mortality is higher than the national average of 156 per 1,000 live births, and ranges from 173 in Bo to 224 in Kenema (SSL and ICF International, 2014) (Table 4.4).

Table 4.4: Summary of health system information and selected health indicators for the three districts

District	**Num. of PHUs** (MoHS)	**Tot num. of HWs** (MoHS staff list 2013 – DHTM, hospital and PHU staff, *qualified and unqualified*)	**Deliveries in a health facility** (SSL and ICF International, 2014)	**Under 5 mortality (deaths per 1,000 live births)** (SSL and ICF International, 2014)	**Nutrition (children under 5 years who are stunted)** (SSL and ICF International, 2014)
Kenema	116	1,134	77%	224	39%
Bo	131	908	72%	173	45%
Moyamba	99	346	33%	199	34%

4.4 References

Donnelly J. 2011. How did Sierra Leone provide free health care? (Special Report). *Lancet* **377**: 1393–6.

Gberie L. 2005. *A dirty war in West Africa. The RUF and the destruction of Sierra Leone*. Indiana University Press: Bloomington.

GoSL. 2009. *Free healthcare services for pregnant and lactating women and young children in Sierra Leone*. Government of Sierra Leone: Freetown.

MoHS. 2009. *National Health Sector Strategic Plan 2010-2015*. Ministry of Health and Sanitation: Freetown.

MoHS. 2010. *Basic Package of Essential Health Services for Sierra Leone*. Ministry of Health and Sanitation: Freetown.

MoHS. 2012. *Republic of Sierra Leone National Health Accounts - Financial Year 2007, 2008, 2009 and 2010*. Ministry of Health and Sanitation: Freetown.

Smillie I, Minear L. 2004. *The charity of nations: humanitarianism in a calculating world*. Kumarian Press: Bloomfield.

SSL, ICF International. 2014. *Sierra Leone Demographic and Health Survey 2013*. SSL and ICF International: Freetown and Rockville.

WB, SSL. 2013. *A poverty profile for Sierra Leone*. Statistics Sierra Leone & World Bank: Freetown and Washington, DC.

WHO. 2012. *Country Health Profile - Sierra Leone*.

Witter S, Brikci N, Harris T, *et al.* 2016a. *The Sierra Leone Free Health Care Initiative (FHCI): Process and Effectiveness Review*. HEART - Health and Education Advice and Resource Team: Oxford.

Witter S, Wurie H, Bertone MP. 2016b. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? *Health Policy and Planning* **31**: 1–9.

World Bank. 2010. *Project Information Document - Sierra Leone*. World Bank: Freetown.

World Pop. Sierra Leone population projections.

5. Methods

5.1 Study design and methods

In order to explore the questions outlined in the previous chapter with relation to the complex remuneration of health workers, the overall research presented in this thesis is designed as a case study design, focusing on primary health workers in three districts of Sierra Leone. Furthermore, in most of the thesis (Chapters 7, 9 and 10), the design takes the form of a 'nested' case study where sub-cases are made at district level and the analysis is carried out by comparing and contrasting the data and results in the three districts, to draw higher level conclusions, as in a multiple case study approach (Yin, 2003; Gilson *et al.*, 2014).

In terms of methodology, a variety of methods have been adopted to conduct the research. While some chapters (Chapters 6 and 7) make exclusive use of qualitative data, the majority of the analysis carried out for this thesis adopts a mixed-method approach. Methodologies that mix approaches making use of qualitative and quantitative methods have been increasingly adopted for social enquiry in recent years, because of the practical demands of that type of research (Greene, 2008). From a theoretical standpoint, a vast literature exists which reflects on the epistemological value of mixed-methods and the feasibility of mixing approaches that rest on opposed paradigmatic assumptions (usually assumed to be positivism for quantitative research versus interpretivism or constructivism for qualitative approaches) (Bazeley, 2002). While this literature recognizes the merit of mixed-method approaches, it stresses that their application is as much possible and useful when the researcher is actively aware of such paradigmatic differences. In particular, Sale *et al.* (2002) argue that, while resting on different assumptions, quantitative and qualitative methods can be successfully combined for complementary purposes, rather than validation. In such cases, each method will look at close, but different phenomena, coupling the strength of each approach to look at similar questions.

Following the pragmatic approach of Sale et al (2000), from a methodological perspective, this thesis aims to examine the different research questions by using the methods that are better apt to explore in depth each of them. In this sense, while I recognize the inherent differences of the ontological and epistemological paradigms underlying each quantitative and qualitative methods, I adopt a pragmatic stance focusing on choosing the most appropriate techniques and methods to address each research question (Richardson, 1996; Seale, 1999; Ritchie and Lewis, 2003). In this study, qualitative analysis is adopted to explore the background at macro (central) and meso (district)-level for the remuneration of HWs, while the quantitative component focuses on the individual HWs level (micro) in order to describe the extent of the complex remuneration phenomenon, and to analyze the determinants at individual, facility and district level of the remuneration structure and levels, as well as of the activities that HWs carry out in their productive time. At individual level, the quantitative analysis is complemented by qualitative information to understand the views and perspectives of HWs on their incomes and the use they

make of them, as well as on factors and actors that influence the activities that they perform. In this sense, I do not make use of one approach to validate findings from another. Rather, in line with the multiple methods approach (Spicer, 2011), quantitative and qualitative methods are combined in a complementary manner, and both inductively and deductively, to describe and investigate different phenomena that are part of the broader issue of HRH complex remuneration, so that findings from one approach also further illuminate the analysis of the other and vice versa (Sale *et al.*, 2002).

Table 5.1 provides an overview of the different data collection and analysis methods for each of the research components. Further details on the empirical methods can be found in each of the chapters/papers presenting the research findings (Chapters 6 to 10), but here I provide a lengthier description of the methods used.

The overall data collection period spanned between October 2012 and May 2014. Initially, I was in Freetown for relatively brief visits in October 2012 and March 2013 to carry out documentary collection, a stakeholder mapping workshop and key informant interviews at central level (section 5.2.1, 5.2.2, 5.2.3). I was then based in Freetown, with frequent travels to the study districts, from June to December 2013, and again from March to May 2014 for quantitative (section 5.3) and qualitative data collection (section 5.2.4, 5.2.5).

Table 5.1: Summary of research components and methods

	Research component (chapter)	Tools used for data collection	Sample	Type of analysis / analytic frameworks
Central level	**Setting the background to HRH policies in Sierra Leone** (Chapter 6)	• Documentary review • Stakeholder mapping workshop • Key informant interviews at central level	• 57 documents • 23 participants to stakeholder meeting • 23 key informant at central level	• Policy analysis
District level	**Exploring HRH remuneration practices at district level** (Chapter 7)	• Key informant interviews at district level • Cross-sectional survey on HWs' remuneration	• 18 key informant in 3 districts • 266 HWs in 3 districts	• Political economy framework • Descriptive analysis of survey data
Individual level	**Capturing HWs' complex remuneration** (Chapter 8)	• Cross-sectional survey on HWs' remuneration (direct and indirect questions • Longitudinal logbooks on HWs' remunerations and activities	• 266 HWs in 3 districts • 266 HWs * 8 weeks	• Comparison of survey and longitudinal data on HWs remunerations
	Analyzing the complex remuneration of HWs (Chapter 9)	• Cross-sectional survey and longitudinal logbooks on HWs' remunerations • Semi-structured, in-depth interviews with HWs	• 266 HWs in 3 districts • 39 HWs in 3 districts	• Descriptive analysis of income data • Multivariate regression analysis on income data • Content framework analysis of in-depth interviews
	Exploring the consequences of the complex remuneration on HWs' productive activities (Chapter 10)	• Longitudinal logbooks on HWs' activities • Semi-structured, in-depth interviews with HWs	• 266 HWs * 8 weeks • 39 HWs in 3 districts	• Descriptive analysis of activity data • Fractional multinomial logit regression analysis on activity data • Content framework analysis of in-depth interviews

5.2 Overview of methods for qualitative data collection and analysis

A number of qualitative methods for data collection and analysis were adopted throughout this research, each with the aim of better fitting the specific research questions to be addressed. This section reports on each of them presenting in turn (and where relevant) the tools designed and used, the sampling or process to select participants/interviewees, data collection procedures and data analysis. The qualitative approaches to data collection included:

- A stakeholder mapping workshop at central level
- A documentary review
- Semi-structured interviews with key informants at central level
- Semi-structured interviews with key informants at district level
- Semi-structured in-depth interviews with health workers.

Additionally, a detailed field diary was kept to record direct observations during fieldwork and to make notes as the data collection evolved over time. While notes taken during the stakeholder mapping workshop and during all interviews (both with key informants and with HWs) were considered data and included in the respective coding and analysis, direct observations noted in the diary were rather used to provide background information and remind myself of key issues, and emerging themes and hypotheses as the research progressed.

Data from the documentary review, stakeholder mapping workshop and key informant interviews at central level were used to inform the analysis of Chapter 6 of this research, on the HRH policy-making processes in Sierra Leone over the post-conflict period (2002-2012). Data from the key informant interviews at district level were analyzed for Chapter 7 of the research to explore the dynamics between those actors at district level. Finally, in-depth interviews with HWs were used in conjunction with quantitative data for Chapter 9 on HWs' income sources, and HWs' views and perceptions on them and Chapter 10 on HWs activities and service delivery.

5.2.1 Stakeholder mapping workshop at central level

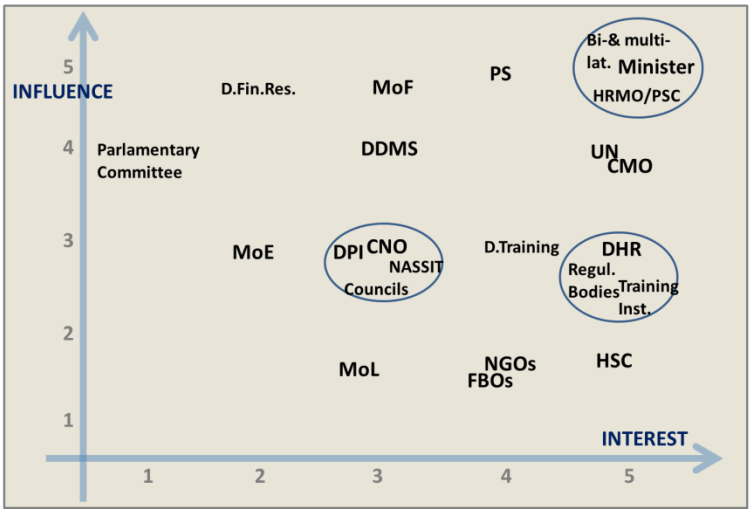
A half-day stakeholder mapping (SM) workshop was held in October 2012 in Freetown, at the initiative of the ReBUILD team working on the core project. Participants were selected and invited by COMAHS (ReBUILD research partner in Sierra Leone) and envisaged to comprise the representatives of the different bodies and agencies involved with HRH planning and regulation, both from the government and public organizations, but also from donors and NGOs and the private sector. The final list of participants included 23 individuals from the MoHS, regulatory bodies, public autonomous bodies involved in the human resource field, training institutions, development partners, NGOs and district medical officers (DMOs). However, development partners (donors and NGOs) and private and private non-for-profit sector representatives (with the exception of the Medical Council) were absent or poorly represented.

The overall aim of the workshop was to provide a preliminary familiarization with the context and the background of the study setting for what concerns HRH issues, and an initial understanding of the key actors who influenced HRH policy and practices in Sierra Leone, as well as of how these changed over the post-conflict period (2002-2012). Secondly, it aimed to lead to the identification of individuals (whether present at the workshop or not) who could be later contacted as key informants and with whom conduct in-depth interviews. Indeed, because these objectives were rather exploratory and descriptive, it was decided to prefer a group discussion rather than individual interviews which had the advantage of bringing together different perspectives and generate discussion (Ritchie and Lewis, 2003). For the following steps of the data collection, individual interviews were chosen, which allowed for a neutral and discreet space for exchange where more sensitive issues could be disclosed.

The workshop was structured similarly to a focus group discussion, where the participants were allowed to discuss and debate the different issues under the guidance of the facilitators (Dr Samai and Prof. Witter). I was in charge of note-taking during the meeting. Questions used to structure the discussion focused on (i) identifying current actors in relation to HRH policy and practice in Sierra Leone and exploring their roles and relationships, (ii) understanding the changes in these over the period since 2002, (iii) plotting the actors according to their perceived 'influence' and 'interest' in HRH policies and reforms (Varvasovszky, 2000). This mapping was done by the participants themselves based on their own perceptions, and final agreement was reached over the scores indicated in Figure 5.1 below. Because of the limited time available, but also because of the general difficulty of retrieving information for a 10-year period, the mapping was limited to the actors and their balance of influence and interest, at the time of the research.

Because of its preliminary nature, the meeting was not recorded and therefore there is no verbatim transcription of the discussion to be coded and analyzed. A descriptive report of the meeting was then prepared by the team based on the notes taken by each of the researchers and the final mapping agreed on by the participants (Witter *et al.*, 2012).

Figure 5.1: Plotting actors for influence and interest in HRH policy-making



5.2.2 Documentary review at central level

Search strategy and documents retrieved

All documents included in the review were retrieved between October 2012 and March 2013, focusing on HRH policies, reforms and assessments during the post-conflict period, but also on other issues which had affected the health workforce such as the introduction of the Free Health Care Initiative, and on other documents useful to provide a general background to the post-conflict challenges in the health sector. The inclusion criteria were purposefully left very broad in order to be able to collect as much information as possible, including from sources such as newspapers and blogs. The search focused on documents in English, which should have not led to the exclusion of any relevant documents as English is the official language of Sierra Leone. As the period of interest covered the post-conflict time in Sierra Leone, documents dating from 2002 to 2012 (the time of the research) were included in the search. Because the majority of the documentation resulted to be composed by grey literature and unpublished reports, the main source of data collection was through contact with the MoHS in Freetown, donors and NGOs, researchers, technical assistants and other stakeholders both in Sierra Leone and in the UK. Additionally, a scoping internet search was also performed using keywords “Sierra Leone” and “human resources for health”, “health workforce”, “health workers”, to identify articles in peer-reviewed journals and other relevant grey literature publicly available, specifically targeting websites potentially archiving information on the topic, such as that of the African Health Workforce Observatory and of the WHO Health Workforce Department as well as of NGOs and organizations operating in Sierra Leone. After a first round of document search, a snowball technique was adopted by which documents mentioned in other documents were actively searched from the

source by asking to the relevant agencies and individuals. If a theme or policy seemed under-represented, new searches were performed.

The search led to the identification of 76 documents (Appendix 3). All of these documents were important to provide background information on the study setting and on policy-making processes and drivers in post-conflict Sierra Leone. In particular, 57 of them were deemed specifically relevant for HRH issues (highlighted in bold in Appendix 3).

The majority of the 76 documents are authored by the MoHS and the Government of Sierra Leone (GoSL). 21 documents (28%) are official policies and strategies, while 17 (22%) are informal documents of the MoHS. 12 documents (16%) are evaluations, assessments of context, policies and technical assistance reports, and 14 (18%) are independent studies, briefs and research articles. Only one document is by an international donor, defining its operational plan (Figure 5.2). In terms of the time of publication of the documentation available, there are very few documents covering the timeframe from 2002 to 2006, while the vast majority of publications refer to the period from 2009 onwards, with 54% of the documents dated 2011-2012 and 16% undated (Figure 5.3).

Figure 5.2: Type of documents retrieved by subject

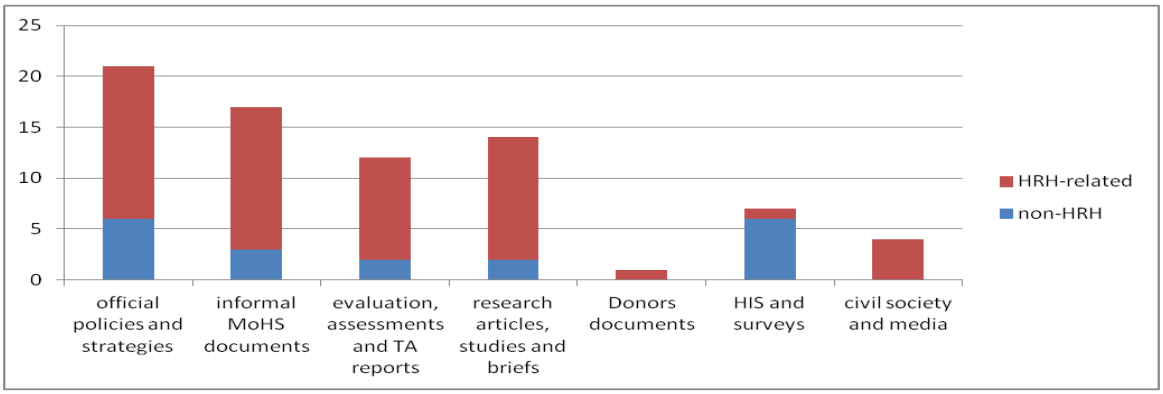
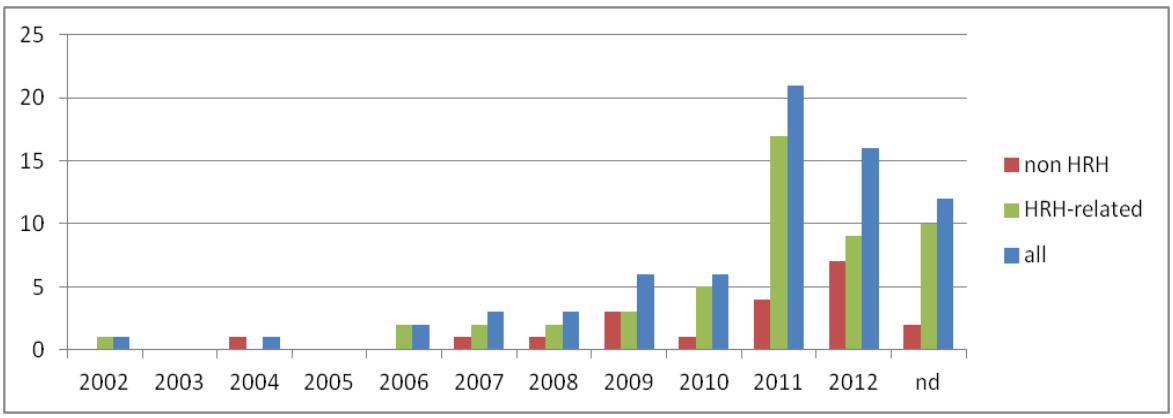


Figure 5.3: Date of publication of the documents retrieved by subject



It is important to stress that the search was not systematic and, despite all the care taken in collecting as much as possible of the relevant information, it is possible that some documents have been omitted. Moreover, most of the documents (such as, official policies and assessments) represent a static, end-point perspective on the discussions held between different actors or on the implementation of reforms, and there is a dearth of documents (such as minutes from meetings) which could highlight debates, discussions and processes of policy-making. Moreover, the majority of documents analyzed were prepared by the MoHS, whilst donors and other stakeholders remains mostly silent in the documentary review. To address both these issues and complement the information gathered in the document review, a series of key informant interviews was carried out and was critical to fill those gaps (section 5.2.3).

Analysis of the documents

To analyze the documents collected, a series of 'themes' were pre-identified, based on the literature existing on the main HRH challenges (WHO, 2006, 2010) as well as on the analysis of policy-making processes and responses (Walt and Gilson, 1994). These themes identified were initially the same in the four countries included in the ReBUILD project (Sierra Leone, and also Uganda, Cambodia and Zimbabwe) where similar analyses were carried out. This choice was made to ensure the cross-country comparability of the findings. However, themes were then discussed and validated with the ReBUILD team in Freetown to ensure they reflected the specific context of Sierra Leone. To address the flexibility and adaptability needs, the themes were purposefully kept broad. This also allowed to capture the chronological dimension of HRH policy development and highlight changes over time, which was a key objective of the study component, for which this data was collected and which focuses on the background to HRH policies and policy-making processes in post-conflict Sierra Leone (Chapter 6).

Themes and corresponding subthemes are listed in Table 5.2. All documents were read and manually coded, looking for reference to those themes with regards to each HRH policy discussed and implemented in Sierra Leone after 2002. A descriptive and intermediary summary of the findings under each of the themes and subthemes was then prepared (Bertone *et al.*, 2013).

Table 5.2: Themes and subthemes used for thematic analysis

Themes	Subthemes	
HRH context and challenges	Recruitment challenges	Changes to these challenges since 2002
	Distribution challenges	
	Retention challenges	
	Performance challenges (pay, motivation, management, etc.)	
Policy responses	Policy objectives and approaches	For each of the policy responses
	Drivers of change	
	Implementation of policies	
	Financing of policies	
	Impacts	

5.2.3 Key informant interviews at central level

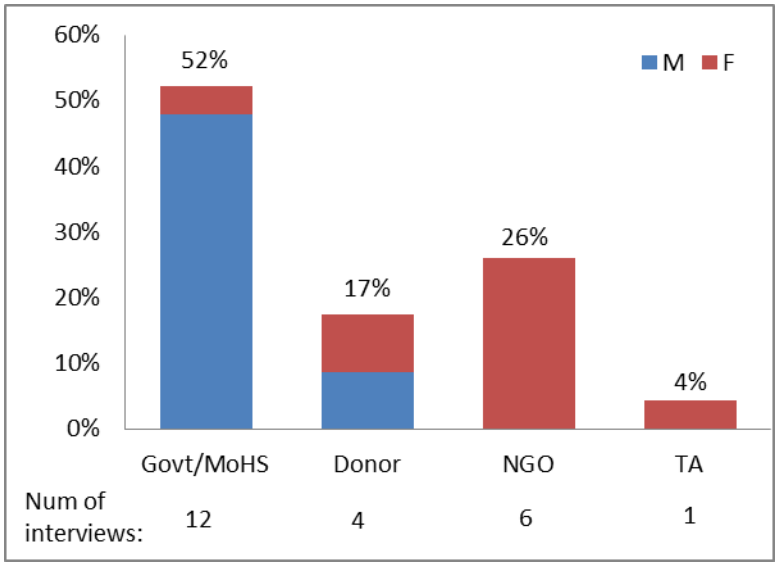
In order to complement the information gathered through the document review and the initial stakeholder mapping workshop, it was deemed important to carry out a series of in-depth interviews with actors who played a key role in the development and implementation of HRH policies and reforms in Sierra Leone, at different times of the post-conflict period. Interviews were preferred to group discussions as they allowed more privacy and comfort for respondents to provide more frank and open answers to sensitive topics (Ritchie and Lewis, 2003), such as those reflecting the dynamics of power between actors and institutions, as well as the attitudes and behaviors of individuals involved, which may have proved influential drivers of change.

Selection of key informants and interviews

23 key informants were interviewed between October 2012 and June 2013. Initially, a preliminary list of relevant key individuals was drafted based on the stakeholder mapping meeting and contextual knowledge. Subsequently, a snow-balling technique was used to identify further informants, based on the suggestions of those who had already been interviewed. The aim of the sample was to be as comprehensive as possible and include the highest number of key stakeholders, given the availability of the interviewees and the time frame of the research. As much as possible, the selection of the interviewees also reflected the need, in order to address one of the limits of the document review, to include actors and views from outside of the government representatives. The challenge here was represented by the fact that many of those actors had moved outside of Sierra Leone by the time of the research and could not be reached. Indeed, for this reason, two interviews were carried out outside of Sierra Leone (one in the UK and the other by telephone), while most of the others (19) were done in Freetown, whilst 2 were conducted at district level. Of the 23 interviewees, 12 of the interviewees work or worked at the MoHS or with other governmental agencies. 6 NGO representatives were interviewed, along with 4 donor representatives and 1 Technical Assistant (TA) (Figure 5.4). I carried out 18 of the key informant interviews at central level, while the remaining 5 were carried out by other members of the ReBUILD team.

The interviews were semi-structured and a topic guide was prepared for use across all of the ReBUILD project countries and adapted for use in Sierra Leone (Appendix 4). Moreover, for what concerns the interviews I carried out personally, the guide was continuously adapted from one interview to the next to allow for the exploration of emerging themes. Overall, the questions were sequenced in chronological order. Participants were asked about the HRH context in the immediate post-conflict period and the challenges that they faced. They were then asked about the policy responses to these challenges and what effects these had on the health system. Finally, they were asked to share any lessons learned from their experience and whether they had any recommendations for the future. As the interviews progressed and also based on the documentary review, more specific themes emerged and the interviews were tailored to reflect those, as well as the specific background and period of experience of the key informant.

Figure 5.4: Summary of characteristics of key informants interviewed



Analysis and triangulation of information

Interviews were recorded and transcribed for thematic analysis, and themes were manually mapped to highlight pattern in the key informants responses and allow interpretation. The list of themes used for coding was the same as for the documentary data collection (Table 5.2). This choice was made because the three tools described so far (e.g. stakeholder mapping workshop, documentary review and key informant interviews at central level) were all used to inform the first component of this research, focused on analyzing the HRH policies and policy-making processes at central (macro) level in post-conflict Sierra Leone (research objective 1). Adopting the same thematic codes for the analysis of documents and interviews allowed to systematically triangulate the information retrieved from both and ensure that the two methodologies were used in a complementary manner, helpful in improving our understanding of the processes of policy-making and the perspectives of different actors. Additionally, information was triangulated not only between methods, but also between different sources, i.e. by comparing the responses of different actors on the same issue or question (Ritchie and Lewis, 2003; Flick, 2006).

A separate report was prepared to describe the findings of the interview analysis, which closely builds on those of the previous document review and start delineating the main emerging themes and issues (Bertone and Witter, 2013). Subsequently, the findings from the three tools were brought together, through constant comparison and triangulation, in the research paper presented in Chapter 6 (Bertone *et al.*, 2014), which provides a chronological narration of the policy-making trajectory (the 'policy story'), but also a higher analytical level in the understanding of the patterns and drivers of such trajectory in the post-conflict setting.

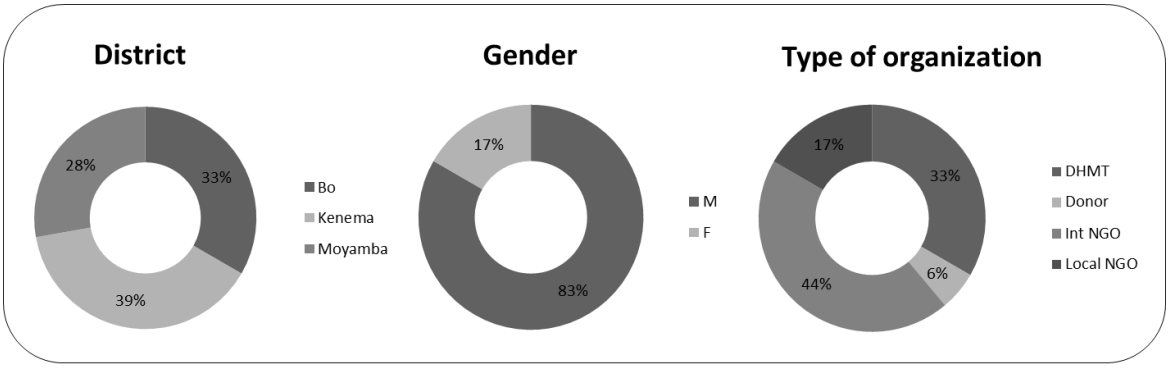
5.2.4 Key informant interviews at district level

In order to inform the second research question on the HRH remuneration practices at district level and the political economy dynamics which re-shape them, a series of key informant interviews was carried out at district level. Although, initially, data collection at district level was planned to only provide general background information, the exploration of the dynamics at that level was then turned into an autonomous research question because of the importance they appeared to have (based on direct observation and the first interviews) in shaping the translation of the policies designed at central level into implemented practices.

Selection of key informants and interviews

At district level, 18 key informant interviews were carried out during the first visit in the study districts (September 2014), with members of each of the District Health Medical Teams (DHMTs) and staff of donors, international and local NGOs active in the districts (Figure 5.5). The selection of the participants aimed to be as comprehensive as possible and include most, if not all, of the actors involved in the health sector at local level. In order to identify the interviewees outside of the DHTMs and among the external partners, two main strategies were used: the first based on the information retrieved from the MoHS at central level on the NGOs operating at district level (although not updated), and the second through a list of contacts provided by the DHMT staff (e.g. participant list to District meetings, etc.). Despite the attempt to reach a comprehensive representation of the main actors involved in the health sector and specifically on HRH issues, one of the major NGOs in the district of Bo was not included as they were not available for interviewing at district level, although information on its operations was collected in an interview with its representative at central level and from secondary sources, as well as triangulated during interviews with actors working in the same district. Moreover, key actors such as Members of Parliament and politicians, civil society members and representatives of Local Councils, who have some authority over health issues under the ongoing decentralisation process, were not interviewed, nor private and informal providers of healthcare which also influence the incentives in the public system were included. This remains a limitation of the study, as explained in Chapter 7.

Figure 5.5: Characteristics of key informants at district level



A semi-structured topic guide was adopted to carry out the interviews (Appendix 5). The focus was initially on a description of the interviewee's organization, particularly in regards of any activities on HRH or which entailed direct payments to HWs. A second set of questions concerned how the organization defined it priorities and took and implemented decisions, for example, on the HRH-related activities to support, fund and/or organize. The topic guide was used flexibly and was iteratively adapted to the emerging issues and themes after each of the interviews. In particular, issues about conflicting priorities between actors at local level and the asymmetry of power became relevant and frequent in many of the informants' narratives, so that the second part was expanded accordingly, by asking question on the relationship between actors, the fora of discussion at district level, etc.

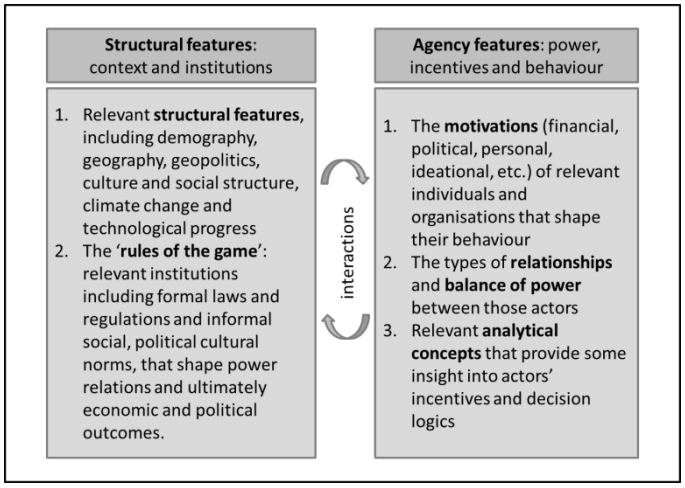
Data analysis

The analysis of the transcribed interviews was structured using a political economy framework, based on that proposed by Harris (2013), but adapted to reflect the fact that my analysis was not driven by a pre-identified problem, but rather exploratory in scope. The framework (Figure 5.6) focuses on the dynamic interactions between the structural features of context and institutions and the agency features. Context is considered as encompassing historical, cultural and geographical features, while institutions are the formal and informal 'rules of the game' (e.g., policies, regulations and social norms) that govern the interactions between actors. On the other hand, agency features relates to the main actors and their power, incentives and behaviors, as well as to the analytical concepts that may explain actors' decision logics and behaviors (Harris, 2013). This framework was chosen because it offers a practical approach to exploring a set of pre-identified elements and dimensions which can shed light onto the political economy dynamics between actors, but also explore elements of the context that can influence those dynamics. Moreover, it allowed freedom to choose an analytical concept that well fits the issue at stake and the conceptual framework I had already developed.

During the analysis process, the elements of the framework were used to organize and interpret the data collected at district level. As described in Chapter 7 (Bertone and Witter, 2015), the framework was specifically applied to the issue of the complex remuneration of HWs with the aim of exploring the factors that contribute to determining it at district level. To do so, the application of the framework focuses on (i) describing the *structural features* of the socio-economic context of the three districts and their history, especially for what concerns the conflict and post-conflict phase, (ii) analyzing the *institutions* that regulate the HRH incentive package, both formal (e.g. the official HRH policies defined at central level) and informal, which are the HW's remuneration practices introduced at local level, such as per diem payments, (iii) describing the actors present in each of the districts which are relevant to the analysis (District Health Management Teams and NGOs), and their agendas and *motivations*, (iv) exploring their *relationships* and discussion fora, and the *balance of power*, and finally (v) analyzing the decision logics of the actors using an *analytical concept*. In line with the conceptual framework presented in Chapter 3, the analytical tool applied was agency theory. As discussed in details in Chapter 7

(Bertone and Witter, 2015), the analysis found two interrelated sets of principal-agent relations (between DHMTs and Ministry of Health and between NGOs and their funders), each ridden with its specific problems.

Figure 5.6: Analytical framework to explore the political economy dynamics at local level



Source: Adapted from Harris (2013)

5.2.5 In-depth interviews with HWs at individual level

The final research component, which explores the complex remuneration of HWs at individual level, makes use in terms of qualitative data of the information collected through a series of in-depth interviews with HWs in the primary facilities of the three study districts, which complements the quantitative data collected at the same level (described in section 5.3). Interviews were carried out both to explore the views of HWs on their remunerations, their income use and financial coping strategies, and how these affect their motivation (research question 4), as well as to investigate the possible links between remunerations and/or other factors, and activities performed (research question 5).

Selection of HWs interviewed

The in-depth interview with HWs took place in two rounds. First, during the second field visit, in October and November 2013, 15 in-depth interviews were carried out. Another round of 24 interviews with HWs was carried out in March-April 2014, for a total of 39 interviews. HWs were selected purposefully as a sub-sample of those included in the survey (see section 5.3.1 for the description of the HWs sampling for quantitative data collection) and to reflect a wide variety of views and situations in terms of cadre, but also rural/urban, male/female, type of facility, in-charge/staff and district, and to be in line with the mix of health workers in the districts. Table 5.3 summarizes the key characteristics of the sample of HWs interviewed.

Table 5.3: Characteristics of respondent sample for qualitative data collection

	CHO (n= 4)	CHA + Nurse (n= 10)	MCH Aide (n= 25)	Total (n= 39)
Gender				
Male	4	3	-	**11**
Female	-	7	25	**28**
Age (mean)	32.5	47	40.4	**41.3**
Type of facility				
CHC	4	5	4	**13**
CHP	-	4	3	**7**
MCHP	-	1	18	**19**
Location				
Urban	3	6	4	**13**
Rural	1	4	21	**26**
District				
Bo	3	1	8	**12**
Kenema	-	4	9	**13**
Moyamba	1	5	8	**14**

Structure of the in-depth interviews

The approach to the interviews was kept purposefully flexible and open to allow capturing as much as possible the HWs' own voices and perspectives. The tools were iteratively adjusted after each interview to focus on the issues that emerged as more relevant in the views of the HWs (Appendix 6). In particular, after a first round of interviews, the topic guides was substantially revised to reflect the context at it emerged from the HWs' narratives and the HWs' challenges in terms of remunerations and coping strategies (Chapter 9), as well as their views on service delivery practices and activity choices (Chapter 10). In order to start the conversation with the HWs, different documents available in the facilities were used, such as the facility schedule which defines the weekly working routine of HWs and is often taped to the facility walls, the visitor book, which records all the actors visiting the facility and the purpose of their visits, or the logbooks reporting activities and incomes which HWs were asked to fill in for this research (section 5.3.2). HWs could interrupt the interviews if they needed to take care of their work or other issues, and interviews resumed once done.

Interviews were carried out in English, or in a mix of English and local Krio, as most HWs speak basic English, but often mix it with the *lingua franca* of Sierra Leone. I carried out all interviews in person, with the help of one of the enumerators who would translate in the rare occasions when the HW and I could not perfectly understand each other. The interviews were recorded and subsequently transcribed and translated (where needed) by the enumerators.

Analysis of the HWs interviews

Qualitative interviews were manually analysed using content framework analysis (Ritchie and Lewis, 2003), which allows for more flexibility than the analysis by themes adopted for the key informant interviews. While for those I used pre-identified codes, here the coding was more inductively-defined, reviewed iteratively multiple times and grounded in the emerging accounts of the HWs. The analysis of the transcripts was carried out twice, once focusing on HWs' income to inform the studies included in Chapter 9 of this research and the second focusing on the actors and factors influencing service delivery which informed Chapter 10. In both cases, the process followed these steps:

- Familiarization with the interviews by printing out the transcripts and reading over both transcripts and field notes taken during each interviews.
- Development of an initial coding framework. At this stage, the codes remained mostly conceptual (based on previously identified key issues) and descriptive, such as the categories of incomes.
- First manual coding of the data (both transcripts and field notes) using different color-codes and making notes on the print-outs.
- Iterative revision of the coding framework until finalized (Appendix 7).
- Final coding of all interviews and notes.
- Preparation of a thematic chart, by sorting and charting the relevant data and quotes so that similar themes are located together in a matrix. Thematic charts were prepared in Excel table, using a different row for each HW interviewed and a different column from each code identified in the coding framework. They were then printed out in tables of 6x4 and 3x3 A4 sheets.
- Summarize and synthetize by coloring and linking issues and themes in the thematic chart in order to identify patterns and interpret data.

As further explained in the relevant findings chapters, qualitative data were explored in complementarity to quantitative data, in a deductive and inductive way, i.e. both to complement and further explore issues emerging from quantitative analysis. Different approaches, among those identified in the literature, have been adopted in order to ensure the validity of data interpretation (Ritchie and Lewis, 2003; Anderson, 2010). Throughout the analysis, 'constant comparison' was employed, by which each of the HWs interviews (and the themes emerging from them) are compared with those of the other HWs, rather than taken on their own. Specific attention was paid to deviant cases potentially emerging from the analysis in order to generate new hypotheses and explore whether there are systematic differences between 'regular' and 'deviant' cases. The use of source triangulation was limited as there was only one source of qualitative information. Methods triangulation was carried out when possible, exclusively focusing on cross-checking descriptive or quantitative elements of the HWs' interviews (e.g., demographic information on the HW, income levels) and to complement and strengthen the interpretation of the HWs' narratives.

Reflexivity on my position, experience and background was exercised throughout interviews and analysis, in order to actively reflect on how these factors could have influenced both my interpreting of the HWs' narratives, as well as the HWs' responses to questions asked by an outsider. The presence of a local enumerator during all interviews, with whom a debrief was carried out after each interviews, allowed to partially bridge some of the cultural gaps in understanding and to pick up specific subtleties that would otherwise have gone unnoticed. On the other hand, being viewed as an outsider, unlikely to have future contacts with the HW or to report their practices to hierarchical superiors, may have represented an advantage in ensuring the openness of the accounts (Walt *et al.*, 2008).

5.3 Overview of methods for quantitative data collection

In this section, details are provided about the sampling, tools and procedures for the quantitative data obtained at HW individual level. Much attention is given to the data collection rather than the analysis carried out, as the latter is explained in each of the chapters/papers presenting the research findings (Chapters 6 to 10).

5.3.1 Sampling of HWs

In terms of quantitative data collection, this thesis made use of a cross-sectional survey on the incomes of the HWs as well as of self-reported longitudinal data on both incomes and activities of the same HWs.

As mentioned before, the three districts of Bo, Kenema and Moyamba were purposefully chosen as study sites to allow for variation in number of NGOs present, as well as level of poverty, urbanization, and type of facilities – elements which were hypothesized to have an impact on the remunerations of HWs. Within each district, a random sample of 66 primary healthcare facilities were selected, for a total of 198 facilities out of the 346 existing in the three districts. The sample included all types of primary healthcare facilities or Peripheral Health Units (PHUs) in Sierra Leone, i.e. Community Health Centers (CHCs), Community Health Posts (CHPs) and Maternal and Child Health Posts (MCHPs). Sampling was conducted at facility level and not at individual HW level, because of the lack of reliable HW lists with updated posting. However, this type of sampling may have led to a selection bias as only those present in the facility on the day of the survey were included. Within each facility, enumerators selected 1 HWs (in MCHPs) or 2 workers (in CHCs and CHPs) who were clinically qualified and available on the day of the survey. “In-charges” (i.e. managers of facilities), if present, were interviewed before other qualified cadres. Clinically qualified cadres to be selected included two cadres of non-clinician physicians: Community Health Officers (CHOs) and Community Health Assistants (CHAs), two cadres of nurses and midwives: Registered Nurses (RN) and State Enrolled Community Health Nurses (SECHN), and a cadre of nursing aides: Maternal and Child Health Aides (MCHA).

The decision to include only primary HWs in health centers, and therefore exclude all those working in hospitals as well as non-qualified Community Health Workers (CHWs) and Traditional Birth Assistants (TBAs) was made because the research aimed to specifically focus on the clinically-qualified staff as well as on those providing services directly to patients at primary level. This selection was also done to limit the type of cadres in the survey as that was envisaged to increase the power of the analysis (i.e. by avoiding to create many categories with few HWs sampled for each). In particular, the focus on in-charges within each facility and on CHOs and MCH Aides (usually in-charge of CHCs/CHPs and MCHPs, respectively) was based on the early findings from ReBUILD’s Health Worker Incentive Survey (HWIS) which had shown that those are the HWs for which the complex remuneration is more relevant (see section 5.3.2 for further detail).

Based on this selection process, the sample of healthcare facilities and HWs identified as described above should have led to the inclusion of 297 HWs. A total of 268 HWs were interviewed (Table 5.4), although the entries for two HWs were later dropped because of the high level of missing information The characteristics of the sample of HWs used for quantitative analysis are reported in Table 5.5.

Table 5.4: Sampling frame and actual sample of individual HWs

District		HWs in CHC+CHP	HWs in MCHP	Total
Bo	*sampling frame*	*66*	*33*	*99*
	actual sample	65	31	96
Kenema	*sampling frame*	*66*	*33*	*99*
	actual sample	59	32	91
Moyamba	*sampling frame*	*66*	*33*	*99*
	actual sample	50	31	81
Total	***sampling frame***			***297***
	actual sample			**268**

Table 5.5: Characteristics of final respondent sample after quantitative data collection

	CHO (n= 30)	**CHA+Nurse** (n= 76)	**MCH Aide** (n= 160)	**Total** (n= 266)	**Statistical Significance of difference in proportions / means**	**Test used**
Gender						
Male	73%	42%	-	**20%**	p<0.0001	Chi2
Female	27%	58%	100%	**80%**		
Age (mean)	41.4	40.8	40.9	**41**	p=0.946	Bonferroni
Role in facility						
In-charge	90%	67%	49%	**59%**	p<0.0001	Chi2
Staff	10%	33%	51%	**41%**		
Type of facility						
CHC	97%	51%	16%	**35%**	p<0.0001	Chi2
CHP	-	42%	29%	**30%**		
MCHP	3%	7%	55%	**35%**		
Location						
Urban	30%	32%	21%	**25%**	p=0.106	Chi2
Rural	70%	68%	79%	**75%**		
District						
Bo	60%	30%	34%	**36%**	p=0.020	Chi2
Kenema	20%	44%	32%	**34%**		
Moyamba	20%	26%	34%	**30%**		

5.3.2 Design of data collection tools

Two tools were used to collect quantitative data at individual HW level:

- A cross-sectional survey on remunerations
- A self-administered longitudinal logbook on remunerations and activities

Copies of each of these tools are in Appendices 8 and 9. The tools were used to inform the analysis of Chapters 8 and 9 on the HWs complex remuneration and Chapter 10 on the activities that HWs perform. Quantitative data on HWs remunerations were also partially used for Chapter 7 to highlight the effects that the dynamics between actors at district level have on HWs' incomes.

Cross-sectional survey on HWs' remunerations

The design of the income questionnaire was based on an adaptation of the Health Worker Incentive Survey (HWIS) developed by the Immpact project to collect data on HWs' remuneration in Ghana, Indonesia and Burkina Faso (Immpact Project, 2007). The HWIS tool was also administered to HWs in Sierra Leone by the ReBUILD's core project (Witter *et al.*, 2015, 2016)[1]. In the case of the ReBUILD's study, the sample of HWs included all cadres and all facility types, rather than only primary healthcare workers which were chosen in this study, and the research was carried out in different districts (Western Area, Kenema, Bonthe and Koinadugu). The experience with ReBUILD's HWIS was essential to identify mistakes and lessons, and improve the sampling strategy and actual survey questionnaire used in this thesis.

A key finding from the HWIS carried out by ReBUILD concerned the tool itself which was considered too long and cumbersome to administer. Therefore, for the tool used in this thesis, care was taken to simplify it avoiding to ask questions not strictly necessary for this research and which had led to a low response rate for the ReBUILD survey. In particular, the sections on (i) households' income and consumption, (ii) HWs' workload and (iii) perceptions of HWs on motivating factors, benefits of training, changes in their work life since the war and their plans for the future, were not included in the cross-sectional survey for this study. Concerning the questions on incomes, which remained the cornerstone of the survey tool, only information about amounts earned for per diems and non-health activities, rather than including extra details (e.g. changes to income in the last three years, location of the private practice or type of non-health activity, etc.) as done in ReBUILD's HWIS.

Finally, the HWIS tool used by ReBUILD's core project did not include questions on amounts earned from (i) gifts and payments from patients and (ii) sale of drugs and other items with in the facility. Those incomes are considered particularly sensitive because they are earned from illegal activities and HWs tend to underestimate or

[1] I was involved as research consultant in the design, training, piloting and analysis for the HWIS carried out by ReBUILD's core project, and I co-authored a report and academic publication including HWIS data.

not declare any earnings from them (Roenen *et al.*, 1997). The choice of not including them in the ReBUILD's questionnaire had been made in order to avoid normative answers and to avoid creating tension between enumerator and HW during the interview. For the present study, however, it was important to have an estimate as complete as possible of all the formal and informal incomes of HWs. Therefore, in order to increase the changes of obtaining a reliable response for sensitive incomes[2], questions concerning the amounts earned from them were asked through indirect questions. Indirect questioning techniques have been introduced precisely to improve the accuracy of answers to sensitive questions. There are numerous techniques and designs, based on the properties of statistical distributions and probability, to allow the respondent to conceal the true answer even to the enumerator, thereby maintaining complete confidentiality. One of these approaches is the Randomized Response Technique (RRT). It was first proposed by Warner (1965) and has been used to explore sensitive questions on health-related issues, such as alcohol and drug use (Striegel *et al.*, 2010; Dietz *et al.*, 2013), abortion (Chow *et al.*, 1979), sexual behavior (Williams and Suen, 1994), etc. A variant of the RRT makes use of a randomizing device (for example, a die), to conceal the response, by asking respondents to add or multiply their actual response by a randomly drawn number resulted of the die (Jamison and Karlan; Greenberg *et al.*, 1971; Pollock and Bek, 1976). Because the average die roll is known to the researcher, it is possible to calculate the average response for the sample by subtracting/dividing the average results by the average die roll. Several studies have been carried out to compare responses elicited with direct and indirect questioning, including a meta-analysis of 42 studies (Lensvelt-Mulders *et al.*, 2005b). This analysis shows that randomized response results in more valid population estimates than direct answer. Moreover, RRT proves more valid as the sensitivity of the topic increases (Lensvelt-Mulders *et al.*, 2005a). On the other hand, RRT presents some disadvantages: it is less efficient than direct questioning designs, as estimates need to be drawn from larger samples to maintain statistical power (Lensvelt-Mulders *et al.*, 2005a), and some of the designs may be complex to administer, inspire limited trust and face a strong false response bias (Lensvelt-Mulders and Boeije, 2003; Coutts and Jann, 2011).

Based on these reflections, the cross-sectional questionnaire used for this research was administered face-to-face to HWs and designed to include direct questions on (i) demographic and basic personal information of the respondents (i.e., gender, age, marital status, district of work and district of origin, type of facility s/he is working in, qualification, cadre, role within the facility), as well as information on facility characteristics (i.e., type of facility, remoteness level, district); and (ii) on the following individual incomes of the respondents: salary (amounts received and date), remote allowance, individual PBF bonus, share of the user fees charged for non-exempted services and redistributed to staff, salary supplementations (e.g., top-ups from NGOs or other organizations), per diems (usually called Daily Subsistence Allowance (DSA) in Sierra Leone), earnings from income-generating activities (IGA) outside the health sector. In the third section, an adapted version of the RRT was implemented to elicit response to quantitative questions on amounts earned for the most sensitive remunerations. Indirect

[2] For this study it was decided to consider as sensitive incomes (estimated using indirect questioning) not only (i) gifts and payments from patients, (ii) sale of drugs and other items, but also (iii) private practice, as the direct question of ReBUILD's HWIS had resulted in a very low response rate for the question on earnings from private practice.

questions referred to: gifts and payments received in kind or cash from patients, sale of drugs and other items within the health facility, private practice (i.e., provision of health services outside of the facility). In practice, HWs were asked to roll a purposefully-built die without letting the enumerator know the result. The die was built so that each face would show a figure in the same order of magnitude of plausible remunerations, so that adding the result to the actual remuneration would effectively mask the real amount (Figure 5.6). Once seen the result of the die, HWs were asked to add the result to the actual amount of remuneration received last month (a calculator was provided for this purpose). This same process was repeated for each of the three sensitive incomes.

Figure 5.7: Adapted dice used for indirect questioning

Self-administered longitudinal logbook on remunerations and activities

In order to collect information on which activities the HWs undertake daily and how much time they dedicate to different tasks, several options were considered. The literature on time use and workload measurement points to different techniques to collect this type of information, which are summarized, alongside their advantages and drawbacks in Table 5.6. Hybrid tools can also be devised, for example, by coupling logbooks with end-line interviews or with survey questionnaires (Department of Health, 2006).

Table 5.6: Approaches to the measurement of time use of health workers

Method	Description	Advantages	Disadvantages
Observational studies			
Time and motion (TM) studies	• A trained observer follows a health worker and records all his activities in a period of time (day, shift, etc.). • Activities may be pre-listed in groups (Bryant and Essomba, 1995).	• The 'gold standard' method • Very reliable and accurate information	• Costly in terms of financial and human resources → limits to the sample size • Potential observer bias • Potential "Hawthorn effect" (i.e., because the observer is present, the subjects modify their behavior). However, some studies show that if the observation is sufficiently long this effect should disappear (Westbrook *et al.*, 2011).
	• Activities to be observed are	• Reliable and accurate	• For statistical accuracy, it requires

Activity sampling or work sampling	selected at random points in time	information	many subjects and a large amount of time for observations
Self-reports			
Retrospective self-administered questionnaire (SAQ)	• Filled in at the end of the day or week by the health worker (Valadez *et al.*, 1990) • Can be more or less structured. A structured questionnaire with a pre-categorized list of activities helps focusing on the specific research questions and saves time during the analysis, but limits the detail of information received (Corti, 1993).	• Could be coupled with end-line (semi-structured) interviews to check completeness of entries and clarify, validate, corroborate the information (Corti, 1993). • Cheap and not too time consuming for the researcher • Particularly useful to analyze a specific, narrow question/task, when reasons to misreport are weak, and/or the question is framed in such a way to avoid misreporting	• Recall bias • Errors in reporting due to low accuracy and forgetfulness • Low truthfulness as people may be tempted to provide "normative desirable answers" (Jacobs, 1998) • Relatively time consuming for the responded
Prospective timesheet or logbook	• Activities recorded as they are performed, or right after • Can be more or less structured (see above)	• No recall bias – however, in practice, people often do not fill in the logbook during the day, but leave it for the end of it • Could be coupled with end-line interviews (see above) • Relatively cheap and not too time consuming • Useful for narrow research question (see above)	• Errors in reporting due to low accuracy and forgetfulness • "First day effect" as respondents change their behavior precisely because they are recording it (a sort of Hawthorne effect) (Corti, 1993). • Very time consuming for the responded → requires some "buy-in" and interest in the research (Pitt *et al.*, 2009)
Retrospective interviews	• Field data collectors interview HWs at the end of a period (day or shift) and ask about activities performed.	• May require less buy-in than SAQ and logbooks, as it is usually easier to reply to questions rather than fill in a questionnaire	• Recall bias and low accuracy (see above) • Costlier and more time consuming than SAQ or logbooks, as skilled interviewers are required

Source: adapted from (Bratt *et al.*, 1999; Pitt *et al.*, 2009)

Pitt *et al.* (2009) offer a useful checklist to assist researchers in defining which technique could be the most suitable. They suggest considering the following factors:

- the level of details needed to answer the research question: how many and what type of activities are to be observed? Can they be grouped into categories?
- the available resources: time of both fieldworkers and participants, funding, availability of skilled fieldworkers
- potential for bias: what are the likely sources of bias? Which method is suited to reduce them? Are the activities observed many or few? sensitive or not? prone to misreporting bias? Prone to observation bias? Could the 'Hawthorn effect' represent a problem?
- the buy-in of participants (when buy-in is higher, misreporting should decrease).

In the case of primary HWs in Sierra Leone, the hypotheses to be tested concerned the potential effects of the complex remuneration on HWs activities, and in particular the possibility that payments would cause HWs to spend more time on disease/service-specific tasks or outside the facilities. Therefore, the level of detail required was considered not extremely high and information not too sensitive or complex. For this reason, and also given the resources available and time and skills of enumerators, a self-administered daily logbook was chosen over observational approaches, despite its disadvantages in terms of misclassification and reporting bias. Additionally, a structured end-line interview was included during the last visit to check completeness, clarify and validate

information of the logbook entries (Corti, 1993). The end-line interview took the form of a weekly summary sheet which the enumerators completed together with the HW, by checking the information and summarizing the amounts earned and the activities undertaken each week, in a standardized way using pre-defined categories[3].

Logbooks given to the HWs were A5-format booklets. Each page referred to one day of the week (Monday to Sunday) and contained a list of all day hours, and two blank columns: one to be filled with the activities undertaken and second one with the amounts received. Indeed, critically, it was decided to also ask for the remunerations received during the week via the logbook. This choice allowed me to have a second estimate of incomes, which may be less subject to recall bias. In particular, it was hypothesized that the logbook measure would have been more reliable for irregular incomes linked to particular activities (e.g. income received for occasional private practice or non-health activities, income from sale of drugs or other items, gifts from patients, per diems, etc.), which can be more easily forgotten over time.

Logbooks were to be filled in daily for a prospective period of 8 weeks and sufficient copies were left with the HWs. This length was chose to balance the concern of HWs fatigue over time and potential loss-to-follow-up, with the necessity of having a time period long enough to allow capturing variability in incomes over time and include at least one full monthly cycle.

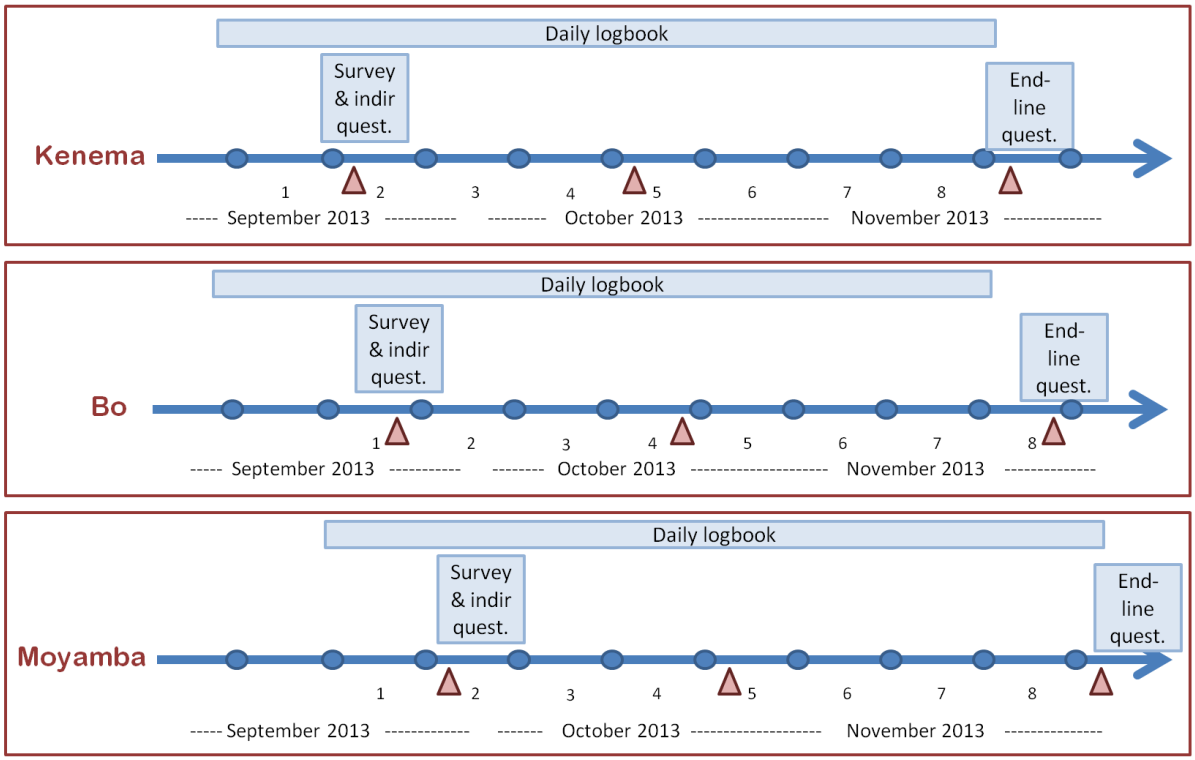
5.3.3 Procedures for quantitative data collection and data entry

Ten local enumerators were selected and trained in Freetown to carry out the data collection. First, quantitative tools were piloted in Freetown (Western Area district) over a week in early September 2013 and their formatting slightly revised after feedback from participants and enumerators. Quantitative data collection was carried out between September and November 2013 in the three districts, starting from facilities in Kenema, then Bo and lastly Moyamba. The fieldwork was organized in three rounds of visits to the facilities (Figure 5.7) and the same enumerator returned to visit the same HW three times. This approach was chosen as it was considered to increase the trust and understanding of the HWs and therefore potentially increase the reliability of their answers. During the first visit, the enumerators administered the cross-sectional survey, including both direct and indirect questions. They also introduced the logbooks, providing the necessary explanations to the HWs and leaving with them enough copies to be filled in over the following weeks. A second visit was planned to collect the logbooks already filled in, check on the progress, encourage the HWs to continue completing the logbook and correct potential mistakes, and a third one to collect the remaining logbooks and fill in the end-line summary. Enumerators also regularly called and texted HWs to remind them of the importance of filling in the logbooks, answer their queries and agree on the timing of the visit to the facility.

[3] The categories of activity include: general clinical activities; general administrative work; disease/service specific clinical activities; disease/service specific administrative work; meeting within facility; outreach; meeting outside facility; training, workshop, etc.; private practice; non-health activities that generate income.

Each round of data collection would last about two weeks in the field, followed by a week or two in Freetown. During the time in Freetown, enumerators entered the data collected up to that time. Double-data entry using EpiInfo and careful reconciliation of the databases was carried out for all data. Additionally, a focus group discussion with the enumerators was held after the first round of data collection to reflect on the experience of administering the indirect questionnaire, which involved an innovative technique and the use of a die.

Figure 5.8: Timeline of activities in the field, by district



Note: pink triangles represent the time of the visit to HWs in that province

5.4 References

Anderson C. 2010. Presenting and evaluating qualitative research. *American Journal of Pharmaceutical Education* **74**.

Bazeley P. 2002. Issues in Mixing Qualitative and Quantitative Approaches to Research. In: *1st International Conference - Qualitative Research in Marketing and Management. University of Economics and Business Administration, Vienna*

Bertone MP, Witter S. 2013. *The development of HRH policy in Sierra Leone, 2002-2012 – report on key informant interviews*. ReBUILD Consortium: Liverpool and Freetown.

Bertone MP, Witter S. 2015. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine* **141**: 56–63.

Bertone MP, Edem-Hotah J, Samai MH, Witter S. 2013. *The development of HRH policy in Sierra Leone, 2002-2012 – a document review*. ReBUILD Consortium - Available at: https://rebuildconsortium.com/media/1019/the-development-of-hrh-policy-in-sierra-leone-2002-2012-a-document-review.pdf: Freetown and Liverpool.

Bertone MP, Samai M, Edem-Hotah J, Witter S. 2014. A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002-2012. *Conflict and Health* **8**: 11.

Bratt JH, Foreit J, Chen PL, West C, Janowitz B, de Vargas T. 1999. A comparison of four approaches for measuring clinician time use. *Health Policy and Planning* **14**: 374–81.

Bryant M, Essomba RO. 1995. Measuring time utilization in rural health centres. *Health Policy and Planning* **10**: 415–22.

Chow LP, Gruhn W, Chang WP. 1979. Feasibility of the randomized response technique in rural Ethiopia. *American Journal of Public Health* **63**: 273–6.

Corti L. 1993. *Using diaries in social research*. University of Surrey - Social Research Update: Guildford.

Coutts E, Jann B. 2011. Sensitive Questions in Online Surveys : Experimental Results for the Randomized Response Technique (RRT) and the Unmatched Count Technique (UCT). *Sociological Methods & Research* **40**: 169–93.

Department of Health. 2006. *UK General Practice Workload Survey 2006 - 2007*. Department of Health, British Medical Association, NHS Employers: London.

DfID. 2009. *Political Economy Analysis: How To Note*. DfID - Practice Paper: London.

Dietz P, Striegel H, Franke A, Lieb K, Simon P, Ulrich R. 2013. Randomized response estimates for the 12-month

prevalence of cognitive-enhancing drug use in university students. *Pharmacotherapy* **33**: 44–50.

Flick U. 2006. *An Introduction to Qualitative Research*. Sage Publications: London.

Gilson L, Schneider H, Orgill M. 2014. Practice and power: a review and interpretive synthesis focused on the exercise of discretionary power in policy implementation by front-line providers and managers. *Health Policy and Planning* **29**: iii51-iii69.

Greenberg BG, Kuebler RR, Abernathy JR, Horvitz DG. 1971. Application of the Randomized Response Technique in Obtaining Quantitative Data. *Journal of the American Statistical Association* **66**: 243–50.

Greene JC. 2008. Is Mixed Methods Social Inquiry a Distinctive Methodology? *Journal of Mixed Methods Research* **2**: 7–22.

Harris D. 2013. *Applied political economy analysis. A problem-driven framework*. Overseas Development Institute: London.

Immpact Project. 2007. *Health Worker Incentives Survey (HWIS)*. University of Aberdeen - Immpact Project Toolkit: Aberdeen.

Jacobs JA. 1998. Measuring time at work: are self-report accurate? *Monthly Labor Review*.

Jamison J, Karlan D. Measuring Preferences and Predicting Outcomes.

Lensvelt-Mulders GJLM, Boeije HR. 2003. Evaluating compliance with the Computer Assisted Randomised Response Technique. A qualitative research into the backgrounds of lying and cheating.

Lensvelt-Mulders GJLM, Hox JJ, van der Heijden PGM. 2005a. How to Improve the Efficiency of Randomised Response Designs. *Quality & Quantity* **39**: 253–65.

Lensvelt-Mulders GJLM, Hox JJ, van der Heijden PGM, Maas CJM. 2005b. Meta-Analysis of Randomized Response Research: Thirty-Five Years of Validation. *Sociological Methods & Research* **33**: 319–48.

Pitt C, Greco G, Hanson K, Mills A. 2009. *Measuring time use in health economics : a methodological perspective Background : Time use studies*. Presentation at the iHEA conference: Beijing.

Pollock KH, Bek Y. 1976. A Comparison of Three Randomized Response Models for Quantitative Data. *Journal of the American Statistical Association* **71**: 884–6.

Richardson J. 1996. *Handbook of Qualitative Research Methods for Psychology and the Social Sciences*. BPS Books: Leicester.

Ritchie J, Lewis J. 2003. *Qualitative Research Practice*. Sage Publications: London.

Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W. 1997. How African doctors make ends meet: an exploration. *Tropical Medicine & International Health* **2**: 127–35.

Sale JEM, Lohfeld LH, Brazil K. 2002. Revisiting the Quantitative-Qualitative Debate: Implications for Mixed-

Methods Research. *Quality and Quantity* **36**: 43–53.

Seale C. 1999. *The Quality of Qualitative Research*. Blackwell: Oxford.

Spicer N. 2011. Combining qualitative and quantitative methods. In: Seale C (ed). *Researching Society and Culture - Third Edition*. Sage. London

Striegel H, Ulrich R, Simon P. 2010. Randomized response estimates for doping and illicit drug use in elite athletes. *Drug and Alcohol Dependency* **106**: 230–2.

Valadez J, Vargas W, Diprete L. 1990. Supervision of primary health care in Costa Rica: time well spent? *Health Policy and Planning* **5**: 118–25.

Varvasovszky Z. 2000. How to do (or not to do) . . . A stakeholder analysis. **15**: 338–45.

Walt G, Gilson L. 1994. Reforming the health sector in developing countries: the central role of policy analysis. *Health Policy and Planning* **9**: 353–70.

Walt G, Shiffman J, Schneider H, Murray SF, Brugha R, Gilson L. 2008. 'Doing' health policy analysis: methodological and conceptual reflections and challenges. *Health policy and planning* **23**: 308–17.

Warner SL. 1965. Randomized Response: A Survey Technique for Eliminating Evasive Answers Bias. *Journal of the American Statistical Association* **60**: 63–9.

Westbrook JI, Duffield C, Li L, Creswick NJ. 2011. How much time do nurses have for patients? A longitudinal study quantifying hospital nurses' patterns of task time distribution and interactions with health professionals. *BMC Health Services Research* **11**: 319.

WHO. 2006. *World Health Report 2006 - Working together for health*. World Health Organization: Geneva.

WHO. 2010. *Increasing access to health workers in remote and rural areas through improved retention*. World Health Organization: Geneva.

Williams B, Suen H. 1994. A methodological comparison of survey techniques in obtaining self-reports of condom-related behaviors. *Phychological Reports* **75**: 1531–7.

Witter S, Bertone MP, Wurie H, Samai MH, Edem-Hotah J, Amara R. 2015. *Health worker incentives: survey report, Sierra Leone*. ReBUILD Consortium & College for Medical and Allied Health Sciences: Liverpool & Freetown.

Witter S, Kosia YJ, Samai M. 2012. *Health worker incentives: stakeholder mapping report (Sierra Leone)*. ReBUILD Consortium: Freetown.

Witter S, Wurie H, Bertone MP. 2016. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? *Health Policy and Planning* **31**: 1–9.

Yin R. 2003. *Case Study Research: Design and Methods*. Sage Publications: London.

PART II - FINDINGS

6. Setting the background to HRH policies in Sierra Leone

6.1 Preface

Part II of the thesis will present the empirical findings of this research, moving from the central (macro) level (Chapter 6), on to the district (meso) level (Chapter 7) and finally to the individual HWs (micro) level (Chapters 8-10). The analyses at central and district level allow to explore the overall context, processes and dynamics that defines the HRH incentives. The also identify the key factors that shape HRH incentives, both at design and implementation stage. A thorough understanding of the environment at macro and meso level and of how it contributes to set the HWs payment structure and levels, and potentially gives rise to the complex remuneration phenomenon, is necessary to build on for the following chapters, focused on the analysis of the remuneration at individual level and of its consequences for HWs.

The present chapter (Chapter 6) consists in a research paper which looks at how the HRH policies defining the set of incentives available to HWs in Sierra Leone were developed during the years that span along the post-conflict period, from 2002 to 2012. The paper explores how such policies evolved over time, and examines the policy trajectory and its drivers, in terms of actors, evolving context and processes. Although its central focus concerns the timing of the reforms and the existence of a post-conflict 'window of opportunity' for change, the analysis carried out is particularly useful and instrumental to this thesis in order to provide a detailed context and to set the background to HRH policies. It aims to identify the policies and reforms which defined the HRH incentive package, and allows for a better understanding of how and why they were introduced, as well as of the details of their design as envisaged at central level.

A key element that emerges from the article, which is essential to build on for the following analysis, concerns the efforts of harmonization and alignment of the design of HRH incentive package that ware undertaken, by government and donors in the wake of the introduction of the Free Health Care Initiative (FHCI), in 2009-2010. Chapter 7 will examine in more details the actual implementation of the reforms designed at central level, and highlight the challenges as well as the HRH incentive practices emerging at district level.

6.2 Cover sheet for research paper

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
www.lshtm.ac.uk

Registry
T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

RESEARCH PAPER COVER SHEET

PLEASE NOTE THAT A COVER SHEET MUST BE COMPLETED FOR EACH RESEARCH PAPER INCLUDED IN A THESIS

SECTION A – Student Details

Student	Maria Paola Bertone
Principal Supervisor	Dr Mylene Lagarde
Thesis Title	Exploring the complex remuneration of health workers in Sierra Leone

If the research paper has previously been published please complete Section B. If not, please move to section C

SECTION B – Paper already published

Where was the work published?	Conflict & Health		
When was the work published?	July 2014		
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion	N/A		
Have you retained the copyright for the work?*	Yes (see © on paper)	Was the work subject to academic peer review?	Yes

** If yes, please attach evidence of retention. If no, or if the work is being included in its published format, please attach evidence of permission from the copyright holder (publisher or other author) to include this work.*

SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	
Please list the paper's authors in the intended authorship order:	
Stage of publication	

SECTION D – Multi-authored work

For a multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary).	As detailed in the article, I led the data collection process for the documentary review and key informant interviews carrying out myself 18 interviews of the total 23, and contributed to the stakeholder workshop with the other co-authors. I was then responsible for the analysis of all data collected and for the writing-up of the article, as well as submission and revision during the publication process.

Student signature:  **Date:** _____17/06/2016_____

Supervisor signature: _____  _____ **Date:** _____17/06/2016_____

CONFLICT AND HEALTH

RESEARCH Open Access

A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002–2012

Maria Paola Bertone[1*], Mohamed Samai[2], Joseph Edem-Hotah[2] and Sophie Witter[3]

Abstract

Background: It is recognized that decisions taken in the early recovery period may affect the development of health systems. Additionally, some suggest that the immediate post-conflict period may allow for the opening of a political 'window of opportunity' for reform. For these reasons, it is useful to reflect on the policy space that exists in this period, by what it is shaped, how decisions are made, and what are their long-term implications. Examining the policy trajectory and its determinants can be helpful to explore the specific features of the post-conflict policy-making environment. With this aim, the study looks at the development of policies on human resources for health (HRH) in Sierra Leone over the decade after the conflict (2002–2012).

Methods: Multiple sources were used to collect qualitative data on the period between 2002 and 2012: a stakeholder mapping workshop, a document review and a series of key informant interviews. The analysis draws from political economy and policy analysis tools, focusing on the drivers of reform, the processes, the contextual features, and the actors and agendas.

Findings: Our findings identify three stages of policy-making. At first characterized by political uncertainty, incremental policies and stop-gap measures, the context substantially changed in 2009. The launch of the Free Health Care Initiative provided to be an instrumental event and catalyst for health system, and HRH, reform. However, after the launch of the initiative, the pace of HRH decision-making again slowed down.

Conclusions: Our study identifies the key drivers of HRH policy trajectory in Sierra Leone: (i) the political situation, at first uncertain and later on more defined; (ii) the availability of funding and the stances of agencies providing such funds; (iii) the sense of need for radical change – which is perhaps the only element related to the post-conflict setting. It also emerges that a 'windows of opportunity' for reform did not open in the immediate post-conflict, but rather 8 years later when the Free Health Care Initiative was announced, thus making it difficult to link it directly to the features of the post-conflict policy-making environment.

Keywords: Post-conflict, Human resources for health, Policy analysis, Window of opportunity, Sierra Leone

Introduction

In the immediate aftermath of a conflict, governments and international donors alike recognize the necessity to rapidly rebuild the health system and increase health service provision for the population, as a goal in itself as well as an entry point for peace building [1]. At this time, one of the most problematic aspects lies in striking the balance between the humanitarian aid, focused on saving lives, and the longer term development approach to health system reconstruction and strengthening, aimed at consolidating the state, providing legitimacy to the government and ensuring effective and equitable service delivery [2-4]. This balance is even more delicate as decisions taken in the early recovery period are thought to affect the long-term development of the health system, including its efficiency and equity [5]. For this reason, it is particularly useful to reflect on the policy space that exists in the post-conflict period, by what this space is shaped and how

* Correspondence: maria.bertone@lshtm.ac.uk
[1]ReBUILD Consortium & Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK
Full list of author information is available at the end of the article

decisions are made, and about the long-term implications of those decisions. A longitudinal approach to examining policy-making going beyond the immediate recovery years is particularly needed and has been highlighted as a gap in the literature on health systems in post-conflict and fragile settings [6].

This study aims to address this gap by focusing on the development of policies and reforms around the issue of human resources for health (HRH) in Sierra Leone over the decade that followed the end of the civil war, from 2002 until 2012. It is widely recognized that HRH represent a key component of health systems, albeit an often overlooked one, especially during the rebuilding of the health system and the re-establishing of the health services after conflict [7]. Moreover, public health workers (HWs) are an essential link between the government and the population in all areas of the country, including the most remote ones, which could help develop the legitimacy of the government and demonstrate the government's commitment to service provision and equity [8]. However, beyond the importance of health workforce reconstruction in the post-conflict period and the need to establish an effective incentive environment to recruit, retain and motivate HWs, focusing on HRH policy development may also provide a useful case study to (i) explore the pattern of reform and features of the post-conflict policy environment and (ii) verify the hypotheses suggested in relation to post-conflict policy settings. In particular, we explore whether policies developed according to 'path-dependency' [9] because of historical decisions made (or not made) in previous stages and linked (or not) to the post-conflict setting. Or rather, whether there was a political 'window of opportunity' for reform in the post-conflict period, as suggested by some [5,7,10].

In line with this aim, the focus on the study is rather on the policy choices, the 'drivers' and reasons of these choices, than on the evaluation of the policy outcomes[a]. We look at the trajectory taken by the HRH policy, including the official strategic documents and the practical shifts and measures introduced to address the HRH challenges over the first post-conflict decade. Our objective is to narrate the 'policy story' and investigate how decisions were made, which factors and actors influenced them and what defined their timing. We believe that looking at the path taken by the HRH policy trajectory can illuminate the policy-making patterns in the post-conflict period and the legacies of such decisions in the longer term.

This paper is structured as follows. The next section briefly sets the context of the health status of the population and the health system in Sierra Leone before the conflict. Then, we present the methods and some limitations of our study. The findings section begins with the health system and HRH context in the immediate aftermath of the war and then narrates the policy story, depicting how HRH policy developed from 2002 until 2012. In the discussion section, the post-conflict policy-making trajectory and its features are identified and analyzed, before concluding with a review of the research questions.

Context

Sierra Leone emerged in 2002 from a 10-year period of war and social and economic unrest. During that time, about 50,000 people were killed and 2 million displaced, which amounted to almost half of the population. It is estimated that more than 20,000 children were conscripted as soldiers [11].

Studies carried out before the conflict provide some information on the health status of the population and on the health system. Data from the 1974 census show that life expectancy at birth was 36–40 years for females and 33–37 years for males and the infant mortality rate was 225 per 1000 [12,13]. In 1980, 31 of the 146 chiefdoms (the lower level in the administrative system in Sierra Leone) had no government health facilities, whether a hospital or a dispensary, and only 5-10% of children below the age of 5 were enrolled at a clinic [12]. According to some studies, the underutilization of health care services, particularly in rural areas, was related to the low availability of healthcare facilities, poor quality of services in the available public facilities [14], frequent drug stock-outs and irregular payment of health workers salaries [15]. As a consequence, most people chose to buy drugs from the market, visit private or mission clinics or make unofficial payments to healthcare workers in public health facilities. Against this background, user fees were introduced in the 1980s, through the Cost Recovery Policy of the Ministry of Health and Sanitation Sierra Leone emanating from the Bamako Initiative. Public health expenditure declined by 60% between 1980 and 1987, such that by 1995 91% of the health expenditure were private, of which 95% were out-of-pocket expenditures, providing no financial protection against illness [15].

The conflict lasted between 1991 and 2002 and, although it alternated between periods of higher and lower intensity and affected the areas of the country in different ways, it paralyzed the economy and the provision of public services and caused the destruction of the infrastructures and governmental institutions throughout the country. The public health system in the aftermath of the conflict was practically collapsed. Only 16% of the health centers were still functioning by 1996, mainly in Freetown [16]. Recent data paint a dire picture of the health situation in the country. Maternal mortality remains extremely high at 857 deaths per 100,000 live births for the period between 2003–2008 [17], while in 2010 under-five mortality was estimated at 217 per 1,000 live births and infant mortality at 128 [18].

Methods

This study is part of a research project carried out by the ReBUILD Project Consortium in Sierra Leone which specifically focused on health workers incentives. The overall objectives of the project are, to document how the incentive environment has evolved after the conflict and understand what influenced the trajectory; to describe the reform objectives, mechanisms, intended and unintended consequences; and to document lessons learned (on design, implementation, sustainability and suitability to context), reflecting on how they can be used to guide future interventions. The study received ethics approval from the Liverpool School of Tropical Medicine and from the Sierra Leone Ethics and Scientific Review Committee.

The overall study design of the research project utilizes both quantitative and qualitative methods and is based on retrospective collection of data and information on the 10-year period between the end of the conflict in 2002 and the time of the research, which started in 2012. Six different tools were applied to gather data. A half-day stakeholder mapping (SM) workshop was held in October 2012 in Freetown with 23 stakeholders in the health sector in order to understand the key actors who have influenced policy and practices in HRH in Sierra Leone over the post-conflict period [19]. Subsequently, a document review was carried out, based on documents retrieved through contacts in country, as well as in journals and grey literature. A total of 76 documents were identified, of which 57 were deemed relevant for HRH issues [20]. Finally, 23 key informant interviews (KII) were conducted, in and outside Sierra Leone, between October 2012 and June 2013. Twelve of the interviewees work(ed) with the Ministry of Health and Sanitation (MoHS), 6 were NGO representatives, 4 donor representatives and 1 a technical assistant to the MoHS[b] [21]. The other three data collection methods were: routine HRH data analysis, in-depth interviews with health workers and a survey of health workers. These are not described in detail in this article as this study draws from the first three research components only[c].

The methodology adopted reflects the difficulty of collecting original data over such a long period of time and in a post-conflict setting, where information is scarce and difficult to retrieve [22]. The combination of methods was conceived so that each could build upon the others, allowing for the collection of information to be enriched in an iterative way. For instance, the document review was helpful in order to formulate preliminary hypotheses and guide the key informant interviews, and the interviews were critical to illuminate on the gaps that had emerged in the documentary review, in particular regarding the discussions, processes and dynamics between actors, for which the documents were silent. Due to the combination of data collection methods, it was possible to compare and thoroughly triangulate findings. Similarities and discrepancies were analyzed in a reflective way to better understand why perceptions and insights differ between actors and sources. This process ensured that the methodologies are complementary and helpful in shedding light on the processes of policy-making in a comprehensive way and from different perspectives.

Despite the careful triangulation of information, our methodology and sampling present the following limitations: (i) the majority of the participants during the key informant interviews and in the group discussion for the stakeholder mapping, as well as the bulk of the documents retrieved (about half), are from the MoHS or from other governmental bodies; (ii) few documents referred to the HRH situation prior to 2009, whilst more than 50% of the documents were dated after 2011; and (iii) only few respondents were present in Sierra Leone and engaged in HRH policy-making for the period under review, and particularly during the immediate post conflict period. Those who were present for the entire time found it difficult to recall events that occurred in the immediate post conflict period and emotional and personal narratives emerge rather than organizational ones.

Although the findings section is based on the chronological narration of the HRH policy evolution and does not follow in its structure the conceptual elements of an analytical framework, the analysis is inspired by political economy and policy analysis approaches [23,24]. Drawing from these approaches, rather than looking exclusively at the policy content and implementation, our analysis focuses on the interactions between the context, including the historical legacies, the evolving formal and informal institutions and power structures; the actors, both national and external, applying ideological, political and financial pressures to decision-making; and the dynamic processes of the political system [25-28]. We use these analytical tools in a flexible manner as our analysis is not performed cross-sectionally looking at a specific moment in time, but rather covers a 10-year period. We explore, for each reform or policy stage in turn, the political processes and dynamics of change, looking at the key drivers of reform, the main actors, their roles, agendas and influences, and the formal and informal arenas in which they interacted.

Findings: the unfolding 'policy story'

Immediate post-conflict context and HRH challenges

By the end of the conflict in 2002, the situation of the health system was extremely challenging. Concerning HRH, little data and documentation exist and those available are often unreliable and contradictory [29]. As one respondent noted, this reflects the fact that all actors were primarily concerned with the pressing needs of the early recovery and little time was available for the

production of documents and reports, and even less for academic research.

The available information shows that the challenges faced at the time in Sierra Leone are not dissimilar to those in other post-conflict contexts [7,10,29]. The basic health infrastructure was destroyed and most services were completely disrupted, especially in the eastern and southern part of the country where most of the rebel activity took place. Health facilities were grossly understaffed as many HWs had left the country, and particularly those in the higher cadres. Other HWs were employed by NGOs or held dual positions with NGOs and the MoHS [30]. The majority of those HWs who stayed in the government service preferred to work in Freetown or in the Western Area around the capital. The data available for that period clearly indicate a significant loss of qualified HWs in the public health sector in Sierra Leone which created a gap that remained to be filled in the aftermath of the conflict. Of the 203 Medical Officers that were present in the country in 1993, only 67 remained in 2005 and of the 623 State Registered Nurses (SRN) 152 remained [31]. While the private sector employed only a small minority of the health workforce, centered in the capital, in the few years immediately after the conflict, many HWs in the public sector were working with NGOs in the governmental facilities, for which they would receive incentives and training, whether under a formal agreement with the MoHS or without. NGOs supporting public facilities also recruited and funded personnel, which was later absorbed in the MoHS payroll.

In those early years, the extreme lack of coordination between the different actors in the health system appears to be an important feature of the policy context. The term 'chaos' frequently emerged in the respondents' narratives:

> "What happened was, during a period of chaos, most of the NGOs were operating on their own" (KII - MoHS).

> "After the war, it was complete chaos. The NGOs came and went […]. They employed the nurses directly, without even consulting the Ministry. […] They never presented any budget. But this was a war. We had to bend backwards in the Ministry" (SM – MoHS).

This highlights the fragmentation of the health system at this stage and the struggle that the government through the MoHS faced to create a system and establish control over the health workforce. However, it seems that the MoHS was able to maintain a certain leadership to start the process of reconstructing the public health system. For example, in contrast to other countries in similar post-conflict situations [6,32-34], in Sierra Leone health services were provided by public facilities and were not contracted-out to other actors of the health system. Although the choice of not adopting a contracting-out approach did not appear to be made explicitly by any of the actors but was rather the consequence of the specific context, it clearly had lasting consequences which affected the future development of the healthcare system.

The development of formal HRH policies: 2002–2009

Against this backdrop, HRH reforms began to develop. Our findings reveal that between 2002 and 2009 the progress towards policy-making for a coherent restructuring of the health workforce was not rapid or effective. Although the challenges were correctly identified by the MoHS and potential solutions being proposed (cf. for example [30,35]), very little was happening in practice.

Relatively minor changes were introduced to improve the management of HWs in order to keep the system functioning. For instance, between 2006 and 2007, the Scheme of Service was reviewed to ensure a clearer career path and HWs started receiving allowances for housing, remote area placements, and leave [35,36]. However, the major reforms suggested in the annual presentations of the MoHS HRH Manager and in other informal MoHS documents [30,35], remained unfunded and unimplemented and the response to the HRH challenges was fragmented. At the same time, a series of broad policies and strategies were being drafted – in 2002 the *National Health Policy* (NHP) [37], followed by the *Human Resources for Health Development Plan 2004–2008* [38] and then the *Human Resources for Health Policy in Sierra Leone* [39]. Similar to other post-conflict contexts, these documents tended to remain relatively vague normative frameworks rather than operational documents to be reflected in changes at peripheral level [7,22,40]. As the most recent *HRH Policy* (2012) states, "there have been two attempts to formulate national policy to guide the development and management of Human Resource for Health in Sierra Leone […], but none was finalized or adopted for implementation" ([41]: p.6). The lack of technical and implementation capacity within the MoHS could explain why policies remained on paper. Additionally, external agencies played a significant role in this, in particular because their mandate narrowly focused on production rather than implementation of the strategies. Some key informants pointed out to the fact that these policies were externally-driven, lacking the national ownership that would ensure their effective implementation:

> "People started working on their own areas and they started developing a policy and plan and things like that […]. But it was all happening in parallel, also depending […] on the focus of donors to provide TA

and funding for certain things. So I think a lot of policies applied at the beginning were definitely donor-driven. WHO said 'you don't have a policy on this and this. We have to develop it', and you'll get it." (KII - NGO).

The piecemeal support of the international community did not allow for the strengthening of the MoHS, especially as donors focused on 'their' programmes, supporting one or another department or units, undermining the overall capacity of the MoHS and creating a fragmentation within the Ministry, with long-lasting consequences [4].

Among the reasons for the delay in the adoption and implementation of major shifts in HRH policy may be the lack of clear political vision on the future of the health system more broadly. Indeed, key informants agree that in the years following the conflict, strategic policies and plans were slow to be put in place or missing altogether.

"The main issue during this time [was that] the Human Resources Strategic Plan was not adequately addressing the issues of Human Resources. Because of the absence of a strategic plan, we were just swimming with ideas […] and there was no clear direction as to what to do." (KII – donor).

"Let me tell you something, in life when you do not have a goal you are working towards and you go purposeless, aimless, you're slow at it." (KII – MoHS).

The consequence of the lack of political guidance and strategic vision was a general sense of 'purposelessness'. This resonates with the findings of the documentary review, where it emerged how fluid and uncertain policy context was, as explicitly recognized by the *HRH Development Plan 2004–2008* which states that a certain flexibility will be allowed in the proposed activities "given the current level of *uncertainty* regarding the exact nature of the reforms" ([38]: p.80 – italics added). Obviously, the broader political dimension is important to understand the lack of strategic vision for the health sector. The government elected in 2002, which seemed to initially enjoy some support, soon lost much of its popularity given its weaknesses in terms of leadership to drive for reform, especially compared to the following administration in power from 2007 ([4] & KII). For the HRH sector, the consequence of drafting broad policies without an overall vision on the ways to rebuild and strengthen the health system was a relatively static approach, which left little space for innovation and focused mostly on "fire-fighting", as suggested by a respondent, i.e. tackling the most immediate issues with quick-fix solutions. The situation substantially changed with the introduction of the 'free health care initiative' (FHCI).

The introduction of the FHCI: 2009–2010

In September 2009, the President of Sierra Leone, Ernest Bai Koroma, announced at a donors' conference in London his intention to launch a reform to introduce free healthcare for pregnant women, lactating mothers and children under 5 years of age [42]. Soon after, the announcement was made in Sierra Leone to the MoHS and partners and an official launching document was drafted [43]. A few months were allowed to prepare the launch of the new policy in April 2010. Without doubt, the introduction of the Free Health Care Initiative (FHCI) is the key event that emerged from the document review and that informants consistently mentioned in their narratives about the reconstruction of the health sector.

Different factors emerge as the 'drivers of change' for this reform. Certainly, the health status of the population with one of the highest maternal mortality rates in the world, as well as emerging evidence of financial barriers in access to healthcare, played an important part in promoting the policy ([44] & KII). However, even more critical seems to be the role of the President and the lead he took to include the FHCI among the government's priorities. The political dimension of the FHCI is confirmed by the President's direct involvement in the announcement of it as a 'Flagship Project', by the work done by the Strategy and Policy Unit, a very influential, high-level advisory unit in charge of promoting the presidential agenda [42], as well as in numerous interviews. Additionally, the international environment and the pressure from external actors also contributed to the decision. Indeed, free healthcare was at the time an increasingly popular reform in many African countries, supported by some of the international donors, and in particular the UK Department for International Development (DfID), which also made funding available tied to the implementation of this particular reform. As one informant stated:

"You have to have it [the FHCI] in context. I know that there was a push in 2008/2009 by Gordon Brown and he decided, DfID decided to support [the reform]. And because of DfID support, […] that is why it was able to get off. Under our government's own resources they could not [support it]." (KII – MoHS).

The launch of the FHCI provided an opportunity for health system strengthening and to address in a more comprehensive and organic way the issues that previously were partially solved with piecemeal changes. The design and preparation of the FHCI (much more than its implementation) represented an occasion to increase

and improve coordination among actors and provide a broad, common objective to all stakeholders (KII). Six Technical Working Groups were put in place, of which one focused on HRH, which held meetings weekly and were tasked with designing the necessary reforms, as well as of coordinating among the different partners [45].

With reference to HRH, the launch of the FHCI played an instrumental and catalytic role in pushing reforms. It was explicitly recognized by all stakeholders that addressing issues affecting the health workforce was critical for the success of the FHCI, for at least two reasons: firstly, HWs would have to deal with an increased workload; and secondly, in order to compensate facilities and HWs for the loss in revenues due to the end of the cost-recovery. With the inputs from the Working Group, HRH reforms started developing. The result was that, by April 2010, salaries had been increased for all HWs in technical positions. The increase was substantial, ranging from 314% for the lower grades up to 705% for the higher grades [46]. As a corollary to the salary increase, an in-depth verification and cleaning of the MoHS payroll was carried out to ensure that only legitimate staff were included and to eliminate 'ghost workers' [47]. Additionally, a mobile recruitment programme at district level was put in place for the fast-track recruitment of new workers and of those already volunteering in the facilities [47]. At the same time, discussions began about the introduction of a system to monitor the presence of HWs in the facilities, which was later introduced in mid-2010 when staff absence begun being monitored through the Attendance Monitoring System, and January 2011 when the Sanctions Framework was implemented [48].

Obviously, the decision-making process that led to the choice, design and implementation of these reforms was less smooth and linear that it would appear from the end results. While the creation of inter-agency working groups undoubtedly increased coordination, some issues were hidden under the surface. As one respondent recalls,

> "Of course we had our Working Group meetings and we would talk, but these were the 'big lines'. If you go to the little activities, we were not so well coordinated". (KII – NGO).

In particular, concerns emerged around the role of the donors, their different views on FHCI and on how different components of the health system could be reorganized to provide free health services. In particular, the argument between two donors around the merits of a salary increase compared to the introduction of a performance-based financing (PBF) scheme stalled the discussion for some time. As a key informant recalls,

> "These meetings [of the HRH Working Group] were completely dominated by [two donors] having their ideological fight effectively. I mean, it wasn't just those two individuals but these meetings achieved very little, because, when these two big donors are busy having a fight, week after week after week not much else gets discussed." (KII – TA).

In the end, while conflicting agendas and ideologies may have played a role in the decision, the choice of policy approach (i.e. the salary increase) was ultimately taken on the basis of practical feasibility. Although it was recognized that PBF would have had the advantage of improving the accountability of HWs, it was also agreed that setting up a PBF scheme would have higher transaction costs and take longer than a salary increase. This was perceived as a major disadvantage given the urgency of the launch of the FHCI (KII – donor). Moreover, after a nation-wide HWs strike which took place in March 2010 in request for higher salaries, this option became inevitable. What emerges from the analysis is that the MoHS perspective seemed to have been caught in the cross-fire of the donors' agendas and the funding possibilities that came with donors' support. It also appears that the corollary measures taken, such as the payroll cleaning and the introduction of the Sanctions Framework, were not only strategies to improve the HRH management and performance, but also a conditional request from the donors funding the reform, and DfID in particular, in order to "protect their investment" and "minimize risk" of misuse of their funds (KII – donor).

Several episodes confirm the influence of external actors, as well as the fragmented and 'serendipitous' nature of policy-making at the time. Many respondents recognized the drawbacks of the technical assistance provided, characterized by high turnover and little coordination, which resulted in the loss of institutional memory, duplications and incoherence in policy-making and implementation. This is, for instance, the case with the cleaning of the MoHS payroll which was done in 2009–2010, but had already been carried out a few years before for the entire civil service ([49] & KII). Providing another example, some informants recalled how, despite the pressures and promises of some partners, the issue of funding the salary increase, was resolved in an "entirely coincidental" way (KII – TA), when the Global Fund's Health System Strengthening funds became available. Interestingly, the Global Fund had not participated in the Working Group's discussions directly and its low level of engagement contributed to creating a commonly accepted narrative around the role of donors, where DfID (contributing, over three years, about 22% of the total health salaries after the increase, but highly involved in the discussion and providing substantial, direct support to the MoHS

through numerous technical assistants) took a much more central role and was able to steer critical decisions, than the Global Fund (contributing 20% of the total amount, in the initial 3 years) [50].

HRH policy-making after the Free Health Care Initiative: 2011–2012

Beyond the urgency of the FHCI launch, the momentum for the collaboration between MoHS and partners seems diminished, if not lost, afterwards. The Working Groups are reported to meet much less regularly after the launch of the FHCI and were almost inactive by March 2013. Nevertheless, two major reforms were implemented after 2010, which in fact had been discussed or planned at the time of the FHCI design: a Performance-based Financing (PBF) scheme and a Remote Allowance for HWs working in rural posts.

While the discussion of a PBF scheme became detached from the design and the planning of the FHCI as the salary increase option was preferred, meetings for the planning of PBF continued, especially between the World Bank and the Department for Planning and Information (DPI) of the MoHS. The scheme was designed and has been implemented since April 2011. Along with the World Bank, which as the promoter and the funder of the scheme is recognized to be the driving actor for its implementation, the DPI also played a critical role and remains in charge of the operationalization of the policy. In contrast, the Department for HRH (D-HRH) which is in charge of the payroll management (which, incidentally, is supported by a different donor) is far less involved in the scheme and has surprisingly little overview of the working mechanisms of PBF. The consequence of this is a further fragmentation, not only in terms of the design of the HRH policies and the package of incentive for HWs, but also of the implementation of the PBF scheme. This has been plagued with severe delays in the payments made to the facilities, which undermine the effectiveness of the scheme and may have had negative consequences on the performance of the HWs (KII).

A similar story applies to the Remote Allowance for HWs, which was introduced in early 2012. This policy had already been discussed before the launch of the FHCI; however, it was not implemented because of the lack of resources. As further funding from the Global Fund became available, the policy was finally designed and introduced. Again, the DPI is mainly responsible for its implementation and, despite some collaboration with the D-HRH to access payroll data, there appears to be a strict division of tasks between the two departments, with little transparency in its management. As a consequence, few actors seem familiar with the mechanisms for eligibility and funding. Furthermore, the Remote Allowance currently rarely reaches the HWs that are eligible for it, due to the discontinuity of the Global Fund funding, as well as the poor communication and coordination within the MoHS (KII). The separate management of the Remote Allowance creates a further fragmentation of policies and activities, even within the MoHS.

Beyond these two major reforms (and their implementation challenges), several HRH issues remain unsolved or only partially addressed. For instance, during the preparation for the FHCI, a mobile recruitment programme had been set up. However, this remained a one-off exercise. For the routine recruitment of HWs, the establishment of a Health Service Commission (HSC) was planned to replace the Human Resources Management Office (HRMO). Despite the HSC being established by a Governmental Act in 2011 and the Commissioners being nominated, the HSC appears to be still not functional in March 2013. Similarly, pre-service training has been overlooked in the rush for the launch of the FHCI, in order to focus on aspects that it was possible to address faster (e.g., recruitment of HWs and in-service training). In-service training proliferated in an uncoordinated manner and only in early 2014 was the D-HRH of the MoHS preparing an HRH Training Plan for the next 10 years, to ensure the standardization and coordination of both pre-service and in-service training. Additionally, the role of non-financial incentives for the motivation of HWs, and in particular for those in rural postings, also emerges as largely ignored by policy-makers.

In terms of official MoHS policies, while the documents prepared before 2009 have remained mostly on paper, as described above, those approved following the launch of the FHCI, and in particular, the *Human Resources For Health Policy* and the *Human Resource for Health Strategic Plan 2012–2016* [41,51] seem to have been prepared to give an *ex-post*, official shape to the changes that had already taken place at operational level in HRH strategies.

Discussion

The stages of policy-making in post-conflict Sierra Leone

Figure 1 plots the sequence of Sierra Leone's main HRH policy and operational reforms over time. It points out to three broad stages in the policy-making process.

The initial post-conflict period was certainly critical to define the trajectory in the reconstruction of the health system and determine the shape of the system in place. It was, for example, the decision *not* taken to contract-out health services that put the MoHS in charge not only of the stewardship of the system, but also of service delivery. The decision appears to be based on contextual factors. First, the government legitimacy was (more or less) extended to the entire country and its authority recognized by all [4]. This means that the MoHS was recognized to have sufficient capacity to reach all areas, and that public services could be provided safely without the need of

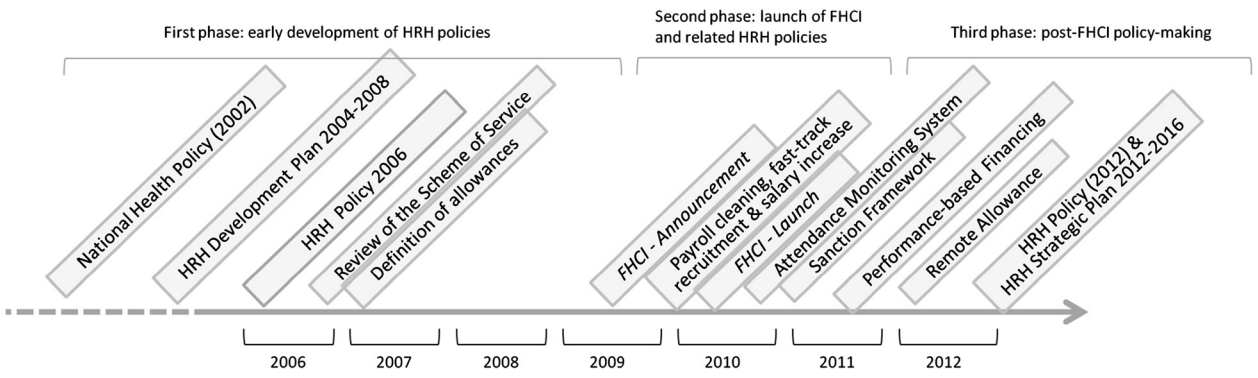


Figure 1 The sequencing of HRH policies and reforms in Sierra Leone: 2002-2012.

delegating to third-parties. More importantly, the influence of the UK, because of the historical relations between the two countries (from the freed slaves' settlements in Sierra Leone to the active role played by the British Army at the end of the conflict) may have led to a certain pattern in terms of aid and development. DfID preferences in terms of health systems organization may have influenced the decision to opt for direct public provision of healthcare.

However, in the immediate post-conflict, efforts to tackle HRH issues were limited to 'fire-fighting' measures, as noted in other post-conflict settings [4,7]. Rarely were these measures translated into formal, coherent and comprehensive Ministerial policies, as partners adopted a fragmented approach, often implemented without the involvement of the MoHS (for example, by providing salary supplementations or hiring HWs directly). Little or no opportunities opened for strategic reforms, possibly because of the uncertain political context, which is a common feature of post-conflict settings [10,22,40].

While these difficulties are generally recognized, some authors suggest that there is a 'window of opportunity' for reform in the immediate post-conflict period due to the political energy released by the change of regime, the fluidity of the situation with new players and ideas entering the political arena, and increased funding available [5,7,10,40]. Sierra Leone experienced a prolonged transition at the end of the conflict comparable to that of Liberia and South Sudan, rather than a 'sudden onset' of peace [3], but, for example in contrast to Liberia, there was no transitional government. National elections were held immediately after the peace agreement (in 2002) and the government retained a certain degree of legitimacy, control and capacity to provide services [4]. Despite these possibly favorable conditions, in those early years, there was no decision space opening for strategic health system strengthening reforms (including HRH changes), under the weak leadership of the government and the patchy interventions of the development partners. In terms of funding, the National Health Accounts reveal that the donors' contribution to the Total Health Expenditure (THE) was 146.86 billion Leones in 2004. It then decreased to 109 billion in 2007, but substantially increased to 450.77 billion in 2010. In relative terms, this represented 18% of the THE in 2004, 12% in 2007 and 25% in 2010 [52,53]. The data confirm that, while donor funds were higher in 2004 than in 2007 both in absolute and relative terms, the substantial increase in funding followed the establishment of the FHCI.

Therefore, in the case of HRH policy in Sierra Leone, the 'window of opportunity' seems to have opened later than usually recognized and for reasons not necessarily linked to the post-conflict phase, but rather to the momentum created around the FHCI. Indeed, it took about eight years after the official end of the conflict for a second phase of intensive policy-making to begin, brought by strategic reforms for the health system. The disappointingly late onset and slow pace of the reconstruction process has been noted in other contexts. In South Sudan, it took three years after the peace agreement before an actual start to the recovery activities was made [3], while in Liberia the international community was not able to stimulate preparatory steps for an organic health system strengthening reform during the initial 3-year transitional phase, so that another 3 years under the new government had to go by before it was possible to start addressing the reconstruction of the health sector [54]. Also, for the case of Sierra Leone, it was a separate event, i.e. the launch of the FHCI, not related to the post-conflict setting that made it possible to overcome the political uncertainty and bring pressure for change, opening a political 'window' for it.

The announcement of the FHCI was the necessary instrumental event and catalyst for action in all respects of the health system, including HRH. This pattern of HRH reform is not uncommon to other contexts, whether post-conflict or not. The most salient moment in this trajectory was the introduction (for reasons mostly external to the health sector) of a broader health financing reform, not

specifically focused on HRH, but which had a critical impact on the HRH reform process and was instrumental to it. While Sierra Leone has been one of the few (if not the only) country to explicitly address the link between the removal of fees and the incentives faced by HWs [46], thus making the FHCI more effective (at least, in the design), the fact that a broader health financing reform may be a helpful or even indispensable entry point for HRH reform is a key insight common to other contexts ([22] & KII).

Undeniably, following the introduction of the FHCI, some important progress was made, at least in the design of HRH policies and likely in their implementation and impact on the health system (an evaluation of the effects of the FHCI and related reforms is currently underway). However, below the surface appearance of successful reforms, issues remained for the overall planning and, as noted in other post-conflict settings [22], different HRH-related policies were managed separately with little coordination between donors, as well as within the MoHS, between the different departments.

After the launch of the FHCI and related reforms, a new phase in HRH policy-making can be identified. In this phase, post-conflict issues and features become less apparent. Compared to the previous phase, the pace of HRH decision-making and reforms slowed down, losing the previous momentum. The Working Groups almost stopped meeting altogether and coordination became more difficult. Additionally, with reduced political pressure for the policies introduced after the FHCI, implementation of the policies has not followed the design and there are several problems and delays in their execution.

Features of the policy-making context

The HRH policy trajectory in Sierra Leone shows the role played by historical events and contextual factors in constraining future choices (the concept of 'path dependency'). As noted in other post-conflict countries, uncontrovertibly "the future health system [is] shaped by the present decisions" ([22]: 665). In the case of Sierra Leone, for example, the fact that the contracting-out approach, which is often adopted in post-conflict settings, was not taken, has affected the subsequent trajectory of policy-making in HRH and beyond. However, despite the fact that some decisions appear irreversible because of how policies developed in previous stages, the Sierra Leonean HRH policy trajectory also shows that it is possible to generate radical reforms in the health sector. As pointed out in the literature, political uncertainty and (politically) fragmented health systems are unlikely to produce "big non-incremental change". Nevertheless, the realization of propitious conditions could increase the likelihood of such change taking place [55]. In the case of Sierra Leone, the emergence of a powerful initiative, which acted as catalyst both with respect to the internal political will and the external (political and financial) support, was critical to build momentum, open a political 'window of opportunity' and create widespread support for radical reform in all aspects of the health system, including HRH.

It could be argued that some elements more common in a post-conflict context facilitated this process. One of these features is the fluidity of power relations and dynamics between influential actors that could facilitate reform. An example of this emerged in our study. While in other countries the professional boards are a powerful actor and the relations between those bodies and the MoH are entrenched in the system, often limiting the space for reform on HRH issues, in Sierra Leone the power relations with the professional associations seemed much more fluid. The Nursing Board, for instance, is chaired by the Chief Nursing Officer (Director of Nursing) at the MoHS, and is by definition aligned to the decisions taken by the MoHS, so that there is less or no opposition to radical changes. No opposition to the introduction of the Sanction Framework came from any of the professional boards on behalf of their affiliates (KII). Secondly, it is possible that because of the state of the health system, the launch of the FHCI could not be based on some relatively minor, incremental measure, but it required wider reforms, including for HRH. It could be hypothesized that in other non post-conflict contexts, such reforms could be postponed or diluted over time, while in a reconstruction context, the gravity of the situation, accompanied by the general climate of reform, renovation and change could foster new initiatives and gather national and international support around them. Indeed, similarly to South Africa in 1994 where the post-crisis situation created both an opportunity and a need for dramatic change [56,57], Sierra Leone has enjoyed high levels of political interest and pressure. This was coupled with substantial donor funding and technical assistance, while in other sub-Saharan Africa countries free health care initiatives were introduced without generating such momentum (as for example in Burundi, Burkina Faso, Ghana, Senegal, Sudan and others [58-64]). The reasons are likely to be related to the combination between (i) the national political conjuncture under the new government interested in implementing a visible and successful flagship reform, (ii) the international momentum around the improvement of Maternal and Child Health and the introduction of fee exemptions, as well as the major role played by some donors, and especially by a donor such as the UK with close historical ties to Sierra Leone, and (iii) the health needs of the population (in particular, with reference to the high maternal mortality levels).

Other features of the policy-making environment that our analysis highlights are less specific to the post-conflict context. It could be argued that they are not qualitatively different from those in low-income settings, but that

perhaps the differences are only quantitative (i.e. same issues but worse) or, in fact, negligible. One such feature relates to the role of external actors in influencing the policy-making processes, which occurs in non post-conflict settings and is well documented in post-conflict where governments are under-resourced and weak [3,10,40,54,65]. Sierra Leone is no exception and, although evidence and health needs certainly played a role, the approach adopted for decision-making seems to be a pragmatic one, where the critical issue of the availability of funding allowed space for donor influences. Also, some HRH measures, such as the reorganization and management of the payroll, received high levels of donor-funded technical assistance, which may have allowed their realization, but raises concerns around their sustainability in the longer-term. Additionally, despite the noteworthy increase in the alignment of partners to the ministerial policies during the preparation of the FHCI, there appear to be some disconnections between the different actors. The fragmentation of views and agendas was partially overcome by the urgency to make decisions at the time of the launch of the FHCI. However, the lack of coordination became problematic later on, as the political pressure for rapid reforms was reduced. The result was fragmented policy-making, a set of policies that are not completely coherent and a largely ineffective implementation of some of those policies [10]. Moreover, reforms remained incomplete as the adoption and implementation of other necessary measures (e.g., recruitment and deployment of HWs, improved pre-service training and development of non-financial incentives) were not pursued or pursued in a slow and partial manner.

Finally, the apparent success of Sierra Leone in addressing HRH issues by taking advantage of a window of opportunity for reform cannot hide the evident challenges of having HRH changes pushed forward by a short-lived political pressure. As a consequence of the urgency of the reforms, preference was often given to one-off exercises, such as the mobile recruitment, or shorter-term solutions (as for example the decision to overlook pre-service training or the postponement of the introduction of the remote allowance). Similarly to other settings [65], much attention was generated around the design of the policies, while far less was given to their implementation at local level, which remains problematic, despite some innovative features, such as use of civil society monitors at facility level[d].

Conclusions

'Post-conflict' is a relatively little studied and poorly understood period of time, which may be extremely influential for the reconstruction of the health system after a period of social and political unrest. The trajectory of HRH policy developments in Sierra Leone provides a useful case study to examine the pattern of reform and the features of the post-conflict policy-making environment, as well as to reflect on the hypotheses about 'path-dependency' and 'windows of opportunity' in the policy-making processes.

Our analysis identifies different stages in the policy-making processes and discusses the key drivers that determined the shifts and the progression along the policy trajectory. In terms of context, it appears that policy-making was driven by the changing overall political situation, at first uncertain and later on more clearly defined as the new government set its priorities and put pressure for the success of its 'flagship' reform. It has also shown that the sense of need for radical change (and the decision space for it given by the evolving political dynamics) also played an important part. In terms of actors, the will of internal high-level political players, as well as the pressure of international partners contributed to the emergence of a catalyst initiative (the FHCI). Looking specifically at the decisions taken on HRH, the role of the agencies in influencing the reform options adopted emerges more clearly, given the fluidity of power relations in the health sector, as well as the relatively weak hierarchical structures and the fragmentation between departments within the MoHS. The donors' availability of funds to support reform, but also, importantly, their direct participation in policy-making forums and the provision of technical assistance in key roles within the MoHS defined the relative capacity of these agencies to influence policy-making.

Our analysis of 'path-dependency' and 'windows of opportunities' allows reflection on the overall processes and patterns of policy change over time. 'Path-dependency' and the influence of the decisions taken (or not taken) in previous stages of the policy-making process contributed to define the trajectory and limit the options available. Nevertheless, the case of Sierra Leone shows that some events, by creating an alignment of actors and agendas, can act as catalyst for substantial (not incremental) change. Indeed, the pattern of HRH policy in Sierra Leone allows us to reflect on the timing of such political 'window of opportunity' for reform along the recovery process. As noted for other post-conflict countries, despite the potential opportunities for needed reforms to be introduced with less resistance post-conflict, "long-suffering health systems are poor reformers" ([51]: 662). From our analysis, it emerged that the decision space for the reform of the health system did not open in the immediate post-conflict period, which was instead characterized by incremental policy-making and stop-gap measures. A window of opportunity opened later on (8 years after the end of the war), making it difficult to link it directly to the features of the immediate post-conflict policy-making environment.

Endnotes

[a]For an assessment of the outcomes of the HRH policy making, and an analysis of the evolving incentive environment in the post-conflict period and how it affected the recruitment, retention and performance of HWs, see further work carried out by the ReBUILD Consortium (www.rebuildconsortium.com/publications/index.htm).

[b]Quotes from the stakeholder meeting are marked SM, while those from key informant interviews are marked KII. In both cases, the type of organization to which the respondent belongs to is also detailed (i.e., MoHS, donor, NGO, or TA), unless the same issue was mentioned by more than one respondent.

[c]Further work making use of these data is ongoing and will be available on the ReBUILD Consortium website (www.rebuildconsortium.com).

[d]A civil society organization, the Health for All Coalition (HAC), was entrusted in 2011 with the function of guaranteeing an independent oversight on the implementation of the FHCI and in particular to monitor the possible under-the-table payments of patients and HWs' attendance.

Competing interests
The author declares that they have no competing interest.

Authors' contributions
SW, MS and JEO designed the study. All authors participated in the stakeholder workshop. MPB and SW carried out the interviews and the documentary collection, and planned the analysis. MPB analyzed the data and drafted a first version of this article, which was commented on by all authors. All authors read and approved the final manuscript.

Acknowledgements
The authors would like to thank all those who participated to the stakeholder workshop and agreed to be interviewed for this research. Without their contributions and their willingness to openly share memories of long and complex processes, this research would not have been possible. We gratefully acknowledge the UK Department for International Development (DfID) which funds the ReBUILD Research Consortium. This manuscript is part of the 'Filling the Void: Health systems in fragile and conflict affected states' thematic series.

Author details
[1]ReBUILD Consortium & Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK. [2]ReBUILD Consortium, College of Medicine and Allied Health Sciences, University of Sierra Leone, Freetown, Sierra Leone. [3]ReBUILD Consortium, Reader, IIHD, Queen Margaret University, Edinburgh, UK.

Received: 5 February 2014 Accepted: 4 June 2014
Published: 23 July 2014

References

1. Smith J, Kolehmainen-Aitken R-L: *Establishing Human Resource Systems for Health during Postconflict Reconstruction.* Boston, Ma: Management Science for Health, Occasional Paper No.3; 2006. 3.
2. WHO: *Everybody's business. Strenghtening Health Systems to improve health outcomes.* Geneva: World Health Organization; 2007.
3. Cometto G, Fritsche G, Sondorp E: **Health sector recovery in early post- conflict environments: experience from southern Sudan.** *Disasters* 2010, **34:**885–909.
4. Eldon J, Waddington C, Hadi Y: *Health Systems Reconstruction: Can it Contribute to State-building?* London: HLSP Institute; 2008.
5. Kurtenbach S: *Post-War and Post-Conflict Challenges for Development Cooperation.* Duisburg: Institute for Development and Peace - University of Duisburg Essen; 2009.
6. Witter S: **Health financing in fragile and post-conflict states: what do we know and what are the gaps?** *Soc Sci Med* 2012, **75:**2370–2377.
7. WHO: *Guide to health workforce development in post-conflict environments.* Geneva: World Health Organization; 2005.
8. Kruk ME, Freedman LP, Anglin GA, Waldman RJ: **Rebuilding health systems to improve health and promote statebuilding in post-conflict countries: a theoretical framework and research agenda.** *Soc Sci Med* 2010, **70:**89–97.
9. Liebowitz S, Margolis S: **Path dependence.** In *Encyclopedia of Law and Economics.* New York: Springer; 2000:981.
10. Pavignani E, Colombo S: *Analysing Disrupted Health Sectors: A Modular Manual.* Geneva: World Health Organization; 2009.
11. Smillie I, Minear L: *The Charity of Nations: Humanitarianism in a Calculating World.* Bloomfield: Kumarian Press; 2004.
12. MacCormack CP: **Primary health care in Sierra Leone.** *Soc Sci Med* 1984, **19:**199–208.
13. Kandeh BS: **Causes of infant and early childhood deaths in Sierra Leone.** *Soc Sci Med* 1986, **23:**297–303.
14. Kanden H, Dow T: *Correlates of Infant Mortality in the Chiefdoms of Sierra Leone.* Njala: University College; 1980.
15. Fabricant SJ, Kamara CW, Mills A: **Why the poor pay more: household curative expenditures in rural Sierra Leone.** *Int J Health Plann Manag* 1999, **14:**179–199.
16. Gberie L: *A Dirty War in West Africa. The RUF and the Destruction of Sierra Leone.* Bloomington: Indiana University Press; 2005.
17. Statistics Sierra Leone: *Sierra Leone - Demographic and Health Survey 2008.* Freetown and Calverton, MA: Statistics Sierra Leone & Ministry of Health and Sanitation & ICF Macro; 2009.
18. Statistics Sierra Leone & UNICEF-Sierra Leone: *Sierra Leone Multiple Indicator Cluster Survey 2010.* Freetown: Statistics Sierra Leone & UNICEF; 2011.
19. Witter S, Kosia YJ, Samai M: *Health Worker Incentives: Stakeholder Mapping Report (Sierra Leone).* Freetown and Liverpool: ReBUILD Consortium; 2012.
20. Bertone MP, Witter S, Samai MH: *The development of HRH Policy in Sierra Leone, 2002–2012 – A Document Review.* Liverpool and Freetown: ReBUILD Consortium; 2013.
21. Bertone MP, Witter S: *The Development of HRH Policy in Sierra Leone, 2002–2012 – Report On Key Informant Interviews.* Liverpool and Freetown: ReBUILD Consortium; 2013.
22. Pavignani E: **Human resources for health through conflict and recovery: lessons from African countries.** *Disasters* 2011, **35:**661–679.
23. Walt G, Gilson L: **Reforming the health sector in developing countries: the central role of policy analysis.** *Health Policy Plan* 1994, **9:**353–370.
24. DfID: *Political Economy Analysis: How To Note.* London: DfID - Practice Paper; 2009.
25. Moncrieffe J, Luttrell C: *An analytical Framework for Understanding the Political Economy of Sectors and Policy Arenas.* London: Overseas Development Institute; 2005.
26. Leftwich A: *Drivers of Change: Refining the Analytical Framework - Part 1: Conceptual and Theoretical Issues.* York: Department of Politics, University of York; 2006.
27. Leftwich A: *Drivers of Change: Refining the Analytical Framework - Part 2: A Framework for Political Analysis.* York: Department of Politics, University of York; 2006.
28. Leftwich A: *From Drivers of Change to the Politics of Development: Refining the Analytical Framework to Understand the Politics of the Places where we Work - Part 3: Final Report.* York: Department of Politics, University of York; 2006.
29. Tulloch O, Raven J, Martineau T: *Human Resources for Health in Post-Conflict Settings.* Liverpool: ReBUILD Consortium; 2011.
30. Sandi A: *Human Resources Status in MoHS.* Freetown: Ministry of Health and Sanitation - annual presentation; (nd).
31. MoHS: *Human Resources Capacity Challanges in the Health Sector in Sierra Leone.* Freetown: Ministry of Health and Sanitation; (nd).
32. Palmer N, Strong L, Wali A, Sondorp E: **Contracting out health services in fragile states.** *Br Med J* 2006, **332:**718–721.
33. Newbrander W, Waldman RJ, Shepherd-Banigan M: **Rebuilding and strengthening health systems and providing basic health services in fragile states.** *Disasters* 2011, **43:**639–660.

34. Loevinsohn B, Harding A: **Buying results? Contracting for health service delivery in developing countries.** *Lancet* 2005, **366:**256–261.
35. Sandi A: *Overview of HR Status in MoHS.* Freetown: Ministry of Health and Sanitation - annual presentation; 2007.
36. MoHS: *Human Resources for Health Situation in Sierra Leone - The Consequences of Brain Drain.* Freetown: Ministry of Health and Sanitation - Minister's communication to the Cabinet; 2007.
37. MoHS: *National Health Policy.* Freetown: Ministry of Health and Sanitation; 2002.
38. MoHS: *Revised Human Resource for Health Development Plan 2004–2008.* Freetown: Ministry of Health and Sanitation; 2006.
39. MoHS: *Human Resources For Health Policy in Siera Leone for the Ministry of Health and Sanitation.* Freetown: Ministry of Health and Sanitation; 2006.
40. Macrae J, Zwi AB, Gilson L: **A triple burden for health sector reform: "post"-conflict rehabilitation in Uganda.** *Soc Sci Med* 1996, **42:**1095–1108.
41. MoHS: *Human Resources For Health Policy.* Freetown: Ministry of Health and Sanitation; 2012.
42. Scharff M: *A Promise Kept: How Sierra Leone's President introduced free health care in one of the poorest nations on earth, 2009–2010.* Princeton, NJ: Princeton University - Innovations for Successful Societies; 2012.
43. GoSL: *Free healthcare services for pregnant and lactating women and young children in Sierra Leone.* Freetown: Government of Sierra Leone; 2009.
44. Ponsar F, Tayler-Smith K, Philips M, Gerard S, Van Herp M, Reid T, Zachariah R: **No cash, no care: how user fees endanger health — lessons learnt regarding financial barriers to healthcare services in Burundi, Sierra Leone, Democratic Republic of Congo, Chad, Haiti and Mali.** *Int Health* 2011, **3:**91–100.
45. GoSL: *Health Compact.* Freetown: Government of Sierra Leone; 2011.
46. Newlands D, Ensor T, McPake B: *Removing Financial Barriers to Access Reproductive, Maternal and Newborn Health Services: The Challenges and Policy Implications for Human Resources for Health (HRH): Sierra Leone Case Study.* Edinburgh: Queen Margaret University; 2011.
47. Heywood T: *Report of the short term Technical Assistant in Human Resources for Health - March-April 2010.* Freetown: Ministry of Health and Sanitation & Concern Worldwide; 2010.
48. MoHS: *MoHS Conduct and Sanctions Framework and Implementation.* Freetown: Ministry of Health and Sanitation; 2011.
49. Hoke GEJ: **Ghost-busting in Sierra Leone.** *Infonomics* 2010, **24:**32–36.
50. Stevenson D, Kinyeki C, Wheeler M: *Evaluation of DFID Support to Healthcare Workers Salaries in Sierra Leone.* London: DfID Human Development Resource Centre; 2012. 44.
51. MoHS: *Human Resource for Health Strategic Plan 2012–2016.* Freetown: Ministry of Health and Sanitation; 2012.
52. MoHS: *Republic of Sierra Leone National Health Accounts - Financial Year 2007, 2008, 2009 and 2010.* Freetown: Ministry of Health and Sanitation; 2012.
53. MoHS: *National Health Accounts. Financial Year 2004, 2005 and 2006.* Freetown: Ministry of Health and Sanitation; 2007.
54. Sondorp E, Coolen A: *The Evolution of Health Service Delivery in the Liberian Health Sector between 2003 and 2010.* London & The Hague: LSHTM & KIT; 2012.
55. Wilsford D: **Path dependency, or why history makes it difficult but not impossible to reform health care systems in a big way.** *J Publ Pol* 1994, **14:**215–283.
56. Gilson L, McIntyre D: **Removing user fees for primary care in Africa: the need for careful action.** *Br Med J* 2005, **331:**762–765.
57. Walker L, Gilson L: **"We are bitter but we are satisfied": nurses as street-level bureaucrats in South Africa.** *Soc Sci Med* 2004, **59:**1251–1261.
58. Nimpagaritse M, Bertone MP: **The sudden removal of user fees: the perspective of a frontline manager in Burundi.** *Health Policy Plan* 2011, **26:**63–71.
59. Ridde V: **"The problem of the worst-off is dealt with after all other issues": the equity and health policy implementation gap in Burkina Faso.** *Soc Sci Med* 2008, **66:**1368–1378.
60. Ridde V, Morestin F: **A scoping review of the literature on the abolition of user fees in health care services in Africa.** *Health Policy Plan* 2011, **26:**1–11.
61. Richard F, Antony M, Witter S, Kelley A, Meessen B, Sieleunou I: **Fee exemption for maternal care in Sub-Saharan Africa: a review of 11 countries and lessons for the region.** *Global Health and Governance* 2013, **VI:**53–73.
62. Witter S, Khalid K, Abdel-Rahman M, Hussein R, Saed M: **Removal of user fees for caesareans and under-fives in northern Sudan: a review of policy implementation and effectiveness.** *Int J Health Plann Manag* 2013, **28:**95–120.
63. Witter S, Garshong B, Ridde V: **An exploratory study of the policy process and early implementation of free NHIS coverage for pregnant women in Ghana.** *Int J Equity Health* 2013, **12:**16.
64. Witter S, Dieng T, Mbengue D, Moreira I, De Brouwere V: **The free delivery and caesarean policy in Senegal – how effective and cost-effective has it been?** *Health Policy Plan* 2010, **25:**384–392.
65. Percival V, Sondorp E: **A case study of health sector reform in Kosovo.** *Confl Heal* 2010, **4:**7.

doi:10.1186/1752-1505-8-11
Cite this article as: Bertone *et al.*: A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002–2012. *Conflict and Health* 2014 **8**:11.

7. Exploring HRH remuneration practices at district level

7.1 Preface

In the previous chapter (Chapter 6), I explored the policy-making context and trajectory which led to the emergence of the official HRH policies in post-conflict Sierra Leone, from a central level perspective. In theory, such analysis should be sufficient to present the list and design of the incentives available to primary HWs, which is needed to set the background for the analysis of the HWs remuneration. On this basis, data collection at district level, through a series of key informant interviews, was initially planned with the sole aim to provide general background information useful to complement the analysis of the individual HWs remuneration, for example, by triangulating information on training or campaigns carried out in the district (which would explain an increase in per diem payments), etc. However, during fieldwork in the districts, it became soon evident that there was a substantial gap in the translation of the official HRH policies as designed at central level into HRH practices implemented at local level. In particular, the narratives of the key informants repeatedly touched upon the issue of the interactions between District Health Medical Teams (DHMTs) and health non-governmental organizations (NGOs) present in the districts, reporting the actors' respective perceptions over the process and evidencing the key role that such dynamic interactions played in re-shaping the HRH policy implementation and leading to the emergence of HRH practices.

The present chapter (Chapter 7) presents a research paper which focuses on the implementation of HRH policies and on the processes by which HRH policies are translated into actual practices. It also explores causes and consequences of the discrepancy between HRH policies as designed versus as implemented. A political economy framework is adopted to structure the analysis and to investigate how features relating to the structure (context, historical legacies and institutions) and agency (actors, agendas and power relations) dynamically interact to define the incentives available to HWs. By exploring the HRH practices in the three districts of focus, this chapter provides a useful background, more relevant than the sole analysis of the policy design at central level, before we turn to the individual HWs incentives (Chapters 8-10). It also identifies the district dynamics as a key driver of the variability in incomes that will be found at individual level (Chapter 9), and unravels the mechanisms behind those dynamics. Finally, this understanding will prove essential for the analysis of the factors defining the activities that HWs do, which is carried out in Chapter 10.

7.2 Cover sheet for research paper

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
www.lshtm.ac.uk

Registry
T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

RESEARCH PAPER COVER SHEET

PLEASE NOTE THAT A COVER SHEET MUST BE COMPLETED FOR EACH RESEARCH PAPER INCLUDED IN A THESIS

SECTION A – Student Details

Student	Maria Paola Bertone
Principal Supervisor	Dr Mylene Lagarde
Thesis Title	Exploring the complex remuneration of health workers in Sierra Leone

If the research paper has previously been published please complete Section B. If not, please move to section C

SECTION B – Paper already published

Where was the work published?	Social Science and Medicine		
When was the work published?	July 2015		
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion	N/A		
Have you retained the copyright for the work?*	Yes (see © on the paper, published with open access)	Was the work subject to academic peer review?	Yes

** If yes, please attach evidence of retention. If no, or if the work is being included in its published format, please attach evidence of permission from the copyright holder (publisher or other author) to include this work.*

SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	
Please list the paper's authors in the intended authorship order:	
Stage of publication	

SECTION D – Multi-authored work

For a multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary).	As first author, I designed the study, collected the original data and analysed them choosing the relevant analytical framework. I was responsible of preparing the draft to be submitted and later revised it following comments from the journal's reviewers.

Student signature:  **Date:** _____17/06/2016_____

Supervisor signature: _____  _____ **Date:** _____17/06/2016_____

Social Science & Medicine 141 (2015) 56–63

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone

Maria Paola Bertone [a, *], Sophie Witter [b]

[a] ReBUILD Consortium, Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK
[b] ReBUILD Consortium, IIHD, Queen Margaret University, Edinburgh, UK

ARTICLE INFO

Article history:
Received 24 November 2014
Received in revised form
26 June 2015
Accepted 25 July 2015
Available online 29 July 2015

Keywords:
Implementation
Political economy
District health medical teams
NGOs
Human resources for health
Sierra Leone

ABSTRACT

The need for evidence-based practice calls for research focussing not only on the effectiveness of interventions and their translation into policies, but also on implementation processes and the factors influencing them, in particular for complex health system policies. In this paper, we use the lens of one of the health system's 'building blocks', human resources for health (HRH), to examine the implementation of official policies on HRH incentives and the emergence of informal practices in three districts of Sierra Leone. Our mixed-methods research draws mostly from 18 key informant interviews at district level. Data are organised using a political economy framework which focuses on the dynamic interactions between structure (context, historical legacies, institutions) and agency (actors, agendas, power relations) to show how these elements affect the HRH incentive practices in each district. It appears that the official policies are re-shaped both by implementation challenges and by informal practices emerging at local level as the result of the district-level dynamics and negotiations between District Health Management Teams (DHMTs) and nongovernmental organisations (NGOs). Emerging informal practices take the form of selective supervision, salary supplementations and per diems paid to health workers, and aim to ensure a better fit between the actors' agendas and the incentive package. Importantly, the negotiations which shape such practices are characterised by a substantial asymmetry of power between DHMTs and NGOs. In conclusion, our findings reveal the influence of NGOs on the HRH incentive package and highlight the need to empower DHMTs to limit the discrepancy between policies defined at central level and practices in the districts, and to reduce inequalities in health worker remuneration across districts. For Sierra Leone, these findings are now more relevant than ever as new players enter the stage at district level, as part of the Ebola response and post-Ebola reconstruction.

1. Introduction

In recent years, there has been increasing attention paid to the need for evidence-based practice to improve health outcomes worldwide (Pang et al., 2003). Research has focused on identifying which policies work, but has also explored the processes by which knowledge is translated to highlight potential bottlenecks for evidence-based policy (Oliver et al., 2014). While a growing literature exists to explore the use of evidence in policy-making, there is limited knowledge on how policies can be successfully translated into effective practices. However, several studies (Chaudoir et al., 2013; Durlak and DuPre, 2008) confirm that implementation does influence the outcomes of an intervention and highlight the importance of understanding which factors affect implementation by looking at elements both in the context outside the organisation of focus and within the cultural and management features of the organisation. The importance of filling the knowledge gap seems even more relevant for complex health system interventions, where the wider context can play a major role in influencing the outcome of the policies. It is therefore essential to look beyond policy-making to reflect on actual practices, and on how, by whom, and why policies are potentially reshaped in the translation process.

In this paper, we aim to analyse how features relating to the context (structure) and the actors (agency) in three districts in Sierra Leone influence the implementation of health workers' incentive policies and define HRH practices at local level. Our

* Corresponding author. 15-17 Tavistock Place, London WC1H 9SH, UK.
E-mail address: maria.bertone@lshtm.ac.uk (M.P. Bertone).

http://dx.doi.org/10.1016/j.socscimed.2015.07.028

research question focuses on if and how the local political economy features and dynamics, and in particular the interactions between District Health Management Teams (DHMTs) and nongovernmental organisations (NGOs), may have effects which contribute to shape incentives for health workers in public facilities and, thus, the functioning of the local health systems. Our focus is not on a specific intervention, but broadly on HRH incentives, including the official policies in place to regulate the incentive package for public health workers, as well as the actual practices that influence the financial and non-financial incentives effectively available for those health workers. We believe that HRH incentive issues make a useful case study to reflect on how deeply structural and agency features can influence local-level practices in a key area, such as HRH. In order to analyse the translation process at local level, we adopt a political economy framework. The framework allows us to explore the policy implementation, going beyond a static view of one organisation (usually the DHMT), to look at the dynamics between the layers of the structural context and the multiple actors and organisations that shape practices and define the incentive package differently in each district.

This research was conducted just before the Ebola virus epidemic started in Sierra Leone, in May 2014. Our findings highlight some of the factors that may have played a role in the collapse of the health system, as we point to in the concluding section. Moreover, our research contributes to the reflection on the consequences of the changing local dynamics as new players enter the stage at district level as part of the Ebola response and post-Ebola reconstruction, of which HRH incentive practices are an essential component.

2. Context

Sierra Leone is a West African country of 6 million people, with a GDP per capita of 613 USD in 2012 (IMF, 2013). Between 1991 and 2002, the country was ravaged by a civil war which left the public health system in ruins (Gberie, 2005). Over the last decade, Sierra Leone's health system underwent a process of reconstruction and reform. However, the Demographic and Health Survey (DHS) for the 2008–2013 period finds that maternal mortality remains high at 1165 deaths per 100,000 live births, while under-five mortality is estimated at 156 per 1000 live births (SSL & ICF International, 2014). In terms of health workforce, in 2011 there were an estimated 0.0071 doctors and 0.0631 nurses per 10,000 people in the public sector (Wurie et al., 2014). The distribution of health workers remains inequitable with major imbalances between rural and urban areas, and health workers attraction, retention and motivation are a challenge (Witter et al., 2015).

We analysed elsewhere the trajectory and drivers of HRH policy-making in the post-conflict period (Bertone et al., 2014). It emerged that the launch of the Free Health Care Initiative (FHCI) in 2010 provided the momentum for the approval of a series of HRH reforms, which included a substantial salary uplift for all technical staff of the Ministry of Health and Sanitation (MoHS), and the cleaning of the MoHS payroll to eliminate 'ghost workers' and add those working as 'volunteers'. The HRH reform process continued with the introduction of a Performance-based Financing (PBF) scheme in 2011 (which includes a staff bonus) and a Remote Allowance for health workers based in rural areas, in 2012. In parallel to their support to the design, and in some cases the funding, of these reforms, certain donors and NGOs adopted measures to ensure the alignment and rationalisation of the health workers' incentive package. In particular, the World Bank and Global Fund abolished supplementary payments to health workers in charge of HIV/AIDS services. However, despite the relative success of the decision-making process and the design of reforms, their implementation remained filled with challenges (Witter et al., 2015).

3. Methods

The present research was undertaken in the districts of Kenema, Bo and Moyamba (Fig. 1), which were purposefully selected to maximize differences in poverty, urbanisation, type and remoteness of facilities, as well as number of NGOs.

This paper draws on a series of key informant interviews at district level (n = 18), carried out in September–November 2013. The interviews aimed to be as comprehensive as possible of actors at local level, including DHMTs, as well as donors and local and international NGOs' staff (Fig. 2). One NGO in Bo was not included as not available for interviewing at district level, although some information was collected from its representative at central level and from secondary sources, and triangulated during interviews with other actors in Bo. Moreover, key actors such as Members of Parliament and politicians, civil society members and representatives of Local Councils, who have some authority over health issues under the on-going decentralisation process, were not interviewed, nor have we included in the analysis private and informal providers of healthcare which also influence the incentives in the public system (Ensor and Witter, 2001). This is due to the fact that initially key informant interviews aimed solely at providing a background to the broader research, focused on health workers at individual level. However, the interactions between DHMTs and NGOs became such a relevant and recurring theme that it was later developed into a specific research question. The omission of actors external to the health system and non-public providers is a major limitation of our work.

The key informant interviews at district level are embedded in a larger mixed-methods research, which aims to investigate the health workers' 'complex remuneration' by quantifying their overall income and exploring the consequences of income levels and fragmentation. The broader research makes use of other data. A longitudinal survey was carried out to collect information on revenues (salary, remote allowance and PBF, as well as per diems and salary top-ups, and informal incomes) for 266 primary healthcare workers (90 in Kenema, 96 in Bo, 80 in Moyamba). The research also involved prolonged fieldwork (September 2013–May 2014), a series of in-depth interviews with health workers (n = 39–13 in Kenema, 12 in Bo, 14 in Moyamba), as well as an earlier documentary review and 23 key informant interviews at central level. Although this study relies mostly on key informant interviews at district level, the other sources of information were important to inform the analysis. For example, preliminary results from the health workers survey are included to support the findings from key informant interviews. Ethical clearance for all research components was obtained from the London School of Hygiene and Tropical Medicine and the Sierra Leone Ethics and Scientific Review Committee.

In order to map the emerging elements and themes, the analysis makes use of a political economy framework. This framework is based on that proposed by Harris (2013), but slightly adapted to take into consideration the fact that this research is not driven by a pre-identified problem, but is rather exploratory in scope (Fig. 3).

Two main areas are identified as the subject of analysis – on the one hand, the *structural features* which include the historical, cultural, geographical context and the relevant 'rules of the game' (institutions), such as policies, regulations and social norms; on the other, the *agency features* relating to the main actors, their interests, incentives and relations of power, and the analytical concepts that may explain actors' decision logics and behaviours. In particular, as analytical concept, we apply 'agency theory', which describes a

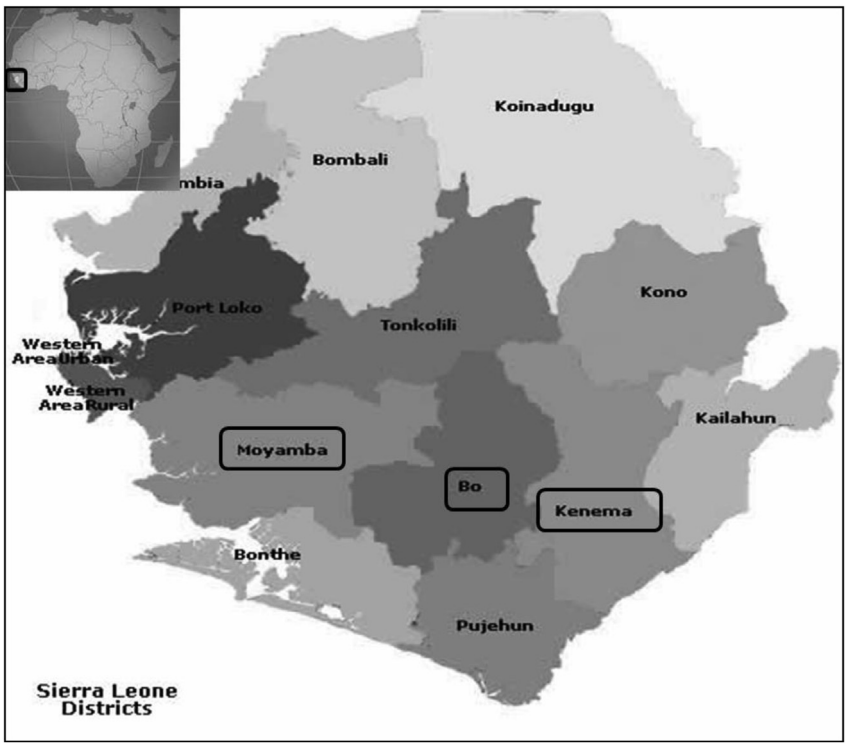


Fig. 1. Maps of Sierra Leone's districts.

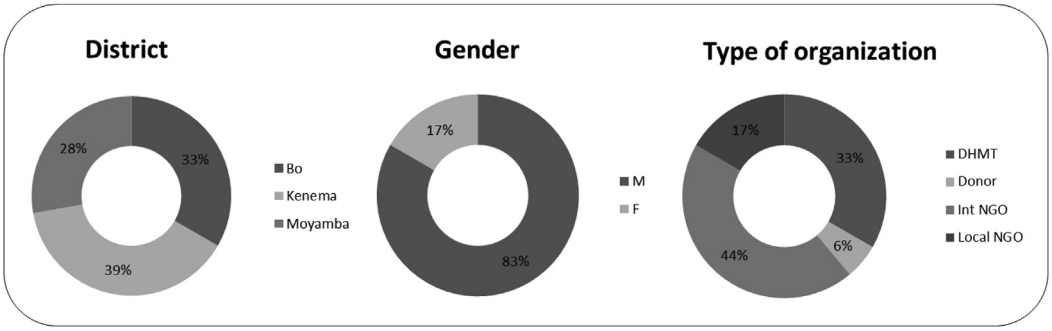


Fig. 2. Summary of characteristics of key informants at district level (n = 18).

situation where someone (principal) delegates a task to another person (agent). The principal typically faces problems in controlling the agent, as (i) the agent's interest may differ from the principal's, and (ii) the agent has better information than the principal on her actions (Kiser, 1999). In economic theory, to minimise these issues, a monitoring system and/or the alignment of incentives are needed (Eisenhardt, 1989). Sociological and management theories deal with more complicated situations as they loosen assumptions allowing for multiple principals, multiple agents (which leads to 'collective action problems'), as well as multiple interests of both principals and agents – for example, agents may not be necessarily self-interested, utility maximisers (which leads to 'stewardship theory' (Perrow, 1986)). In our analysis, we will find two interrelated sets of principal–agent relations, each ridden with its specific problems. Some of the dimensions indicated in the framework (e.g., cultural, social, geopolitical factors, climate change, technology) are relatively little explored as our focus rest on the health sector-specific dynamics.

4. Findings

4.1. Structural features and context

Despite their proximity and the fact that they are all predominantly Mende in ethnic composition, the three districts are rather different for historical legacies and contextual features, including socio-economic and health indicators (Table 1). Kenema is a fairly large district with vast rural areas, although Kenema Town is the third city of Sierra Leone. Some of the diamond mining areas are located in Kenema and the district was severely affected by the conflict, with destruction of infrastructure and population displacement. Bo is the second city of Sierra Leone and the most urban and least poor district among the three (WB & SSL, 2013). During the war, internally displaced people (IDP) camps were set up and Bo witnessed the presence of health NGOs (one of which still operating) engaged in directly providing health services to those populations. Moyamba is the most rural and poorest district among the three (second poorest in Sierra Leone) (WB & SSL, 2013).

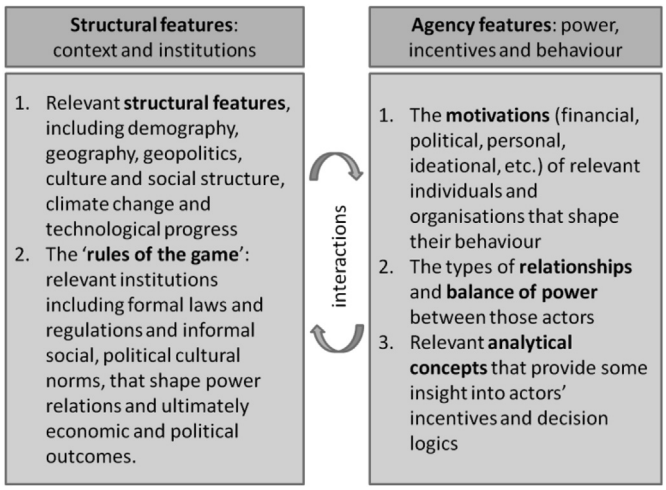


Fig. 3. Analytical framework to explore the political economy dynamics at local level. Source: Adapted from Harris (2013).

In all three districts, the local health system is organized in a pyramidal way with a district hospital (and a second NGO-run hospital in Bo – see below) and three types of primary-level facilities (Peripheral Health Units – PHUs).

4.2. Relevant formal institutions

Institutions are "the 'rules of the game' in a society or, more formally, are the humanly devised constraints that shape human interaction" (North, 1990: p.3). They can be formal, such as laws and regulations, and informal, i.e., accepted and stabilized political, social and cultural practices, such as 'patronage' or the practice of 'tipping'. For HRH in Sierra Leone, in spite of the on-going decentralisation process, formal institutions are mostly set at central level and apply uniformly across districts. The institutional framework to regulate HRH issues is delineated in the *Human Resource for Health Policy* and *Human Resource for Health Strategic Plan 2012–2016*. However, our research highlights discrepancies between centrally-defined policies and practices on the ground as it reveals that formal institutions (i.e., official policies) defining the HRH incentive structure are re-shaped both by implementation challenges common to the three districts, and by informal HRH incentive practices at local level. Below we describe the implementation challenges first, then the district-specific actors, before exploring the dynamics between them and the informal practices that emerge.

HRH reforms described in the context section have been implemented in a very centralized way. Salary uplift and payroll updating were managed by the Office of the Payroll within the MoHS. Little HRH management is performed at district level, although in theory it is a function that has been devolved to Councils and DHMTs. The DHMTs are responsible for the deployment of health workers within their district, but HRH management is not performed systematically as no staff within the DHMT is specifically in charge of HRH. DHMTs have no control over other HRH issues, including the skill mix of the staff they are allocated, career progression and payment. Meanwhile, the payroll in Freetown is increasingly imprecise and our survey found that 15% of the sampled health workers are not paid. At the same time, the PBF scheme's external verification, carried out in April 2014, reports delays of more than one year in payment of PBF bonuses (Cordaid, 2014). As a consequence, health workers have no insight into the relation between performance and payment. Internal verification of PBF indicators is supposedly done quarterly and jointly by DHMT and Local Councils. In practice, only one third of Councils is involved (Cordaid, 2014), while DHMTs face numerous logistic and time challenges to carrying it out regularly. As a result, the verification process is weak and the external verification found figures between 12% and 73% different to those of the internal one (Cordaid, 2014). As for the remote allowance, most respondents were unaware of its existence altogether or of the ways it works. Cross-checking between survey, health workers' interviews and key informant interviews, it emerges that payments were delayed since mid-2012 (soon after its beginning) because of cash-flow issues, and they stopped by the end of 2012.

This description highlights the challenges in the implementation of the official HRH policies, which are related to operational issues at central level, and in particular the slowness in administrative procedures, funding gaps and cash-flow problems. However, the general narrative from actors at central level remains one of 'success' of the FHCI and related reforms (Witter et al., 2015). On the other hand, for actors operating at local level, the implementation failures and the detachment of policy-makers from the reality of the field are a cause of frustration:

> "The real key issue is that with all of these policies and all of these strategies, none of them have been properly operationalised and none of them have stayed around. Like, in 2002, there was a free health care policy announced for pregnant women, lactating mothers, under 5, the elderly, disabled, all this, right, and then it just didn't happen. So free health care is announced again in 2010, and it's like, OK, it's happening, but is that going to slowly start to fall apart? If PBF is announced, it's like, oh it comes and then it stops, you know." (international NGO).

As formal institutions fail (and are expected to fail), informal institutions and practices emerge at local level. We introduce below the main actors present at local level, their objectives and relationships, before turning to the informal institutions.

Table 1
Summary of basic socio-economic, demographic and health system information for the three districts.

District	Area (Km^2)	Population (World Pop, n.d.)[a]	Poverty headcount (WB & SSL, 2013)[b]	Rural HH (WB & SSL, 2013)[b]	Num. Of PHUs (MoHS)	Average remoteness of PHUs[c] (health worker survey)	Tot num. Of health workers (MoHS 2013 – DHTM, hospital and PHU staff)	Deliveries in a health facility (SSL & ICF International, 2014)	Under 5 mortality (deaths per 1000 live births) (SSL & ICF International, 2014)	Nutrition (children under 5 years who are stunted) (SSL & ICF International, 2014)
Kenema	6053	569,300	62%	59%	116	2.01	1134	77%	224	39%
Bo	5219	524,500	51%	55%	131	1.74	908	72%	173	45%
Moyamba	6902	320,900	71%	92%	99	2.66	346	33%	199	34%

[a] Projections for 2010 based on 2004 census.
[b] Data from Sierra Leone Integrated Household Survey 2011
[c] Scale from 0 (urban) to 4 – facilities included are a random sample of all PHUs in the district.

4.3. Main actors at district level, their activities and agendas

In Kenema, a few local and two main international NGOs operate in the health sector. One of these, a large humanitarian NGO, has a holistic focus on the health sector and operates in three war-affected districts (including Kenema) since the end of the conflict. At the time of the research, its health activities were enacted through the support to the public health system, covering all 121 Peripheral Health Units (PHUs) in the district and focussing in particular on Maternal and Child Health (MCH). The NGO is recognised by the DHMT and other NGOs as the "driving force" in the district (key informant – international NGO). Its activities include provision of extra drugs and equipment for MCH, beyond those distributed under the FHCI, support to communication and referral system, including an ambulance for MCH emergencies. Looking specifically at HRH, the NGO provides training, which entails per diem payments to health workers, as well as supervision and coaching to PHU staff through monthly visits (the DHMT only visits facilities every quarter), which are focused on the same indicators and checklist of the PBF scheme. The NGO used to provide a salary supplementation to health workers employed in the public PHUs, but ended this practice once the PBF scheme was introduced to avoid the duplication (key informant – international NGO). However, the NGO still provides a monthly lump-sum payment to DHMT, Council and Hospital staff who do not receive PBF payments, as well as in-kind support for DHMT activities, such as vehicles, fuel, etc. for supervision and PBF verification.

In Bo, the context is more fragmented as several NGOs have divided up their activities roughly based on a geographical repartition of the chiefdoms, although not all PHUs receive external support. One international NGO with a humanitarian mission is present, but was phasing-out its activities. It still runs a hospital at the site of an IDP camp during the conflict where it provides clinical services, and, while it used to include 110 facilities, it now supports only a few public PHUs with drugs and equipment, and an ambulance referral system. The health worker survey revealed that this NGO is one of the few which still provides a salary supplement of about 5–6% of the monthly salary to public health workers in the supported PHUs. This payment has consequences for the DHMT's ability to regulate the distribution of staff, as some health workers refuse to move away from PHUs with where incentives (key informant – DHMT). There are two other main NGOs in Bo, an international and a local one. They both focus on MCH activities and provide rehabilitation of infrastructure, equipment and drugs, ambulance for referral, and mobile phones for communication to some of the PHUs in the district. In terms of HRH activities, while they both provide training and related per diems to the health workers, none pays supplementary incentives. While the first NGO admits not to be able to carry regular supervisions, the second, which only supports 13 facilities, is able to provide supervision and coaching, which also aims to "equip PHUs so they get more PBF money" (key informant – local NGO).

Finally, in Moyamba there are two main international NGOs in the health sector, both focussing exclusively on nutrition, and supporting 49 and 40 public PHUs respectively with overlaps in some facilities. Both NGOs visit the public PHUs either monthly or twice a month (while the DHMT reports to be visiting facilities quarterly), but only on 'feeding days' in order to supervise those activities. Joint NGO-DHMT supervisions also focus only on nutrition services. There are no external actors supporting MCH activities and therefore PHUs receive no (extra) drugs or equipment, and staff has little MCH supervision, training and no other payments from external organisations.

Overall, the distribution of the NGOs between districts seems to be defined by historical legacies and patterns which emerged immediately post-conflict, with large humanitarian NGOs established in the conflict-afflicted districts of Kenema and Bo, and the relatively recent NGO presence in Moyamba. Additionally, the choice of focal activities and operational approaches seems to be based on the NGO's own missions rather than on local health priorities and needs.

4.4. Relationships and balance of power

Relations between actors at district level are negotiated through various committees, as well as bilateral meetings between the DHMT and each NGO. Officially, DHMTs are required to chair the District Health Coordination Meeting (DHCC) which is supposed to meet quarterly and is the main coordination forum, including the DHMT, the Local Council and all health partners. In Kenema, the DHCC appears to be meeting regularly, but one key informant (DHMT) reports that this was not the case for the previous one or two years. While in Bo the DHCC is reported to meet regularly, in Moyamba it seems to have happened rarely, if ever. Other committees may be created *ad hoc* for different reasons, including addressing donor's requirements. For example, in Kenema, an NGO reported that another 'stakeholder meeting' is held quarterly and explained that:

> "The stakeholder meeting, we wanted it because it is in our proposal to meet with district partners, whilst the DHCC is theirs [of the DHMT]. But it is almost just like the same thing; but the key difference is, ehm, this [stakeholder meeting] is mainly [NGO] kind of programme focusing on reproductive health issues. But the DHCC now is [focused on] all health things and matters" (international NGO).

In other cases, NGOs prefer to hold bilateral meetings with the DHMTs. In Moyamba, for example, the two main NGOs, although both working on nutrition issues, prefer to address their concerns directly with the DHMT rather than in multilateral meetings (key informant – international NGO).

These interactions through bilateral meetings or committees are clearly characterized by a substantial asymmetry of power, both regarding financial resources as well as access to information between the parties. On the one hand, DHMTs struggle to ensure the coordination of activities to avoid duplications and balance priorities and they have no lever to enforce it when NGOs are not willing to engage. As they chronically lack funds even for tasks that they are mandated to carry out by the MoHS (e.g., routine supervision, PBF verification, etc.), they have to rely on NGOs for support. As one DHMT staff stated:

> "[…] at the end of the day, who pays the bride price calls for the tune. […] They have their own priorities. [So] at times, as head of the district, you need to strike the balance, because the NGO world is a very powerful world […], so our own duty is to see where you can tap into their resources" (DHMT).

On the other hand, depending on their approach or their donors' requirements, NGOs either seek to align with DHMT and MoHS policy or need, at least formally, the official support of the DHMT for their activities. Providing the DHMT with in-kind donations (vehicles, motorbikes, fuel, communication means, etc.) or cash allowances to support its tasks, or at least those that match the NGO's objectives and scope (geographical, disease-wise, mission–wise, etc.), becomes a bargaining tool to ensure the smooth running of both NGO and DHMT activities. In this 'bargaining', DHMTs have varying levels of oversight over the amount and timing of funding

and donations, as budgets are usually not shared or known in advance by NGOs:

> "Even with our yearly planning, you ask them [NGOs] for their own budget, what they plan to do, and it is very, very difficult to get it from them" (DHMT).

The result of the differences in objectives, resources and power is an 'unbalanced' mutual dependency between DHMTs and NGOs, which often leads to frustration on both sides.

4.5. Relevant analytical concepts to explore actors' incentives and decision logics

To analyse these dynamics and the logic behind actors' behaviours (the last element of our framework), we found helpful to explore elements of agency theory delineated above. While DHMTs and NGOs are co-dependent for the implementation of activities, they are not tied together in a principal–agent relation. Instead, they act (at least, in theory) as agents for two different principals, the MoHS and the funders/donors, respectively. Not only do the usual agency problems apply to both cases, but for the case of international NGOs an ample literature exists on the challenges presented by multiple principals and accountabilities, 'steward' behaviour coupled with financial, material pressures, and competitive incentives resulting in collective action problems (Cooley and Ron, 2002; Edwards and Hulme, 1996). Moreover, although all principals should share the same overall objectives and approaches, in reality these are slightly different, at least in the way they are operationalised. This results in differences between the two sets of principals and agents, for example, in activity focus (specific diseases/conditions versus system approach), geographical targeting, long versus short-term planning and budgeting, quantity of activities carried out versus quality, willingness to coordinate, etc. Moreover, objectives and incentives of NGOs and DHMTs are not perfectly aligned. For instance, some NGOs are rewarded to reach a large number of beneficiaries, a target which is not only difficult to measure, but also does not take into account quality issues and the specific features of the context, including the need to avoid duplication with other NGOs. Some NGOs may be required to coordinate with the DHMT and work in partnership, but the practice is rather unbalanced, as we showed, given the absence of common planning and budgeting tools. In other cases, especially if funded with own resources, NGOs have little reason to coordinate with DHTMs. In conclusion, the misalignment of agendas and incentives of DHMTs and NGOs, who are accountable to different principals, is reflected in their bargaining dynamics and objectives. In turn, the bargain shapes local-level practices, including HRH incentives.

4.6. Informal institutions and HRH incentive practices at local level

Because formal institutions defining HRH incentives partially fail when implemented or are expected to fail and, at the same time, district-level actors continuously negotiate to achieve their objectives, a set of informal institutions (i.e., established and stable practices) emerge at local level. In the case of HRH incentives, informal institutions take the form of selective supervisions and support to some programs (e.g., PBF), as well as salary supplementations and per diems paid to individual workers to provide extra remunerations beyond those officially set. Salary supplementations and per diems have received attention in the health literature, mostly for their disruptive effect. Specifically, salary supplementations are discussed in relation to vertical disease-focused programmes because of their potential to create parallel systems (Brugha et al., 2010; Hanson, 2012; Mussa et al., 2013). Per diems have been explored as 'corrupt' practices, with perverse consequences for the health system's performance and governance (Chene, 2009; Ridde, 2010; Vian et al., 2013).

At district level, informal HRH incentive practices have a key function as they are used to achieve a better fit between the health workers' incentive package and the NGOs' objectives and agendas. Because of this, they are defined by the district-level actors' motivations, resources and approaches, mediated by the negotiation processes with the other actors, including the DHMT. Indeed, our analysis shows that different local dynamics produce differential HRH practices, influencing financial and non-financial incentives. Provision of equipment and drugs, rehabilitation, and selective supervision and coaching can act as non-financial incentives, improving the working environment and motivating those health workers deployed where such support is in place and for the programmes/activities which have been selected. Moreover, access to drugs can be a powerful financial incentive for health workers if there is room for misappropriation and informal sale. Finally, such support can also entail a potential increase in PBF revenues, per diems and top-ups. Based on the survey data, we observed a variation between individual health worker remuneration across districts (although there are limitations to this analysis because sampling was representative of the entirety of PHUs in each district, regardless of the proportion of those supported by the different NGOs and because of other confounding factors), Table 2 provides preliminary evidence of the impact of local-level dynamics on individual health workers' incomes. While the difference in salaries is non-significant across districts, in Kenema, the long-term presence of a large NGO, working closely with the DHMT, and expanding its coverage over time to include all PHUs with a clear focus on MCH activities results, at individual level, in higher income from PBF, whose indicators focus only on MCH, and higher per diems. In Bo, the fragmentation of the support, with many PHUs not covered by external organisations, results in substantially lower incomes compared to Kenema both for PBF individual bonuses and per diems. In Moyamba, where almost all PHUs are covered by NGOs with a focus on nutrition, the picture is mixed, with the lowest income levels from per diems, and PBF bonuses substantially lower than in Kenema but higher than Bo. Ultimately, the different levels of revenue for each component are reflected in the total income for health workers, which is found to be unequal across districts.

5. Discussion

The analysis of the district-level dynamics shows the effects of the interplay between structure (i.e., context, historical legacies and formal and informal institutions) and agency (actors, agendas and power relations) on HRH incentives. The 'bargaining' process between actors at local level and the informal practices it creates can modify, substantially in some cases, the individual health workers' incentive package. The result is a discrepancy between official HRH incentive policies and actual practices.

The role of NGOs at district level emerges as one of the driving factors in shaping HRH incentives. Similarly, Pfeiffer (2003) describes the model of collaboration between international NGOs and primary healthcare in Mozambique. Although the focus is at individual level (expatriate personnel and their local counterparts) and on the social dynamics rather than political economy ones, he finds that official coordination coexists with behind-the-scenes dealmaking which "hinged on the provision of extra financial benefits to health workers in a new aid-specific patronage system" (Pfeiffer, 2003: p.732). In his ethnography of an aid project, Mosse (2004: p.639) describes how development practices are "driven by a multilayered complex of relationships and the culture of organizations

Table 2
Average income of PHU staff from selected sources and total monthly income in the three districts (Leones).

District	Income from PBF			Income from per diems			Income from salary			Total income (incl. All sources of revenue)		
	Mean	[95% conf int]		Mean	[95% conf int]		Mean	[95% conf int]		Mean	[95% conf int]	
Kenema	102,392	79,387	125,398	207,722	160,331	255,114	491,276	445,702	536,851	849,903	763,069	936,737
Bo	57,112	40,258	73,966	134,132	91,974	176,289	516,984	467,925	566,044	786,986	694,985	878,986
Moyamba	92,985	72,196	113,773	109,966	85,512	134,421	484,913	444,007	525,819	719,854	653,579	786,130

Note: 1 USD = 4270 Leones (October 2013).

rather than policy". At the same time, "actors work hardest of all to maintain coherent representations of their actions as instances of authorized policy, because it is always in their interest to do so" (Mosse, 2004: p.639). Our cases highlight a similar pattern. The district-specific context and dynamics shape HRH practices and reshape the health workers' incentive package defined at central level in different ways, while most NGOs strive to maintain a narrative of alignment and harmonization with national policies and DHMTs. On the other hand, though, NGOs are also accountable to their funders. Often donors do not reward coordination (Pfeiffer, 2003) – or if they do (as in our case in Kenema, in line with Mosse's point), they impose coordination as a box to tick with the creation of a new 'inclusive' committee rather than by strengthening existing structures. The lack of coordination, combined with the unbalanced mutual dependency between NGOs and DHMTs, is a cause of constant frustration, as recounted by our key informants and described in other studies (Gilson et al., 1994).

Coordination of the 'unruly mélange' of external actors has long been recommended (Buse and Walt, 1997). Most NGOs are aware of this issue and some have signed a Code of Conduct (Health Alliance International, 2008). Tellingly, three articles out of the six which compose the Code refer to HRH practices, including hiring, remuneration and in-service training. However, such calls do not seem to be sufficient, if not accompanied at national level by strengthened effort for coordination between 'principals' to ensure alignment of incentives, and by the explicit consideration of the existence of local-level practices. At the other end of the 'bargaining' process, the role of the DHMT as agent for the MoH should be also carefully considered, as it is central for stewardship, coordination and priority-setting at district level. Since the Harare Declaration of 1987, the role of the Health District as a key agent for the functioning of health systems and the delivery of primary health care has been stressed, with the recommendation to decentralise financial and HRH management, and adopt district planning processes (CoP Health Service Delivery, 2013). DHMTs have also been at the centre of attention for their governance role to ensure accountability both upward, i.e. towards higher-level health administration agencies and the MoH, and downward, i.e. towards the communities they serve (Cleary et al., 2013; Van Belle and Mayhew, 2014). However, Van Belle and Mayhew (2014) note how "constrained decision-spaces, inadequate resources and capacity hamper public accountability practices" of DHTMs, while other studies highlight the prevalence of informal practices in HRH management, because of the lack of power, resources and institutional incentives to enforce formal rules (George, 2009).

In light of our findings, it seems essential to empower DHMTs with tools to redress the power imbalances between them and the external actors at local level, in order to create a more effective and balanced 'mutual dependency'. These tools include transparency in budgeting and planning processes, increased financial and human resources, improved skills and capacity, widened decision-spaces, and openly shared objectives and agendas. The current planning process in Sierra Leone envisages a bottom-up approach with the preparation of district plans which should feed into a national plan. However, the preparation of district plans appears to the DHMTs themselves a formal exercise based on pre-set and unrealistic items, rather than an essential and locally-adapted tool. The result is a wish-list of activities for which there is unsecure funding, given the meagre DHMT resources and the unknown or unpredictable NGOs activities and budgets (key informant—DHMT). In contrast, realistic and contextualized planning, budgeting and reporting should be strengthened under the DHMT leadership so that it would (i) define in advance a plan of activities and tasks, based on the nationally-defined health priorities (rather than NGO/donor-specific ones), adapted to the local context. Such plan should leave enough room for flexibility and adaptation to the evolving context and potential stressors or emergencies (such as the Ebola outbreak); (ii) identify those responsible to carry activities out and when; and (iii) include all resources available, from internal and external sources, in a transparent and predictable manner. The latter could be done through district-level 'basket funds', pooling resources available and envisaging a funding mechanism linked to the accomplishment of each task, which would hold actors accountable for their performance under the same contractual framework. While this process would dramatically reduce the influence of external partners, with reference to our HRH case, it would, in parallel, improve the alignment of HRH practices to the nationally-defined incentive package, eliminating the room for extra salary supplementation and differential support to national policies, and standardizing per diem payments. Limiting the unbalanced bargaining processes at local level would not only create a more equal partnership between actors in the local health system, which could benefit HRH and other practices (including priority-setting and service delivery), but could also improve governance at local level and ensure the responsiveness and accountability of DHMTs towards communities, civil society and patients alike.

From a methodological perspective, these findings stress the importance of looking at both structural and agency factors (related to multiple internal and external organisations), and exploring their variation across contexts. If policy is political, implementation is no less so (Morgan-Trimmer, 2014). This calls for the use of tools that allow a closer look into the political economy to unravel them in research programs, and to take them openly into consideration when implementing programs (Brinkerhoff and Bossert, 2013; Erasmus and Gilson, 2008). This analysis also shows that qualitative tools and a flexible political economy framework incorporating elements of institutional economics can be useful to illuminate these dynamics.

6. Conclusions

Our analysis looked at what happens in three districts of Sierra Leone when HRH incentive policies established at central level are translated into practice. We presented not only the formal institutions defining the incentive package and how effectively (or not) they are implemented at local level, but also analysed the informal institutions and practices that emerged as the outcome of the 'bargaining' process between the local health actors. We have shown how the political economy dynamics between those actors define incentives with effects that ultimately extend to the

individual health workers. Moreover, the comparison of the three districts shows how differences in contexts and actors lead to different HRH practices. The consequence is a discrepancy between policy and practice, and inequalities across areas of the country.

Some scholars conclude that this discrepancy is intrinsic and unavoidable (Mosse, 2004). We believe that it is possible to go beyond this, if key actors at central level (government, MoH and development partners) and at district level (local councils, DHMTs, local and international NGOs) remain aware of these dynamics and ensure that they are channelled in a way that, as much as possible, contributes to the reinforcement of the health system. A more careful attention to the role of DHMTs and NGOs as local health actors, as well as the balance of powers between them within a bargaining process turned into open and transparent planning, may improve policy implementation. Moreover, research focussing on the evaluation of interventions and their implementation must carefully investigate these dynamics and adopt tools that allow for their exploration.

In the current context of the Ebola virus epidemic afflicting Sierra Leone, our findings are particularly relevant. Indeed, some of the weaknesses we highlighted may have played a role in the collapse of health services induced by the outbreak. For instance, the disconnect between central authorities and districts, the poor provision of central support functions, the narrow mandates of NGOs, and the rigid incentives related to pre-determined results may have reduced the responsiveness and resilience of the local health systems in the face of the Ebola challenge. Some scholars have hinted at the heavy NGO involvement in healthcare in Sierra Leone and Liberia as one of the reasons for the delay in the control of the epidemic, because it removed from local governments the responsibility of coordinating a single healthcare policy and because of the lack of investment at the meso-level of health administration (Abramowitz, 2014). As this analysis illuminates the political economy dynamics that were shaped in the post-conflict period, their legacies and impact on local practices, it can also provide useful insights for the post-Ebola transition and health system reconstruction.

Acknowledgments

Since May 2014 Sierra Leone is battling an unprecedented outbreak of Ebola Virus Disease. Many of the health workers, DHMT and NGO staff interviewed for this paper are in the frontline of the fight against the outbreak. To them go all our thoughts and appreciation, beyond the thanks for agreeing to participate in this research. Thanks to Luisa Enria for key references, to the participants in the ITM seminar and, in particular, our discussant Sara Van Belle for insightful feedback, and to our anonymous reviewers for their constructive comments. We gratefully acknowledge funding from the Fondation AEDES (http://www.fondation-aedes.org/) for MPB's PhD scholarship and from DfID-funded ReBUILD Research Consortium (http://www.rebuildconsortium.com) for fieldwork activities.

References

Abramowitz, S.A., 2014. How the Liberian health sector became a vector for Ebola. Cult. Anthropol. Online (Fieldsights – Hot Spots). Available online: http://www.culanth.org/fieldsights/598-how-the-liberian-health-sector-became-a-vector-for-ebola.

Bertone, M.P., Samai, M., Edem-Hotah, J., Witter, S., 2014. A window of opportunity for reform in post-conflict settings? the case of Human Resources for Health policies in Sierra Leone, 2002–2012. Confl. Health 8 (11).

Brinkerhoff, D.W., Bossert, T.J., 2013. Health governance: principal-agent linkages and health system strengthening. Health Policy Plan. 29 (6), 685–693.

Brugha, R., Kadzandira, J., Simbaya, J., Dicker, P., Mwapasa, V., Walsh, A., 2010. Health workforce responses to global health initiatives funding: a comparison of Malawi and Zambia. Hum. Resour. Health 8 (19).

Buse, K., Walt, G., 1997. An unruly mélange? coordinating external resources to the health sector: a review. Soc. Sci. Med. 45 (3), 449–463.

Chaudoir, S.R., Dugan, A.G., Barr, C.H.I., 2013. Measuring factors affecting implementation of health innovations: a systematic review of structural, organizational, provider, patient, and innovation level measures. Implement. Sci. 8 (22).

Chene, M., 2009. Low Salaries, the Culture of Per Diems and Corruption. Michelsen Institute – U4 Anti-Corruption Resource Centre, Bergen: Chr.

Cleary, S.M., Molyneux, S., Gilson, L., 2013. Resources, attitudes and culture: an understanding of the factors that influence the functioning of accountability mechanisms in primary health care settings. BMC Health Serv. Res. 13 (320).

Cooley, A., Ron, J., 2002. The NGO scramble: organizational insecurity and the political economy of transnational actors. Int. Secur. 27 (1).

CoP Health Service Delivery, 2013. Renewing health districts for advancing universal health coverage in Africa. In: Dakar: CoP Health Service Delivery – Report of the Regional Conference "Health Districts in Africa: Progress and Perspectives 25 Years after the Harare Declaration.".

Cordaid, 2014. Performance Based Financing in Healthcare in Sierra Leone. External Verification – Final Report. In: Freetown and the Hague: Cordaid, vol. 1 (unpublished report).

Durlak, J.A., DuPre, E.P., 2008. Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. Am. J. Community Psychol. 41 (3–4), 327–350.

Edwards, M., Hulme, D., 1996. Too close for comfort? the impact of Official Aid on Nongovernmental Organizations. World Dev. 24 (6), 961–973.

Eisenhardt, K., 1989. Agency theory: an assessment and review. Acad. Manage Rev. 14 (1), 57–74.

Ensor, T., Witter, S., 2001. Health economics in low income countries: adapting to the reality of the unofficial economy. Health Policy 57, 1–13.

Erasmus, E., Gilson, L., 2008. How to start thinking about investigating power in the organizational settings of policy implementation. Health Policy Plan. 23 (5), 361–368.

Gberie, L., 2005. A Dirty War in West Africa. The RUF and the Destruction of Sierra Leone. Indiana University Press, Bloomington.

George, A., 2009. "By papers and pens, you can only do so much": views about accountability and human resource management from Indian government health administrators and workers. Int. J. Health Plan. Manage 24, 205–224.

Gilson, L., Sen, P.D., Mohammed, S., Mujinja, P., 1994. The potential of health sector non-governmental organizations: policy options. Health Policy Plan. 9 (1), 14–24.

Hanson, S., 2012. Need to reform the remuneration system to initiate a system approach to the health sector in resource-poor countries. Trop. Med. Int. Health 17 (6), 792–794.

Harris, D., 2013. Applied Political Economy Analysis. A Problem-driven Framework. Overseas Development Institute, London.

Health Alliance International, 2008. NGO Code of Conduct for Health Systems Strengthening. Health Alliance International, Seattle.

IMF., 2013. World Economic Outlook. International Monetary Fund, Washington, DC.

Kiser, E., 1999. Comparing varieties of agency theory in economics, political science, and sociology: an illustration from state policy implementation. Sociol. Theory 17 (2), 146–170.

Morgan-Trimmer, S., 2014. Policy is political; our ideas about knowledge translation must be too. J. Epidemiol. Community Health 68 (11), 1010–1011.

Mosse, D., 2004. Is good policy unimplementable? Reflections on the ethnography of aid policy and practice. Dev. Change 35 (4), 639–671.

Mussa, A.H., Pfeiffer, J., Gloyd, S.S., Sherr, K., 2013. Vertical funding, non-governmental organizations, and health system strengthening: perspectives of public sector health workers in Mozambique. Hum. Resour. Health 11 (26).

North, D., 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge.

Oliver, K., Innvar, S., Lorenc, T., Woodman, J., Thomas, J., 2014. A systematic review of barriers to and facilitators of the use of evidence by policymakers. BMC Health Serv. Res. 14 (1).

Pang, T., Sadana, R., Hanney, S., Bhutta, Z.A., Hyder, A.A., Simon, J., 2003. Knowledge for better health – a conceptual framework and foundation for health research system. Bull. World Health Organ. 81 (03), 815–820.

Perrow, C., 1986. Economic theories of organization. Theory Soc. 15 (1–2), 11–45.

Pfeiffer, J., 2003. International NGOs and primary health care in Mozambique: the need for a new model of collaboration. Soc. Sci. Med. 56 (4), 725–738.

Ridde, V., 2010. Per diems undermine health interventions, systems and research in Africa: burying our heads in the sand. Trop. Med. Int. Health 00 (00).

SSL & ICF International, 2014. Sierra Leone Demographic and Health Survey 2013. Freetown and Rockville: SSL and ICF International.

Van Belle, S.B., Mayhew, S.H., 2014. Unearthing the mechanisms behind the public accountability practices of district health management teams. A realist inquiry in two local health systems in Ghana. In: Poster at the Global Symposium on Health Systems Research, Cape Town – 30 Sept-3 Oct 2014.

Vian, T., Miller, C., Themba, Z., Bukuluki, P., 2013. Perceptions of per diems in the health sector: evidence and implications. Health Policy Plan. 28 (3), 237–246.

WB & SSL, 2013. A Poverty Profile for Sierra Leone. Statistics Sierra Leone & World Bank, Freetown and Washington, DC.

Witter, S., Wurie, H., Bertone, M.P., 2015. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? Health Policy Plan. (Advance Access).

World Pop. (n.d.). Sierra Leone population projections.

Wurie, H., Samai, M.H., Witter, S., 2014. Policies to Attract and Retain Health Workers in Sierra Leone Particularly in Rural Areas: Secondary Data Analysis. ReBUILD Consortium, Freetown and Liverpool.

8. Capturing HWs' complex remuneration: a comparison of methodological approaches

8.1 Preface

After setting the background to the issue of the complex remuneration of HWs by exploring the drivers and the outcomes of HRH policy-making at central level (Chapter 6) and HRH practices as implemented in the districts (Chapter 7), in the following chapters (Chapters 8 to 10) I move on to the individual level perspective.

The first research objective at this level is to describe the remuneration structure of primary HWs in the study districts and the absolute and relative levels of each of their income in order to map the complex remuneration of HWs. As detailed in the Methods (Chapter 5), the research carried out for this thesis made use of different tools to collect information concerning the multiple remunerations of HWs, namely: a cross-sectional survey, which included a series of indirect questions for sensitive incomes, and a self-administered longitudinal logbook filled in daily over 8 weeks. The present chapter (Chapter 8) provides a description of the analysis carried out to calculate the remuneration estimates based on the different approaches and each of the estimates is analyzed, carefully triangulated and compared, and reflected upon.

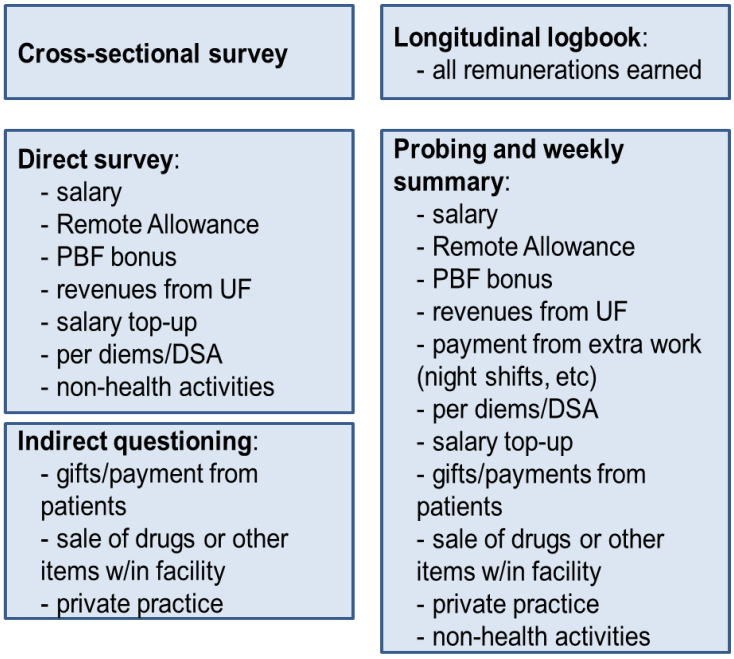
This section is drafted as a thesis chapter rather than an academic paper. The choice of presenting in a separate chapter the comparison of the methodological approaches and the calculation of the income estimate, which is then used for further analysis in Chapter 9, was made because of the limited space that is usually allowed in journal publications which did not permit to explain the detail of the methodological procedures. Indeed, the research papers included in Chapter 9 (Bertone and Lagarde, 2016; Bertone *et al.*, 2016a) make use of the final income estimate which is calculated as detailed in this chapter. While they provide a brief explanation on the data sources, they do not report the analysis behind its calculations, which is presented here.

In the following pages, first, I review and summarize the approaches used to collect data on the remuneration received by the HWs from each source. Then, I present the results based on each of these data collection methods, before comparing them and describing which data sources were used for the final income estimate needed for further analysis in Chapter 9.

8.2 Approaches used to collect data on HWs' remuneration

As Chapter 5 describes, three different approaches were adopted to collect quantitative data on the incomes of the HWs: a cross-sectional survey including (i) direct and (ii) indirect questions, and (iii) a self-administered longitudinal logbook. However, not all income sources were captured by the three approaches. Direct questioning in the cross-sectional survey focused on remunerations considered less sensitive (i.e. salary, remote allowance, PBF bonus, share of the user fees, salary supplementations or top-ups, per diems, earnings from non-health income-generating activities) and did not include questions on sensitive remunerations (i.e., gifts and payments received in kind or cash from patients, sale of drugs and other items within the health facility, private practice). Instead, those were captured with indirect questions. Finally, HWs were also asked to record all incomes earned on their daily logbook, for 8 weeks. Additionally to the self-report, when visiting the facilities to collect the filled-in logbooks, enumerators carried out an end-line interview with the HWs, checked the logbooks, probed for potentially missing incomes and summarized the information in weekly summary sheets. Figure 8.1 below provides a summary of the remuneration amounts collected under each methods.

Figure 8.1: Overview of the remuneration questions included in the three data collection methods



As a consequence of this approach, while there is a complete overlap between the information collected from the survey (through direct and indirect questions) and from the logbook so that all information is available from the two tools and can be triangulated, there is no perfect overlap between direct and indirect questioning so that some information is available from one but not from the other. In particular, data on sensitive incomes are only

available from indirect questioning, while data on all other, less sensitive incomes are available from direct questions[1].

The rationale for collecting information on HWs remunerations based on different approaches was an attempt to test and potentially compensate the biases of each of them and reflect on the advantages and disadvantages of the methods to capture HWs remunerations. One initial hypothesis was that the cross-sectional survey would have led to the underestimation of many remuneration components due to recall bias. In particular, irregular remunerations such as per diems, PBF bonuses, gifts/payments from patients, as well as earnings from sale of drugs or other items, private practice and non-health activities were thought to be potentially more subject to recall bias compared to regular and fixed incomes such as salary, remote allowance and top-ups. In contrast, it was envisaged that the data collection through a longitudinal logbook filled in daily would have limited the recall bias of HWs. Additionally, collecting longitudinal data on HWs' remunerations via the logbooks was considered to have another advantage as it allowed capturing the level of variation of irregular incomes over time. A second hypothesis concerned the possible normative bias of sensitive remuneration components. Indirect questioning was applied to those incomes to address such possibility, for activities that are illegal or informal and subject to negative perceptions which could have led to a substantial underestimation of the amounts earned.

[1] Questions on the amounts earned for sensitive incomes were not asked among the direct questions of the survey, because asking about those remunerations twice (once directly and once using indirect questioning) would have defeated the purpose of using a technique apt to mask the real amounts earned.

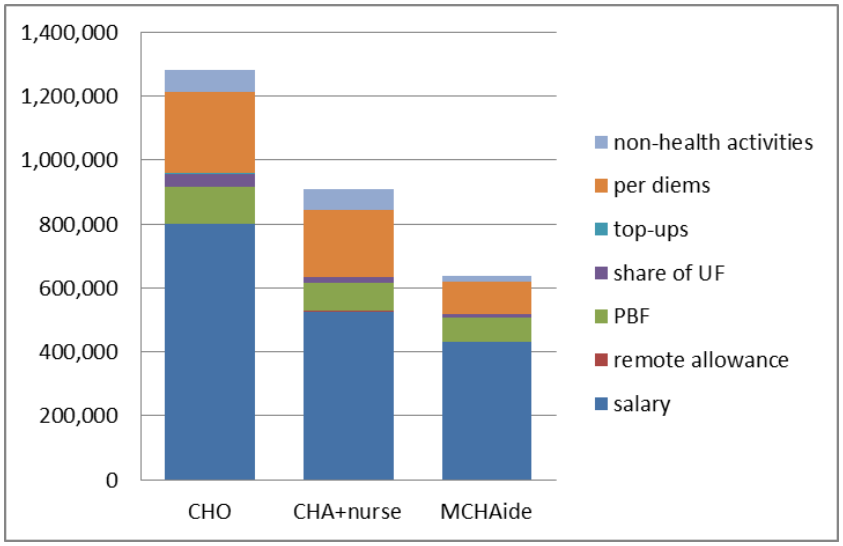
8.3 Income estimates from the three data collection approaches

This section looks separately at the income estimates based on the three different approaches used for data collection, highlighting issues and challenges in data analysis and interpretation for each of the methods, before comparing the results in the next section.

8.3.1 Results from direct questions in cross-sectional survey

Data from the direct questions in the cross-sectional survey were entered, cleaned and descriptively analyzed. Particular attention was given to distinguish between missing values (no response), non-applicable question (e.g. remote allowance for those posted in urban areas) and 0 Leones value. The descriptive results, standardized as average monthly estimates, are summarized in Figure 8.2. For the purpose of the analysis, CHAs and nurses/midwives were grouped together as they have similar grades in the MoHS designation plan.

Figure 8.2: Average monthly remuneration per component by cadre, estimated from direct questions



Note: Exchange rate: 1 USD = 4,270 Leones (October 2013)

8.3.2 Results from indirect questions in cross-sectional survey

Data on sensitive remunerations were collected through indirect questions. HWs were asked to roll a die, unseen by the enumerators, then add the result of the die roll to the actual amount earned in Leones (or add 0 if they did not earn any income from that particular source), and report to the enumerator only the final result of the calculation. This way, even the enumerator would not know the actual amount earned.

The adapted die had the following values: 20,000; 30,000; 50,000; 80,000; 250,000; 400,000 (Figure 5.6 – Chapter 5). Therefore, the expected mean of a die roll, known to the researcher, was 138,333 Leones (Le.), with a confidence interval ranging between 114,755 and 161,912 Le. for the entire sample of 266 HWs. By subtracting the average earning as recorded from the sample of HWs, it is possible to calculate the actual average of amount earned from each of the informal activities. However, in practice, the calculations based on the actual averages obtained from the survey led to negative results, summarized in Table 8.1.

Table 8.1: Results from indirect questions on sensitive incomes

Income question	Average earning as recorded	Expected average from die roll	Estimate of actual average amount earned
Gifts/payments from patients	128,707	138,333	-9,626
Sale of drugs and other items	134,422	138,333	-3,911
Private practice	116,266	138,333	-22,067

The reasons behind the negative results could be related to practical issues in the design and administration of the indirect questioning survey, as well as to the 'reticence' of HWs to report the correct amounts. Concerning practical design issues, one problem rests on the relatively low number of HWs sampled which resulted in a relatively wide confidence interval in the expected die results. Additionally, for the game to be effective, the mean and distribution of the die roll should be similar to the expected mean and distribution of the remunerations to be estimated. However, the mean earning amounts for those sensitive questions, and their distributions was unknown before the survey, and it is likely to be non-normal (unlike the die distribution). Moreover, during the administration of the survey, it is possible that some HWs did not fully understand the procedures they had to follow and, for example, did not add the amounts to the die roll.

More importantly, the negative results could be caused by the reticence of HWs to answer truthfully those questions, even with an approach that concealed the real answer. A focus-group discussion with the enumerators to debrief about the first round of data collection highlighted that, because of the high sensitivity of the questions and the stigma attached to earning incomes from those sources, HWs were unlikely to report a high number out of the calculations, even when the number was the result of a high die roll, rather than their actual earning. Despite explanations and reassurance by the enumerators that the number stated and recorded was "just a number", and not their actual earning, HWs attempted to provide lower estimates. One common way of doing so was by throwing the die again until they got a lower die results to which to add their actual income. This reticence, despite the indirect questioning technique adopted, is not dissimilar to what found by Lensvelt-Mulders and Boeije (2003) when exploring the motives of respondents to give social desirable answers or cheat on the rules during computer-administered indirect questioning, as well as, in a setting more similar to Sierra Leone, by Akwataghibe *et al.* (2013), when investigating financial coping strategies of HWs in Nigeria, including giving priority to activities

that enabled the earning of per diems, pilfering drugs from facilities and accepting informal payments and gifts from patients in return for priority treatment.

8.3.3 Results from self-reported incomes in longitudinal logbooks

The information on amounts earned from each remuneration sources was also collected through the longitudinal logbooks. In adopting this method, one of the main concerns was the potential high attrition. Table 8.2 reports the absolute and relative loss to follow-up during the 8-week prospective period of data collection. Enumerators reported that the reasons for not filling in the logbooks were related both to the fact that they required extra work, as well as to personal circumstances (e.g. HWs moved to another facility, travelled to town, were sick or pregnant, etc.). The relative high number of HWs who did not fill in the logbook for week 8 is mostly due to logistic reasons, as some HWs were visited mid-week and did not have time to fill in the full week-long logbook. However, until week 7, the overall loss to follow-up was low. Further analysis of the HWs lost to follow-up shows that, though not systematically different by district of posting, there were a higher proportion of drop-outs among CHOs (perhaps because of their higher burden of work), than among CHAs, nurses and MCH Aides. Additionally, despite the relatively low attrition, the analysis revealed that some logbooks were not fully filled-in, with pages or the income column left blank in some cases, which raises issues about the quality and reliability of the data collected.

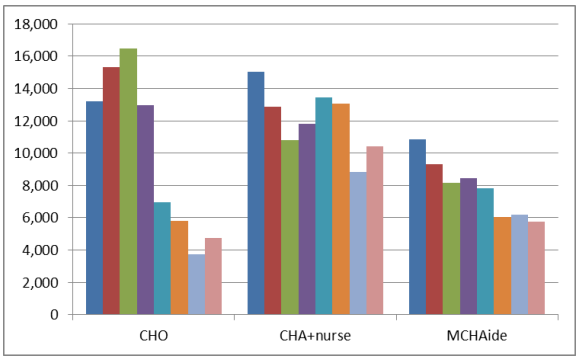
Table 8.2: Loss to follow-up over the 8 weeks covered by the logbooks

Week	HWs lost to follow-up	Proportion of HWs lost to follow-up	HWs having filled in their weekly logbook
w1	8	3%	258
w2	8	3%	258
w3	8	3%	258
w4	12	5%	254
w5	19	7%	247
w6	19	7%	247
w7	20	8%	246
w8	53	20%	213

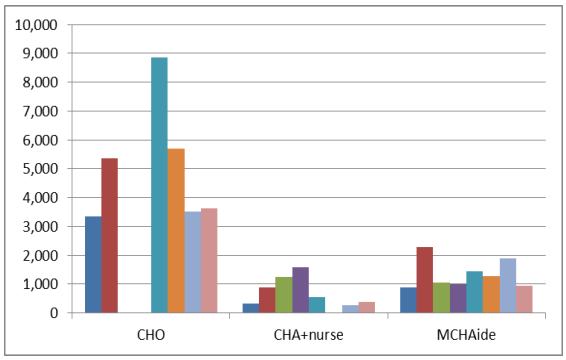
The length of the follow-up could have also influenced the responses in two different ways. On the one hand, HWs could have become more accustomed to the task and therefore accurate in filling in the logbook as time passed. On the other hand, they could have become increasingly fatigued and therefore underreport their earnings. The analysis shows no clear trend in the reporting for irregular remunerations, such as private practice, non-health activities, sale of drugs and per diems. The only exception is gifts and payments received from patients, which shows a decrease in reported remunerations over time (Figure 8.3).

Figure 8.3: Amount received for irregular/occasional remunerations over time (week 1 to 8)

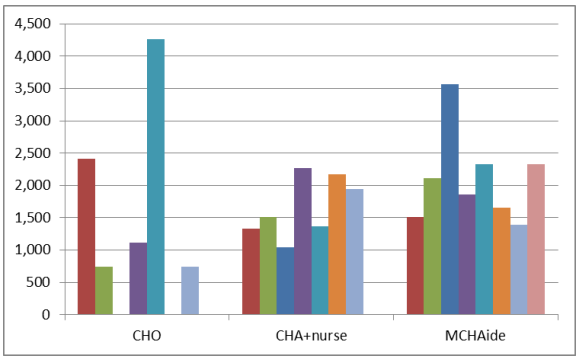
Gifts and payments from patients



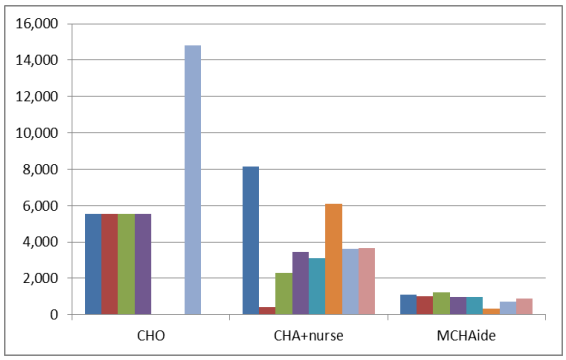
Sale of drugs and other items



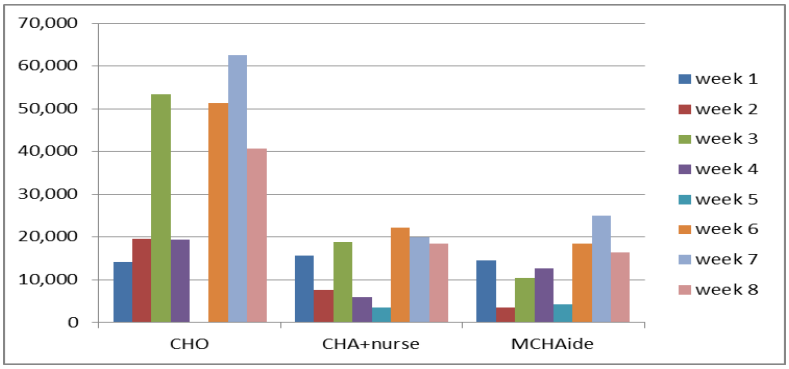
Private practice



Incomes from non-health activities



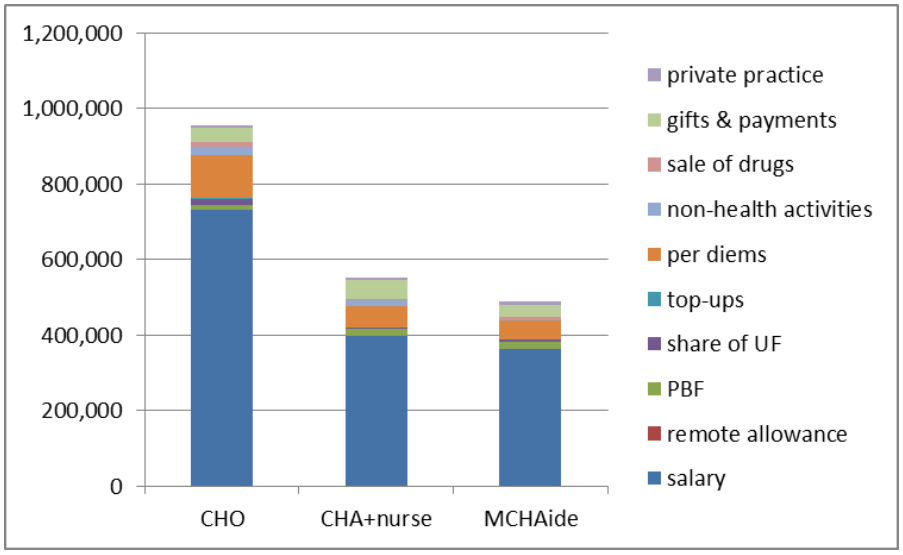
Per diems



Logbooks proved to have the advantage of recording the variability in remuneration levels between weeks, in particular for those remunerations that are occasional and irregular. This is particularly clear, for example, for the per diems estimates (last panel in Figure 8.3 above), which reflect the organization of some of the activities for which HWs receive per diems, such as training and immunization campaigns. While not all the activities ongoing in the districts and involving some or all of the facilities are known, it is known that on week 3 an Human Papilloma Virus (HPV) vaccine campaign took place in Bo, and at varying time on weeks 6, 7 and 8 a polio vaccine campaign was carried out in all districts.

The total income amount based on the logbook data was estimated by calculating the average weekly amount for each remuneration source that varied from week to week (per diems, incomes from non-health activities, sale of drugs, gifts and payments from patients and private practice) and standardizing it to monthly values, and then adding the estimate for the remunerations received monthly (salary, top-ups and share of user fees), and quarterly (remote allowance and PBF bonus), the latter also standardized as monthly value. Figure 8.4 presents the final monthly income estimate, by component for the different cadres of HWs.

Figure 8.4: Average monthly remuneration per component by cadre, estimated from logbooks



8.4 Comparison of income estimates

In this section, a comparison of the income estimates obtained from the different methodological approaches is presented. I also present the rationale and calculations for the compounded estimate used for further analysis of the HWs remuneration.

Overall, I find that income estimates from logbooks were lower compared to those from the direct questions of the survey for most components (Table 8.3). Statistical tests for difference between direct questions and logbook estimates (paired t-test) confirm that differences are significant for most income components for MCH Aides and CHAs/nurses (except for share of user fees for MCH Aides), while for CHOs estimates are not significantly different (except for per diems), most probably due to the smaller sample.

It appears that the general finding of lower amounts for logbook estimates is true both for remunerations that are regular and received once a month or once a quarter, but also for those that are occasional. In the first case, which includes salary, remote allowance (negligible in practice), PBF, share of user fees and top-ups/salary supplementations, the lower amount could be explained by the fact that the specific income was not received during the 8 weeks of logbook records, either because it was a quarterly income or because the payment was late or not physically collected, and therefore not accounted for by the HWs. The latter is often the case with incomes received on a bank account located in the district towns and far from the posting of HWs. However, the reasons for lower estimates in the irregular remunerations is more puzzling as these are those hypothesized to be better captured by logbooks, which should have limited the recall bias of the survey. However, the lower estimate may be due to the lack of completeness and low reliability of the logbook. Additionally, while it was hypothesized that the recall bias in the survey estimate would have led to a under-estimation of the amounts earned, it is possible that HWs, when not precisely remembering the amounts earned, tended to actually overestimate them. The reasons which could lead to the overestimation of some incomes may be related to the HWs reporting theoretical incomes, rather than what actually received, or may be influenced by HWs' perceptions on the importance they ascribe to some of their incomes within their financial coping strategies (Chapter 9 - Bertone and Lagarde, 2016).

Table 8.3: Comparison of average income estimates for survey (direct questions) and logbooks

Income component	Cadre	Survey estimate (Leones)	Logbook estimate (Leones)	p-value of paired t-test testing if average income estimates are different
Salary	CHO	799,700	708,115	0.0509 *
	CHA+nurse	554,526	395,228	0.0004 ***
	MCH Aide	443,971	359,102	0.0001 ***
Remote allowance	CHO	--	--	-
	CHA+nurse	3,867	425	0.2676
	MCH Aide	3,030	--	-
PBF bonus	CHO	114,805	17,529	0.0019
	CHA+nurse	87,277	23,150	0.0000 ***
	MCH Aide	75,373	25,504	0.0000 ***
Share of UF	CHO	41,607	18,679	0.1712
	CHA+nurse	16,111	4,719	0.0041 ***
	MCH Aide	8,500	6,443	0.3301
Top-ups	CHO	3,333	3,333	no difference
	CHA+nurse	--	--	-
	MCH Aide	--	--	-
Per diems	CHO	254,554	117,099	0.0227 **
	CHA+nurse	210,355	57,382	0.0000 ***
	MCH Aide	104,658	54,636	0.0000 ***
Non-health activities	CHO	66,533	25,516	0.2209
	CHA+nurse	67,534	16,024	0.0098 **
	MCH Aide	17,285	3,221	0.0002 ***
Sale of drugs	CHO	--	10,790	-
	CHA+nurse	--	3,608	-
	MCH Aide	--	5,261	-
Gifts and payments from patients	CHO	--	42,026	-
	CHA+nurse	--	54,266	-
	MCH Aide	--	35,446	-
Private practice	CHO	--	5,431	-
	CHA+nurse	--	6,984	-
	MCH Aide	--	8,580	-

Note: CHO: n=27, CHA+nurse: n=71, MCH Aide: n=244. *** p<0.01, ** p<0.05, * p<0.1

8.4.1 Income estimate used for further analysis

In order to further the analysis on the complex remuneration of HWs and calculate the absolute and relative amounts earned from each sources, as well as the determinants of the income received and their levels, one single income estimate for each HWs was needed. For what concerned sensitive remunerations (i.e., gifts and payments from patients, sale of drugs and other items, private practice), because of the problems with the indirect questioning which led to negative results, the choice was limited to only one possible option, i.e. relying on the logbook estimates. The estimate is likely subject to some degree of normative bias because of the sensitivity of the earnings, but it was hypothesized that the prolonged relation between HW and the same enumerator over time, with three in-person visits and multiple calls and texts, may have increased trust, leading to a higher level of

disclosure and improved reliability of the answers beyond what expected from direct questions in a cross-sectional survey.

On the other hand, for what concerns non-sensitive remunerations, data both from cross-sectional survey (direct questions) as well as from the longitudinal logbooks were available. It was decided to include the estimates based on the survey in the final income calculation. The choice was relatively straightforward for 'regular' incomes received monthly or quarterly (i.e., salary, remote allowance, PBF, share of user fees and top-ups), which were not well captured by the daily logbooks. For the irregular remunerations (i.e., per diems, earnings from non-health activities, sale of drugs, gifts and payments from patients and private practice), the choice was done because the self-reported estimates of the logbooks were considered to be of lesser quality and reliability than the answers to the survey, administered by trained enumerators. Table 8.4 provides a summary of the data sources used to estimate each component of the HWs remuneration in the research papers included in Chapter 9.

Table 8.4: Summary of data sources for the estimate of each remuneration

Type of income	Data source
Salary	Cross-sectional survey (direct questions)
Remote allowance	Cross-sectional survey (direct questions)
PBF bonus	Cross-sectional survey (direct questions)
Share of user fees	Cross-sectional survey (direct questions)
Top-ups	Cross-sectional survey (direct questions)
Per diems	Cross-sectional survey (direct questions)
Income from non-health activities	Cross-sectional survey (direct questions)
Sale of drugs and other items	Longitudinal logbooks
Gifts/payments from patients	Longitudinal logbooks
Private practice	Longitudinal logbooks

8.4.2 Discussion

The research carried out for this thesis made use of multiple and innovative approaches to collect data on HWs remunerations, test the differences between the different estimates obtained and reflect on the reasons of the variation. This experience with data collection methods points to some key issues on how to produce an estimate of the formal and informal remunerations of HWs, and on the advantages and disadvantages of some of the potential approaches.

In particular, the original idea for this research was to use different methods based on some hypotheses relative to each of the approaches adopted. While some of these hypotheses were confirmed during data collection, others were not. Table 8.5 provides a summary of the rationale behind the initial selection of the different data collection approaches, the actual results and the possible explanations behind the results observed.

Table 8.5: Summary of initial hypotheses that led to methods' choice, results and possible explanations

Method	Initial hypotheses	Results	Possible explanations
Cross-sectional survey (direct questions)	Recall bias likely to lead to underestimation of all income components	Generally, higher estimates from survey than logbook	• Lack on completeness in logbooks • In the survey, HWs reported theoretical income rather than what actually received • HWs' perceptions around own income
Indirect questioning	More reliable estimates for sensitive incomes	Negative results (under-reporting)	• Reticence of HWs even with indirect questions masking the real answer • Design issues (mean earnings and distribution unknown)
Longitudinal self-reported logbooks	• High attrition rate • Capture variation over time of irregular incomes	• Acceptable attrition rate over time, but: • Lack of completeness and low quality of entries • Some variation over time captured	• Self-reported estimates • Time consuming exercise

This research highlights the advantages and disadvantages of the possible methods to collect HWs income data (Table 8.6). Overall, surveys prove to have the advantage of low costs and limited time requirements which allow for an increase in sample size and higher statistical power. However, surveys are subject to recall bias, especially for irregular incomes, and looking at the logbook results, HWs will tend to over-estimate these revenues. Additionally, surveys carried out at one point in time do not capture the elements of the HWs' remuneration which vary from one week to the next, because of seasonality (e.g. incomes from agricultural activities, in-kind gifts from patients) or with no specific patterns (e.g. per diems for training and workshops, private practice, etc.). Finally, directly asking questions on the amounts earned for informal incomes may be extremely sensitive and lead to normatively biased answers, because such earnings are illegal or because of the negative perceptions around them. I attempted to address this issue by using one of the indirect questioning techniques (i.e., the randomized response technique), although results point to HWs' reticence also under this approach.

Table 8.6: Advantages and disadvantages of methods for data collection on HWs multiple remunerations

Method	Advantages	Disadvantages
Cross-sectional survey (direct questions)	• Relatively inexpensive and rapid	• Recall bias (in which direction?) • Does not capture variation over time • Normative bias for sensitive questions
Indirect questioning	• More reliable estimates on sensitive questions (in theory) • Relatively rapid to administer	• Less efficient (needs larger sample) • Complex to administer (requires well trained enumerators) • "Reticence" of HWs, acceptability and understanding
Longitudinal logbook	• More precise estimation for irregular incomes • Multiple contacts with the same enumerator increase trust and improve quality of data on sensitive incomes	• Self-administered and time consuming / extra work for HWs → low reliability and completeness • Costly and time consuming for researcher / enumerators

In conclusion, collecting reliable estimates, especially on sensitive incomes, remains a challenge and other approaches could be tested in this sense by future research. Although further exploration could be made with indirect questioning, overall, it appears that cross-sectional surveys remain a good option for the task, especially in settings similar to this study and given limited resources. A potential solution which could be envisaged to improve the estimate from surveys is to carry out multiple cross-sectional surveys repeated over time (e.g., every 3-6 months). This would allow to better capture the variability and seasonality of the incomes. Mixed-method approaches, coupling quantitative methods with in-depth and key informant interviews and direct observation, are essential to provide essential additional information to better understand the context and key issues of the complex remuneration of HWs in a specific setting, as well as complement and explain the income information based on the survey with that from other sources.

8.5 References

Akwataghibe N, Samaranayake D, Lemiere C, Dieleman M. 2013. Assessing health workers' revenues and coping strategies in Nigeria — a mixed-methods study. *BMC Health Services Research* **13**: 387.

Bertone MP, Lagarde M. 2016. Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone. *Health Policy and Planning (Advanced Access)*.

Bertone MP, Lagarde M, Witter S. 2016a. *Performance-Based Financing in the context of the complex remuneration of health workers: findings from a mixed-method study in rural Sierra Leone*. Under review.

Lensvelt-Mulders GJLM, Boeije HR. 2003. Evaluating compliance with the Computer Assisted Randomised Response Technique. A qualitative research into the backgrounds of lying and cheating.

9. Analyzing the complex remuneration of HWs

9.1 Preface

After setting the background to the policies and the implementation practices that define the complex remuneration of HWs at macro and meso levels in Chapters 6 and 7, Chapter 8 focused on the methods to collect data and estimate the different components of the individual HWs remuneration. The present chapter (Chapter 9) presents the in-depth analysis of the complex remuneration of primary HWs in the three study districts, going beyond the description of the absolute level of each income estimate.

The analysis has been divided into two research papers, presented below. The first one (section 9.3) focuses on all the components of the remuneration of HWs, while the second (section 9.5) looks specifically at one component, that is the performance-based financing (PBF) bonus. The decision to separate the analysis into two publications was made, firstly, because of the limited space allowed in journal articles which did not permit to present all the findings in one paper. Secondly, specific issues emerged in the HWs' interviews concerning the linkages between PBF, and its features beyond the face monetary value, and HWs' motivation. Because of the relevance of PBF and motivation issues in the current international debate for researchers and policy-makers alike, it was deemed important to carry out a separate analysis and report it in a second paper.

The two research papers are rather similar in the overall structure. First, they present a description of the remuneration of HWs, and of the absolute and relative level of their different incomes. Second, they examine the determinants of both the likelihood of receiving a certain income, and of the income level. This analysis is carried out for variables at individual level, as well as for facility characteristics and based on the district of posting, and it contributes to identify the causes, at these levels, behind the variability in incomes and the complex remuneration. Finally, the consequences of the complex remuneration of HWs are explored from the own perspective of HWs, by looking at their views on each of their incomes, including monetary amount, but also non-financial features and the interaction between incomes. The first paper focuses specifically on the use that HWs makes of each income and discusses the consequences of the different elements of the HWs remuneration (remuneration structure, perceptions on the income level, financial and non-financial features of the incomes, income use) on the financial coping strategies that HWs enact. The second paper looks at how the motivational potential of PBF payment is transformed, positively or negatively, by the HWs' perceptions of the payment, its features and its interaction with other incomes within the complex remuneration, as well as by the PBF implementation issues.

9.2 Cover sheet for research paper

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
www.lshtm.ac.uk

Registry
T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

RESEARCH PAPER COVER SHEET

PLEASE NOTE THAT A COVER SHEET MUST BE COMPLETED FOR EACH RESEARCH PAPER INCLUDED IN A THESIS

SECTION A – Student Details

Student	Maria Paola Bertone
Principal Supervisor	Dr Mylene Lagarde
Thesis Title	Exploring the complex remuneration of health workers in Sierra Leone

If the research paper has previously been published please complete Section B. If not, please move to section C

SECTION B – Paper already published

Where was the work published?	Health Policy and Planning		
When was the work published?	April 2016		
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion	N/A		
Have you retained the copyright for the work?*	Yes (see © on article)	Was the work subject to academic peer review?	Yes

** If yes, please attach evidence of retention. If no, or if the work is being included in its published format, please attach evidence of permission from the copyright holder (publisher or other author) to include this work.*

SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	
Please list the paper's authors in the intended authorship order:	
Stage of publication	

SECTION D – Multi-authored work

For a multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary).	As first author, I designed the study, and collected and analyzed the original data. I was responsible of preparing and submitting the article draft and later revised it following comments from the journal's reviewers.

Student signature:  **Date:** _____17/06/2016_____

Supervisor signature: _____  _____ **Date:** _____17/06/2016_____

Health Policy and Planning, 2016, 1–10
doi: 10.1093/heapol/czw031
Original article

Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone

Maria Paola Bertone[1,2,*] and Mylene Lagarde[3]

[1]Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK [2]ReBUILD Research Consortium and [3]Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK

*Corresponding author. 15-17 Tavistock Place, London WC1H 9SH, UK. E-mail: maria.bertone@lshtm.ac.uk

Accepted on 3 March 2016

Abstract

Exploring the entire set of formal and informal payments available to health workers (HWs) is critical to understand the financial incentives they face and devise effective incentive packages to motivate them. We investigate this issue in the context of Sierra Leone by collecting quantitative data through a survey and daily logbooks on the incomes of 266 HWs in three districts, and carrying out 39 qualitative in-depth interviews. We find that, while earnings related to the HWs official jobs represent the largest share, their income is fragmented and composed of a variety of payments, and there is a large heterogeneity in the importance of each income source within the total remuneration. Importantly, each income has different features in terms of regularity, reliability, ease of access, etc. Our analysis also reveals the determinants of the incomes received and their level based on individual and facility characteristics, and finds that these are not in line with HRH policies defined at national level. Additionally, from their narratives, it emerges that HWs are 'managing', in the sense both of 'getting by' and of enacting financial coping strategies, such as mental accounting (spending different incomes differently), income hiding to shelter it from family pressures, and re-investment of incomes to stabilize overall earnings over time, in order to ensure their livelihoods and those of their families. These strategies question the assumption of fungibility of incomes and the neutrality of increasing or regulating one rather than another of them. Together, our findings on earning and income use patterns have important policy implications for how we go about (re)thinking financial incentive strategies.

Key words: Human resources, incentives, income use strategies, income hiding, mental accounting, Sierra Leone

Key messages

- This study describes the incomes of primary health workers in Sierra Leone and finds that salaries make up about 60% of the total revenues, while the rest is composed by a variety of formal and informal incomes.
- Health workers' narratives reveal that the satisfaction related to the incomes does not depends only on their amounts, but also on non-financial features. Based on these features, health workers choose to assign incomes to different uses.
- These findings have policy implications for designing incentives as they call for more attention to the earning opportunities for health workers beyond formal allowances, and to the HWs own perspectives which question the assumption of income fungibility.

Introduction

In recent years, there has been an increased attention to the determinants of health workers' (HWs) motivation, and in particular the role of financial incentives (Willis-Shattuck *et al.* 2008). Some countries in sub-Saharan Africa have embarked on reforms to increase salary levels (Mueller *et al.* 2011), while new incentives such as performance-based financing are increasingly introduced (Witter *et al.* 2012). In some settings, remunerations from external sources, such as salary supplementations ('top-ups') and per diems from aid agencies, are thought to account for an important part of HWs' income (Ferrinho and Van Lerberghe 2000; Vian *et al.* 2013). Moreover, given the weak regulatory capacity of governments and the presence of informal healthcare markets in many low-income settings (Ensor and Witter 2001), HWs often engage in various other activities, including private practice, non-health activities such as trading or agriculture, informal fees requests and illegal sale of drugs (Roenen *et al.* 1997; Ferrinho and Van Lerberghe 2000). The existence of multiple sources of income, that we termed 'complex remuneration', creates a multifaceted set of incentives which may affect the motivation and performance of HWs in several ways (Bertone and Witter 2015a).

A comprehensive approach to the study of financial incentives is essential to describe the income of HWs and the relative and absolute level of each of the income components, beyond those received for their official job. However, with some exceptions (McCoy *et al.* 2008), few studies look at the entire set of earnings, and little is known about the individual and facility characteristics associated with the fragmented income structure and with the variability in income levels, or about the implications of such fragmentation in terms of HWs' views and relative satisfaction with the different components of their income. From a policy perspective, taking into account the full set of incomes of HWs is essential in order to design effective incentive packages. These issues are particularly critical, and even less studied, in post-conflict settings where the fragmentation of the health system and the presence of many, often uncoordinated, actors at local level may determine the multiplication of payment sources.

In this paper, we look at the case of healthcare providers working in public primary care facilities in three districts in Sierra Leone. Using a quantitative survey, the study aims firstly at describing the level of each source of income, and their relative importance. We then model the determinants of the incomes received to explore which factors, at individual and facility level, affect them. Finally, we explore the HWs' perceptions about each of the revenues, and how incomes are relevant to them, beyond the amount. By exploring the HWs' narratives on income use, we also investigate their financial coping strategies and the role that the different incomes play in those.

Context

After a decade of armed conflict and social and economic unrest, Sierra Leone has been rebuilding its health system since 2002. In order to increase the demand for health services and improve health outcomes, user fees for maternal and child health services were removed in April 2010 (Donnelly 2011). Given the low number of HWs (in 2011, there were an estimated 0.071 doctors and 0.631 nurses per 1000 people in the public sector) and their uneven distribution (Witter *et al.* 2016), with the launch of the Free Healthcare Initiative (FHCI), a series of reforms were designed and implemented to address the issues of distribution, retention and motivation of the health workforce (Bertone *et al.* 2014). These reforms included the cleaning of the Ministry of Health (MoH) payroll to eliminate 'ghost workers' and add those working without salary, a salary increase and a one-off fast-track recruitment and deployment process to increase workers in rural areas. In 2011, a performance-based financing (PBF) scheme was launched which includes bonuses for individual staff based on facility performance, and in 2012 a remote allowance for those working in rural posts was introduced. In parallel, donors and most NGOs adopted measures to ensure the alignment and rationalization of the HWs' incentive package, in particular, by abolishing salary top-ups linked to vertical programs and disease-specific activities (e.g. HIV/AIDS services).

However, these reforms have only been partially implemented and many challenges remain (Witter *et al.* 2016). Since the technical assistance to the Payroll Unit ended, the MoH payroll is increasingly imprecise. An external verification of the PBF scheme, carried out in April 2014, reported delays of more than one year in the payment of PBF bonuses (Cordaid 2014). As for the remote allowance, payments stopped by the end of 2012 because of cash-flow issues (Bertone *et al.* 2014). Moreover, the implementation of policies relies on NGOs at district level, whose presence varies considerably for geographical coverage and service/disease focus. Among the three districts where the research was carried out (Bo, Kenema and Moyamba, all in the southern part of Sierra Leone), Moyamba is the most rural and poor district. Two main NGOs, focused on nutrition services only, worked there. In Bo, a wealthier and more urban district, several NGOs divided up their activities based on a geographical repartition but not all facilities were supported, and in Kenema few NGOs operated, with the leading one covering all facilities and providing support on a broad range of maternal and child health services (Bertone and Witter 2015b). Additionally, since May 2014, Sierra Leone has been afflicted by an unprecedented Ebola Virus Disease (EVD) outbreak. The epidemic started weeks after the conclusion of fieldwork for this research so that this paper reflects the situation as it was before the epidemic. However, there is emerging evidence that the EVD outbreak may have emphasized the fragmentation of HWs' remuneration.

Methods

Study design

This is a mixed-methods study carried out in three districts in Sierra Leone, which were purposefully chosen to allow for variation in number of NGOs, as well as level of poverty, urbanization and type of facilities—that we hypothesized to have an impact on the remunerations of HWs. In the districts, primary quantitative and qualitative data were collected at individual HW level. Ethical clearance was obtained from the London School of Hygiene and Tropical Medicine and the Sierra Leone Ethics and Scientific Review Committee.

Quantitative data

Quantitative data were collected between September and December 2013 by a team of ten trained enumerators. A random sample of 198 primary health facilities were chosen, out of the 346 in the three districts. The sample was constructed to include the same number of facilities in each district ($n = 66$) and to include all types of primary healthcare facility, i.e. Community Health Centers (CHC), Community Health Posts (CHP) and Maternal and Child Health Posts (MCHP). Within each facility, enumerators selected 1 or 2 workers (for MCHPs and CHCs/CHPs respectively) who were

clinically qualified and available on the day of the survey. 'In-charges' (i.e. managers of facilities) were interviewed before other qualified cadres. A total of 266 HWs were interviewed, encompassing two cadres of non-physician clinicians: Community Health Officers (CHOs) and Community Health Assistants (CHAs); two cadres of nurses and midwives; and a cadre of nursing aides (Maternal and Child Health Aides—MCH Aides). For the purpose of the analysis, CHAs and nurses/midwives are grouped together as they have similar grades in the MoH designation plan.

HWs were administered a face-to-face survey that included open-ended questions on the amount received monthly for the following sources of income: salary, remote allowance, individual PBF bonus, share of the user fees charged for non-exempted services, top-ups or salary supplementations, per diems and income-generating activities outside of the health sector. The questionnaire also included questions on demographic information (sex, age, marital status, cadre, education, role within facility, i.e. in-charge or staff) and facility characteristics (type of facility, remoteness level, district). In addition, at the end of the interview, HWs were given logbooks to fill daily for a prospective period of eight weeks. In their logbooks, HWs had to report their activities, as well as revenues earned each day. Each HW was visited by the same enumerator three times over the 8 weeks, and received regular calls and text reminders. We believe that this prolonged relation and the consequent increased trust may have led a higher level of disclosure of informal incomes in the logbooks (Corti 1993). Therefore, to estimate the total income, we added, to the incomes estimated in the survey, data from the logbooks for revenues from illegal sale of drugs, gifts and payments from patients and private practice.

Qualitative data

We conducted two rounds of in-depth interviews in November–December 2013 and March-April 2014, with a sub-sample of 39 HWs purposefully selected among the 266 above. HWs were chosen to reflect a wide variety of views and situations in terms of cadre, but also rural/urban, male/female, type of facility, in-charge/staff and district and to be in line with the mix of health workers in the districts (Table 1). The semi-structured interview guide was iteratively adapted during the rounds of interviews, and interviews were carried out until saturation was reached. The main issues of focus were (1) income sources, and views on level and fairness and (2) strategies for the maximization, stabilization and use of income(s), including at individual, household and facility level.

Table 1. Characteristics of respondent sample for qualitative data collection

	CHO ($n = 4$)	CHA + Nurse ($n = 10$)	MCH Aide ($n = 25$)	Total ($n = 39$)
Gender				
Male	4	3	–	11
Female	–	7	25	28
Age (mean)	32.5	47	40.4	41.3
Type of facility				
CHC	4	5	4	13
CHP	–	4	3	7
MCHP	–	1	18	19
Location				
Urban	3	6	4	13
Rural	1	4	21	26
District				
Bo	3	1	8	12
Kenema	–	4	9	13
Moyamba	1	5	8	14

Quantitative data analysis

Income data were converted to monthly equivalents and used to construct the total income of HWs. We calculated the average monthly amount for each income and its importance relative to total income. Then, we estimate two types of multivariate regressions. The first estimates a logistic regression to explore the determinants of the likelihood of receiving each type of income (the dependent variable is equal to 1 if the HW declared to have received some revenue from that particular source in the past month). In the second model, we run a linear regression model to estimate the determinants of the level of each type of income, and total income received (the dependent variables are log-transformed income amounts). For both models, we explore the influence of individual (i.e. gender, age, cadre/qualification, role within facility), as well as facility characteristics (i.e. type of facility, urban/rural, district).

Qualitative data analysis

Qualitative interviews were recorded, transcribed and manually analysed using content framework analysis (Ritchie and Lewis 2003). Qualitative data were explored in complementarity to quantitative data, in a deductive and inductive way, i.e. both to confirm and further explore issues emerging from quantitative analysis (such as, HWs' views and perceptions).

Results

Health workers' remuneration: income components and fragmentation

The characteristics of the sample of HWs surveyed are summarized in Table 2. Overall, results show that the monthly income of primary HWs are 164 USD for MCH Aides, 235 USD for CHAs/nurses and 314 USD for CHOs (Figure 1). They also point to the fact that HWs' remuneration is complex and fragmented, with revenue from official job activities (salary, remote allowance, user fees and PBF) contributing to 71% of total income for CHOs, 66% for CHAs/nurses and 76% for MCH Aides. Governmental salary is the major source of income for public primary healthcare workers, although it represents only slightly more than half of their total income. The second major source of income are the per diems paid by the MoH or external organizations for activities such as attending trainings, taking part in or supervising immunization campaigns. Per diems make up between 15% and 21% of total income depending on the HW cadre. The next most importance source of revenue is PBF bonuses received, providing about 10% of the total income for all cadres, while top-ups seem to represent very limited additional revenue for HWs. Because of the exemptions under the FHCI, user fees also represent a small share of HW revenue (1–3% of total income), with only 27% of HWs declaring to have received revenue from user fees. Similarly, revenues from under-the-counter sale of drugs and other items and private practice represent a negligible proportion of HW income (all <1%). In contrast, although incomes declared as 'gifts and payments from patients' may be underestimating the under-the-table payments for health services still illegally charged to patients (as partially documented in Denney and Mallett 2014), the fact that 74% of workers declared to be receiving them and their estimate at 3–5% of total revenues seems to be reliable with reference to another aspect of the relation between HWs and patients/communities. Indeed, it emerged from the interviews that under this category

Table 2. Characteristics of respondent sample for quantitative data collection

	CHO ($n = 30$)	CHA+Nurse ($n = 76$)	MCH Aide ($n = 160$)	Total ($n = 266$)	Statistical Significance of difference in proportions/means	Test used
Gender						
Male	73%	42%	–	20%	$p < 0.0001$	Chi2
Female	27%	58%	100%	80%		
Age (mean)	41.4	40.8	40.9	41	$p = 0.946$	Bonferroni
Role in facility					$p < 0.0001$	Chi2
In-charge	90%	67%	49%	59%		
Staff	10%	33%	51%	41%		
Type of facility						
CHC	97%	51%	16%	35%	$p < 0.0001$	Chi2
CHP	–	42%	29%	30%		
MCHP	3%	7%	55%	35%		
Location						
Urban	30%	32%	21%	25%	$p = 0.106$	Chi2
Rural	70%	68%	79%	75%		
District						
Bo	60%	30%	34%	36%	$p = 0.020$	Chi2
Kenema	20%	44%	32%	34%		
Moyamba	20%	26%	34%	30%		

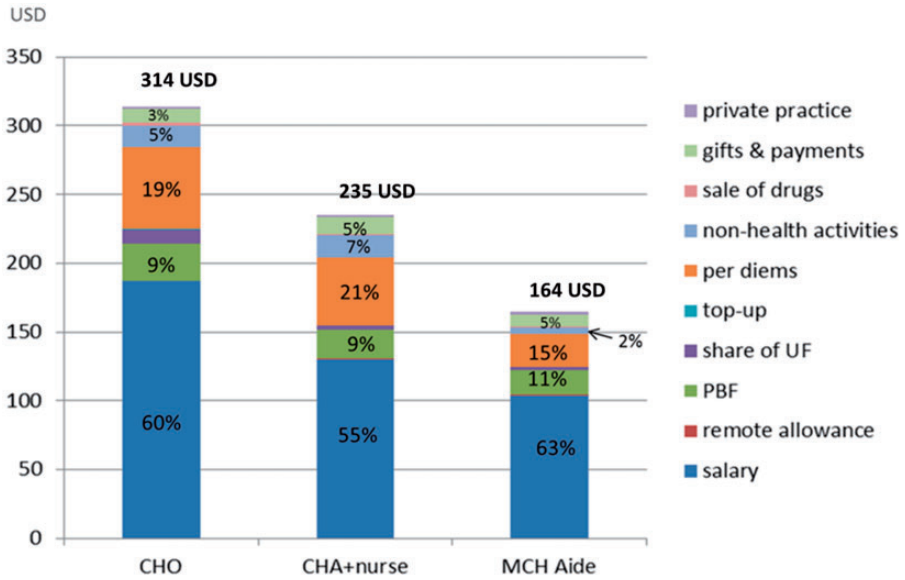


Figure 1. Absolute and relative mean income by cadre and by component. *Note*: Exchange rate: 1 USD = 4270 Leones (October 2013)

HWs report gifts usually in-kind (rice, palm oil, cassava, yam, charcoal, chicken, etc.) that patients and communities provide them with. Finally, income through activities outside of the health sector (most frequently: farming, small trading and businesses including buying palm oil to resell when prices are higher, or credit groups) represents 2–7% of the income. However, for the 21% of HWs reporting such earnings, they represent a substantial revenue, amounting to 20, 23 and 11% of the total income for CHOs, CHAs/nurse and MCH Aides respectively.

The determinants of remuneration

Beyond the issue of income fragmentation, the analysis of survey data reveals that there is much heterogeneity in total income as well as in the revenue breakdown. To explore whether or not differences are linked to justifiable and observed individual characteristics (e.g. higher cadres or older HWs earning more) or to HRH policies (e.g. allowances to HWs in rural areas), we estimated a multivariate regression model of the different income levels. Table 3 presents the results of the analysis exploring factors associated with earnings from the main sources of revenue. We find that the odds of earning income from selling drugs are almost 20 times larger for CHOs compared to CHAs/nurses and MCH Aides (col.6). The odds of receiving a salary are 11 times larger (col.1) for in-charges (i.e. the facility managers) compared to staff workers. Their odds of receiving PBF bonus almost 4 times larger (col.2) and odds of receiving gifts from patients 3 times higher (col.7). Being young decreases the likelihood of receiving a salary (OR: 0.206, col.1) but increases the likelihood of taking up income generating activities outside of the health sector (OR: 2.014, col.5). Looking at facility characteristics, those working in CHPs are more likely to receive a salary (OR: 5.702, col.1) and a

Table 3. Odds of receiving revenues from a particular source (logistic regressions)

	(1) Received Salary	(2) Received PBF	(3) Received user fees	(4) Received per diems	(5) Received income from non-health activities	(6) Received income from sale of drugs	(7) Received gifts
HW characteristics							
Cadre (omitted category: MCH Aide)							
CHO	n/a	0.413	2.441	0.332	0.276	19.081 ***	0.985
		(0.290)	(1.793)	(0.263)	(0.238)	(19.033)	(0.750)
CHA+nurse	0.913	0.348 **	1.966	1.125	0.520	2.128	1.350
	(0.783)	(0.154)	(0.966)	(0.535)	(0.289)	(1.358)	(0.683)
In-charge *(omitted category: staff)*	11.348 ***	3.825 ***	0.878	1.852	2.526	1.384	2.731 **
	(7.627)	(1.476)	(0.354)	(0.757)	(1.226)	(0.751)	(1.139)
Male *(omitted category: female)*	0.370	1.578	1.801	2.804	2.060	0.221 **	0.296 **
	(0.353)	(0.721)	(0.829)	(1.641)	(1.066)	(0.157)	(0.156)
Aged <35	0.206 ***	0.711	1.694	0.982	2.014 **	1.529	1.247
	(0.103)	(0.218)	(0.561)	(0.338)	(0.710)	(0.702)	(0.434)
Facility characteristics							
Urban *(omitted category: rural)*	3.831	1.208	0.931	0.316 ***	1.575	0.819	0.467 **
	(2.966)	(0.432)	(0.348)	(0.116)	(0.623)	(0.427)	(0.168)
Type of facility (omitted category: MCHP)							
Community Health Center	3.899	2.085	0.284 **	1.823	1.764	0.309	1.907
	(3.000)	(1.055)	(0.162)	(1.024)	(1.141)	(0.243)	(1.044)
Community Health Post	5.702 **	2.509 **	0.296 ***	1.223	1.988	0.379	1.595
	(3.916)	(1.040)	(0.137)	(0.526)	(1.000)	(0.238)	(0.716)
District (omitted category: Moyamba)							
Bo	0.397	0.819	1.780	2.121	1.872	0.771	0.623
	(0.248)	(0.269)	(0.666)	(0.825)	(0.780)	(0.428)	(0.230)
Kenema	0.770	1.969	1.664	0.950	2.028	2.227	0.906
	(0.505)	(0.691)	(0.634)	(0.341)	(0.851)	(1.089)	(0.354)
Observations	236	266	266	266	266	266	266

Note: Standard errors in parenthesis.
Incomes from remote allowance, top-ups, private practice not shown.
***$p < 0.01$.
**$p < 0.05$.

PBF bonus (OR: 2.509, col.2) than those in MCHPs, but both those working in CHCs and CHPs are less likely to receive a share of user fees (OR respectively: 0.284 and 0.296, col.3). HWs working in urban areas are less likely to receive per diems from external organizations (OR: 0.316, col.4) or gifts from patients (OR: 0.467, col.7), compared to those working in rural areas. In-depth interviews suggested that this is because most of the gifts received in these rural, farming areas are in-kind, since this is what patients and communities have easier access to.

Table 4 reports factors associated with receiving a higher income for certain sources. As expected, we find that HWs of higher cadres receive significantly higher salary compared to MCH Aides (col.2). CHOs also have a higher income from user fees (col.4). Facility in-charges are shown to earn higher PBF bonuses, and significantly higher overall income compared to workers in staff positions (col.1). Workers in higher level facility receive a lower income from gifts from patients (col.7), but overall have a higher income (significantly for those in CHCs) (col.1). There is also some heterogeneity across districts, as workers in Bo receive less PBF payments and per diems (col.3,5) than those in the other districts, while in Kenema PBF payments received are higher (col.5). This results in a significantly higher overall income for HWs in Kenema (col.1).

Health workers' satisfaction with their incomes

HWs interviewed overall agreed that their salary was the most important and dependable source of income. However, the majority expressed dissatisfaction with their salary level stating that is was '*not enough*' (mentioned by eight HWs), '*small for the job*' (five HWs), or '*not satisfying*' (one HW). The only HWs who had relatively positive views were those already employed before the FCHI, as they were comparing their current salary level to that before. While salary payments were reported to be made on time and regularly, HWs mentioned that salaries can only be accessed through the local branch of banks located in the main towns, far from the rural facilities where they work. Moreover, because of the issue with the payroll, all interviewed HWs who (re)trained after 2010 mentioned they did not receive their salary or received the payment corresponding to their old cadre.

In contrast, HWs' narratives were overwhelmingly positive when discussing performance-based payments. PBF was said to '*help*' (three HWs), to be '*good money*' (two HWs), or '*really enough*' (one HW). While these comments were in stark contrast with the views on salary and at odds with PBF relatively limited contribution to the overall income, positive remarks have to be understood in the context of the entire set of payments, and their features. The rather unpredictable timing and the yearly delays of the PBF payments (which delink it from the activities performed and the effort exerted at the time) make the bonuses seen as a gift, with less sense of entitlement compared to the salary. It also emerged that PBF was perceived as a complement to the salary. HWs admitted that:

> I am happy with it because my salary is so small so if I am getting that [PBF], I am happy with the government (MCH Aide in Kenema)

Table 4. Determinants of amount of revenue from a particular source (linear regressions)

	(1) Total income	(2) Salary	(3) PBF	(4) User fees	(5) Per diems	(6) Sale of drugs	(7) Gifts
HW characteristics							
Cadre (omitted category: MCH Aide)							
CHO	0.283	0.450 ***	0.118	1.215 **	0.500	−1.664	−0.331
	(0.193)	(0.047)	(0.283)	(0.596)	(0.309)	(1.537)	(0.415)
CHA+nurse	0.116	0.161 ***	0.054	0.758	0.141	−0.924	0.044
	(0.123)	(0.030)	(0.186)	(0.395)	(0.198)	(1.192)	(0.276)
In-charge *(omitted category: staff)*	0.529 ***	−0.003	0.332 **	0.082	0.132	0.292	0.459
	(0.105)	(0.027)	(0.158)	(0.295)	(0.171)	(0.532)	(0.237)
Male *(omitted category: female)*	0.035	−0.012	0.266	−0.317	0.195	0.073	0.016
	(0.126)	(0.030)	(0.173)	(0.390)	(0.195)	(0.661)	(0.277)
Facility characteristics							
Urban *(omitted category: rural)*	−0.012	0.018	0.109	0.039	−0.626 ***	0.946	−0.320
	(0.099)	(0.024)	(0.141)	(0.303)	(0.174)	(0.563)	(0.240)
Type of facility (omitted category: MCHP)							
Community Health Center	0.352 **	0.021	0.022	0.003	0.283	2.106	0.107
	(0.143)	(0.037)	(0.214)	(0.400)	(0.231)	(1.451)	(0.324)
Community Health Post	0.166	0.003	−0.126	0.064	0.054	1.701	−0.590 **
	(0.114)	(0.029)	(0.161)	(0.360)	(0.184)	(1.052)	(0.260)
District (omitted category: Moyamba)							
Bo	0.034	0.027	−0.656 ***	0.138	−0.441 ***	−1.509 **	0.388
	(0.094)	(0.023)	(0.136)	(0.311)	(0.149)	(0.612)	(0.211)
Kenema	0.204 **	0.028	−0.160	−0.109	0.541 ***	−1.614 **	0.226
	(0.095)	(0.023)	(0.128)	(0.322)	(0.159)	(0.580)	(0.205)
Observations	266	241	163	72	198	34	197
R-squared	0.242	0.558	0.240	0.190	0.316	0.357	0.113

Note: Standard errors in parenthesis.
Incomes from remote allowance, top-ups, private practice and non-health income generating activities not shown.
***$p < 0.01$.
**$p < 0.05$.

> [PBF] helps me because if you are getting your salary, then you have a small amount adding to that (MCHAide in Kenema).
>
> My salary is acceptable to me with the help of PBF (MCH Aide in Moyamba)

However, the positive views of PBF payments were mitigated by their non-financial features, such as the irregularity, the delays in payment and the complicated and opaque sharing practices which were caused by those delays (Bertone 2015).

Although some HWs complained that per diems were sometimes not sufficient to cover transport to and lodging in the place of training, most agreed that a proportion could be saved and represented a net revenue. As suggested by the quantitative evidence, interviews confirmed that per diems were far from being negligible, and sometimes even substantial. One HW recounted, '*[Once] we had about 600 000 Le. [140 USD] for 5 days. I was joyful!*' (CHA/nurse in Moyamba). Others said that DSA (acronym for Daily Subsistence Allowance, which is how per diems are referred to in Sierra Leone) '*is a good thing*' (MCH Aide in Moyamba), '*is important for us*' (MCH Aide in Kenema). On the other hand, per diems were seen as unstable and unpredictable, and difficult to depend on for regular expenditures.

Finally, most HWs viewed engaging in income-generating activities as a necessary 'back up' to complement their revenues. Some HWs reported to be setting up, or planning to set up, a small business or petty trading, once possible. When that was not possible, many chose to engage in agriculture activities.

> 500,000 [Leones – MCH Aide salary] is very small, so we have to do business! (MCH Aide in Moyamba)
>
> I am doing petty trading to back up (CHA/nurse in Moyamba)
>
> I have a cassava field in the backyard. To do business here is impossible (MCH Aide in Bo).

Overall, it emerged from the HWs accounts that financial issues were a major concern for most, and some mentioned income fragmentation as a specific problem. When asked about their financial coping strategies, HWs recurrently said that they 'manage':

> Well, if I gather everything together at the same time it helps [i.e. my income is enough], but the money does not come together [at the same time], it comes in little bits. So what I have at the moment, I manage with it. I have no other way to do it (CHA/nurse in Kenema).
>
> I have to manage my life with it [my income] (MCH Aide in Moyaba)
>
> Well it is not easy. You have to manage yourself (CHA/nurse in Moyamba)

'To manage' can be rightfully interpreted in the sense that they survive, they 'get by', but also that they actively administer and organize their different incomes and spend them differently in order to maximize financial options, deal with income instability and ensure their subsistence and the livelihoods of their families.

Differential utilization of incomes

In-depth interviews provided evidence of the HWs' differential utilization of their revenues, revealing how they take advantage of the features of each income to choose how and what to use them for. The general practice seemed to use the salary (i.e. the highest and

most stable source of revenue) for expenditures that are large and recurrent, such as school/college fees for children and supporting the (extended) family's financial needs and requests:

> I use it [salary] to provide for my family. Sometimes 50,000 [Leones] remains with me after having spent everything [I need to take care of the family], so that I buy food and bring it here for myself (CHA/nurse in Kenema)
>
> [After collecting my salary], I will always see my family and address problems there before (CHA/nurse in Moyama).
>
> Even yesterday, [. . .] one of my daughters called me for a certain amount of money. I went down to the bank and collected the money and sent it to her in Freetown (MCH Aide in Bo).
>
> Like, the school fees and the college fees depend on the salary. The side [incomes], I keep them for their feeding and all the minor things at home (CHA/nurse in Moyamba).

Moreover, salaries are paid into bank accounts located in district towns. HWs with these accounts were likely to be subject to the immediate financial demands of family members living there. In some cases, financial pressures exerted on the salary were unavoidable due to the family's knowledge (or rumors) of its amount. One HW recounted:

> When the free health care came in action, we were told that our salary scale will be close to 1 million. This is creating a big problem in our marital home. Like... our husbands, some are not educated, some did not go to school, so hearing this rumor, they said it's true. Then sometime in May-June, something was added to our salary, so that month we got 1 million, and that rumor went around. People were saying that our salary is now. that this is what we are earning. So then when we received our normal salary [about 500,000 Le.], when I got home I told my husband, 'here is the salary', and he said, 'this is a big lie'. So I told him, 'let's go to the bank, there you will find out if it is true or a lie'(Female MCH Aide in Kenema).

In contrast, revenues from per diems, activities outside of the health sector and in-kind gifts were used for the personal subsistence and to address 'emergency' issues. Moreover, irregular incomes of an unknown amount (such as per diems and PBF) have the advantage of being more easily 'hidden' from family pressures, and revenues paid in cash (i.e. per diems) are readily available to HWs and appear essential for the subsistence of those in rural posts and those not receiving a salary:

> [interviewer] What do you mean, this [per diems] is the only money you have? You have your salary as well. No. I mean, for here. Because our salary is paid in our account. For here, we don't have any other way to have money' (MCH Aide in rural Moyamba).
>
> [I use per diems because] I need things here. We don't have access to bank so we find things difficult (CHA/nurse in rural Moyamba).
>
> Sometimes DSA is useful because it is no easy to get money here, because I am not on payroll. It is useful, it helps me (MCH Aide in rural Bo)

Some HWs recounted using per diems specifically for themselves, in contrast to other incomes that can be shared with the family. They said that with per diems '*I can buy something for myself*' (MCH Aide in Kenema) or '*I buy anything I want*' (MCH Aide in Kenema).

Income from activities outside of the health sector had also an important function as it could provide flexible financial resources which worked as a mechanism to smooth income and deal with the irregularity of other revenues. Similarly to per diems, income from non-health activities was also reported to provide a personal, less visible allowance. Some mentioned:

> I can use this if I run short of money (MCH Aide in Moyamba)
>
> I have to do some little business, because if there are problems I can solve my problems *quietly* (MCH Aide in Kenema—emphasis added).

In turn, however, the possibility of carrying out business-related non-health activities depended on having substantial amount of unspent money from other sources to be re-invested. PBF, which can represent a considerable amount paid at once, was seen as useful in this sense. The emerging hypothesis that non-health income opportunities are more likely to be available for those with higher incomes on PBF was tested using survey data, by regressing the amounts earned from non-health activities on PBF amounts, controlling for variables at individual and facility level. We found a positive and significant coefficient ($P = 0.05$), which confirmed the hypothesis.

Discussion

This study set out to explore the remunerations of public primary HWs in three districts of Sierra Leone and to investigate the individual and facility determinants of the income levels, and the implications that income fragmentation has for HWs. The results confirm that the remuneration of HWs is made up of different sources, beyond the salary and incomes related to their official job. We found that governmental payments (which include primarily salary and PBF, as the remote allowance had been discontinued in 2012) represent the main share of HWs monthly income. This result is similar to findings in Ghana, Burkina Faso and Nigeria (McCoy *et al.* 2008; Akwataghibe *et al.* 2013). The high share of government pay reflects the efforts towards harmonization and alignment of remuneration undertaken by external actors (donors and NGOs) in Sierra Leone around the launch of the FHCI. In particular, top-ups are found to represent a very limited additional revenue (only one NGO in Bo was still providing them at the time of the research). The harmonization of incentives in Sierra Leone stands in contrast to the experience of other countries where the introduction of fee exemptions did not entail major reforms to ensure incentive alignment (Witter *et al.* 2016). On the other hand, the share of other incomes remain important for HWs. In particular, per diems account for an essential part of their income (15–21%), and non-health activities seem quite relevant for some workers, with 21% who declare engaging in them. This compares with 42% of HWs practicing non-medical businesses in Nigeria (Akwataghibe *et al.* 2013). In contrast with some of the literature (Ferrinho *et al.* 2004a; Akwataghibe *et al.* 2013; McPake *et al.* 2014), revenues from health-related private practice are found to be limited. Although this could reflect underreporting, the finding is likely to be explained by the fact that our sample includes lower cadres of HWs, such as nursing aides, rather than doctors (the focus of much literature on dual practice), posted in rural areas. In those settings, HWs often live and work in the same building and do not have the possibility of practicing in a separate facility. Potential earnings from outreach or home visits would have been accounted under 'gifts and payments from patients'. Also, studies exploring health seeking behavior in Sierra Leone stress that the alternative to treatment in public facilities are traditional healers or drug peddlers, rather than the private healthcare sector, which is underdeveloped outside the capital (Scott *et al.* 2014).

Our results also show that in the three study districts there exist differences between HWs which are explained by individual and

facility characteristics, as well as differences across districts. In particular, we found that CHOs are more likely to sell drugs, possibly given their position within the facility which allows better control of drug stocks (Ferrinho *et al.* 2004b). HWs (re)trained after 2010 did not receive the correct salary for their qualification and younger ones were less likely to receive a salary, revealing the problems in the Ministry payroll. In terms of rural-urban posting, we did not find significant differences in the HWs overall income, despite some literature suggesting that HWs prefer urban posts as they can earn additional income in monetized urban economies (Witter *et al.* 2011). In fact, our findings show that per diems and gifts from patients were higher for those in rural areas, and there were no differences in earnings from non-health activities, which were often linked to agriculture and not viable in towns. However, in the interviews HWs stressed their preference for business-related activities where possible. Again, the absence of a rural–urban divide in incomes may be related to the sample which includes lower cadres in mostly rural areas or smaller towns. A preference for posting in urban areas remained in the narrative of the HWs, and it is likely to be linked to factors such as transport and communication issues (and related costs), working conditions, housing, social relations, etc. While our results show no unfair economic advantage for HWs in rural posts, they highlight the absence of specific incentives to compensate the difficulties of those posts, which had in theory been introduced with the remote allowance (then discontinued). Finally, there were important income differences based on the district of posting, which seems related to the presence of NGOs in the districts (Bertone and Witter 2015b). All these differences are not in line with the HRH strategies established at central level, and may have potential negative effects on recruitment, distribution and motivation of HWs.

Qualitative interviews showed that features of payments, such as regularity, reliability, ease of access, etc., are critical to define how HWs perceive and value each income. It emerged that HWs do not see incomes as perfect substitutes or fungible. Depending on their features, revenues will be used differently. This echoes the literature on 'mental accounting', which looks at the practice of assigning financial activities to specific accounts, by labelling sources and uses of funds and grouping them in categories constrained by mental budgets (Thaler 1999). The main consequence of this practice is that income in one category can be differently perceived from income in another (for example, regular income is considered different from a one-off windfall) and the assumption of fungibility of income becomes open for debate, with potential consequences on how we think about individuals' and households' financial decision-making. The existence of mental accounting has been confirmed in low-income settings (Duflo and Udry 2003; Davies *et al.* 2009; Villa *et al.* 2011). We also identified practices to deal with financial pressures from the extended family. These are in line with rich ethnographic work on moral and affective economy in Africa (Hyden 2006) and economics research exploring the effects of kin on financial choices (Hoff and Sen 2005; La Ferrara 2007). In particular, the practice of 'income hiding' to avoid predatory demands from family members has been documented in sub-Saharan settings, with qualitative and experimental methods (Baland *et al.* 2011; Jakiela and Ozier 2012; Beekman *et al.* 2015).

Our study has some limitations. Results are not representative of the entire country, although they cover 57% of all primary care facilities in three of fourteen districts, and our sample may slightly overrepresent in-charges compared to staff HWs. Moreover, HWs incomes were estimated using methods and data sources with varying levels of reliability. Despite the longitudinal logbook method and the thorough enumerators' training adopted to limit response bias, it is possible that certain revenues, and in particular the most sensitive ones, such as those derived from user fees, illicit sale of drugs or under-the-table payments, were underreported for fear of consequences (in the case of illegal activities) and because of the negative perceptions of the public around user fees even for non-exempted services (Denney and Mallett 2014). However, although those amounts are likely to be lower-end estimates, they are still far from negligible for many respondents, and we are able to derive valuable information about their existence within the remunerations of HWs.

Together, our findings have important policy implications for how we go about (re)thinking the design of financial incentive strategies. While salary in Sierra Leone represents more than half of the HWs monthly revenues and remains their main income, the rest of the remuneration is made up of sources for which there is no routine information available and which often escape central-level actors during the decision-making processes on financial incentive packages. As a consequence, these incomes can be subject to erroneous perceptions. For example, despite the widespread views of actors at central level of the relevance and distorting effects of salary supplementations, our research reveals that this practice had been almost completely discontinued for primary HWs in the study districts at the time of the research. Notwithstanding the obvious difficulties in collecting reliable routine data on all incomes, looking at salaries, even in conjunction with other official allowances and bonuses may not be enough to understand what financial incentives HWs face, and how attractive or not some posts may be. A better knowledge of the income structure and income opportunities for HWs is essential to set rules and establish the right incentive environment to address retention, distribution and motivation issues. In particular, there seems to be room for coordination with donors and NGOs to align remunerations from top-ups (as effectively done in the study districts), as well as per diems (which remain problematic) and reduce unfair differences among HWs deriving from those payments.

Importantly, it emerged from our study that HWs use different incomes in different ways to such extent that incomes are not fully fungible and the marginal effect of increasing one income source will not necessarily be equivalent to the marginal effect of increasing another source. How HWs value their revenue, in relation with one another and within the broader incentive environment, should be carefully considered. For example, salary increments could have little effect if appropriated by the extended family. On the other hand, while per diems have perverse effects (Vian *et al.* 2013) that must undoubtedly be addressed, they could play a particular role as a salary complement that is easily accessible and can be sheltered from family pressures. Similarly, activities outside of the health sector may have negative effects as they increase absenteeism (Van Lerberghe *et al.* 2002), but their revenues have an important role to deal with income instability.

This study reflects the situation as it was in Sierra Leone before the ongoing EVD outbreak. While at the time of the research most of the top-ups from external organizations had been eliminated, with the outbreak new payments have been introduced. A substantial hazard pay of 196–495 USD/month has been added to the remuneration of HWs involved in the EVD response (NERC 2015) and NGOs and donors are reportedly paying a variety of financial incentives in the specific sites where they operate. These allowances are poorly mastered at central level and their impact on the motivation of workers is undocumented. Additionally, they raise questions about the effects of their discontinuation, especially given their considerable amount. The post-EVD reconstruction phase will undoubtedly require new approaches to health system strengthening, taking

into account the role of incentives for HWs. This study can provide useful lessons in this sense. It stresses the importance of rationalization and alignment of incentives under the MoH lead, as well as the need for an increased consideration of the underlying potential to motivate HWs via financial and non-financial features of payments.

Conclusions

This paper highlights a series of important and understudied issues about the remuneration of HWs, which are likely to have a profound impact on retention and motivation and are of key policy relevance. In particular, it stresses the importance of understanding (and the potential for harmonization of) financial incentives beyond those usually known and analyzed at central level, in order to reduce unjustifiable income differences between HWs, which could have negative effects on their distribution, motivation and performance. Additionally, we provide evidence that incomes are not fungible in the views of HWs, so that the same increase in different income components may not have the same effects. Reflecting on the features and uses of incomes from a micro-level perspective is necessary to better understand how changes in incomes' level affect HWs.

Acknowledgements

The authors would like to acknowledge the health workers who participated in the study, and who, since May 2014, have been in the frontlines of the fight against the Ebola outbreak. This study would have not been possible without the tireless work of the enumerators' team. Thanks to Abdulrahman, Alimu, Christiana, Fatmata, Edrissa, James, John, Michael, Precious, Sajallieu and Mr Bah, and to David and Salim at the NGO Solthis for logistic support. Many thanks also to our anonymous reviewers for their useful comments to our manuscript.

Funding

We gratefully acknowledge funding from the Fondation AEDES (www.fondation-aedes.org/) for MPB's PhD scholarship and from DfID-funded ReBUILD Consortium (www.rebuildconsortium.com) for fieldwork activities.

Conflict of interest statement. None declared.

References

Akwataghibe N, Samaranayake D, Lemiere C, Dieleman M. 2013. Assessing health workers' revenues and coping strategies in Nigeria – a mixed-methods study. *BMC Health Services Research* **13**: 387.

Baland J-M, Guirkinger C, Mali C. 2011. Pretending to be poor: borrowing to escape forced solidarity in Cameroon. *Economic Development and Cultural Change* **60**: 1–16.

Beekman G, Gatto M, Nillesen E. 2015. Family networks and income hiding: evidence from lab-in-the-field experiments in rural Liberia. *Journal of African Economies* **24**: 453–69.

Bertone MP. 2015. Performance-Based Financing in the context of the 'complex remuneration' of Health Workers: findings from a mixed-methods study in rural Sierra Leone. Presentation at the international Health Economists Association (iHEA) conference. Milan, 12–15 July 2015. Available at http://www.rebuildconsortium.com/resources/presentations/performance-based-financing-in-the-context-of-the-complex-remuneration-of-heal.

Bertone MP, Witter S. 2015a. The complex remuneration of Human Resources for Health in low-income settings: policy implications and a research agenda for designing effective financial incentives. *Human Resources for Health* **13**: 62.

Bertone MP, Witter S. 2015b. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine* **141**: 56–63.

Bertone MP, Samai M, Edem-Hotah J, Witter S. 2014. A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002–2012. *Conflict and Health* **8**: 11.

Cordaid. 2014. *Performance Based Financing in Healthcare in Sierra Leone. External Verification - Final Report*. Cordaid (unpublished report): Freetown and The Hague.

Corti L. 1993. *Using Diaries in Social Research*. Guildford: University of Surrey – Social Research Update.

Davies S, Easaw J, Ghoshray A. 2009. Mental accounting and remittances: a study of rural Malawian households. *Journal of Economic Psychology* **30**: 321–34.

Denney L, Mallett R. 2014. *Mapping Sierra Leone's plural health system and how people navigate it*. Secure Livelihoods Research Consortium – Briefing Paper No.6: London.

Donnelly J. 2011. How did Sierra Leone provide free health care? (Special Report). *Lancet* **377**: 1393–6.

Duflo E, Udry CR. 2003. *Intrahousehold Resource Allocation in Cote d'Ivoire: Social Norms, Separate Accounts and Consumption Choices*. NBER Working Paper No. 10498: Cambridge, MA.

Ensor T, Witter S. 2001. Health economics in low income countries: adapting to the reality of the unofficial economy. *Health Policy* **57**: 1–13.

La Ferrara E. 2007. *Family and Kinship Ties in Development: An Economist's Perspective*. Milano: Bocconi University – IGIER Working Paper.

Ferrinho P, Van Lerberghe W. 2000. Providing health care under adverse conditions: health personnel performance & individual coping strategies. Anwerp: Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16.

Ferrinho P, Van Lerberghe W, Fronteira I, Hipólito F, Biscaia A. 2004a. Dual practice in the health sector: review of the evidence. *Human Resources for Health* **2**: 14.

Ferrinho P, Omar MC, Fernandes MDJ, *et al*. 2004b. Pilfering for survival: how health workers use access to drugs as a coping strategy. *Human Resources for Health* **2**: 4.

Hoff K, Sen A. 2005. *The Kin System as a Poverty Trap?* Washington, DC: World Bank Policy Research Working Paper 3575.

Hyden G. 2006. Introduction and overview to the special issue on Africa's moral and affective economy. *African Studies Quarterly* **9**: 1–8.

Jakiela P, Ozier O. 2012. *Does Africa Need a Rotten Kin Theorem? Experimental Evidence from Village Economies*. Washington, DC: World Bank Policy Research Working Paper 6085.

Van Lerberghe W, Conceicao C, Van Damme W, Ferrinho P. 2002. When staff is underpaid: dealing with the individual coping strategies of health personnel. *Bulletin of the World Health Organization* **80**: 581–4.

McCoy D, Bennett S, Witter S *et al*. 2008. Salaries and incomes of health workers in sub-Saharan Africa. *Lancet* **371**: 675–81.

McPake B, Russo G, Tseng F-M. 2014. How do dual practitioners divide their time? The cases of three African capital cities. *Social Science & Medicine* **122**: 113–21.

Mueller DH, Lungu D, Acharya A, Palmer N. 2011. Constraints to implementing the Essential health package in Malawi. *PLoS ONE* **6**: e20741.

NERC. 2015. *EVD Risk Allowances*. Freetown: National Ebola Responce Centre.

Ritchie J, Lewis J. 2003. *Qualitative Research Practice*. London: Sage Publications.

Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W. 1997. How African doctors make ends meet: an exploration. *Tropical Medicine & International Health* **2**: 127–35.

Scott K, McMahon S, Yumkella F, Diaz T, George A. 2014. Navigating multiple options and social relationships in plural health systems: A qualitative study exploring healthcare seeking for sick children in Sierra Leone. *Health Policy and Planning* **29**: 292–301.

Thaler RH. 1999. Mental accounting matters. *Journal of Behavioral Decision Making* **12**: 183–206.

Vian T, Miller C, Themba Z, Bukuluki P. 2013. Perceptions of per diems in the health sector: evidence and implications. *Health Policy and Planning* **28**: 237–46.

Villa KM, Barrett CB, Just DR. 2011. Differential nutritional responses across various income sources among East African pastoralists: intrahousehold effects, missing markets and mental accounting. *Journal of African Economies* **20**: 341–75.

Willis-Shattuck M, Bidwell P, Thomas S, *et al*. 2008. Motivation and retention of health workers in developing countries: a systematic review. *BMC Health Services Research* **8**: 247.

Witter S, Fretheim A, Kessy F, Lindahl A. 2012. Paying for performance to improve the delivery of health interventions in low- and middle-income countries (Review). *The Cochrane Collaboration* **3**: CD007899.

Witter S, Thi Thu Ha B, Shengalia B, Vujicic M. 2011. Understanding the 'four directions of travel': qualitative research into the factors affecting recruitment and retention of doctors in rural Vietnam. *Human Resources for Health* **9**: 20.

Witter S, Wurie H, Bertone MP. 2016. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? *Health Policy and Planning* **31**: 1–9.

9.4 Cover sheet for research paper

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
www.lshtm.ac.uk

Registry
T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

RESEARCH PAPER COVER SHEET

PLEASE NOTE THAT A COVER SHEET MUST BE COMPLETED FOR EACH RESEARCH PAPER INCLUDED IN A THESIS

SECTION A – Student Details

Student	Maria Paola Bertone
Principal Supervisor	Dr Mylene Lagarde
Thesis Title	Exploring the complex remuneration of health workers in Sierra Leone

If the research paper has previously been published please complete Section B. If not, please move to section C

SECTION B – Paper already published

Where was the work published?			
When was the work published?			
If the work was published prior to registration for your research degree, give a brief rationale for its inclusion			
Have you retained the copyright for the work?*		Was the work subject to academic peer review?	

** If yes, please attach evidence of retention. If no, or if the work is being included in its published format, please attach evidence of permission from the copyright holder (publisher or other author) to include this work.*

SECTION C – Prepared for publication, but not yet published

Where is the work intended to be published?	BMC Health Services Research
Please list the paper's authors in the intended authorship order:	Bertone MP, Lagarde M, Witter S
Stage of publication	Undergoing revision

SECTION D – Multi-authored work

For a multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary).	I designed the study, and collected and analyzed the original data. I was responsible of preparing and submitting the article draft.

Student signature:  **Date:** _____17/06/2016_____

Supervisor signature: _____  _____ **Date:** _____17/06/2016_____

9.5 Performance-Based Financing in the context of the complex remuneration of health workers: findings from a mixed-method study in rural Sierra Leone

Maria Paola Bertone[1], Mylene Lagarde[2], Sophie Witter[3*]

[1] Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London (UK) & ReBUILD Consortium - maria.bertone@lshmt.ac.uk

[2] Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London (UK) - mylene.lagarde@lshmt.ac.uk

[3] ReBUILD Consortium, IIHD, Queen Margaret University, Edinburgh (UK) - SWitter@qmu.ac.uk

* corresponding author

Abstract

Background

There is growing interest on the impact of performance-based financing (PBF) on health workers' motivation and performance. However, the literature so far tends to look at PBF payments in isolation, without reference to the overall remuneration of health workers. Taking the case of Sierra Leone, where PBF was introduced in 2011, this study investigates the absolute and relative contribution of PBF to health workers' income and explores their views on PBF bonuses, in comparison to and interaction with other incomes.

Methods

The study is based on a mixed-methods research consisting in a survey and an 8-week longitudinal logbook collecting data on the incomes of primary health workers (n=266) and 39 in-depth interviews with a subsample of the same workers, carried out in three districts of Sierra Leone (Bo, Kenema and Moyamba).

Results

Our results show that in this setting PBF contributes about 10% of the total income of health workers. Despite this relatively low contribution, their views on the bonuses are positive, especially compared to the negative views on salary. We find that this is because PBF is seen as a complement, with less sense of entitlement compared to the official salary. Moreover, PBF has a specific role within the income utilization strategies enacted by health workers, as it provides extra money which can be used for emergencies or reinvested in income generating activities. However, implementation issues with the PBF scheme, such as delays in payment and difficulties in access, cause a series of problems that limit the motivational effects of the incentives. Overall, staff still favor salary increases over increases in PBF.

Conclusions

The study confirms that the remuneration of health workers is complex and interrelated so that the different financial incentives cannot be examined independently from one. It also shows that the implementation of PBF schemes has an impact on the way it does or does not motivate health workers, and must be thoroughly researched in order to assess the impact of PBF.

Key words: Performance-based financing, remuneration, financial incentives, health workers, Sierra Leone

9.5.1 Introduction

Performance-based financing (PBF) schemes are implemented in a growing number of low and middle-income countries and in particular in sub-Saharan Africa. At the moment, there are about 34 countries in Africa where at least one pilot or regional scheme is in place [1]. In a few countries, notably Burundi, Rwanda and Sierra Leone, the setting of this research, PBF has been introduced at national level. In a nutshell, PBF schemes entail the payment of a financial bonus to healthcare providers based on their performance, measured by the quantity of services provided (or the achievement of a coverage target), out of a list of pre-identified indicators, usually adjusted by a measure of structural quality. The performance bonus is normally used for facility running costs and individual staff incentives. PBF is envisaged to improve the quantity and quality of services provided by increasing the motivation of health workers and their responsiveness to patients' needs. It is also expected to have positive systemic effects through the reorganization and clarification of roles and responsibilities between actors and increased autonomy of providers, transparency and accountability [2, 3].

Research on the impact of PBF schemes has substantially expanded over the last years, and studies have focused on health outcomes and outputs [4–8], and some process indicators of quality of care [9] and motivation of health workers. This last aspect is the focus of this paper. Limited but growing evidence exists on the relation between financial incentives and health workers' motivation and performance, with a focus on whether PBF affects intrinsic motivation [8, 10–14]. The evidence so far tends to look at PBF payments in isolation, without reference to the broader context of the overall remuneration and the other earning opportunities of health workers. However, we know that health workers, and in particular those in low and middle income settings, earn their revenues from a variety of official and unofficial sources, both related to their activities in the health sector as well as those outside [15–17].

In this paper, we aim to fill this gap in the literature by exploring the role of performance-based payments in the context of the entire complex remuneration of health workers, and in relation to the other revenues that they receive [17]. Taking the case of Sierra Leone, where a PBF scheme was introduced for primary healthcare facilities in 2011, this study investigates the absolute and relative contribution of PBF to the overall income of health workers, explores the views of health workers on performance payments, and analyzes their perceptions of revenues and livelihoods with regards to PBF but also in interaction with other incomes. The analysis is based on a mixed-methods research, including a cross-sectional and longitudinal survey and in-depth interviews with public primary health workers, conducted in three districts in Sierra Leone.

9.5.2 Study setting

In Sierra Leone, following the launch of the Free Health Care Initiative (FHCI) in 2010 which introduced fee exemptions for pregnant women and children under five, a series of complementary reforms has been introduced, many of which addressed issues related to the payment and motivation of health workers [18]. First, in 2010, the public payroll was cleaned to eliminate 'ghost' workers and add 'volunteers'. At the same time, the salary was substantially increased for all technical health workers employed by the Ministry of Health and Sanitation (MoHS). In 2011, a PBF scheme was introduced in primary healthcare facilities nationwide. This scheme was meant to complement the salary increase for staff and substitute the 'cash to facility' program in place before [18], and therefore includes a bonus to be shared between facility and staff. Finally, in 2012, a remote allowance for health workers employed in rural regions was also introduced, although it was discontinued towards the end of the same year, because of cash-flow issues. These reforms profoundly reshaped the remuneration of health workers, into a rational and coherent (at least in the design) package [19]. To align to the governmental policies on incentives, donors and many NGOs also gradually eliminated most of the top-ups payed to health workers, and often to those in charge of disease-specific services (e.g., TB and HIV/AIDS).

The PBF design was purposefully simple and the scheme was introduced nationally without piloting, but limited to primary healthcare facilities and not including hospitals (later, a pilot scheme was also created for two hospitals in Freetown). Primary facilities include three types of health centers: Community Health Centers, Community Health Posts and Maternal and Child Health Posts[1]. The performance bonus is calculated quarterly as a fee-for-service payment based on the number of services produced for six indicators (Table 9.5) [20]. This means that the facility receives a sum equal to the payment corresponding to each one service provided which is included in the scheme (e.g., facilities receive 1,000 Le. for each delivery carried out, and a total of 20,000 Le. if 20 deliveries have been provided in a month, and so on for each of the six PBF-subsidized services). The bonus accrued from the quantity of services provided is then multiplied by a percentage quality score, calculated based on a pre-defined checklist. The checklist includes items concerning the proper completion of the relevant registries for family planning, antenatal and postnatal visits, immunization, under-five consultations, the correct use of partograph for each delivery, the existence of a suitable environment for delivery (cleanliness and availability of equipment) and of a cold chain for immunization. The total bonus is the sum of the bonus based on the quantity provided, plus that same amount multiplied by the quality score (e.g. if the facility above has earned 20,000 Le based on services provided and has a quality score of 80%, it will receive in total 20,000+(20,000*80%)=36,000 Le.). The verification of quantity (by cross-checking the facility registry and declaration) and quality (by compiling the checklist) is performed by the District Health Management Team (DHMTs) in collaboration with the Local Council, the administrative body at district level. The performance bonus is paid into the facility's bank account every quarter, and can be used for two purposes: a minimum of 40% of the bonus has to be used to cover the facility's running costs and small investments (e.g., sanitation and hygiene materials, furniture and small equipment, transport and communication means, stationery, repairs, etc.) and for the payment of casual staff,

such as traditional birth assistants (TBAs) and community health workers (CHWs). A maximum of 60% of the bonus can be used to pay performance bonuses to staff. The bonus for each health worker is determined according to a 'points' system based on the cadre of the health worker. For example, Community Health Officers (CHOs) and midwives receive 10 points, Community Health Assistants (CHAs) and nurses 9 points and Maternal and Child Health (MCH) Aides 8 points. Nurses in-charge of the facility, whatever their cadre, receive 2 extra points [20]. For example, if the staff of a facility is composed of one CHO in-charge (10+2 points), one nurse (9 points) and two MCH Aides (8 points each), they will share the staff bonus in 37 parts (total points in the facility) and redistribute the bonus so that each receives as many parts as his/her points. If the bonus received is 36,000 Le (as in the example above) and the staff decides to share 60% of it (the maximum allowed), i.e. 21,600 Le., each part will be of [(36,000*60%)/37]=584 Le. and the CHO will receive (584*12)=7,005 Le., the nurse (584*9)=5,254 Le., and the MCH Aides (584*8)= 4,670 Le. each.

[insert Table 9.5 about here]

Despite its simple design, the implementation of the PBF scheme faced numerous challenges. An external evaluation by an international NGO was performed in April 2014 looking over the two years of implementation. It revealed the weakness of the verification process and found large discrepancies between the indicators verified internally by DHMTs and Local Councils and used to calculate the performance bonuses. Moreover, practical and logistic challenges in the verification procedures resulted in delays of about one year in the payment of the performance bonus [21]. At district level, there is evidence [22] that the implementation of the PBF scheme partially depended on the presence of NGOs operating there. In particular, in Kenema, an NGO was supporting the PBF scheme, by contributing the logistic and financial means that the DHMT needed to carry out verification and supervisions, as well as by providing facilities with training, equipment and drugs focused specifically on the services included in the PBF scheme. In the districts of Bo and Moyamba, NGO support to facilities was more fragmented and not focused on PBF and PBF indicators.

9.5.3 Methods

This study is based on a mixed-methods research carried out in the districts of Bo, Kenema and Moyamba, between September 2013 and April 2014. Quantitative data were collected from about 200 primary healthcare facilities, where 266 health workers were interviewed. The sample includes the cadres of trained nurses working in health centers, i.e. CHOs (n=30); CHAs, nurses and midwives (grouped together in the analysis) (n=76); and MCH Aides (n=160).

Quantitative data collection consisted in a cross-sectional survey and an eight-week longitudinal logbook collecting data on HWs incomes. Specifically, the survey focused on demographic information as well as on earnings from salary, remote allowance, PBF bonus, share of user fees, top-ups/salary supplementations, per

diems, and income-generating activities from outside of the health sector. The longitudinal logbook was left with the health workers to be filled in daily with the activities carried out and all the revenues earned each day. After a preliminary analysis, it was decided to estimate the total monthly income of health workers by using data from the survey where available (i.e. for data on salary, remote allowance, PBF bonus, user fees, salary supplementations, per diems, and non-health incomes), and from the logbooks for earnings from sale of drugs, gifts and payments from patients, and private practice [23]. Based on these data, we calculated the average monthly amount for each income for each individual health worker, including for PBF bonuses. We then computed their importance relative to total income, and estimated logistic and linear regressions to explore the determinants at individual and facility level of (i) the likelihood of receiving a PBF bonus, and (ii) of the amount of PBF bonus received. At individual level explanatory variables include gender, age, cadre, and role within facility, while at facility level they include type and size of facility, urban/rural, and district. Data on other factors which could influence the amount of PBF bonus via the quality component, such as correctly filled-in registries and availability of essential drugs, equipment and infrastructure were not collected.

Qualitative data were collected based on two rounds of in-depth interviews with health workers. In total, 39 interviews were carried out in November-December 2013 and March-April 2014. Interviewees were purposefully chosen as a sub-sample from the quantitative survey sample reflecting the mix of health workers in the districts, in terms of cadre, rural/urban post, gender, type of facility and district of posting. A semi-structured interview guide was prepared and flexibly used to inform the interviews, while allowing space for new themes and views to emerge. The interviews did not focus exclusively on the health worker views of PBF and the changes it brought, but were more broadly centered on all the different incomes and sources which make up the total remuneration of health workers. Although the topic guide was iteratively adapted during the interviews, the main themes of focus remained (i) the health workers' income sources (including PBF), and views on level and fairness, and (ii) non-financial features of the incomes which affect the way health workers perceive and use their remunerations. Interviews were then recorded, transcribed and manually analyzed using content framework analysis [24]. Coding was carried out using a series of pre-defined themes (such as, income features (e.g., how it is paid, timeliness, regularity, etc.), health worker income maximization strategies and income uses), as well as by identifying emerging themes in the health workers in their narratives. Critically, 'motivation' was one of such emerging themes, in particular with reference to PBF payments. While all incomes are analyzed together in another publication [25], because of the relevance of issues concerning PBF and motivation in the current international debate, a separate analysis is carried out in this paper, specifically referring to the health worker views on PBF.

Ethical clearance for all components of the research was obtained from the London School of Hygiene and Tropical Medicine and the Sierra Leone Ethics and Scientific Review Committee. Information on the study was provided to participants, and their written consent was obtained before the survey and interviews.

9.5.4 Results

What PBF contributes to overall health worker income

The descriptive analysis of the health workers' overall revenues reveals that PBF accounts for 9-11% of the total monthly income across the different cadres (Figure 9.2). In comparison, salaries are the main source of revenue for health workers, representing between 55% and 63% of the income, while per diem payments are the second most important and account for up to 20% of the income. In absolute terms, looking for example at CHAs and nurses, this means that salary accounts for about 130 USD monthly, while PBF bonuses contributes 20 USD per month and per diems about 50 USD (total monthly income is 235 USD). Other revenues, such as those from non-health activities (usually farming or small trading businesses) and gifts from patients (usually in-kind support from the community) are quite important and together add up to about the same amount as PBF payments.

[insert Figure 9.2 about here]

Determinants of PBF income

The multivariate models presented in Table 9.6 explore which health workers are more likely to receive PBF bonuses and higher bonuses. Results show that individual factors do not influence these issues, with the exception of being in-charge of the facility. Health workers in charge are more likely to receive a PBF bonus and to receive a higher PBF amount than others. The second finding suggests that the scheme is implemented as designed, since being in-charge grants more 'points' in the calculation of their bonus.

Looking at facility-level characteristics, it emerges that health workers posted in Community Health Posts are more likely to receive a PBF bonus, thus pointing to unexpected differences between facilities in the implementation of the scheme. Finally, there are important variations at district level, as health workers are more likely to receive PBF bonuses in Kenema and receive significantly less in Bo compared to Moyamba. These patterns confirm what was found at meso-level in the districts about the implementation of PBF and the effects of the presence of NGOs supporting the scheme, for example by providing drugs and technical support on MCH services or supporting the DHMT for the verification procedures [22]. In particular, in Bo, the fragmented NGO support, which did not cover all facilities, may have resulted in lower PBF bonuses for health workers.

[insert Table 9.6 about here]

Health worker views of PBF and motivation

While the quantitative data allow us a preliminary understanding of the relative importance and the potential motivational impact of PBF, the qualitative interviews complete and enrich this picture. Overall, health workers had positive views on the idea of being paid based on their performance, and reported that effort exerted increased following the introduction of performance-based payments. Health workers said:

> *"It [PBF] helps us improve more in our work. […] You will put more effort"* (CHA/nurse in Kenema)
> *"We work harder [with PBF]"* (CHA/nurse in Kenema)
> *"It's a good system because then you perform. If you do not perform well, you do not receive the money"* (MCH Aide in Kenema)
> *"PBF motivates us. Where do I feel there is a lack? Why are my friends getting more than me? What was my problem? Then you sit down and check yourself"* (MCH Aide in Kenema).

It is interesting to note that all those quotes were from health workers posted in Kenema, where measures to complement the PBF scheme were supported by an external NGO covering all facilities. Moreover, the last quote points to the fact that PBF entail a self-reflective process in which in-charges compare themselves to their colleagues in other facilities to improve service delivery.

When asked about their views on PBF as an income, health workers seemed to be satisfied and positive, especially if compared to the generally negative comments on their salary, even if the latter is their main source of income. Health workers said that PBF "*helps*" (two MCH Aides and a CHA/nurse in Bo, Kenema and Moyamba), is "*good money*" (two CHA/nurses in Bo and Kenema), or "*really enough*" (MCH Aide in Kenema). The positive perception of PBF compared to salary seems to be linked to the fact that PBF bonuses, given the unpredictability of the payment, are seen as complement or windfall, with less sense of entitlement compared to the salary. A health worker said,

> "*It [PBF] is manageable, it is just an addition*" (CHA/nurse in Kenema) [where 'manageable' indicates that its level is financially satisfying]

Despite these positive views, when directly probed on whether they would prefer a salary increase or an increase in PBF fees allocated for each service provided, health workers agreed that they would prefer a salary increase:

> "*I would prefer an increase in salary, because PBF depends on us, on the way we work*" (MCH Aide in Kenema)
> "*We have PBF but not all the times. Instead of waiting for PBF, let our salary increase*" (MCH Aide in Kenema)

Non-financial aspects of PBF found to motivate health workers

During the interviews, health workers spontaneously mentioned that non-financial aspects of the PBF scheme contributed to their increased motivation and performance. In the quotes below, they reported that they understood better their tasks and responsibilities, because of how the service delivery requirements are detailed in the PBF contracts and in the quality checklist.

"*PBF is good, but not only the money. You receive the money and you eat it, but when you are used to [fill in] the partograph, then you enjoy your job*" (MCH Aide in Moyamba)
"*I prefer PBF because it helps me. Now I know what to do and what not to do*" (MCH Aide in Kenema)

Health workers also found motivation through the improvements in the working environment that are paid for with the facility component of the bonus. One health worker said,

"*The part used for the facility is motivating. We are improving, we are managing the center*" (CHO in Bo).

Other features of PBF payments that (de)motivate health workers

Moreover, PBF bonuses also have features of which health workers can take advantage within their income utilization strategies. As the quarterly PBF bonus can be a relatively substantial amount of money earned at once, compared to other incomes which are paid in a more fragmented way, it can be saved from family pressures and routine expenditures, and reinvested in non-health income generating activities. An analysis of the quantitative survey data confirmed that income from non-health activities were significantly higher for those with higher PBF bonuses ($p=0.05$). In turn, revenues from non-health activities provide a certain income stability which allows dealing with the instability of most incomes (e.g. PBF and per diems). One health worker explained,

"*I do some little trading, I plan to buy palm oil [with unspent PBF money] and store until the price is favorable. I don't really schedule because PBF doesn't come every day, but whenever money is coming you get uses*" (CHA/nurse in Bo).

On the other hand, a complaint concerned how PBF is shared -or not- by in-charges with the other workers. In other cases, though, sharing practices, highlighting the existence of team spirit within facilities, were found, in particular in health centers with fewer staff. In some cases, health workers posted immediately after training were given individual bonuses despite not being eligible for it as not working in facility when the bonus was accrued. This practice was justified by the fact that they were not yet on payroll and would have little alternative financial means to support themselves.

"*Last time I went for a meeting, there was a lady who went with a complain, saying that her colleague did not recognize her with the PBF*" (MCH Aide in Bo).
"*She [the in-charge] is encouraging me by giving it [share of PBF] to me*" (MCH Aide in Bo).

"*She [the other nurse] was not here, but even if when I receive PBF I give her something*" (MCH Aide in Moyamba).

PBF implementation issues and health worker motivation

One of the problems indicated by health workers are the long delays in the payment of PBF. Those delays are a key issue that affects the scheme, because they effectively remove the link between effort at facility level and payment provided. Moreover, the delays in payment entail complicated bonus sharing practices. Indeed, often those who worked in the facility when the bonus was accrued are posted elsewhere by the time of its receipt after one year. As a consequence, 'old' and 'new' staff in the facility have to travel and meet in person, in order to make sure the payment is shared with the worker entitled to receive it. This system is extremely complicated given the absence of bank transfers and the difficulties in communication and travel in Sierra Leone, and it relies on the transparency of the in-charges in informing and tracing the staff to provide them the correct payment. Instances of misappropriation or mismanagement of PBF bonuses by some in-charges, as well as implementation failures and mistakes have been recounted during the in-depth interviews:

"*I have no access [to PBF] now, because the nurse that was in this center before took the registry and went with it*" (MCH Aide in Moyamba).
"*12 health centers where left out [never received PBF payments – out of 99 in Moyamba district]. Maybe the computer jumped our name...? We don't know*" (MCH Aide in Moyamba).

Another issue around PBF which limit its potential for motivating health workers are the difficulties they experience in accessing the payment. The bonus is received via the facility bank account which is usually located in the district town, far from the rural facilities, and there is often no information on when it will be paid. In the quote below, a health worker in Kenema recounts the problems in accessing PBF:

"*PBF does help actually, but the time to get out PBF is our problem. Because the time when it [the PBF bonus] comes, we have to go through a lot of process before ever accessing it. Certain times you pay transport to Kenema and be there for one or two days and you are not able to access the money, or they tell you to come another time*" (CHA/nurse in Kenema).

9.5.5 Discussion

The findings presented in this paper show the potential for motivation of performance-based pay in Sierra Leone and of the possible paths through which PBF can motivate health workers, as seen from their own perspective. The analysis allows us a first understanding of the relative importance of PBF, in comparison with the other, formal and informal, income sources. It emerges that, in the context of primary healthcare facilities in Sierra Leone, PBF payments are of a relatively small amount (about 10%) compared to the overall income. However, as found in other settings [26], other factors beyond the face monetary value influence the perceptions of health

workers. PBF as a scheme seems to be well perceived and relatively motivating for health workers because of some non-financial features in its design. One of these is the clarification of responsibilities and tasks in service delivery, which resonates with similar findings in the context of Burundi [27]. Another is the perceived improvement in the physical working environment thanks to the facility component of the bonus, which is also noted in Nigeria [26] and Malawi [28]. Our findings highlight a tension in the narratives of the health workers between seeing PBF bonuses as a reward for effort and viewing them as a windfall, as both notions are there for the staff. Often, the unexpected addition to the income provided by PBF payments is seen as a windfall, which takes a different place in the "mental accounts" of health workers and can be spent differently [25]. Health workers also take advantage of the fact that the amount of the payment can be substantial within their income utilization strategies, where PBF is useful to complement and balance the features of other incomes. The strategies for differential use of different incomes by health workers in Sierra Leone are further explored in another publication [25].

On the other hand, a series of design and implementation issues act as 'demotivators' and limit the motivational effects of the incentive. Delays in the payment of the PBF bonus, due to lengthy verification procedures or other issues, are reported across different schemes [26, 29–31] and acknowledged to be a major challenge, in particular because of the disconnection that they cause between effort/performance and payment which is in fact a key point in the theory of change of PBF incentives. Another tension in PBF schemes comes from the fact that performance is measured at facility rather than individual level, and that individual rewards are calculated afterwards, either based on cadre and hierarchy as in the case of Sierra Leone, or on a measure of individual effort, as done in other contexts [26, 30]. A previous study in Sierra Leone [32] found that health staff were motivated by PBF but frustrated by the erratic and unpredictable nature of the payments and because the bonus is shared based on cadre, systematically privileging those in-charge. As found in another setting [30], our findings show mixed results regarding the potential of performance bonuses paid to the facility for the motivation or demotivation of the staff as a team. Some health workers reported sharing payments with those newly arrived who are not entitled to them, pointing to collaboration and reciprocity between staff, while others stressed their discontent for not receiving their rightful bonus. MoHS staff at central level mentioned that "PBF is seen as motivating, but not fair"[2]. While it has been explored in high-income settings [33] and in experimental economic studies outside of the health sector [34, 35], the impact on motivation and performance of the sharing practices within the facility team is an issue which deserves further research across PBF schemes and in low-income settings [14]. Finally, compared to other countries [26, 36], health workers in Sierra Leone did not raise the issue of being demotivated by increased workload linked to PBF, likely because PBF was introduced relatively shortly after the introduction of the free health care initiative which had already entailed a substantial increase in patient load [19] and possibly also because PBF as implemented in Sierra Leone did not entail additional reporting requirements.

Our study has some limitations. Despite the use of different techniques (i.e., survey, longitudinal logbook and in-depth interviews) to triangulate information and avoid biases, one issue concern the reliability of data on income amounts, especially for the most sensitive ones (user fees, gifts and payments from patients, sale of drugs, etc.). However, we consider that for official incomes, such as PBF, the estimate is likely to be reliable. In terms of data analysis, variables at facility level concerning the availability of filled-in registries, drugs, equipment, infrastructure, and other factors which could influence the amount received as PBF bonus were not included. However, we provide qualitative information in terms of the varying support that facilities receive from NGOs in the districts which could partially explain some of the differences. Finally, the results discussed above are closely related to the specific context, as well as the design features and implementation challenges of the PBF scheme in Sierra Leone and may not be valid for other contexts and PBF schemes. This stresses the importance of understanding the setting and the specific challenges in the study of PBF schemes.

Beyond the context-specific findings, what our study points to in a generalizable manner is the importance of research focusing not only on the outputs and outcomes of a PBF scheme, but also on the design and the implementation details [30, 31], in order to unpack and understand the underlying mechanisms by which PBF can motivate or demotivate health workers in practice, and from their own perspective. Our analysis also stresses that the remuneration of health workers is complex and interrelated, so that not only the monetary value of the financial incentive is relevant for their motivation, but also other features of the payments, which affect the way they are utilized and perceived by the health workers.

9.5.6 Conclusions

This study provides a description of the absolute and relative importance of PBF payments within the income of public primary healthcare workers in Sierra Leone and of their views on the motivation provided by performance payments in the context of the overall revenues and incomes.

For policy makers in Sierra Leone, these findings are particularly relevant in the current post-Ebola Virus Disease (EVD) health system strengthening efforts. During the EVD outbreak, the PBF scheme continued to function, although under an even simpler model (e.g. payments were based on data of the health information system with no verification performed) [37], which is likely to have heightened the problems observed above and created others. At the same time, a new scheme was briefly piloted by an NGO in 2015 in the district of Bombali under a different design (so-called “PBF Plus”). While this pilot addressed some of the issues of the ‘simple’ PBF scheme, other challenges emerged, in particular concerning costs and sustainability. At the moment, the future of PBF in Sierra Leone is uncertain and potential new models are being discussed. Given the critical role that PBF seem to play for health workers and facilities despite the numerous weaknesses, it is important that the future development of the PBF scheme capitalize on the lessons learned and builds on them to guarantee an effective role of PBF towards health system strengthening.

Overall, the results confirm the importance of looking beyond each single financial incentive available to health workers separately, but to include all incomes and explore the interrelated dynamics between them which contribute to motivation and performance at individual and team level. As health workers put in place compensating and coping strategies for income use, it is important that researchers and policy-makers look at the effects on motivation of each revenue stream (including performance payments) in relation to one another and considering the broader incentive environment. Findings also stress that the implementation of a PBF scheme at national, district and facility level has a critical impact on the ways it motivates or demotivates health workers and, therefore, must be thoroughly researched in order to assess the impact of PBF.

Competing interests

The authors declare no competing interests.

Funding

We gratefully acknowledge funding from the Fondation AEDES (www.fondation-aedes.org) for MPB's PhD scholarship and from ReBUILD (www.rebuildconsortium.com) for fieldwork activities.

ReBUILD is funded by UK Aid. The views expressed do not necessarily reflect the UK government's official policies.

Authors' contributions

MPB designed the study with guidance from ML and SW. MPB carried out the data collection and analysis with support from, and regular exchange with ML and SW, and drafted a first version of the paper. All authors contributed to subsequent drafts of the manuscript and approved the final version.

Acknowledgements

The authors would like to acknowledge the health workers who participated in the study and shared their views. This study would have not been possible without the tireless work of the enumerators' team. Thanks to Abdulrahman, Alimu, Christiana, Fatmata, Edrissa, James, John, Michael, Precious, Sajallieu and Mr Bah, and to David and Salim at the NGO Solthis for logistic support.

Endnotes

[1] Maternal and Child Health Posts are the lowest level of primary healthcare centers in the health system, and provide only services related to immunization and child health, delivery and maternal health, family planning and nutrition. They are staffed by one or two nursing aides (Maternal and Child Health/MCH Aides). At a higher level are Community Health Posts and Community Health Centres provide a broader range of curative services and are staffed with non-physician clinicians (Community Health Officers/CHOs and Community Health Assistants/CHAs), nurses and midwives. Community Health Centres are the largest health centers of all and

usually headed by CHOs, who are also responsible for supervising the Maternal and Child Health Posts in their area.

[2] Personal communication with MoHS.

9.5.7 References

1. Fritsche G, Soeters R, Meessen B: *Performance-Based Financing Toolkit*. Washington, DC: World Bank; 2014.

2. Meessen B, Soucat A, Sekabaraga C: **Performance-based financing: just a donor fad or a catalyst towards comprehensive health-care reform?** *Bull World Health Organ* 2011, **89**:153–6.

3. Witter S, Toonen J, Meessen B, Kagubare J, Fritsche G, Vaughan K: **Performance-based financing as a health system reform: mapping the key dimensions for monitoring and evaluation**. *BMC Health Serv Res* 2013, **13**:367.

4. Basinga P, Gertler PJ, Binagwaho A, Soucat AL, Sturdy J, Vermeersch CM: **Effect on maternal and child health services in Rwanda of payment to primary health-care providers for performance: an impact evaluation**. *Lancet* 2011, **377**:1421 – 1428.

5. Falisse J-B, Ndayishimiye J, Kamenyero V, Bossuyt M: **Performance-based financing in the context of selective free health-care: an evaluation of its effects on the use of primary health-care services in Burundi using routine data**. *Health Policy Plan* 2014, **30**:1251–1260.

6. Bonfrer I, Van de Poel E, Van Doorslaer E: **The effects of performance incentives on the utilization and quality of maternal and child care in Burundi**. *Soc Sci Med* 2014, **123**:96–104.

7. Binyaruka P, Patouillard E, Powell-Jackson T, Greco G, Maestad O, Borghi J: **Effect of Paying for Performance on Utilisation, Quality, and User Costs of Health Services in Tanzania: A Controlled Before and After Study**. *PLoS One* 2015, **10**:8.

8. Huillery E, Seban J: *Financial Incentives Are Counterproductive in Non-Profit Sectors: Evidence from a Health Experiment*. Paris: Science Po, Department of Economics - Working Paper; 2015.

9. Binyaruka P: *Measuring Quality of Care in Tanzania*. Dar es Salaam: Presentation at the workshop "Payment for Performance: a health systems perspective" (24-26 November 2015); 2015. Available at: http://www.slideshare.net/resyst/measuring-quality-of-care-in-tanzania-55931507

10. Meessen B, Kashala JPI, Musango L: **Output-based payment to boost staff productivity in public health centres: Contracting in Kabutare district, Rwanda**. *Bull World Health Organ* 2007, **85**:108–115.

11. Kalk A, Paul FA, Grabosch E: **"Paying for performance" in Rwanda: does it pay off?** *Trop Med Int Heal* 2010, **15**:182–90.

12. Paul E, Sossouhounto N, Eclou DS: **Local stakeholders' perceptions about the introduction of performance-based financing in Benin: a case study in two health districts**. *Int J Heal Policy Manag* 2014, **3**:207–214.

13. Patouillard E, Borghi J, Binyaruka P, Powell-Jackson T, Greco G, Torsvik G: *Do Financial Incentives Undermine Health Workers Intrinsic Motivation? Evidence from a Pay-for-Performance Scheme in One Region of*

Tanzania. Dar es Salaam: Presentation at the workshop "Payment for Performance: a health systems perspective" (24-26 November 2015); 2015. Available at: http://www.slideshare.net/resyst/do-financial-incentives-undermine-health-workers-intrinisc-motivation-borghi-et-al

14. Witter S: *Growing Pains (and Gains): Reflections on the Current State of Play and Future Agenda for Performance Based Financing*. Harmonization for Health in Africa Blog; 2015. Available at: http://www.healthfinancingafrica.org/home/growing-pains-and-gains-reflections-on-the-current-state-of-play-and-future-agenda-for-performance-based-financing

15. McCoy D, Bennett S, Witter S, Pond B, Baker B, Gow J, Chand S, Ensor T, McPake B: **Salaries and incomes of health workers in sub-Saharan Africa.** *Lancet* 2008, **371**:675–81.

16. Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W: **How African doctors make ends meet: an exploration.** *Trop Med Int Heal* 1997, **2**:127–35.

17. Bertone MP, Witter S: **The complex remuneration of Human Resources for Health in low-income settings: policy implications and a research agenda for designing effective financial incentives**. *Hum Resour Health* 2015, **13**:62.

18. Bertone MP, Samai M, Edem-Hotah J, Witter S: **A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002-2012.** *Confl Health* 2014, **8**:11.

19. Witter S, Wurie H, Bertone MP: **The Free Health Care Initiative: how has it affected health workers in Sierra Leone?** *Health Policy Plan* 2016, **31**:1–9.

20. GoSL: *Sierra Leone Simple Performance-Based Financing Scheme for Primary Healthcare - Operational Manual*. Freetown: Government of Sierra Leone; 2011.

21. Cordaid: *Performance Based Financing in Healthcare in Sierra Leone. External Verification - Final Report*. *Volume 1*. Freetown and The Hague: Cordaid (unpublished report); 2014.

22. Bertone MP, Witter S: **An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone**. *Soc Sci Med* 2015, **141**:56–63.

23. Bertone MP: *Investigating Health Workers Remuneration in Sierra Leone: Preliminary Results and Reflections on Methods*. Presentation at the 3rd Conference of the African Health Economics and Policy Association. Nairobi, 11-13 March 2014; 2014.

24. Ritchie J, Lewis J: *Qualitative Research Practice*. London: Sage Publications; 2003.

25. Bertone MP, Lagarde M: **Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone**. *Health Policy Plan* (*Advanced Access)* 2016.

26. Bhatnagar A, George AS: **Motivating health workers up to a limit: partial effects of performance-based financing on working environments in Nigeria**. *Health Policy Plan (Advanced Access)* 2016.

27. Bertone MP, Meessen B: **Studying the link between institutions and health system performance: a framework and an illustration with the analysis of two performance-based financing schemes in Burundi.** *Health Policy Plan* 2013, **28**:847–57.

28. Brenner S: *Effects of the RBF4MNH on Health Workers' Work Environment*. Dar es Salaam: Presentation at the workshop "Payment for Performance: a health systems perspective" (24-26 November 2015); 2015. Available at: http://fr.slideshare.net/secret/tzpb0vrFp9tMh4

29. Antony M: *Design and Implementation of Operational Components of RBF Schemes: The Case of the Verification in Benin*. Dar es Salaam: Presentation at the workshop "Payment for Performance: a health systems perspective" (24-26 November 2015); 2015. Available at: https://fr.slideshare.net/secret/44rbjGPkpEnLSj

30. Ogundeji YK, Jackson C, Sheldon T, Olubajo O, Ihebuzor N: **Pay for performance in Nigeria: the influence of context and implementation on results**. *Health Policy Plan (Advanced Access)* 2016.

31. Ssengooba F, McPake B, Palmer N: **Why performance-based contracting failed in Uganda--an "open-box" evaluation of a complex health system intervention.** *Soc Sci Med* 2012, **75**:377–83.

32. Wurie H, Witter S: *Serving through and after Conflict: Life Histories of Health Workers in Sierra Leone*. Liverpool & Freetown: ReBUILD Consortium; 2014. Available at: https://rebuildconsortium.com/media/1018/serving-through-and-after-conflict-life-histories-of-health-workers-in-sierra-leone.pdf

33. Encinosa WE, Gaynor M, Rebitzer JB: **The sociology of groups and the economics of incentives: Theory and evidence on compensation systems**. *J Econ Behav Organ* 2007, **62**:187–214.

34. Bandiera O, Barankay I, Rasul I: *Team Incentives: Evidence from a Firm Level Experiment*. Bonn: Institute for the Study of Labor (IZA) - Discussion Paper No. 6279; 2012.

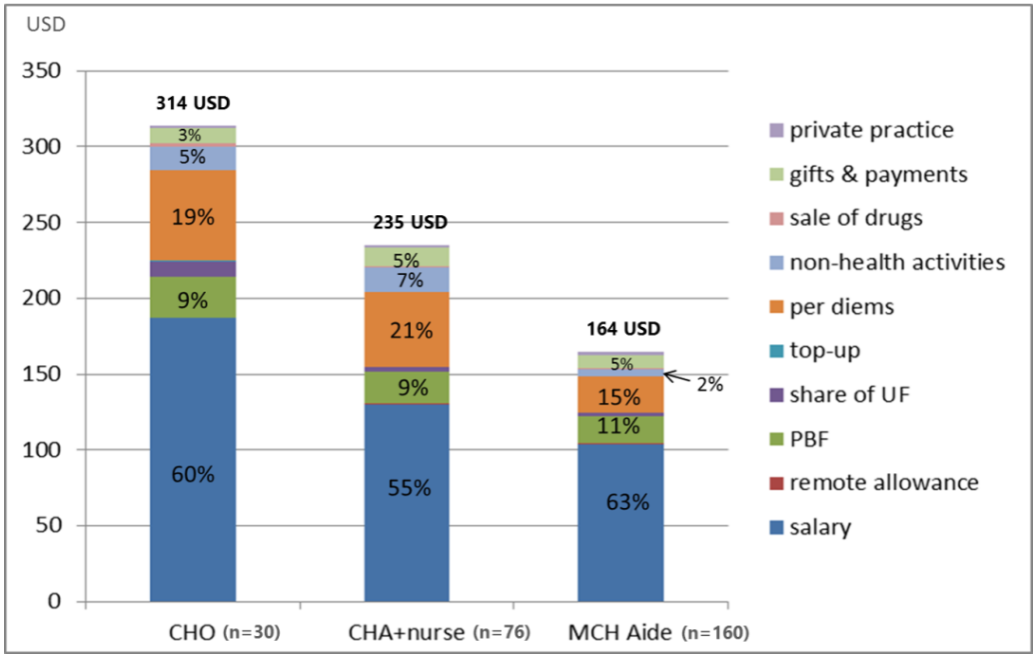
35. Barr A, Serneels P: **Reciprocity in the workplace**. *Exp Econ* 2008, **12**:99–112.

36. Fox S, Witter S, Wylde E, Mafuta E, Lievens T: **Paying health workers for performance in a fragmented, fragile state: reflections from Katanga Province, Democratic Republic of Congo**. *Health Policy Plan* 2014, **29**:96–105.

37. Schramm N: *Reflections from Sierra Leone: How Performance-Based (under) Financing Still Makes a Difference*. World Bank RBF Health Blog; 2015. Available at: https://www.rbfhealth.org/blog/reflections-sierra-leone-how-performance-based-under-financing-still-makes-difference

Figure

Figure 9.2: Absolute and relative average income by cadre and by component, including PBF payments (n=266)



Tables

Table 9.5: Indicators included in the PBF scheme

Indicator	Payment per service provided	
	Leones	USD
New and current users of family planning	1,000	0.25
Pregnant women completing four antenatal consultations	6,000	1.40
Women in labor assisted by skilled personnel at facility	10,000	2.30
Women completing three postnatal consultations	6,000	1.40
Children under 12 months completing their immunization course	6,000	1.40
Outpatient visits of children under five years	300	0.07

Note: Exchange rate at the time of data collection (October 2013): 1 USD = 4,270 Leones

Table 9.6: Determinants of receiving a PBF bonus (logistic regression) and of the amount received (linear regression)

	(1) Did receive PBF bonus (1=yes)		(2) Amount of PBF bonus	
Health worker characteristics				
Male	0.456		0.266	
	(0.457)		(0.173)	
Age	-0.341		-	
	(0.307)			
In-charge	1.342	***	0.332	**
	(0.386)		(0.158)	
Cadre (omitted category : MCH Aide)				
Community Health Officers	-0.884		0.118	
	(0.701)		(0.283)	
Community Health Assistants + nurses	-1.057	**	0.054	
	(0.442)		(0.186)	
Facility characteristics				
Type of facility (omitted category: Maternal and Child Health Post)				
Community Health Centre	0.735		0.022	
	(0.506)		(0.214)	
Community Health Post	0.920	**	-0.126	
	(0.415)		(0.161)	
Urban	0.189		0.109	
	(0.358)		(0.141)	
District (omitted category: Moyamba)				
Bo	-0.199		-0.656	***
	(0.328)		(0.136)	
Kenema	0.677	*	-0.160	
	(0.351)		(0.128)	
Obs	266		163	
R-squared	-		0.240	
Log-likelihood	-163.335		-	
Proportion of correct answers predicted	65.8%			

Note: Standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

10. Exploring the consequences of the complex remuneration on HWs' productive activities

10.1 Preface

The papers included in Chapter 9 described the complex remuneration of HWs and explored its causes, or determinants, at individual, facility and district level. An analysis of the consequences of the complex remuneration structure, from the perspective of the HWs, on their financial coping strategies and their motivation was also carried out in the two research papers.

In the present chapter (Chapter 10) another of the possible consequences of the complex remuneration is looked at, and specifically its potential effects on the activities that HWs do. The hypothesis, brought forward by agency theory, is that agents who can make unconstrained choices would select the activities they carry out in order to maximize earnings while minimizing effort. In this chapter, I investigate if agency model is applicable to the context of primary health care in Sierra Leone and examine the multiple factors and actors constraining HWs activities and influencing the organization of service delivery at facility level. Secondly, I explore the effects that these have on the relative and absolute time spent by HWs on a range of productive activities, and understand the drivers of the heterogeneity. The district of posting of the HWs emerges again as one of the key elements to define the variability in the time use of the HWs. By building on the analysis carried out at meso level on the dynamics between actors in the districts (Chapter 7), the present chapter explores the reasons for the variability and the mechanisms behind it, and how the influence of district dynamics extends to the HWs activities and contributes to defining their complex remuneration.

This chapter is written as a thesis section, rather than a research paper. While its organization reflects the traditional structure of the journal article, the chapter does not repeat sections already described previously (e.g., the study setting and the methods for data collection) and contains direct links and references to the rest of the work in this thesis, on which it closely builds.

10.2 What do health workers do, and why? A preliminary study of the activities performed by primary healthcare workers in Sierra Leone

Abstract

Background: What health workers (HWs) do, how much time they spend on clinical, administrative or disease-specific tasks, or on work outside of facilities are central elements in determining HWs performance and service delivery. Agency theory predicts that multitasking agents who can make unconstrained labor supply choices will aim to maximize earnings while minimizing effort. This study, first, investigates if agency theory's model is applicable to the context of primary health care in Sierra Leone and examines whether HWs have unconstrained choices or conversely, which are the multiple factors and actors constraining HWs' activities and influencing the organization of service delivery at facility level. Secondly, quantitative data are used to analyze the effects that this has on the relative and absolute time spent by HWs on a range of productive activities, and explore the drivers of the heterogeneity.

Methods: Data were collected in three districts of southern Sierra Leone from 266 primary HWs, who filled in a logbook recording their activities each day for 8 weeks. A series of 39 in-depth interviews were also carried out with a sub-sample of the same HWs.

Results: From the HWs interviews, it became apparent that HWs' discretion in the choice of activities is constrained. This is due both to the existence of service delivery schedules at facility level as well as to the interactions of HWs with a variety of actors, including District Teams and NGOs. Although HWs are not formally accountable to all of them, these dynamic interactions play a crucial role in influencing service delivery according to the actors' own priorities, by introducing reporting requirements, being physically present within the facilities and providing material and technical support. The externally-defined constraints and influences are reflected in the activities that HWs do. Logbook data reveal little difference based on individual characteristics, while the district of posting significantly affects the time spent on disease/service-specific activities and on activities outside of the facilities (e.g., training, campaigns, outreach).

Conclusions: Although preliminary, this study is useful to illuminate the HWs' organization of time over tasks and how it affects service delivery. Both qualitative and quantitative findings concur in highlighting the role of external actors. It is not only the utility maximization of HWs who are constrained in their activity choice, nor the formal accountability links which define service delivery at facility level, but a broader network of relations within the local health system, which critically includes the provision of material and technical support that HWs need to be able to carry out their tasks.

10.2.1 Introduction

What health workers (HWs) do, how much time they spend on each of their clinical and administrative tasks and how much time outside of the facilities are central elements in shaping service delivery. Indeed, how HWs choose between productive and non-productive activities and how they choose to spend their time while working can have a direct impact on access to health care services for the population. Furthermore, the time spent working within facilities rather than outside, or on integrated rather than disease/service-specific tasks is important to shape the nature and organization of the services delivered to patients.

Given the overall topic of this research, in this chapter, I am particularly interested in assessing the potential consequences of the HWs' complex remuneration on the activities and tasks carried out. Agency theory in economics provides a theoretical framework to explain the relation between income and tasks undertaken. Agency refers to a situation where someone (a principal) needs a task to be performed, and delegates its performance to a second person (an agent) is described by the agency model. This model has been applied to health care labor markets, where HWs are seen as agents of both their employer (typically the Ministry of Health, in low-income countries) and patients (Arrow, 1963; McPake *et al.*, 2002). In the simple agency model, in order to maximize utility, the agent aims to maximize earnings while minimizing effort. Therefore, to elicit the desired behavior and obtain optimal effort levels, the principal needs to ensure that the agent's remuneration structure is in line with the principal's own objectives, by using the appropriate 'power' of incentives (e.g., the extent to which the remuneration is linked to production) in the contract of the agent, given the level of monitoring and performance measurement that can be put in place. A particular case arises when agents are multitasking. In this situation, if tasks are substitutes (i.e. exerting more effort on one increases the marginal cost of the other task), stronger incentives to perform one task will drive the agent's effort away from the other task(s) (Holmstrom and Milgrom, 1991).

This chapter focuses on HWs as multitasking agents in charge of providing a range of health services to the population. In Sierra Leone, HWs working in the public sector are paid a salary to perform tasks related to their job. These tasks include general clinical work, as well as disease or service-specific activities (nutrition, HIV, family planning, etc.) and activities outside of the facility (e.g., outreach, administrative meetings, training, immunization campaigns). At the same time, I have shown in Chapter 9 (Bertone and Lagarde, 2016) that, on top of their salary, that they also receive a number of other payments. Some of these payments are related to specific activities. For example, through the quarterly performance-based financing (PBF) bonus allocated to their facility, HWs receive a payment to carry out six maternal and child health (MCH) services[1]. PBF payments are found to represent about 10% of the total income of primary HWs. HWs also receive per diems to carry out work outside of the facilities (training, meetings at district level, immunization campaigns), which account for about 18% of their

[1] The PBF bonus allocated to each facility is based on the number of services provided related to family planning, antenatal consultations, assisted deliveries, postnatal consultations, immunization and consultations for children under 5 (MoHS, 2011).

total income. Finally, they receive fee-for-service payment for their health-related private practice and for activities outside of the health sector (business, trade or agriculture), accounting for about 5% of the total income[2].

While salary creates a weak incentive to perform the worker's tasks as it is received regardless of the number of services provided, other payments such as PBF bonus, per diems, and fee-for-service for private practice set stronger incentives, because the payments are directly linked to the activities carried out. As a consequence, agency theory predicts that HWs would focus their effort for example on linked to PBF payments, as well as trainings and immunization campaigns which allow them to earn per diems to, and would neglect activities which do not lead to extra income. However, this is a valid hypothesis only if the fundamental assumption on which the agency model hinges is actually met in the context of the study: that individuals' labor supply choices are unconstrained. In other words, this implies that all workers studied are actually (and equally) offered the possibility to perform the different types of activities, and that they are free to choose the effort (e.g. the number of hours of work) they do.

In this chapter, first, I use qualitative methods to investigate whether the agency model is applicable to the context of primary healthcare in Sierra Leone by examining if, in this setting, HWs are free to choose from the different sets of activities. The analysis highlights challenges and limitations in the practical application of the model to our case as it is found that there are limits to HWs' choices. The HWs' narratives provide a rich description and further investigation of the multiple factors and actors constraining the choice of activities to be undertaken by HWs, and therefore influencing the organization of service delivery at facility level. In the second part of the chapter, I use quantitative data to analyze the effects of these constraints on the relative and absolute time spent by HWs on a range of productive activities, and explore the heterogeneity in our results in order to unpack its drivers at individual, facility and district level.

10.2.2 Methods

Sampling of HWs and methods for data collection are described in detail in Chapter 5. This section briefly presents the quantitative and qualitative data collection approaches used specifically for HWs' activities. I then focus more attention on the analysis methods.

Data collection approaches

Qualitative in-depth interviews

Two rounds of in-depth interviews were carried out in November-December 2013 and March-April 2014, following the quantitative data collection in the facilities. Interviews included a sub-sample of 39 HWs purposefully selected

[2] Table 10.4 in the Annex to this chapter presents a summary of the main categories of activities that HWs do and the payments received for each

among the 266 which were administered the income survey and activity logbook (see below). The selection of the interviewees aimed to maximize individual and facility-level differences and to reflect the composition of the workforce at primary healthcare level (Chapter 5, par. 5.2.5). During the first round, interviews focused mostly on the enumerations of the actors visiting the facility and the description of the reasons of their visits (monitoring, supervision, etc.) as well as of the reactions to their visits from the perspective of the HWs. For the second round, new elements were added focused on the organization of service delivery, its schedule over the week, the internal division of work and the repartition of clinical and administrative tasks. In order to provide a context and practical relevance to the questions, I often used the HW's logbook or other documents available within the facility, such as the facility schedule or the visitors' book, as a basis to start the conversation.

Quantitative logbooks

As described in Chapter 5, a sample of 266 HWs was selected in the three districts and was administered an income survey. After the survey, the same HWs were also given logbooks to fill in daily for a prospective period of eight weeks. In their logbooks, HWs had to report their activities as well as revenues earned each day, in a pre-printed table. While written and oral instructions on how to fill in the logbook and on the categories of activities to report on were provided, the logbook did not ask to fill in the number of hours worked on each category of activity, but was purposefully left open-ended (i.e. it only listed the hours of the day leaving to the HWs to indicate how much time she had spent, and on what) to increase ease and flexibility when filling it, thereby hopefully increasing the response rate[3]. Each HW was visited by the same enumerator three times over the 8 weeks, and received regular calls and text reminders to fill the logbooks. During the last visit, HWs were administered an end-line questionnaire to check completeness of entries and clarify, validate, corroborate the information provided in the logbooks (Corti, 1993). Despite its disadvantages in terms of misclassification and reporting bias, the self-reported approach to collect data on activities was chosen for its practical advantages in terms of enumerators' time and skills required and costs compared to observational methods (Jacobs, 1998; Bratt *et al.*, 1999; Pitt *et al.*, 2009).

Data analysis

Qualitative data analysis

In-depth interviews were recorded, transcribed and manually analyzed. Overall, the analysis focused on the exploration of the setting in which HWs make their choice of activities and was based on pre-identified concepts as well as on those emerging from the HWs' narratives. Coding of qualitative data looked at (i) the facility's weekly schedule as described by the HWs and (ii) the actors and factors influencing service delivery. This second theme was initially guided by codes referring to the upward accountability relations of the HWs, conceptualized in

[3] Chapter 5 & Appendix 9 provide a detailed description and a copy of the tool.

terms of 'answerability' and 'sanctions' (Brinkerhoff, 2004), and then inductively extended to cover emerging themes on multiple factors that influence service delivery, which I broadly refer to as 'material and technical support' and are further described in the findings section. A full description of the data analysis process is provided in Chapter 5 (par. 5.2.5) and the coding framework can be found in Appendix 7.

Quantitative data analysis

Based on the activities recorded by HWs in their logbooks and consolidated in the end-line interview, a summary of the time spent on each activity along a predefined set of categories (Table 10.1, column (1)) was initially prepared manually by the enumerators. The broader categories were chosen with the aim to provide synthetic and consistent information across all logbooks. Only the summary calculations were entered in an electronic database. For the purpose of the analysis, the 12 types of activities were then regrouped into 6 categories, two of them also including disease/service-specific sub-categories (Table 10.1, column (2)):

- General clinical activities
- General administrative activities
- Disease/service specific clinical activities (with subcategories)
- Disease/service specific administrative activities (with subcategories)
- 'Outside': i.e., activities related to public job carried out outside of facilities, such as outreach, meetings outside of facility and training/workshops
- Income generating activities outside of public job, such as trade or business, agriculture, etc.

Table 10.1: Categories used to summarize activities, for data entry and for analysis

	(1) Categories of activities (data entry)	(2) Categories of activities (analysis)
Within facility	General clinical activities Night guards and other extra work Other activities within facility (not included in this list)	General clinical activities
	General administrative work Meetings within the facility	General administrative activities
	Disease/service specific clinical activities: • Nutrition • Immunization • Family Planning • HIV • Others	Disease/service specific clinical activities: • Nutrition • Immunization • Family Planning • HIV • Others
	Disease/service specific administrative activities: • Nutrition • Immunization • Family Planning • HIV • Others	Disease/service specific administrative activities: • Nutrition • Immunization • Family Planning • HIV • Others
Outside	Outreach activities in the community Meeting outside of the facility Training, workshop, etc.	Activities outside of facilities, related to public job ('outside')
	Private practice (pp) Non-health activities that generate income (e.g., trade, business, agriculture)	Income generating activities outside of public job (private practice + non-health activities, such as trade/business or agriculture)

The average time spent on each of the 6 categories over the 8 weeks was calculated and descriptively analyzed. Hours spent on productive activities were then converted into a proportion of the total time worked to calculate the relative time dedicated to each. The use of proportion was preferred because HWs were found to work extremely different amounts of hours per week, and therefore this approach provided a way to standardize the total time on productive activities across HWs. The proportion of time spent on each activity was then converted into averages over 8 weeks[4].

To look at the determinants of the proportion of time spent on each type of activity, I used a fractional multinomial logit regression *(fmlogit* in Stata) (Papke and Wooldridge, 1996). This model estimates each proportion as a function of individual (i.e., gender, age, cadre, role within facility) as well as facility (i.e., type and size of facility, urban/rural, district) characteristics. The base category used was 'general clinical activities', as these were found to take up the majority of the HWs productive time. Marginal effects were computed from the estimated coefficients (*dfmlogit* in Stata). Disease/service specific administrative activities, as well as private practice and non-health activities were discarded from the regression analysis because their distribution was found to be highly skewed (Figure 10.6 – Annex to this chapter) and HWs spend less than 0.5% of time on each of them. The proportions of time spent were recalculated for all other remaining activities.

10.2.3 Findings

Are labor supply choices of HWs unconstrained?

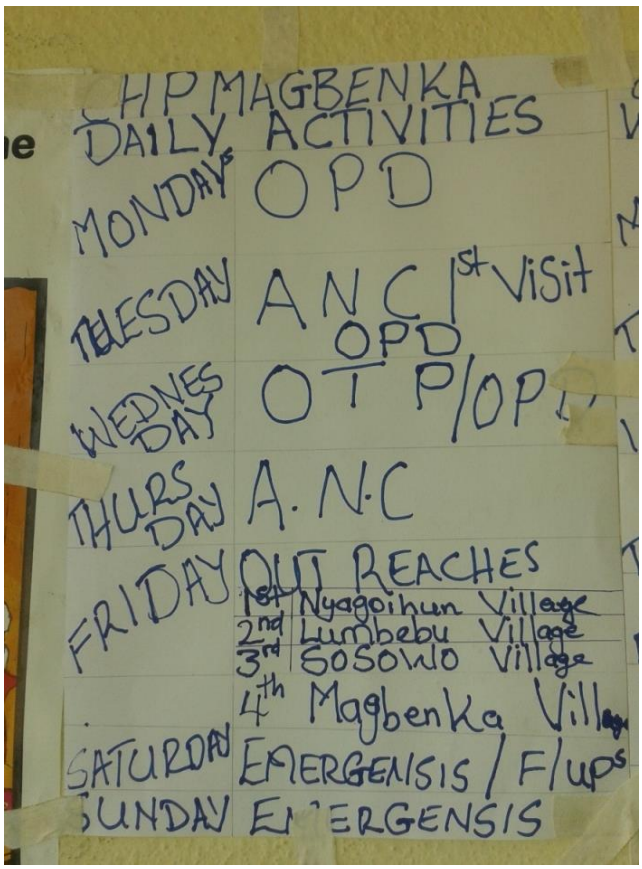
The in-depth interviews with HWs focused on the process of activity choice process and the factors influencing it, and revealed that HWs have little discretion and autonomy on their daily activities. This is partially due to a fixed weekly schedule defined for each facility which determines the main service to be provided on that day, but importantly also to other factors, including their upward accountability to DHMTs, as well as the broader network of actors (and NGOs in particular) present at facility level. I analyze these elements in turn below.

The HWs' accounts and direct observation pointed to the fact that most health facilities operated under a weekly schedule, sometimes taped to the facility wall (see an example in Figure 10.1). The schedule defines which services are to be provided primarily each day (e.g. vaccination, antenatal/postnatal visits, child health, nutrition, outreach, etc.), although it still allows flexibility on some days (e.g. 'general consultation' or outpatient (OPD) days when all services are provided) and emergencies or deliveries are attended to at any time of the week and weekend.

[4] The overall average was calculated by using all the logbooks available for each HW. If 8 logbooks were available for one HW, they were all used to calculate the average, while if only the logbooks for the 5 first weeks were available, those 5 were used to calculate the average.

Detailed information on the weekly schedules was collected during the in-depth interviews and from its analysis it appears that the schedules vary significantly between facilities. However, as a general pattern, it seems that facilities in Moyamba tended to provide nutrition services (and in particular, Outpatient Therapeutic Program (OTP)-related services, rather than Supplementary Feeding Program - SFP) every week or every two weeks, which is more often than in Kenema and Bo. When asked about who established the schedule, six HWs said that it was 'them' as facility staff or in-charge (i.e. facility manager) to decide. However, one stressed that it was the DHMT who required that they have a weekly schedule (CHA/nurse in Moyamba), and another indicated that that "*they [NGO] decided to feed the people every week. We are to choose our own day, so we chose Tuesday*" (CHA/nurse in Moyamba).

Figure 10.1: Picture of weekly schedule posted on a facility wall



While the facility schedule emerged as a first element to define what activities HWs can do, the in-depth interviews allowed me to explore also the influence of other factors. Based on an initial hypothesis on the role of accountability, the analysis focused initially on the formal upward accountability relation of HWs. Upward accountability is defined as a "contract-like connection in which policymakers [or their representatives] specify objectives, procedures, standards; provide resources and support; and exercise oversight relative to providers. In exchange […], providers carry out the agreed-upon desires and directives" (Brinkerhoff and Bossert, 2008: p.8).

This type of formal accountability represents in theory an obvious constraint to the activity choice of HWs. Specifically, in the case of primary healthcare in Sierra Leone, HWs at facility level are formally accountable to the managers in the District Health Medical Teams (DHMTs), under whose direction they operate and who are in charge of providing them with the necessary support and resources. However, based on the HWs' accounts, the analysis was further extended beyond the role of the DHMTs to explore the relations of HWs with other actors who are present at facility level and appeared to be influencing the possibility to undertake certain activities. In this sense, the HWs' narratives allowed me to map and describe a wide network of actors visiting facilities and provide key insights on the constraints that such networks create and the influence it has on what HWs do. Below, I look first at the role of DHTMs, before moving to the analysis of the broader network of actors present at facility level.

The HWs interviewed undoubtedly felt that they primarily respond to DHMTs, to which they are directly accountable. As some clearly stated, "*they [DHTM staff] are our immediate bosses*" (CHAs/nurses in Kenema and Moyamba). However, when attempting to unpack the relation and its role in influencing HWs' activities, the picture emerged as rather blurred. Indeed, although DHMTs are in principle responsible for overseeing HWs and sanctioning them for not respecting directives or being absent from the facility (for example, because moonlighting on another job), a role which could influence the choices of HWs, in practice the potential for sanctions emerged as relatively weak in the accounts of the HWs. The sole element by which DHMTs appeared to exert some control of the activities and services carried out by HWs was by providing (or not) critical inputs. Provision of inputs, such as drugs and vaccines, was found to be irregular and many facilities reported long periods where they remained out of stock because of delayed procurement by the DHMT. The lack of inputs had a direct consequence on the activities carried out by HWs, as when essential inputs were not available they could not provide certain services, including those which were, in theory, envisaged by the facility schedule, as described by one HW:

> "*Mondays I have under five clinic and I give immunization to children. But today is unfortunate because I don't have all the various vaccines*" (MCH Aide in Moyamba).

At the same time, the interviews revealed that the HWs interacted with a number of other actors, although they were not directly accountable to them. In particular, the staff of local and international NGOs and (more rarely) of donor agencies regularly visited the facilities. I have described elsewhere (Chapter 7) (Bertone and Witter, 2015), based on key informant interviews at district level, the type of health NGOs present in each district, their main activities and priorities, and the extent of their support in terms of facility coverage within the districts. It had emerged that in Kenema and Moyamba fewer NGOs supported all or most facilities, while in Bo NGOs support was more fragmented and limited to few facilities. Importantly, NGOs in Kenema and Bo tended to focus on a wide range of MCH services, while in Moyamba NGOs focused exclusively on nutrition. The interviews with the HWs analyzed for this chapter provide further information and differentiate NGOs based on the type of technical

and material support they provided, and the consequences this had in terms of constraining or allowing certain activities, thus influencing service delivery. The NGOs technical and material support could include: provision of inputs and in-kind support, regular supervision and guidance to staff, and direct support to service delivery by being present at the facility during the provision of (some) services.

Inputs in the form of drugs, nutritional supplements and equipment emerged as essential to guarantee the delivery of services. Many HWs mentioned that, if they have no drugs or 'food' (which is how nutritional supplements are usually referred to) they will not be able to carry the related activity, even if planned in the weekly scheduled. The presence of an NGO providing inputs helped address those issues. This was the case of one NGO-supported facility in Bo, and of almost all facilities in Kenema which were supported by one NGO with a broad MCH focus.

> "*With their presence, we never run out of drugs*" (CHO in Bo)
> "[*NGO] brings us drugs (...). There are times we don't have free healthcare drugs so we use the [NGO] drugs to treat*" (CHA/nurse in Kenema).

Some NGOs were also directly defining the service to be delivered by having a representative present at the facility. This was the case for several facilities in Moyamba where NGO staff was physically present on 'feeding' days to support the delivery of nutrition services and coordinate the facility staff. This resulted in all HWs working on that service for the day (mentioned by 4 HWs in Moyamba). Similarly, NGOs were seen to influence service provision also by providing regular supervision and guidance, as well as introducing reporting requirements on certain activities (which likely affected the time spent by HWs on clinical/service-specific administrative activities). This was the case in Kenema where the support referred to the entire range of services provided by the facilities, and even more clear in Moyamba where it focused on nutrition services, as described in the quote:

> "[*NGO] they come and teach us some paperwork we don't understand. [...] When they came, they teached me how to enter the documents they are sending*" (MCH Aide in Moyamba)

In summary, the analysis of the HWs' interviews suggests that, although HWs are not formally accountable to all of these actors, their dynamic interactions, realized through different mechanisms, play a crucial role in constraining or allowing the provision of certain services, thus defining service delivery. In the next section, the quantitative analysis of the time spent on activities by HWs, as recorded in the logbooks, provides evidence on the consequences of these externally-defined influences on the activities that HWs end up doing and confirms the importance of drivers at district level, rather than individual choices.

Sample of HWs for quantitative analysis

A sample of 266 HWs was approached for the cross-sectional survey and asked to fill in the logbooks. Within the sample, the attrition over time was found to be relatively low, with 8 individuals (3%) lost in the first 3 weeks, 20 individuals (8%) by week 7 and 53 individuals (20%) by week 8 (Table 10.2). According to the enumerators, the factors that explained the loss to follow-up were related both to the extra work required by the logbook as well as to personal circumstances (e.g. HWs moved to another facility, travelled to town, were sick or pregnant). Finally, the low number of logbooks filled in for the 8th week is mostly due to logistic reasons, as some HWs were visited mid-week and did not have time to fill in the full week-long logbook.

Table 10.2: Loss to follow-up over the 8 weeks covered by the logbooks

Week	HWs lost to follow-up	Proportion of HWs lost to follow-up	HWs having filled in their weekly logbook
w1	8	3%	258
w2	8	3%	258
w3	8	3%	258
w4	12	5%	254
w5	19	7%	247
w6	19	7%	247
w7	20	8%	246
w8	53	20%	213

Total working hours

HWs declare to be spending on average 66.8 hours a week (with a median of 64 hours) on productive activities (Figure 10.2), ranging from a minimum of 40.5 hours per week, to a maximum of 109.62 hours (Figure 10.3). The high number of hours worked per week is likely to be due to the fact that the working week for many facilities comprises 6 days. Moreover, most of the HWs included in the sample, and in particular those posted in rural areas, live within or next door to the facility and are on call 24 hours a day, for 7 days a week for emergency procedures, which would have been included in the logbook of productive activities.

Figure 10.2: Average hours spent on activities, per week

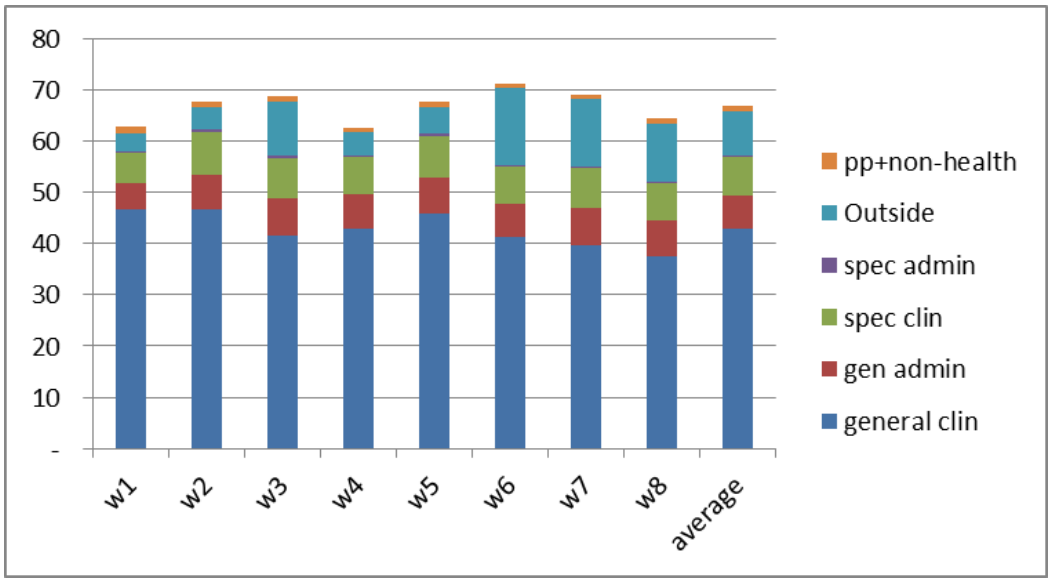
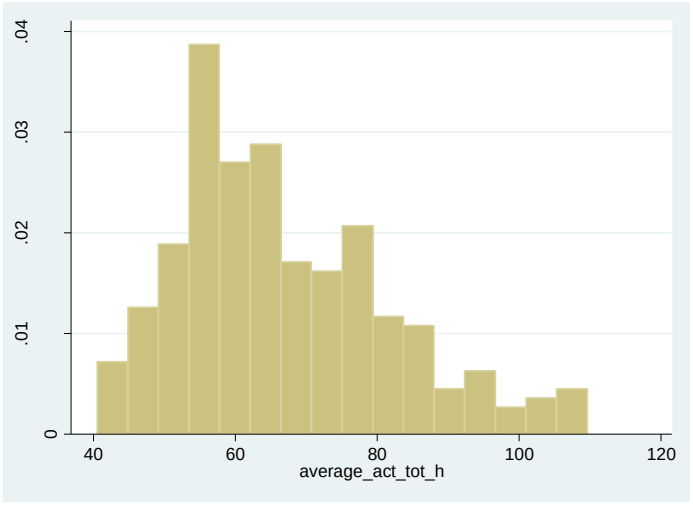


Figure 10.3: Distribution of total hours worked, average for 8 weeks



The absolute number of hours spent on activities also varies between week, from a minimum of 62.57 hours on week 4 to a maximum of 71.12 hours on week 6 (Figure 10.2). It seems that the increase in working hours in weeks 3, 6, 7 and 8 was driven by an increase in the 'outside' activities[5].

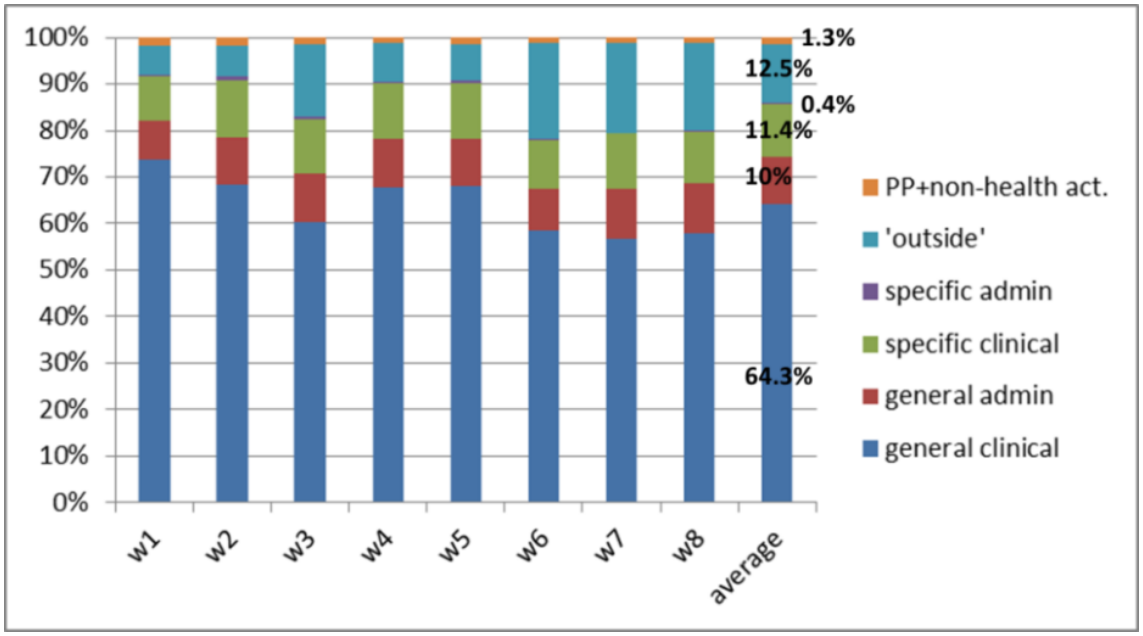
Proportion of time spent on different activities

The analysis of the proportion of time spent on each of the productive activities reveals that HWs spend the majority of their time (86.12%) within the facilities. 64.29% of their time is dedicated to general clinical activities

[5] Through direct observation in the districts at the time of the data collection, I know that on week 3 a pilot Human papillomavirus (HPV) vaccine campaign took place in some chiefdoms in Bo, while in weeks 6-7-8 a polio vaccine campaign was ongoing, affecting (at different times) many facilities in all 3 districts.

and 9.98% to general administrative activities, such as filling in registries and staff meetings. A total of 11.85% of their time is spent on disease/service specific activities, of which the vast majority (11.43%) on clinical tasks and only a small portion (0.43%) on administrative tasks. The time spent outside of the facilities accounts for about 13.88%. Of this, only 1.34% is declared to be spent on private practice and non-health activities, while 12.54% is spent on activities related to the main public job, but outside of the facility. These include outreach, immunization campaigns, workshops and training, supervision to other facilities (in the case of the higher cadres), meeting at district or chiefdom level, etc. (Figure 10.4).

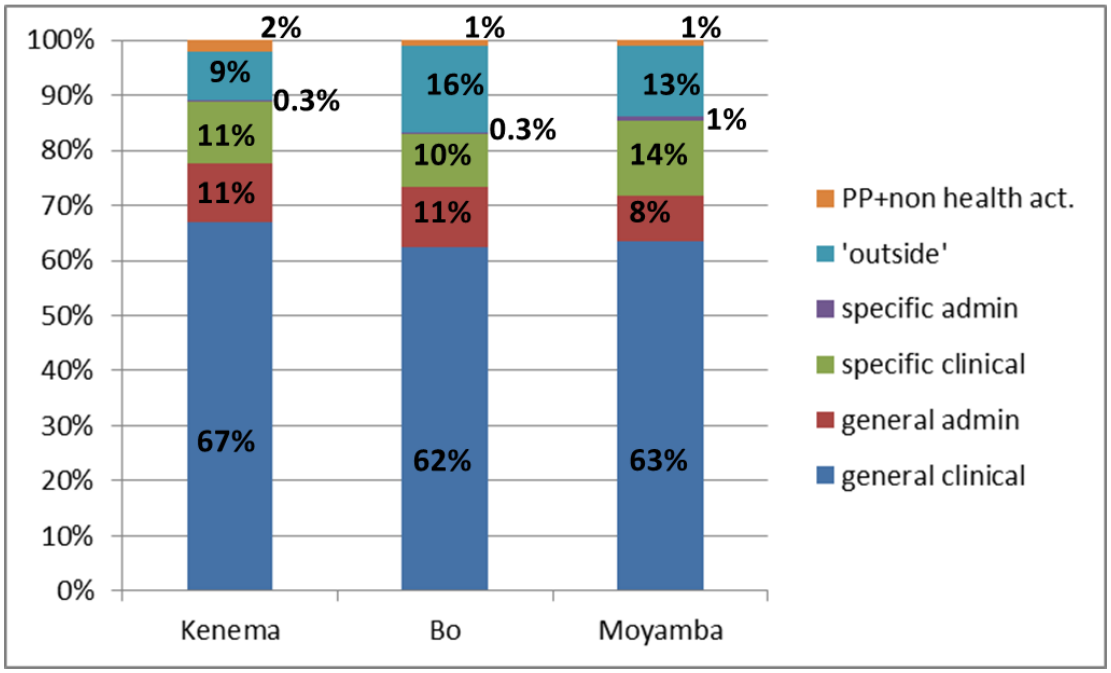
Figure 10.4: Proportion of time spent on activities, per week and on average



Looking at the detailed of the specific clinical activities undertaken, it emerges that the time on those is equally shared between time on family planning (4.24% of the total weekly hours worked), immunization (3.38%), and nutrition and feeding (3.08%), while very little time is spent on HIV (0.25%) and other specific activities (0.41%) (Figure 10.7 in Annex).

The disaggregated analysis by district seems to confirm the patterns highlighted by qualitative analysis, in terms of the consequences of the constraints and influence exercised by external actors at district level (Figure 10.5). It shows that HWs in Bo spent a higher proportion of their times on 'outside' activities (16%), compared to those in Moyamba (13%) and Bo (9%, $p<0.0001$). Also the time spent on disease/service specific clinical activities varies across districts, accounting for 14% in Moyamba compared to 11% in Kenema and 10% in Bo ($p<0.0019$). In the next section, the regression analysis of the determinants of the proportion of time spent on each of the activities confirms these patterns.

Figure 10.5: Average proportion of time spent on activities, by district



Determinants of the proportion of time spent on activities

Table 10.6 presents the results of the fractional multinomial logit regression. The analysis shows that the most consistent factor that appears to determine the proportion of time spent on activities is the district of posting. Those working in Bo and Kenema are likely to be doing less specific clinical activities, compared to those in Moyamba (respectively -3.92 and -2.13 percentage points). Moreover, HWs in Kenema are likely to be doing substantially less 'outside' activities (-4.02 percentage points) compared to those in Moyamba and Bo. By contrast, the results reveal that there is no difference in the way HWs allocate their time based on individual characteristics. At facility level, one difference found is that HWs in CHCs are likely to be doing less specific activities, and more general clinical activities, compared to those in MCHPs (-2.18 percentage points).

Similar regressions were run for the sub-categories of 'special clinical activities' (Table 10.5 - Annex). Results for the district determinants complement the findings on HWs in Bo and Kenema doing less specific activities and provide further details. It emerges that HWs in Bo and Kenema are likely to be doing less nutrition activities, and more general clinical activities, compared to those in Moyamba (respectively -3.2 and -1 percentage points). Those in Kenema are likely to be doing less immunization activities (-1.5 percentage points) and to be doing more HIV activities (0.2 percentage points), compared to those in Moyamba.

Table 10.3: Results of fractional multinomial logit regression on average proportion of time spent on each activity (reference for comparisons 'general clinical activities')

		Coef.	Std. Err.	p-value		Marginal effects
Gen admin	Male	0.3820	0.1991	0.055		0.0369
	Young	0.1282	0.1455	0.378		0.0082
	CHO	0.2082	0.3095	0.501		0.0138
	CHA+nurse	-0.0418	0.1971	0.832		3.40E-04
	In-charge	-0.0532	0.1659	0.749		-0.0059
	Small facility	-0.2752	0.1671	0.100		-0.0229
	CHC	-0.2625	0.2247	0.243		-0.0221
	CHP	-0.1733	0.1788	0.332		-0.012
	Urban	-0.1473	0.1625	0.365		-0.0106
	Bo	0.1315	0.1642	0.423		0.0145
	Kenema	0.0810	0.1577	0.608		0.0155
Clin special	Male	-0.2148	0.1702	0.207		-0.0283
	Young	0.1266	0.1076	0.239		0.0091
	CHO	0.1581	0.2309	0.493		0.0095
	CHA+nurse	-0.1240	0.1330	0.351		-0.0089
	In-charge	-0.0415	0.1336	0.756		-0.0053
	Small facility	-0.0633	0.1172	0.589		-0.002
	CHC	-0.0307	0.1636	0.851		7.40E-04
	CHP	-0.2493	0.1253	0.047	**	-0.0218
	Urban	-0.1246	0.1373	0.364		-0.0096
	Bo	-0.3680	0.1335	0.006	***	-0.0392
	Kenema	-0.2611	0.1186	0.028	**	-0.0213
Outside	Male	0.2441	0.1704	0.152		0.0252
	Young	0.1625	0.1152	0.158		0.0145
	CHO	0.2765	0.2744	0.314		0.0267
	CHA+nurse	-0.2252	0.1719	0.190		-0.0215
	In-charge	0.1184	0.1436	0.410		0.014
	Small facility	-0.0896	0.1332	0.501		-0.0054
	CHC	-0.0639	0.1951	0.743		-0.0033
	CHP	-0.0557	0.1444	0.700		-5.30E-04
	Urban	-0.0823	0.1515	0.587		-0.0054
	Bo	0.1339	0.1261	0.288		0.0182
	Kenema	-0.4104	0.1380	0.003	***	-0.0402

Note: *** p<0.01, ** p<0.05, * p<0.1

10.2.4 Discussion

How HWs spend their time and what influences their choice of activities is a question of key importance because of its potential effects on service delivery at facility level. Although several studies have been carried out to explore HWs' time use, the existing research tends to look at the ratio between productive and unproductive time with the aim of assessing HWs' productivity (Manzi *et al.*, 2012; Maestad and Mwisongo, 2013), or to focus exclusively on time spent on specific activities, such as TB and HIV or immunization (Abotsi, 2011; Hontelez *et al.*, 2012; Odendaal and Lewin, 2014). The only study retrieved in the literature which looks at time use from a broad perspective was carried out in Cameroon in 1989. It found that primary HWs (nurses, nursing aides and community assistants) in rural facilities spent 73% of their time on unproductive activities (i.e., not working). The

remaining time was spent for 17.5% on clinical activities (65% of productive time), 5.4% on hygiene (20% of productive time), 3.3% on administrative (12% of productive time) and 0.8% on outreach (3% of productive time) (Bryant and Essomba, 1995). Although only focused on productive activities, data collected for the present study provide a strikingly unchanged assessment of what rural primary HWs do in the context of Sierra Leone in 2013. HWs declared to spend the majority of their time within facilities, doing clinical activities (64% on general clinical and 11% on specific clinical activities). 10% of time is spent on administrative activities. Productive work outside facilities accounts for 14% of the total (which is the only category substantially changed, and higher than what was in Cameroon) and is mostly spent on activities related to the main public job, such as training, meetings, outreach and campaigns. The analysis conducted here goes further and also points to the drivers of the variability in the time spent on activities, highlighting the key role of district, rather than individual variables.

However, it is important to note that, the data collected for this study on HWs activities have a number of limitations. One of the main biases reflects the nature of the logbooks and the fact that a self-reported approach was chosen, rather than the observational approach which is most often adopted for analyses of time use (i.e., time-and-motion studies). With the use of self-administered logbooks, it is likely that HWs provided in some cases "normative desirable answers" (Jacobs, 1998) and filled in what they are supposed to do accordingly to the weekly schedule, rather than what they actually did. A second problem is the inconsistency in the level of detail reported, which made it difficult to reconcile the information into detailed categories. Indeed, while some logbooks provided rich accounts of the productive time of HWs, others provided a much lower level of detail in the activities which did not allow for disaggregation. Another problem relates to the length of the follow-up period. It is impossible to know whether HWs became more accurate in their logbooks as time passed, or conversely logbooks were increasingly less precise because of a fatigue effect over time.

In this chapter, I specifically set out to analyze the time spent by HWs on different activities with the aim of exploring whether the complex remuneration of HWs has implications for the activities they do. In other settings, this has proven a plausible hypothesis, in line with agency theory's predictions. For example, in a study carried out in Nigeria, it was found that giving priority to activities that enabled the earning of per diems was an essential financial coping strategy and 56% of primary and secondary HWs sampled reported to be doing it (Akwataghibe *et al.*, 2013). A qualitative study in Malawi and Uganda reported that participants (in that case, managers with Ministry of Health at central and district level, nursing school, health facilities and NGOs) described that per diems influence their allocation of time, as they try to work more on activities which have per diems associated to them (Vian *et al.*, 2013). However, in the context of primary healthcare in Sierra Leone, this analysis points to the fact that, although in theory HWs could choose from a range of activities and somewhat increase their income, in practice their choice is constrained by external factors: on the one hand, the activities on offer outside of the facility (e.g. whether a training or meeting is planned) and on the other, within facilities, a fixed weekly schedule determining the activities to be provided and by the availability of inputs or technical support necessary to carry out these activities. This finding confirms the strong evidence found in empirical economic literature against the

hypothesis of unconstrained labor supply choices for workers in non-experimental settings (Kahn and Lang, 1991; Dickens and Lundberg, 1993), as it suggests that the variability in what HWs do is related to options available rather than active individual choices.

In particular, in the context of this study, district-level elements emerge as the main driver of the differences in the activities undertaken by HWs as they define the patterns of NGO presence and of provision of material and technical support for specific activities, which are reflected in the variability of the time spent on these activities by HWs, based on the district of posting. It appears that HWs have no control over the priorities and decisions taken by external actors, but in turn these decisions constrain their choice of activities or influence their daily practices of service delivery. The analysis of the HWs narratives provides evidence over the mechanisms through which this influence is exerted, i.e. by supplying (or not) the necessary inputs, providing guidance, support, introducing reporting requirements for certain activities, or being physically present at the facility to oversee the delivery of some services.

The possibility of DHMTs influencing providers practices has been highlighted by Gilson and others, who pointed to the role of managers in "aligning resources and organizational environment to support HWs towards policy goals" (Gilson *et al.*, 2014: p.iii63). However, the findings of this research suggest that, in the study districts in Sierra Leone, the provision of material and technical support that may shape service delivery is not the prerogative of the DHMTs and only partially reflects upward accountability structures. Importantly, other actors, and in particular the NGOs active at district or sub-district level, also exercise this influence, and this is done towards their own specific set of goals and priorities.

Looking at the role of external actors, I had shown in Chapter 7 (Bertone and Witter, 2015) how the political economy dynamics between NGOs and DHMTs at district level defined the HRH incentive practices, such as selective supervision, salary supplementation and per diem payments, with effects that ultimately extend to the remunerations of individual HWs. The present analysis takes that result further by revealing that this is done by shaping local health priorities. The different agendas of NGOs are reflected in the activities carried out by HWs, and, critically, these activities influence in turn HWs incomes. For example, HWs would have higher per diem payments if there are more 'outside' activities available, or higher PBF bonuses if material and technical support is provided for the MCH indicators included in the scheme. While I had started out this study with the aim of investigating the hypothesis that the complex remuneration of HWs may define their choice of activity, I found that, in fact, it is rather the activities available to HWs, driven by external actors and their priorities, which contribute to define the HWs remuneration structure and level, and explain the significant differences that I observed in HWs income between districts (Chapter 9 - Bertone and Lagarde, 2016).

10.2.5 Conclusions

This study is useful to illuminate the organization of HWs time between tasks and how it affects service delivery. It points to the fact that HWs spend the majority of their productive time within facilities undertaking clinical work, while the time spent working outside depends on the need to carry out activities as defined by external actors. The analysis also reveals that the district of posting seems to have a significant impact on HWs activities. Indeed, both qualitative and quantitative findings concur in highlighting the importance of the role of external actors, and NGOs in particular, in defining what HWs do and therefore shaping service delivery. It is not only the utility maximization of HWs who are constrained in their choice of activities, nor the formal upward accountability links which define service delivery at facility level, but a broader network of relations within the local health system, which critically includes the provision of material and technical support that HWs need to be able to carry out their tasks.

Further research is therefore necessary in order to explore such network of relations not only at district level as we did in Chapter 7 (Bertone and Witter, 2015), but also around facilities and individual HWs. In particular, it is essential to understand the role of these networks in defining service delivery and policy implementation, and whether or not this influence is conducive to better performance at facility and HW level. Moreover, the finding that external actors active at district level can influence service delivery and shift local health priorities requires a re-thinking of governance beyond the formal upward accountability which is usually examined (Cleary *et al.*, 2013). From a policy perspective, this is particularly relevant in those (local) health systems where numerous, poorly coordinated external actors are presented who do not necessarily work together or respect the country priorities (Mikkelsen-Lopez *et al.*, 2011).

10.2.6 References

Abotsi AK. 2011. A time and motion studt of the time burden on health workers administering expanded programme of immunization and intermittent preventive treatment for infants in the Upper East Region of Ghana. *African Journal of Interdisciplinary Studies* **4**: 37–43.

Akwataghibe N, Samaranayake D, Lemiere C, Dieleman M. 2013. Assessing health workers' revenues and coping strategies in Nigeria — a mixed-methods study. *BMC Health Services Research* **13**: 387.

Arrow KJ. 1963. Uncertainty and the Welfare Economics of Medical Care. *The American Economic Review* **53**: 941–73.

Bertone MP, Lagarde M. 2016. Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone. *Health Policy and Planning (Advanced Access)*.

Bertone MP, Witter S. 2015. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine* **141**: 56–63.

Bratt JH, Foreit J, Chen PL, West C, Janowitz B, de Vargas T. 1999. A comparison of four approaches for measuring clinician time use. *Health Policy and Planning* **14**: 374–81.

Brinkerhoff DW. 2004. Accountability and health systems: toward conceptual clarity and policy relevance. *Health Policy and Planning* **19**: 371–9.

Brinkerhoff DW, Bossert T. 2008. *Health Governance: Concepts, Experience, and Programming Options*. Health Systems 20/20, Abt Associates: Bethesda, MD.

Bryant M, Essomba RO. 1995. Measuring time utilization in rural health centres. *Health Policy and Planning* **10**: 415–22.

Cleary SM, Molyneux S, Gilson L. 2013. Resources, attitudes and culture: an understanding of the factors that influence the functioning of accountability mechanisms in primary health care settings. *BMC Health Services Research* **13**.

Corti L. 1993. *Using diaries in social research*. University of Surrey - Social Research Update: Guildford.

Dickens WT, Lundberg SJ. 1993. Hours Restriction and Labor Supply. *International Economic Review* **34**: 169–92.

Gilson L, Schneider H, Orgill M. 2014. Practice and power: a review and interpretive synthesis focused on the exercise of discretionary power in policy implementation by front-line providers and managers. *Health Policy and Planning* **29**: iii51–69.

Holmstrom B, Milgrom P. 1991. Multitask Principal-Agent Analyses : Incentive Contracts, Asset Ownership, and Job Design. *Journal of Law, Economics and Organiazations* **7**: 24–52.

Hontelez JAC, Newell ML, Bland RM, Munnelly K, Lessells RJ, Barnighausen T. 2012. Human resources needs

for universal access to antiretroviral therapy in South Africa: a time and motion study. *Human Resources for Health* **10**: 39.

Jacobs JA. 1998. Measuring time at work: are self-report accurate? *Monthly Labor Review*.

Kahn S, Lang K. 1991. The Effects of Hours Constraints on Labor Supply Estimates. *Review of Economics and Statistics* **73**: 605–11.

Maestad O, Mwisongo A. 2013. Productivity of Health Workers: Tanzania. In: Soucat A, Scheffler RM, Ghebreyesus TA (eds). *The Labor Market for Health Workers in Africa. A New Look at the Crisis*. World Bank: Washington, DC

Manzi F, Schellenberg JA, Hutton G, *et al.* 2012. Human resources for health care delivery in Tanzania: a multifaceted problem. *Human resources for health* **10**: 3.

McPake B, Kumaranayake L, Normand C. 2002. *Health Economics. An international perspective*. Routledge: London.

Mikkelsen-Lopez I, Wyss K, de Savigny D. 2011. An approach to addressing governance from a health system framework perspective. *BMC international health and human rights* **11**: 13.

MoHS. 2011. *Sierra Leone Simple Performance Based Financing Scheme for Primary Healthcare - Operational Manual 2011*. Ministry of Health and Sanitation: Freetown.

Odendaal WA, Lewin S. 2014. The provision of TB and HIV/AIDS treatment support by lay health workers in South Africa: a time-and-motion study. *Human Resources for Health* **12**: 18.

Papke LE, Wooldridge JM. 1996. Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates. *Journal of Applied Econometrics* **11**: 619–32.

Pitt C, Greco G, Hanson K, Mills A. 2009. *Measuring time use in health economics : a methodological perspective Background : Time use studies*. Presentation at the iHEA conference: Beijing.

Vian T, Miller C, Themba Z, Bukuluki P. 2013. Perceptions of per diems in the health sector: evidence and implications. *Health Policy and Planning* **28**: 237–46.

10.2.7 Annex

Table 10.4: Link between activities and related payment

	Categories of activities	Payment related to activity
Within facility	General clinical activities	Salary + PBF bonus (for 6 MCH activities)
	General administrative activities	Salary + PBF bonus (for 6 MCH activities)
	Disease/service specific clinical activities:	
	• Nutrition	Salary
	• Immunization	Salary + PBF bonus
	• Family Planning	Salary + PBF bonus
	• HIV	Salary
	• Others	Salary
	Disease/service specific administrative activities:	
	• Nutrition	Salary
	• Immunization	Salary + PBF bonus
	• Family Planning	Salary + PBF bonus
	• HIV	Salary
	• Others	Salary
Outside	Activities outside of facilities related to public job (e.g., outreach, immunization campaigns, meetings, training and workshops)	Salary + per diems
	Income generating activities outside of public job (private practice + non-health activities, such as trade/business or agriculture)	Fee-for-service and other earnings

Table 10.5: Results of fractional multinomial logit regression on average proportion of time spent on specific clinical activities (reference for comparisons 'general clinical activities')

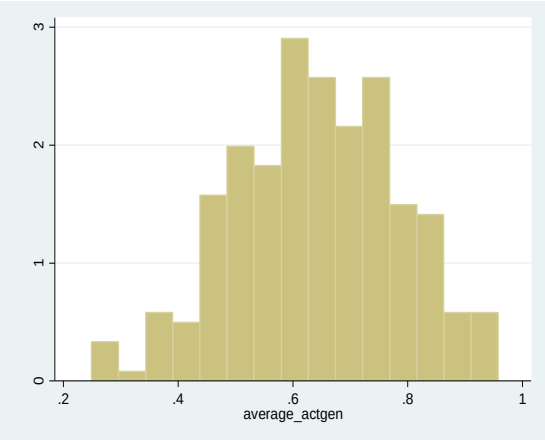
		Coef.	Std. Err.	p-value		Marginal effects
Nutrition	Male	0.0281	0.2405	0.907		-8.70E-04
	Young	0.3828	0.1673	0.022	**	0.0096
	CHO	0.2974	0.3836	0.438		0.0063
	CHA+nurse	-0.0012	0.2027	0.995		0.0012
	In-charge	-0.1933	0.2382	0.417		-0.0051
	Small facility	-0.2391	0.1975	0.226		-0.0047
	CHC	0.1723	0.3262	0.597		0.0059
	CHP	-0.2721	0.2701	0.314		-0.0056
	Urban	-0.3248	0.2084	0.119		-0.0069
	Bo	-1.3938	0.2069	0.000	***	-0.0323
	Kenema	-0.4264	0.1706	0.012	**	-0.009
Immunization	Male	-0.2433	0.2700	0.367		-0.0093
	Young	0.0938	0.1506	0.534		0.0016
	CHO	0.0824	0.3536	0.816		2.00E-04
	CHA+nurse	-0.1795	0.2178	0.410		-0.0044
	In-charge	0.0759	0.1744	0.663		0.0026
	Small facility	-0.2043	0.1793	0.254		-0.0049
	CHC	-0.1589	0.2535	0.531		-0.0037
	CHP	-0.1771	0.2032	0.383		-0.0042

	Urban	0.1263	0.1785	0.479		0.0059
	Bo	-0.2724	0.1913	0.154		-0.0084
	Kenema	-0.5302	0.1695	0.002	***	-0.0146
Family Planning	Male	-0.4672	0.2721	0.086		-0.0188
	Young	-0.0460	0.1510	0.761		-0.0038
	CHO	0.1464	0.3520	0.677		0.003
	CHA+nurse	-0.1262	0.1982	0.524		-0.0033
	In-charge	-0.0593	0.2012	0.768		-0.0024
	Small facility	0.0674	0.1824	0.712		0.0052
	CHC	-0.2112	0.2358	0.370		-0.0067
	CHP	-0.2190	0.1782	0.219		-0.0068
	Urban	-0.1725	0.2027	0.395		-0.0052
	Bo	0.0924	0.1739	0.595		0.0043
	Kenema	0.0332	0.1660	0.841		0.004
HIV	Male	1.5988	0.5987	0.008	***	0.0034
	Young	1.0097	0.5685	0.076		0.0016
	CHO	-0.3590	0.8686	0.679		-4.70E-04
	CHA+nurse	-1.9517	0.8281	0.018	**	-0.0019
	In-charge	0.7705	0.6086	0.205		9.40E-04
	Small facility	0.1321	0.4618	0.775		2.50E-04
	CHC	1.5647	0.5601	0.005	***	0.0029
	CHP	0.3863	0.6751	0.567		6.10E-04
	Urban	-0.2372	0.5283	0.654		-2.40E-04
	Bo	-0.5278	0.6796	0.437		-6.20E-04
	Kenema	1.2430	0.4850	0.010	*	0.0022
Other	Male	-0.9854	0.5178	0.057		-0.0027
	Young	0.6237	0.4324	0.149		0.0022
	CHO	0.3344	0.7348	0.649		9.60E-04
	CHA+nurse	0.3927	0.6374	0.538		0.0016
	In-charge	0.0583	0.4080	0.886		2.00E-04
	Small facility	-0.8794	0.5569	0.114		-0.0027
	CHC	-1.2571	0.7195	0.081		-0.0036
	CHP	-1.0954	0.6269	0.081		-0.003
	Urban	-0.5580	0.6678	0.403		-0.0015
	Bo	0.0700	0.4679	0.881		2.70E-04
	Kenema	-0.7599	0.5596	0.174		-0.0021

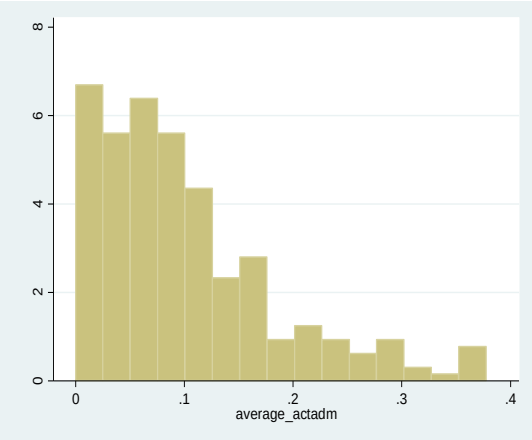
Note: *** p<0.01, ** p<0.05, * p<0.1

Figure 10.6: Distribution of average proportion of time spent on each activity

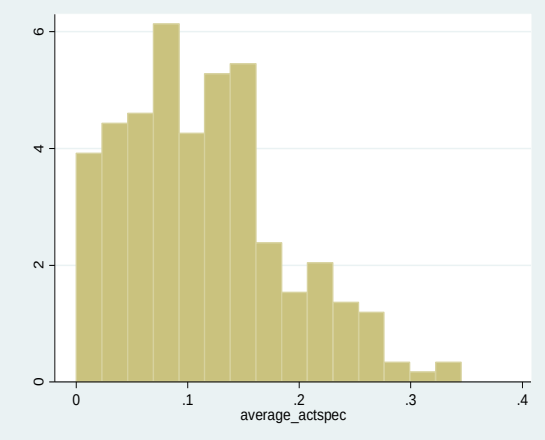
General clinical activities



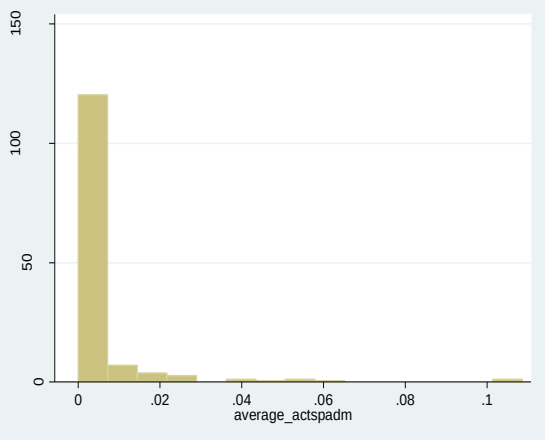
General administrative activities



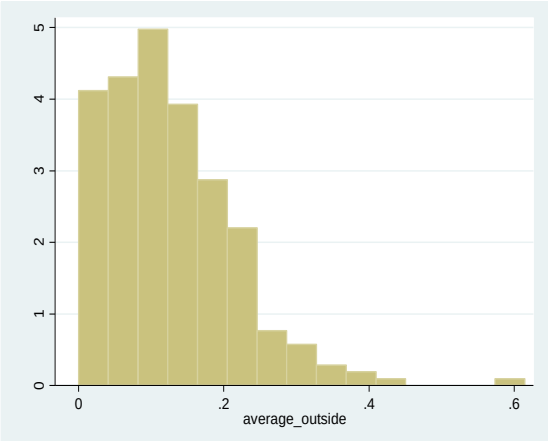
Disease/service-specific clinical activities



Disease/service specific admin. activities



'Outside' activities



Private practice and non-health activities

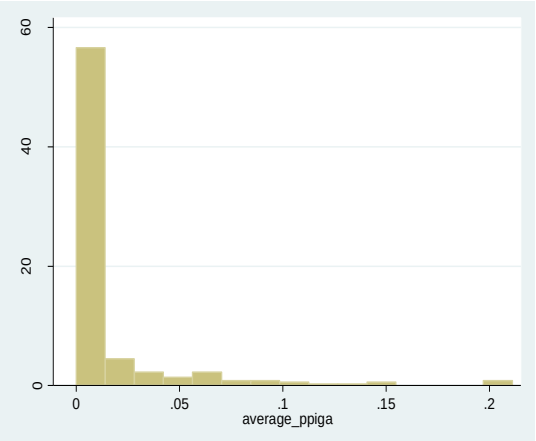
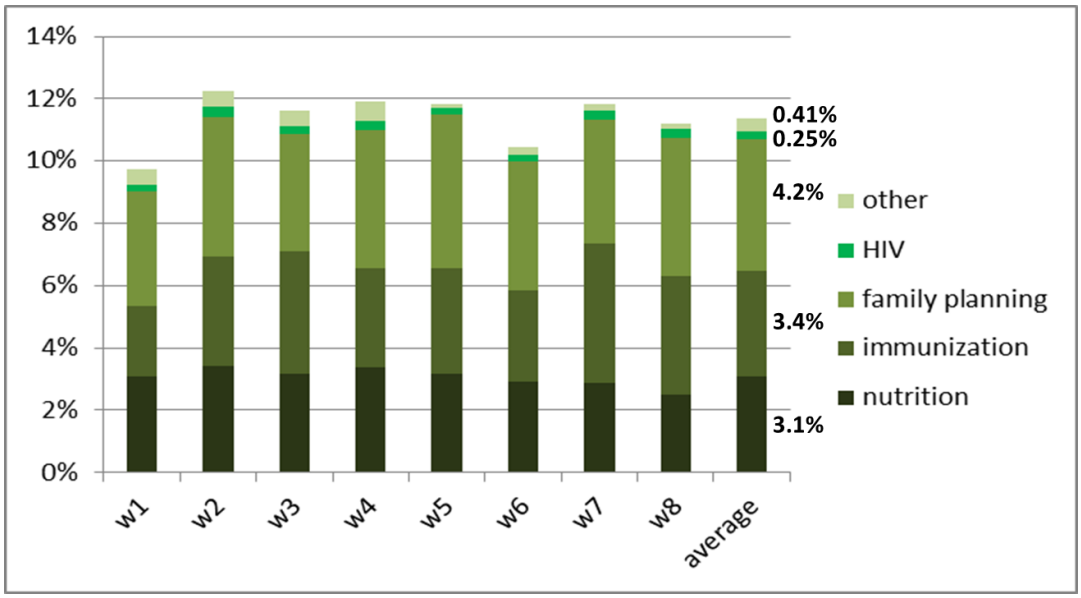


Figure 10.7: Detail of the proportion of time spent on each type of 'special clinical activity', per week and on average



PART III - DISCUSSION

11. Discussion and conclusions

11.1 Introduction

The primary aim of this research was to analyze the complex remuneration of primary HWs in Sierra Leone, explore its causes and drivers at different levels, as well as the consequences it has for the HWs and on the activities they perform. In Chapter 2, a review of the available literature suggested that the topic of financial incentives of HWs in low and middle-income settings had been discussed in a variety of studies pertaining to different literatures and disciplines. However, the existing research tends to focus on each of the income sources separately and I proposed a broad research agenda to provide a comprehensive look at the financial incentive available for HWs and analyze them simultaneously (Bertone and Witter, 2015a). Based on that initial proposition, I set out to provide a detailed analysis of the remuneration of primary HWs in Sierra Leone (before the Ebola epidemic).

The specific research objectives for this work were the following (see Chapter 3):

1. Describe the official financial incentives available for HWs, by analyzing the HRH policies and policy-making processes at macro (central) level which developed in Sierra Leone during the post-conflict period.
2. Investigate the factors and dynamics between key actors of the health system at meso (district) level which contribute to re-shape the financial incentive package.
3. Estimate the absolute and relative contribution of each income to the remuneration of HWs, and analyze the determinants of the remuneration at micro (individual HW) level.
4. Explore the views of HWs on their remunerations, as well as their income use and financial coping strategies, and how these affect their motivation.
5. Investigate the possible links between remunerations and activities performed.

The present chapter synthesizes the key findings of the thesis, it discusses the overall limitations of the study, and identifies its contribution to knowledge as well as its policy implications. Finally, potential areas for future research are mentioned.

11.2 Summary of main findings

11.2.1 Key findings in relation to the research questions

This thesis brings together the findings of a broad and innovative body of work focused on the issue of the complex remuneration of HWs. This section provides an overview of the key findings of this research in relation to the specific research questions identified in Chapter 3 (Table 11.1 below).

Table 11.1: Overview of research questions and key findings

	Research objectives	**Chapter**	**Research questions** (HT: hypothesis testing) (EX: exploratory or descriptive)	**Key findings**
Central level	Setting the background by describing the official HRH incentive package in Sierra Leone	Chapter 6	• What dynamics and processes at central level have led to the definition of the HRH incentive policies in Sierra Leone over the post-conflict period? (EX) • Was there a political 'window of opportunity' for reform in the immediate post-conflict period? (HT) • What type of financial incentive package for HWs emerged after the decade of post-conflict reforms? (EX)	• The main drivers of HRH policy-making in post-conflict Sierra Leone were (i) sense of need for radical change, (ii) increasingly clear political direction, (iii) availability of funding • A 'window of opportunity' for reform did not open in the immediate post-conflict when leadership and capacity were weak and focus on 'fire-fighting' measures, but 8 years later when the FHCI was announced, which played as a major catalyst for reform • Notable efforts were made overtime for the harmonization and alignment in the design of the official financial incentives for HWs
District level	Exploring how HRH remuneration is re-shaped at district level	Chapter 7	• Which factors and dynamics between local-level actors contribute to re-shaping the financial incentives of HWs? (EX) • What is the impact of such influence on the actual financial incentives experienced by HWs? (EX)	• Implementation gaps in official HRH incentive policies, as well as dynamic interactions between DHMTs and NGOs (characterized by asymmetry of power between them in favor of NGOs) contribute to the emergence of informal practices at local level (e.g. selective supervision, payment of salary top-ups and per diems) • Such informal practices result in inequalities in the remuneration of HWs across districts

	Estimating HWs' complex remuneration	Chapter 8	• What are the different estimates of HWs' incomes based on the three methods used (i.e., survey, indirect questioning, prospective daily logbook)? (EX) • How do results of income estimates compare to the hypotheses on biases that had been formulated initially? (HT) - Recall bias in survey responses lead to underestimation of income amounts - Indirect questioning reduces reticence in response to questions on sensitive (i.e. informal or illegal) incomes and address normative bias - Daily logbooks can help address the issue of recall bias and capture variation overtime, but suffer from low response rate.	• Survey estimates are higher than other estimates, which challenge the assumption of recall bias leading to underestimation of incomes. • Respondents are still reticent to talk about sensitive issues, even when using indirect questioning methods' • The attrition rate for longitudinal logbooks is acceptable, however their lack of completeness and low quality are major issues • Each methods has advantages and disadvantages and collecting data on HWs' incomes remains a challenge. A potential solution could be to run multiple surveys over time. Additionally, mixed-methods approaches proved useful in providing essential information to interpret data and improve collection tools
Individual level	Analyzing the complex remuneration of HWs	Chapter 9	• What is the contribution of each income to the remuneration of HWs? (EX) • Which factors at individual, facility and district level drive the differences in the total remuneration and between components? (EX) • What are the views of the HWs on their incomes, and their satisfaction in relation with their livelihood strategies? (EX)	• Salaries make up about 60% of the income of primary HWs in Sierra Leone, while the rest is composed of a variety of formal and informal incomes. • There is much heterogeneity in the total income as well as in the revenue breakdown. Results show significant differences in total income across district, for in-charges and HWs in Community Health Centres. • The satisfaction of HWs in relation to their remunerations also depends on the non-financial features of the different income streams, and on how these features allow them to use each of their incomes differently to cope financially. • Analysis conducted specifically on PBF bonuses shows that they contribute to about 10% of the total remuneration of primary HWs. However, views on the bonus are rather positive, because of the role that it plays within the income use strategies of the workers
	Exploring the links between complex remuneration and HWs' productive activities	Chapter 10	• Is the choice of activities of HWs driven by their effort to maximize income and minimize effort (as hypothesized by agency theory)? (HT) • Which factors constrain the choice of activities of HWs and influence the patterns of service delivery at facility level? (EX)	• Agency's hypothesis cannot be tested as one of its key assumptions (i.e., that HWs can freely choose which activities to perform) does not hold • Two main factors constrain the activity choice: (i) a schedule which dictates which services are to be provided each day; (ii) the availability of material (drugs, equipment) and technical (supervision) support to actually provide those services • Qualitative and quantitative results point to the fact that external actors, such as NGOs. play a key role in defining the activities of HWs by providing material and technical support to them.

The following section highlights three broader findings that emerge from the overall analysis carried out for this thesis, beyond those specific to each research paper, and discusses them against the backdrop of the original conceptual framework.

11.2.2 Main overall findings of the research

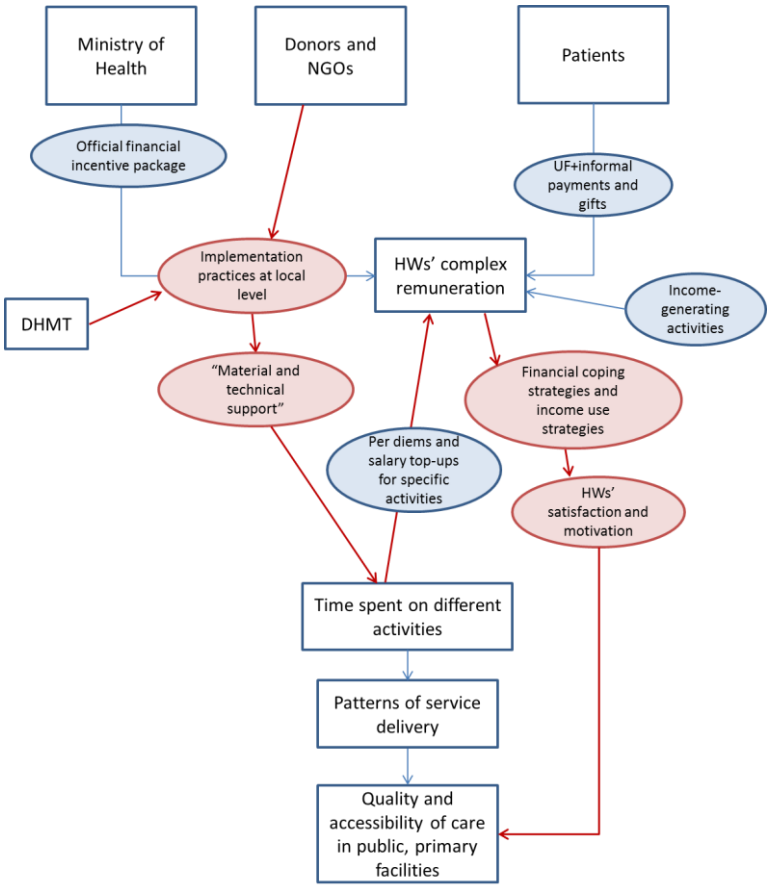
Beyond the results of each research paper related to the specific research questions, the overall research and analysis carried out in the thesis highlighted three broad findings. The first, key finding of the analysis of the total income estimate for HWs is the confirmation that the complex remuneration exists and it is a relevant phenomenon to study. In the context of three rural districts of Sierra Leone, the remuneration of primary HWs is indeed composed of a variety of formal and informal remunerations, of which the government salary remains the main one providing just more than half of the total income (60%). In this setting, the efforts undertaken by government, donors and NGOs have led to some harmonization and alignment of the HRH remuneration (Bertone *et al.*, 2014), which is reflected in the high share of government pay for primary HWs, as well as the low revenues from top-ups found in Chapter 9 (Bertone and Lagarde, 2016). Despite these efforts, however, the remuneration of HWs in Sierra Leone remains complex and other formal and informal incomes beyond the government payments contribute to a large share of it. It could be argued that the complex remuneration of HWs is not a problem *per se*. Indeed, as highlighted in our third overall finding (below), from the individual perspective of the HWs, the complex remuneration, which allows for the differential use of different income streams, is an understandable and constructive response to the specific problems that primary HWs face in Sierra Leone, and specifically to address their concerns over low salaries and delayed official payments. However, from a systems' perspective, the complex remuneration reveals more fundamental problems which affect the healthcare sector. In particular, the causes of the complex remuneration, i.e. the factors that lead to and define it, are related to fragmentation and misalignment in the local health system which is introduced, despite the efforts at central level, because of a substantial implementation gap between the official policies and the field reality, and because of the external actors who re-shape the local health priorities, thus influencing HWs' activities and incomes.

Further illustrating this last point, the second main finding of this thesis shows the key role of the dynamic interactions at district (meso) level in shaping the HWs' remuneration and activities in Sierra Leone. The analysis of the political economy dynamics between DHMTs and NGOs (Chapter 7) unravels the mechanisms by which these interactions affect the implementation of centrally-designed policies and allow for the emergence of informal HRH practices which ensure a better fit between the NGOs agenda and the HWs incentive package. These practices take the form of selective supervision, salary supplementations and per diems paid to HWs and lead to differences in HWs' remuneration across districts (Bertone and Witter, 2015b). Building on that finding and taking it further, the analysis of the factors influencing the activities of HWs (Chapter 10) reveals the mechanisms by which external actors shape local health priorities to be in line with their own priorities, through the provision of selective technical and material support to facilities. Such support strongly influences what HWs (can) do, beyond their formal accountability relations. Critically, the activities that HWs carry out define, in turn, the HWs remuneration structure and level, and explain the significant differences that I observed in HWs' income between districts in Chapter 9 (Bertone and Lagarde, 2016; Bertone *et al.*, 2016a).

Finally, the study illuminates important features of the different payment streams, and how they are perceived by the HWs in relation to one another within the complex remuneration. It points to the fact that the non-financial features of the incomes such as regularity, reliability, ease of access, linkage to performance, fairness in sharing practices, etc., matter beyond the monetary value. In their daily lives, primary HWs enact a series of compensating and coping strategies, such as spending different incomes differently (mental accounting), hiding income to shelter it from family pressures, and re-investing certain incomes to stabilize earnings over time. Each of these strategies takes advantage of the fact that the remuneration is complex and composed of different incomes, each with own specific financial and non-financial features (Bertone and Lagarde, 2016). Additionally, this study finds that design issues and implementation challenges that influence the non-financial features of the remuneration, such as those found for the PBF scheme in Sierra Leone, have important consequences for the motivation of HWs (Bertone *et al.*, 2016a).

It is important to note that the overall findings presented above challenge the original conceptual framework (Chapter 3) and call into question the causal path it hypothesized to explain how complex remuneration influences the allocation of time on different activities and, in turn, health service delivery and use. Indeed, a modified conceptual framework is now needed (Figure 11.1). The new framework incorporates the key findings in two key ways. First, it recognizes that the translation of the official incentive package available for HWs into elements of their actual remuneration is mediated by the implementation of informal HRH practices at local level, influenced by the dynamic interaction between DHMTs and NGOs. As described above, this is done by external actors through the provision of selective technical and material support to facilities and HWs. In turn, this support influences which activities HWs can or should do and, in turn, defines the elements of their complex remuneration. Therefore, while the original framework hypothesized that the complex remuneration of HWs would define their choice of activity, through their utility maximization strategies, the new framework reflects the finding that, in fact, it is rather the activities available to HWs, driven by external actors and their priorities, which contribute to define the HWs' remuneration structure and level. Secondly, the revised conceptual framework recognizes the importance of financial and non-financial features of the different income streams within the complex remuneration for the HWs' financial coping and livelihood strategies. The fact that incomes are perceived and can be used differently (for reasons beyond their face monetary value) affects the potential that each income has to motivate HWs, which in turn impacts on the quality and type of service delivered.

Figure 11.1: Revised conceptual framework



11.3 Limitations

The analysis carried out in this thesis presents some limitations. A number of limitations have already been described in each of the relevant finding chapters. Here, I present some overall limitations, which have implications for the conclusions that can be drawn from the body of work presented.

11.3.1 Limitations related to sampling

The analysis was carried out in three of the fourteen districts of Sierra Leone, selected purposefully, rather than randomly. Moreover, all three districts are mostly rural, and the sample did not comprise the Western Area district around Freetown, where patterns in HWs' remuneration are probably different. As a consequence, while this choice limits the external validity of our results, it is probably broadly representative of rural Sierra Leone and frontline HWs (non-clinician physicians, nurses and nursing aides) and facilities (public, primary facilities). This may also explain the fact that I found overall limited variability between HWs incomes based on individual features or characteristics of the facility, as shown for example by the absence of a strong rural/urban divide, discussed in Chapter 9 (Bertone and Lagarde, 2016).

The sampling strategy for the HWs survey has two main limitations. First, because it was envisaged that enumerators start administering the survey to highest cadres, our sample may slightly over-represent in-charges compared to staff HWs. Second, as sampling was done at facility level, rather than HW level and only those present at the facility on the day of the visit were included in the survey, there is a risk of selection bias. This is because HWs with higher levels of absenteeism were more likely not to be present on the day of the survey. This bias is likely to lead to the underestimation of income from and time spent on activities outside of the health sector, private practice, etc.

HWs included in the qualitative sample were selected purposefully as a sub-sample of those who were administered the survey and logbooks. The selection aimed to reflect a wide variety of views and situations in terms of cadre, but also rural/urban, male/female, type of facility, in-charge/staff and districts, in line with the principle of 'fair dealing' (Mays and Pope, 2000). However, as shown in Table 5.3, more MCH Aides, female HWs and those posted in MCHPs were interviewed, while CHOs, man and those working in CHPs are under-represented in the final sample. The choice was made for convenience reasons (as there are very few male HWs, CHOs and CHP facilities, it was unpractical to reach them). Importantly, it also closely reflects the actual mix of HWs in the districts and all different groups are represented, in the interview sample, by at least one, if not more, individuals.

11.3.2 Data limitations

In terms of quantitative data collection, several innovative techniques have been used to collect data on the different HWs remunerations, as explained in Chapters 5 and 8. As there exists no 'golden standard' for the collection of data on HWs' incomes, these were estimated using methods with varying levels of reliability, because of both recall and normative bias. In particular, it is possible that certain revenues, and in particular the most sensitive ones such as those derived from user fees, illicit sale of drugs or under-the-table payments, were underreported for fear of consequences or because of the negative perceptions of the public around them. Similarly, normative bias is also a potential limitation of the self-reported data collected on HWs activities (Chapter 10). Additionally, the inconsistency of the activity reporting in the logbooks did not allow for a more disaggregated analysis of what HWs do.

Finally, it is also possible that HWs attempted to provide normative or biased answers also during the in-depth interviews, by stating what they thought the researcher would like to hear or by depicting issues in a certain light to obtain improvements to their conditions. The latter could be, for example, the case of HWs complaining of their low income and requesting me to act, at national level or in other ways, to obtain an increase. Such applications could be increased by the fact that, because of my appearance, background and position (and despite the efforts to clarify my role of independent researcher), I could be easily likened to NGO workers or donors, who do have indeed some power to directly influence HWs incomes. To limit this issue as much as possible, the interviews focused on asking pragmatic and contextually-grounded descriptions of the HW daily life and of their habits, both concerning the income use and financial coping strategies, as well as the organization of the activities. Especially towards the beginning, questions on HWs' broad opinions (e.g. on the fairness of salary, etc.) were avoided. Moreover, as explained in Chapter 5, reflexivity was exercised during the interviews as well as during the analysis of the data to critically consider how my presence could have influenced the responses of the HWs, but also how my perspectives and personal biases may have affected the interpretation of the data. Iterative discussion with my supervisor and other advisors, some familiar with the context of Sierra Leone and other outsiders, was essential to actively reflect on my positionality as a researcher, as well as the role of my personal views in influencing the analysis (Walt *et al.*, 2008).

11.3.3 Limitations to external validity

The results of the work carried out in this thesis are certainly valid within the context of the study districts in Sierra Leone, at the time of the research. However, because of the specificity of the setting, their generalizability could be limited. For example, the findings relating to the design and implementation of the PBF scheme are closely related to the context of Sierra Leone and may not be valid for other settings (Bertone *et al.*, 2016a). Also, the efforts to promote HRH reforms and harmonize HWs incentives in parallel to the launch of the FHCI are exceptional among the countries which introduced fee exemptions around the same time (Bertone *et al.*, 2014;

Witter *et al.*, 2016), while the relatively high number of NGOs operating directly within facilities (Chapter 7 - Bertone and Witter, 2015b) may be a specificity of Sierra Leone's health system. It is also important to stress that, as further explained in the second part of section 11.4.3, the context in Sierra Leone and in those same study districts is now substantially different because of the Ebola Virus Disease (EVD) outbreak, the changes it caused in the health system and at socio-economic level, and the emergency response it triggered, which modified the mapping of the external actors present at central and district levels, and the dynamics between them and with state actors.

However, notwithstanding the context-specificity of some of the findings, the health system and the HRH situation and challenges in Sierra Leone before Ebola were not substantially different from those in many countries in sub-Saharan Africa and low-income countries. These contexts are often characterized by the fragmentation of the health system, even within the public sector and, due to its weak regulation and under-funding, the existence of an 'unofficial' healthcare sector (Ensor and Witter, 2001), which gives rise to the issue of the complex remuneration of HWs. Additionally, as it is the case for numerous countries over the 2000s decade, a targeted fee exemption policy had been launched in Sierra Leone, which reduced incomes from user fees for health staff (Ridde and Morestin, 2011; McPake *et al.*, 2013b). Similarly, a PBF scheme including individual HW bonuses had been introduced in Sierra Leone, as it is currently the case, whether at pilot stage or national level, in 34 countries in sub-Saharan Africa (Fritsche *et al.*, 2014). Finally, the key role of donors in providing funds to the health system, as well as the presence of donors and implementing agencies (NGOs) at sub-national level is a common feature to many countries in the region, in particular in fragile, post-conflict settings (Brinkerhoff, 2008; Witter, 2012).

11.3.4 Limitations of the conceptual framework and theoretical approach

Although the conceptual framework defined at the beginning of the research (Chapter 3) proved a useful tool to guide and structure the different components of the analysis in this thesis and to provide a common theoretical approach (i.e., agency theory), the limits of the framework became evident as the research progressed. This is illustrated, for example, by the need to update the framework and review the hypotheses on the causal path which determines the complex remuneration of HWs and defines its consequences, as shown in section 11.2.2 above.

In particular, agency theory proved unsuitable to the issue and context of study. Concerning the latter, at individual level, the agency model and the assumptions on which it hinges (and in particular that of unconstrained labor supply choices) did not prove valid for HWs employed in the context of Sierra Leone. Moreover, at higher level (district), while a number of principal-agent relations are found (between Ministry of Health and DHMTs, between donors and NGOs, and between DHMTs and NGOs, and heath facility staff), the relations between

these actors are revealed to be more complex than what modelled by agency theory. The adoption of agency as the underlying theoretical framework of this thesis is therefore one of its limitations, and the analysis could benefit from extending beyond agency theory and applying concepts and tools drawing from the field of political science. In this sense, the insights provided by implementation theory, exploring the role of politics, power and practices in processes at meso and micro levels (Erasmus and Gilson, 2008; Gilson *et al.*, 2014) could be useful. Among these theories, street-level bureaucracy, for example, could offer a possible alternative framework to interpret the practices of HWs at facility and individual level. A particularly useful conceptualization of it views street-level bureaucrats as policy co-makers surrounded by context-specific 'micro-networks of relations', i.e. a web of multiple, vertical and horizontal relations, in which their work and interactions are embedded (Hupe and Hill, 2007). Such model could be fruitfully applied to extend the findings of Chapter 10.

Concerning the issue of study, i.e. the remuneration of HWs, simple agency models consider it, alongside effort levels and power of incentives, as the key variable in defining HWs' behavior. However, some have successfully argued that professional norms, intrinsic motivation and self-selection of agents into a public sector jobs also contribute to shape the agents' behaviors and mitigate the predictions of the standard agency model (Perrow, 1986; Burgess and Metcalfe, 1999; Kiser, 1999; Burgess and Ratto, 2003; Shapiro, 2005). In this sense, it is important to remind that the research carried out for this thesis focuses exclusively on the financial incentives of HWs and does not take into consideration non-financial incentives, such as access to training, social recognition, supervision, although their relevance has been shown in the literature (Buchan *et al.*, 2000; Lehmann *et al.*, 2008; Willis-Shattuck *et al.*, 2008; Chandler *et al.*, 2009; Lagarde and Blaauw, 2009). Given their importance, omitting non-financial incentives from the analysis represents a limitation of the research. However, this choice was explicitly made since the early stages of the research (Chapter 2 (Bertone and Witter, 2015a), and section 3.2.1) and is dictated by the need to contain the amount of work and ensure the feasibility of the research as a PhD project.

11.4 Contribution of the thesis

11.4.1 Methodological contributions

From a methodological perspective, this thesis contributes to developing and testing a range of approaches to data collection and analysis on the issue of the complex remuneration of HWs, which are useful to build on for the proposed research agenda (Chapter 2 - Bertone and Witter, 2015a). In particular, the methodological contribution refers to (i) the challenge of capturing the multiple remunerations of HWs, and (ii) the analysis of the complex remuneration to explore the causes of the variability of income between HWs.

Methodological approaches to the collection of data on HWs incomes

The traditional approach to collect data on HWs incomes adopted in most of the existing literature is by the use of a survey, and several studies report the results of that type of surveys (Macq and Van Lerberghe, 2000; Witter *et al.*, 2007, 2016; McCoy *et al.*, 2008). Additionally, different approaches to indirect questioning have also been attempted in the literature, such as asking what other HWs (rather than the interviewee) do in terms of financial coping strategy (Roenen *et al.*, 1997) or by using the Randomized Response Technique (RRT) with binary answers (yes/no) (Akwataghibe *et al.*, 2013). In other studies, qualitative methods (direct observation, interviews, focus groups) were adopted to elicit information on certain incomes, although this did not always lead to a precise quantification of the remuneration(s) (McPake *et al.*, 1999; Stringhini *et al.*, 2009; Witter *et al.*, 2011; Vian *et al.*, 2013).

Building on these approaches and attempting to improve each of them, the quantitative component of this research includes a direct survey, indirect questioning for sensitive incomes and self-administered prospective logbooks. The comparison of the results, carried out in Chapter 8, highlights the advantages and disadvantages of each of these methods. It confirms that direct, cross-sectional surveys remain a useful tool, apt to provide income estimates in an inexpensive manner. However, the research contributed to explore new techniques of indirect questioning which had not been yet applied to the study of HWs income, such as the RRT in the variant design for quantitative estimates. The negative results highlight the limits of this type of technique in the context of Sierra Leone and point to the fact that other, indirect techniques could be explored in the future to increase the reliability of answers on sensitive incomes, such as for example the 'unfolding bracket' approach used in DR Congo (Bertone *et al.*, 2016b). Additionally, knowledge of specific context and culture is essential to assess which are the most sensitive income questions and how likely they are to the answered truthfully in a direct survey.

Although the use of self-administered, longitudinal logbooks had been attempted to collect data on HWs' daily income and expenses in a study in Uganda (McPake *et al.*, 1999), logbooks were completed by only 20 HWs for one month and results were not used in the final analysis. In this research, despite the potential bias of the self-

administered approach (of which I was aware from the beginning, but was inevitable because of the costs and unpracticality of observational approaches), it seems that the logbooks proved useful to provide an estimate of HWs' incomes, including the most sensitive ones. Logbook data were used in the final estimate for the sensitive incomes and, although likely to be lower-end estimates, they are far from negligible for many respondents. However, unfortunately, in the case of sensitive incomes the comparison of logbook estimates with data collected with a different method is not possible.

While collecting reliable estimates, especially on sensitive incomes, remains a challenge and other approaches could be tested in the future, this work contributes to the preliminary testing and comparison of some of the possible approaches, which will be useful to build on for future research on the complex remuneration of HWs.

Analysis of the determinants of the complex remuneration of HWs

The multivariate regression analysis applied to the quantitative data on each of the remuneration of the HWs and their total income is also an innovative approach introduced by this research. By looking at the determinants of the HWs, at individual, facility and district level, the analysis allows to explore some of the causes of the variability of incomes between HWs. Results are useful to investigate the features at different levels which entail higher earning opportunities for the HWs and identify the type of income which may increase. This analysis also has the potential to illuminate on whether the income levels for individual HWs are in line with the policies in place to address the HRH challenges of availability, distribution and motivation (e.g. higher official incomes for those in rural areas), or there are unacceptable inequalities between HWs, which could be policy-amenable. Both elements are of key policy relevance, as described in section 11.4.3.

11.4.2 Contribution to knowledge

The research carried out for this thesis provides one of the first case studies coupling a mapping the HWs' complex remuneration with an in-depth exploration of its causes and consequences. In doing so, this thesis effectively brings together different bodies of literature (agency theory, literature on HRH, on HWs' incentives and motivation, and on power, governance and accountability in the health sector), pertaining to a range of disciplines (such as health economics, policy analysis, political economy), under the field of health policy and systems research.

Beyond the specific findings of each of the research papers, this thesis provides an original contribution to the current knowledge on how we conceptualize and analyze HWs' incentives in low and middle income countries (LMICs). This contribution is not only consistent with, but also expands some of the most recent theoretical developments in the HRH literature. Indeed, while I was working on this thesis, a series of articles and books was

published arguing for the adoption of a 'health labor market' (HLM) approach to understand HRH challenges and health workforce policies (McPake *et al.*, 2013a, 2014; Soucat *et al.*, 2013; Sousa *et al.*, 2013; Araujo *et al.*, 2016), moving beyond the traditional HRH literature which tends to focus on workforce planning (i.e., estimating the quantity of HWs needed based on a given population's health needs), supply-side interventions (e.g., scaling up training of HWs) and HRH management. In contrast, the HLM framework pays increased attention to the dynamic nature of the labor market for HWs and the interaction between the supply of HWs (defined by the number of HWs willing to work in the health sector) and the demand of HWs (partially derived from health needs, but also depending on the willingness and ability to hire and pay of HWs of the public, private and non-for-profit sectors), looking at the role of incentives, employment preferences and labor market failures (McPake *et al.*, 2014; Araujo *et al.*, 2016).

This thesis is in line with the theoretical arguments of the HLM approach, as it moves beyond HRH management approaches to focus extensively on the financial incentives available to HWs, how they are established and how they affect HWs, their motivation and activities. As recommended by McPake *et al.* (2013), it provides an in-depth understanding of the absolute and relative levels of all sources of remuneration, which is preliminary to the analysis of the HLM and the reflection on workforce policies and reforms. Critically, however, this thesis also represents an extension of the HLM approach and a more contextualized application to low-income countries. Indeed, the HLM approach, as conceptualized so far, only partially takes into account the specificity of the health system and HRH organization in many LMICs, and the substantial difference with high-income settings. In particular, as well explained by Ensor and Witter (2001), this concerns the way in which, in LMICs, low incomes of staff, lack of resources for material supplies, unstable labor markets and difficulties in regulation of unofficial private activity, can generate hidden 'internal' market behavior. Although some HLM publications acknowledge that the "*pay of health professionals, especially in middle and low-income countries, consists in multiple components, including salaries, informal payments, bonuses and allowances that can vary considerably among individual health workers* [and] *health professionals often hold multiple jobs*" (McPake *et al.*, 2013: p.844, see also McPake *et al.*, 2014), and refer to the issue of the multiple remuneration of HWs in LMICs (Araujo *et al.*, 2016), the general HLM framework tends to consider the wage rate (normally understood as the average HW salary) as the market clearing point, which is the salary level which would ensure the right number, quality and productivity of HWs, given the health needs of the population covered by an health system. However, as shown in this thesis, the practices that influence the HWs' remuneration include also dual practice (private health practice, or non-health activities) or informal activities (such as, sale of drugs, payments from patients, etc.) and are affected by the presence of external actors who contribute to the financing of the health sector, including the direct funding of the health workforce through salary supplementations and per diems. A focus of health labor market analysis exclusively on salary ignores a large part of the remuneration of HWs, which is important for them in different ways (i.e., not only because of the extra amount of income they provide, but also because of their non-financial features) and ensures their participation to the health labor market, as well as their retention and motivation.

This thesis extends, theoretically and empirically, the HLM approach to incorporate more explicitly the relevance of the phenomenon of the complex remuneration of HWs and the fact that HWs receive a range of formal and informal incomes, each entailing a different type of contract, a varying 'power' of the incentive and a range of different non-financial features which affect HWs' satisfaction and motivation. By reflecting all these elements of the HWs' remuneration, it provides a more adapted perspective to analyze the reality of low-income settings and offer pertinent policy recommendations.

Moreover, this research also points to the role that disciplines other than health and labor economics can play in the understanding of the health labor market. These include policy analysis and political economy analysis for the investigation of the dynamics defining HRH policy design and implementation at central and district level, as well as qualitative health system research for the analysis of non-financial aspects of income and of HWs' views and perceptions. In the case of the latter, some evidence exist on the importance of the non-financial features of HWs' incomes. For example, a study in the DR Congo found that receiving a salary is seen by HWs as a recognition of their role as agents of the state (Fox *et al.*, 2014). In Tanzania, the perceived unfairness of salary, allowances and access to training (and therefore, per diems) is found to be a key demotivating factor (Songstad *et al.*, 2011) and the availability of deferred income through a pension scheme a critical element for remaining in public employment (Songstad *et al.*, 2012; Zinnen *et al.*, 2012). Finally, recent literature on PBF schemes finds that non-monetary factors (such as clarification of responsibilities, supervision and improvements in the work environment) influence the HWs' perceptions of being paid based on performance, but on the other hand HWs may be demotivated by design and implementation issues (Bhatnagar and George, 2016; Ogundeji *et al.*, 2016). This research adds to this body of work by looking at all of the HWs' incomes and their respective features in relation to each other, and reveals the compensating and coping strategies of primary HWs, as highlighted in the main findings (section 11.2). Additionally, in line with the multidisciplinary perspective adopted, the thesis confirms the value of mixed-method approaches for the research agenda on HWs' remuneration, already used in another study (Akwataghibe *et al.*, 2013).

In this sense, this research contributes more broadly to the field of health policy and system research. The multidisciplinary approach embraced throughout the thesis is not limited to the methods adopted, but also reflected in the recognition of the health system as a complex system, where the 'hardware' (e.g., the functional or instrumental elements which compose it, including HRH) dynamically interacts with the 'software' (e.g., ideas, interests, relations, power, values and norms), within the broader socio-economic context of the study districts in Sierra Leone (Sheikh *et al.*, 2011). Accordingly, the type of analysis performed allows to explore both sets of features at multiple levels, including the central, sub-national (district and facility) and individual level, and to reflect on how they influence the remuneration of HWs and, ultimately, service delivery.

11.4.3 Policy implications

Policy implications for financial incentive strategies in low-income settings

The analysis and findings of this research have important policy implications for how we go about (re)thinking financial incentive strategies, in terms of how policies and reforms can be devised to address HRH challenges, through the design and implementation of effective incentive packages.

First, the findings call for an increased attention by national policy-makers as well as donors and external technical advisers (such as, for example, those working within the HRH Technical Working Group in Freetown), to components of the HWs remuneration other than those usually looked at, i.e. government salary and official allowances. This is essential in order to have a better and more comprehensive understanding of the incentives available to HWs and, therefore, be able to establish or modify them through health workforce reforms which effectively address HRH challenges, such as retention, motivation and distribution. Gathering comprehensive information on HWs remunerations does not necessarily entail new research or expensive *ad-hoc* surveys. Indeed, at least some of the key information could be collected through routine systems, both by improving the existing or creating new ones. For example, government's salary payrolls could be designed to also include information on payment execution, and donors and NGOs could be mandated to inform the Ministry of Health or the DHMTs of the payments made to individual HWs, in the form of top-ups or per diems. Existing HR management systems, such as iHRIS[1] could be adapted to allow the inclusion of both these data. Also supplementary information could be calculated through the current OpenRBF platform[2] used to manage PBF data in many countries, to keep track of bonuses paid to individual HWs (at the moment, the system allows tracking payments to facilities, but not to individuals). Information on informal incomes such as payments from patients and income from private practice, is undoubtedly more difficult to obtain, but households and patients' surveys could be used to obtain estimates of them.

Once the information is available, the analysis of all the remunerations of HWs should be built into the ongoing health labor market analyses and would allow policy-makers and advisers, first, to explore the characteristics (such as, the cadre or gender of the HWs, the location (urban/rural, district) and size of the facility where they work, etc.) that entail better earning opportunities for HWs in the form of informal incomes, private practice, or payments from external agencies. An understanding of which HWs (and where) have higher remunerations is necessary to address income inequalities by, for example, harmonizing opportunities for payment by NGOs and donors across districts and facilities, as well as better regulating private and dual practice. Secondly, information on all of HWs' remunerations can contribute at central level to the definition of the amount of the official payments, so that it is set up to a level which is effective to address HRH challenges. For example, if a remote

[1] https://www.ihris.org/
[2] http://www.openrbf.org/

allowance is introduced, does it contribute to increase the income level of those posted in rural areas above that of urban HWs? Or, does a PBF bonus provide a sufficient incentive to induce behavioral change, and for which HWs? (e.g. for the in-charges only, or also for staff HWs, etc.). Finally, this information is also necessary to monitor the effective implementation of HRH incentive policies and verify whether these policies are actually reflected in the remuneration of HWs.

The availability of information on the HWs' remuneration also has the advantage of diminishing the reliance on anecdotal evidence and on the perceptions of actors at central level which can be misled. For example, as discussed in Chapter 9 (Bertone and Lagarde, 2016), most of the actors working at central level in Sierra Leone, and in particular donors and NGOs, overestimated the relevance of salary supplementations paid to HWs by external agencies, possibly because their views did not reflect the most recent collective efforts made towards incentive alignment. Interestingly, many NGO representatives reported that, while their organizations had eliminated top-ups, they suspected others of continuing the practice. Similarly, many stakeholders supposed that the large majority of HWs were not receiving their salary or receiving it with long delays. However, this research found that 15% of the HWs do not receive salary (largely, those trained or retrained after 2010)[3] and salaries are generally paid on time into the bank accounts. It is possible that the views of some stakeholders reflect the complaints of a vocal minority of HWs.

Secondly, the findings of this thesis expose some of the potential reasons of the income variation between HWs, as driven by factors concerning implementation processes. It shows that the alignment of policies and incentive packages at central level may not be sufficient to ensure effective incentive packages at HW level. This is because the dynamics between actors at district level play a key role in influencing the incomes of HWs, as well as the activities they perform, thus effectively modifying incentive packages and service delivery. From a policy perspective, this calls for better monitoring of implementation practices and for further coordination, both at national as well as at sub-national level. In order to do so, it will be essential to ensure the empowerment of DHMTs as lead in the stewardship, coordination and priority-setting processes, as further explained in Chapter 7 (Bertone and Witter, 2015b). This will require, from donors and NGOs, the provision of additional financial and technical support to the long-term efforts of capacity building of district-level staff, possibly through pooled district-level basket funds, as detailed in Chapter 7 (Bertone and Witter, 2015b). At the same time, it would be essential that national governing bodies at central level establish a legal framework that strengthen decentralization and allows for the shifting of key roles and powers to the DHMTs, as well as provides them with the necessary human and financial resources. Development partners also have a role in reducing the fragmentation of the health system at local level, which directly affects inequalities in HWs' income as well as what HWs do. Such fragmentation is often introduced by the disjointed support that donors offer to NGOs operating directly within the districts, and bypassing the central level and its coordination role. Additionally, there is room for improvement by

[3] This is in line with the finding from operational research carried out in 2013-2014 which found that 14.5% of HWs did not receive their salary (Narayan and Gage, 2015).

donors and NGOs towards coordination and alignment of remunerations from top-ups, by reducing or halting them altogether (as effectively done in the study districts at the time of the research), as well as per diems by harmonizing their levels across donors/NGOs and limiting their use, in order to reduce unfair differences among HWs deriving from those payments (Chapter 9 – Bertone and Lagarde, 2016). Finally, ensuring the regular provision of basic inputs by increasing donor funding to, and NGO use of, uniform and reliable supply-chain mechanisms rather than parallel ones or, at least, making sure that the material and technical support that NGOs provide to facilities and individual HWs is in line with national and local health priorities, would also contribute to enable a full and balanced package of services to be offered across facilities and districts (Chapter 10).

Finally, the findings of this thesis call for more attention to the HWs' own perspectives on their remunerations. It is found that the non-financial features of incomes, ingrained in the design and implementation of HRH incentives, lead to a series of compensating and coping strategies of HWs. These strategies do not concern each single income separately, but influence how HWs perceive and value their revenues in relation with one another and within the broader incentive environment. Importantly, from a policy perspective, this questions the assumption of income fungibility, so that the marginal effect of increasing one income source may not necessarily be equivalent to the marginal effect of increasing another source. Moreover, while some of the coping strategies of HWs are undoubtedly predatory and generate perverse effects (e.g., absenteeism, and distorted incentives, abuse, neglecting/privileging some areas of work caused by moonlighting and per diems respectively - Van Lerberghe *et al.*, 2002; Vian *et al.*, 2013), they emerge in parallel as essential for the financial survival of HWs and should be carefully considered, and dealt with, by policy-makers. Specifically, with reference to the above examples, attention of policy-makers and their advisers should focus on the introduction of health workforce reforms that address the low level of salaries, but also that provide an explicit regulation of dual practice and strengthened efforts to channel per diems as effectively as possible, by harmonizing rates, improving NGOs coordination to avoid duplications and to ensure that activities are in line with health priorities, and enforcing rules to limit abuse by some individuals (see also Vian *et al.*, 2013). Concerning PBF schemes, which are increasingly implemented in sub-Saharan Africa, the findings of this research highlight the fact that income from such schemes is considered differently by HWs and stresses the different behavioral impact of these incomes compared to other types of remuneration (for example, related to their timing, ease of access, knowledge by others of their amount, etc.). HRH and financing technical working groups at national level should be aware of these issues and explicitly take them into account , when designing and implementing PBF schemes.

Policy relevance in the current context in Sierra Leone

Fieldwork for this thesis was carried before the Ebola Virus Disease (EVD) epidemic which profoundly modified the context in Sierra Leone[4]. The EVD epidemic has caused so far a total of almost 4,000 deaths in Sierra Leone (WHO, 2016), and has engendered deep changes in the socio-economic situation of the country (Himelein *et al.*,

[4] Data collection was carried out between October 2012 and May 2014. The last few interviews in the district of Kenema were carried out just weeks before the first official EVD case.

2015). For what concerns the health sector, the outbreak has evidenced the problems of the health care system in Sierra Leone and in the aftermath the gains in terms of population health outcomes made in the post-conflict years may be partially offset (Evans *et al.*, 2015). Concerning the health workforce, recent evidence shows that HWs have been disproportionally affected by the epidemic. 11 of the 136 doctors of Sierra Leone died during the outbreak, and HWs were 21 to 32 times more likely to get infected than the general population. Additionally, the epidemic caused increased absenteeism and low morale among HWs (WHO, 2015; McMahon *et al.*, 2016).

In terms of incentive environment available to primary HWs, the outbreak entailed substantial changes. Official payments available to HWs increased as a substantial hazard pay of 196–495 USD per month had been added to the remuneration of those working on EVD-related posts (NERC, 2015). Later on, with the decrease in EVD cases, the incentive was discontinued, which raises issues about the potential demotivating effects on HWs. Moreover, because of the influx of aid, the distribution, characteristics and focus of external interventions, in terms of donors and NGOs supporting health facilities and individual HWs, has considerably changed and (for what concerns HWs incentives) many of the external projects often include salary supplementations and top-ups for HWs posted in certain sites. These allowances, their level and prevalence, are currently unknown to the Ministry of Health and Sanitation (MoHS).

Despite the challenges of a weak information base, HRH issues have emerged as prominent in the ongoing debates in Sierra Leone and have gathered much attention and funding, because of key role that the health workforce, or rather its low availability, uneven distribution, and the lack of trust between communities and HWs as frontline representatives of the state (Witter *et al.*, 2015), is recognized to have had in the EVD outbreak (Denney and Mallett, 2015). As HRH issues are high on the political agenda of government and donors, it will be important to capitalize on the lessons learned from this research to put in place effective HRH incentives and reforms, within the broader health system strengthening process. In order to do so, the main findings of this research have been shared with stakeholders from both government and partner organizations in Sierra Leone, and presented at a workshop organized in Freetown in January 2016[5]. Moreover, I have been in contact with the Ministry of Health and in particular the Department for Human Resources for Health since leaving Freetown in May 2014, with the purpose of sharing findings and data to respond to questions raised by the Department (for example, on HWs' income from per diems and time spent in workshops, as a means for the MoHS to advocate for a reduction of NGO-funded in-service training).

In particular, in the current context of Sierra Leone, findings from this research point to the urgent need for renewed efforts in terms of coordination, at central and sub-national levels. Coordination is essential not only to

[5] Policy briefs available to stakeholders can be found at:

- https://rebuildconsortium.com/media/1101/rebuildconsort-aspecialbrief.pdf
- https://rebuildconsortium.com/media/1268/rebuild-sl-policy-brief-3-hrh-practices-at-district-level.pdf
- https://rebuildconsortium.com/media/1267/rebuild-sl-policy-brief-2-hw-incomes.pdf

The first policy brief was prepared by ReBUILD's communications team, while the others by myself.

better understand the payments available and the remuneration structure of individual HWs, but also to ensure its rationalization and the alignment of incentives and avoid the perverse effects in HRH distribution, motivation and performance caused by the arbitrary geographical distribution of external aid (and its legacy in the next decades), or by vertical priorities such as the current infection prevention and control (IPC) focus. The strengthening of existing coordination mechanisms and the establishment of new ones must take place under the strong leadership of the MoHS and of the DHMTs as its decentralized representatives. Their will to take up this role and their capacity to do so are therefore essential, and must be supported in a systematic way and seizing the opportunity of the current health system's reconstruction to build up sustainable data infrastructures and coordination mechanisms and fora. However, donors and NGOs must also actively contribute to the coordination by putting in place procedures that allow and/or force them (and, in the case of donors, the NGOs they fund) to collaborate with central and district authorities, by sharing information and budgets, participating in meetings, aligning their objectives to national policies and priorities. This is particularly relevant for humanitarian NGOs, whose operations procedures are usually more adapted to emergency situations and require little accountability to national structures, often bypassing them altogether.

Secondly, this research points to the importance of a broader consideration of the entirety of the remunerations available for HWs, beyond their salary. For post-EVD Sierra Leone, this translates in a reflection on critical reforms in the incentives available to the HWs. Such reforms include for example (i) the reinstatement of the remote allowance, which is essential to address concerns about the distribution of the health workforce and the motivation of rural HWs, but whose funding had come to a halt in early 2013 with no clear explanation to the workers; and (ii) the continuation of the PBF scheme (whose future is uncertain as external funding is set to end by December 2016), which this research has shown, although perfectible especially in its implementation, plays a key role in the motivation of HWs through the financial and non-financial features of the bonus. Instead, the current discussions in Freetown are (externally) driven by the preference of donors and implementing agencies to fund and carry out simple and discrete activities, such as modelling HRH needs or running payroll clear and HR headcount (both took place post-EVD despite being two similar exercises), rather than engaging in complex policy discussions or in reforms requiring long-term technical and financial commitment.

Additionally, as well argued by Denney and Mallett (2015), a radically new approach to capacity building is needed in order to take advantage of the current opportunity for reform. Such approach must look at the health system, including in dealing with HRH issues, in a less technocratic and modular way and instead adopt a comprehensive perspective, recognizing that rebuilding and strengthening the health system "*does not happen in a linear fashion, but is ultimately a product of deeply social and political processes*" (Denney and Mallett, 2015: p.8). This will require building on the past experiences and evidence, rather than repeating the same discrete activities (such as, in the case of the current discussions in Freetown, supporting yet another costly and time-consuming payroll clean, without ensuring the presence of lasting capacity to manage it in the central and decentralized structures in charge of it), as well as paying attention to the relations and linkages between the

different pillars of the health system. For what concerns HRH incentives, this translates, for example, in a more health labor market-oriented approach to addressing the challenges of availability, retention and deployment of HWs, but also in an increased attention to the 'software' defining HRH incentives, such as the interests and power of key stakeholders and their interplay, as well as the views, values and norms of the HWs.

11.5 Areas for further research

This thesis proposes a new research agenda on the complex remuneration of HWs, its causes and consequences, and provides a first empirical application of it to a case study. However, the focus of this thesis is limited to one country (and three districts within it) and the research would undoubtedly benefit of an extension to other settings. Future analyses would also have the advantage of potentially testing and comparing other data collection methods and improve the tools available for the collection of reliable income data. A first step for extending both methods tested and study setting was taken with the research I carried out in the DR Congo in 2014-2015 (Bertone *et al.*, 2016b). Building on these initial case studies, further research focusing on the complex remuneration of HWs could be carried out in other contexts and countries.

Even more importantly, the rigorous and systematic comparison of the case-study results across settings could further improve the generalizability and analytic generalizability of the findings (Gilson *et al.*, 2011). Such cross-country research agenda is essential to explore the relevance of the phenomenon of the complex remuneration of HWs in different contexts and assess the extent and the determinants of variability of income(s) between HWs in multiple LMICs. As indicated in Chapter 2, questions such as 'do HWs in some countries have more complex incomes than in others? And if so, why?', are relevant (Bertone and Witter, 2015a). Furthermore, the comparison may reveal interesting patterns or differences about how different are the remunerations for HWs of the same cadre across countries, and whether the income variability is higher in some settings rather than others (and why). Such cross-country analyses are not only useful to look at HRH incentive issues in a comprehensive and comparative way, but also to examine the health system at large, the degree of its fragmentation, the role of external actors and of the private sector (including the relevance of dual practice). In this sense, it will be useful to extend the analysis carried out in Sierra Leone to include other cadres (doctors, pharmacists, technicians, administrative and managerial personnel) and facilities (public, private and non-for-profit, but also secondary and tertiary hospitals, and district teams).

A related issue that deserve further analysis concerns the potential consequences of the complex remuneration of the activities that HWs do and how they organize their time. It would be interesting to carry out in other settings and for other cadres (including managers at district or higher level) a similar study to that presented in Chapter 10, perhaps adopting alternative methods where possible (e.g. observational approaches), to reflect on the influence of remuneration and/or of other factors, such as the material and technical support from external actors in order to test the hypothesis of whether giving priority to activities that enabled the earning of per diems is a deliberate strategy of HWs to maximize income or rather a consequences of the constrained set of choice that they have.

Finally, in line with this last point but also as an independent set of questions, the role of external actors and dynamics at district level in influencing HWs activities and shape service delivery also deserves further research

for its potential to shift local health priorities and establish new (informal) lines of upward accountability for HWs, beyond the formal ones which are usually considered (Cleary *et al.*, 2013). While the role of external actors for the governance of health system and their impact on the stewardship role of the Ministry of Health has been relatively well studied since the seminal study of Buse and Walt (1997), there is a dearth of evidence on these dynamics at the sub-national level, with few exceptions (for example, Conn *et al.*, 1996; Devahive *et al.*, 2015). Such analysis could benefit from extending beyond economic agency theory and applying analytical frameworks drawing from the field of political sciences, including insights from (both top-down and bottom-up) implementation theory, exploring the role of politics, power and practices in those processes at meso and micro levels (Erasmus and Gilson, 2008; Gilson *et al.*, 2014).

11.6 References

Akwataghibe N, Samaranayake D, Lemiere C, Dieleman M. 2013. Assessing health workers' revenues and coping strategies in Nigeria — a mixed-methods study. *BMC Health Services Research* **13**: 387.

Araujo EC, Evans TG, Maeda A. 2016. Using economic analysis in health workforce policy-making. *Oxford Review of Economic Policy* **32**: 41–63.

Bertone MP, Lagarde M. 2016. Sources, determinants and utilization of health workers' revenues: evidence from Sierra Leone. *Health Policy and Planning* **31**: 1010–9.

Bertone MP, Witter S. 2015a. The complex remuneration of Human Resources for Health in low-income settings: policy implications and a research agenda for designing effective financial incentives. *Human Resources for Health* **13**: 62.

Bertone MP, Witter S. 2015b. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine* **141**: 56–63.

Bertone MP, Lagarde M, Witter S. 2016a. Performance-Based Financing in the context of the complex remuneration of health workers: findings from a mixed-method study in rural Sierra Leone. *BMC Health Services Research* **16**: 286.

Bertone MP, Lurton G, Mutombo PB. 2016b. Investigating the remuneration of health workers in the DR Congo: implications for the health workforce and the health system in a fragile setting. *Health Policy and Planning (Advanced Access)*.

Bertone MP, Samai M, Edem-Hotah J, Witter S. 2014. A window of opportunity for reform in post-conflict settings? The case of Human Resources for Health policies in Sierra Leone, 2002-2012. *Conflict and Health* **8**: 11.

Bhatnagar A, George AS. 2016. Motivating health workers up to a limit: partial effects of performance-based financing on working environments in Nigeria. *Health Policy and Planning (Advanced Access)*.

Brinkerhoff DW. 2008. *From Humanitarian and Post-conflict Assistance to Health System Strengthening in Fragile States: Clarifying the Transition and the Role of NGOs*. Health Systems 20/20, Abt Associates: Bethesda, MD.

Buchan J, Thompson M, O'May F. 2000. *Health workforce incentive and remuneration strategies. A research review*. World Health Organization: Geneva.

Burgess S, Metcalfe P. 1999. *Incentives in Organisations: A Selective Overview of the Literature with Application to the Public Sector*. CMPO - Working Paper Series No. 00/16: Bristol, UK.

Burgess S, Ratto M. 2003. *The Role of Incentives in the Public Sector: Issues and Evidence*. The Leverhulme

Centre for Market and Public Organisation - Working Paper No. 03/071: Bristol, UK.

Buse K, Walt G. 1997. An unruly mélange? Coordinating external resources to the health sector: a review. *Social Science & Medicine* **45**: 449–63.

Chandler CIR, Chonya S, Mtei F, Reyburn H, Whitty CJM. 2009. Motivation, money and respect: a mixed-method study of Tanzanian non-physician clinicians. *Social Science & Medicine* **68**: 2078–88.

Cleary SM, Molyneux S, Gilson L. 2013. Resources, attitudes and culture: an understanding of the factors that influence the functioning of accountability mechanisms in primary health care settings. *BMC Health Services Research* **13**.

Conn CP, Jenkins P, Touray SO. 1996. Strengthening health management: experience of district teams in The Gambia. *Health policy and planning* **11**: 64–71.

Denney L, Mallett R. 2015. *After Ebola: why and how capacity support to Sierra Leone's health sector needs to change*. Secure Livelihoods Research Consortium: London.

Devahive E, Paul E, Samaké S, Berthé I, Yattara M, Poncelet M. 2015. Stakeholder Incentives and Aid Effectiveness – A Case Study in the Health District of Kayes in Mali. *The Journal of Development Studies*: 1–13.

Ensor T, Witter S. 2001. Health economics in low income countries: adapting to the reality of the unofficial economy. *Health Policy* **57**: 1–13.

Erasmus E, Gilson L. 2008. How to start thinking about investigating power in the organizational settings of policy implementation. *Health Policy and Planning* **23**: 361–8.

Evans DK, Goldstein M, Popova A. 2015. Health-care worker mortality and the legacy of the Ebola epidemic. *The Lancet Global Health* **3**: e439–40.

Fox S, Witter S, Wylde E, Mafuta E, Lievens T. 2014. Paying health workers for performance in a fragmented, fragile state: reflections from Katanga Province, Democratic Republic of Congo. *Health Policy and Planning* **29**: 96–105.

Fritsche G, Soeters R, Meessen B. 2014. *Performance-Based Financing Toolkit*. World Bank: Washington, DC.

Gilson L, Hanson K, Sheikh K, Agyepong IA, Ssengooba F, Bennett S. 2011. Building the Field of Health Policy and Systems Research : Social Science Matters. *PLoS Medicine* **8**.

Gilson L, Schneider H, Orgill M. 2014. Practice and power: a review and interpretive synthesis focused on the exercise of discretionary power in policy implementation by front-line providers and managers. *Health Policy and Planning* **29**: iii51-iii69.

Himelein K, Testaverde M, Turay A, Turay S. 2015. *The socio-economic impacts of Ebola in Sierra Leone : results from a high frequency cell phone survey (round three)*. World Bank - Available at

http://documents.worldbank.org/curated/en/2015/06/24646532/socio-economic-impacts-ebola-sierra-leone-results-high-frequency-cell-phone-survey-round-three: Washington, DC.

Hupe P, Hill M. 2007. Street-Level Bureaucracy and Public Accountability. *Public Administration* **85**: 279–99.

Kiser E. 1999. Comparing Varieties of Agency Theory in Economics, Political Science, and Sociology: An Illustration from State Policy Implementation. *Sociological Theory* **17**: 146–170.

Lagarde M, Blaauw D. 2009. A review of the application and contribution of discrete choice experiments to inform human resources policy interventions. *Human resources for health* **7**: 62.

Lehmann U, Dieleman M, Martineau T. 2008. Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. *BMC Health Services Research* **8**: 19.

Van Lerberghe W, Conceicao C, Van Damme W, Ferrinho P. 2002. When staff is underpaid: dealing with the individual coping strategies of health personnel. *Bulletin of the World Health Organization* **80**: 581–4.

Macq J, Van Lerberghe W. 2000. Managing health services in developing countries: moonlighting to serve the public? In: Ferrinho P, Van Lerberghe W (eds). *Providing health care under adverse conditions: Health personnel performance & individual coping strategies*. Institute of Tropical Medicine - Studies in Health Services Organisation & Policy 16: Anwerp, 171–80.

Mays N, Pope C. 2000. Assessing quality in qualitative research. *British Medical Journal* **320**: 50–2.

McCoy D, Bennett S, Witter S, *et al.* 2008. Salaries and incomes of health workers in sub-Saharan Africa. *Lancet* **371**: 675–81.

McMahon SA, Ho LS, Brown H, Miller L, Ansumana R, Kennedy CE. 2016. Healthcare providers on the frontlines: a qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic. *Health Policy and Planning (Advanced Access)*.

McPake B, Asiimwe D, Mwesigye F, *et al.* 1999. Informal economic activities of public health workers in Uganda: implications for quality and accessibility of care. *Social Science & Medicine* **49**: 849–65.

McPake B, Maeda A, Araújo C, Lemiere C, El Maghraby A, Cometto G. 2013a. Why do health labour market forces matter ? *Bulletin of the World Health Organization* **91**: 841–6.

McPake B, Scott A, Edoka I. 2014. *Analyzing Markets for Health Workers. Insights from Labor and Health Economics*. The World Bank: Washington, DC.

McPake B, Witter S, Ensor T, *et al.* 2013b. Removing financial barriers to access reproductive, maternal and newborn health services: the challenges and policy implications for human resources for health. *Human Resources for Health* **11**: 46.

Narayan V, Gage G. 2015. *Sierra Leone's Health Workforce Crisis: Drivers of Rural Mal-Distribution and Attrition of Primary Healthcare Workers*. University of Washington and HASDA - Presentation to HRH Technical

Working Group: Freetown.

NERC. 2015. *EVD Risk Allowances*. National Ebola Responce Centre: Freetown.

Ogundeji YK, Jackson C, Sheldon T, Olubajo O, Ihebuzor N. 2016. Pay for performance in Nigeria: the influence of context and implementation on results. *Health Policy and Planning (Advanced Access)*.

Perrow C. 1986. Economic theories of organization. *Theory and Society* **15**: 11–45.

Ridde V, Morestin F. 2011. A scoping review of the literature on the abolition of user fees in health care services in Africa. *Health Policy and Planning* **26**: 1–11.

Roenen C, Ferrinho P, Van Dormael M, Conceição MC, Van Lerberghe W. 1997. How African doctors make ends meet: an exploration. *Tropical Medicine & International Health* **2**: 127–35.

Shapiro SP. 2005. Agency Theory. *Annual Review of Sociology* **31**: 263–84.

Sheikh K, Gilson L, Agyepong IA, Hanson K, Ssengooba F. 2011. Building the Field of Health Policy and Systems Research : Framing the Questions. **8**: 1–6.

Songstad NG, Moland KM, Massay DA, Blystad A. 2012. Why do health workers in rural Tanzania prefer public sector employment? *BMC Health Services Research* **12**.

Songstad NG, Rekdal OB, Massay DA, Blystad A. 2011. Perceived unfairness in working conditions: the case of public health services in Tanzania. *BMC Health Services Research* **11**.

Soucat A, Scheffler RM, Ghebreyesus TA. 2013. *The Labor Market for Health Workers in Africa. A new Look at the Crisis*. The World Bank: Washington, DC.

Sousa A, Scheffler RM, Nyoni J, Boerma T. 2013. A comprehensive health labour market framework for universal health coverage. *Bulletin of the World Health Organization* **91**: 892–4.

Stringhini S, Thomas S, Bidwell P, Mtui T, Mwisongo A. 2009. Understanding informal payments in health care: motivation of health workers in Tanzania. *Human Resources for Health* **7**: 53.

Vian T, Miller C, Themba Z, Bukuluki P. 2013. Perceptions of per diems in the health sector: evidence and implications. *Health Policy and Planning* **28**: 237–46.

Walt G, Shiffman J, Schneider H, Murray SF, Brugha R, Gilson L. 2008. 'Doing' health policy analysis: methodological and conceptual reflections and challenges. *Health policy and planning* **23**: 308–17.

WHO. 2015. *Health worker Ebola infections in Guinea, Liberia and Sierra Leone - A preliminary report*. World Health Organization: Geneva.

WHO. 2016. *Ebola Situation Report - 30 March 2016*. World Health Organization. Available at http://apps.who.int/ebola/current-situation/ebola-situation-report-30-march-2016: Geneva.

Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P. 2008. Motivation and retention of health

workers in developing countries: a systematic review. *BMC health services research* **8**: 247.

Witter S. 2012. Health financing in fragile and post-conflict states: what do we know and what are the gaps? *Social Science & Medicine* **75**: 2370–7.

Witter S, Falisse J-B, Bertone MP, *et al.* 2015. State-building and human resources for health in fragile and conflict-affected states: exploring the linkages. *Human Resources for Health* **13**: 33.

Witter S, Kusi A, Aikins M. 2007. Working practices and incomes of health workers: evidence from an evaluation of a delivery fee exemption scheme in Ghana. *Human Resources for Health* **5**: 2.

Witter S, Thi Thu Ha B, Shengalia B, Vujicic M. 2011. Understanding the 'four directions of travel': qualitative research into the factors affecting recruitment and retention of doctors in rural Vietnam. *Human resources for health* **9**.

Witter S, Wurie H, Bertone MP. 2016. The Free Health Care Initiative: how has it affected health workers in Sierra Leone? *Health Policy and Planning* **31**: 1–9.

Zinnen V, Paul E, Mwisongo A, Nyato D, Robert A. 2012. Motivation of human resources for health: a case study at rural district level in Tanzania. *The International Journal of Health Planning and Management* **27**: 327–47.

Appendices

Appendix 1 - Ethics approvals

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
United Kingdom
Switchboard: +44 (0)20 7636 8636

www.lshtm.ac.uk

Observational / Interventions Research Ethics Committee

Mylene Lagarde
Lecturer in Health Economics
GHD / PHP
LSHTM

18 July 2013

Dear Dr. Lagarde,

Study Title: **Health Workers' Remuneration, Incentives and Accountability in Sierra Leone**
LSHTM ethics ref: **6427**

Thank you for your email of 11 July 2013, responding to the Observational Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

Approval is dependent on local ethical approval having been received, where relevant.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
LSHTM ethics application	n/a	
Protocol		April 2013
Information Sheet & Consent form - Key informant interviews		
Information Sheet & Consent form – Cohort Study		
Information Sheet & Consent form - HWs qualitative interviews		

After ethical review

Any subsequent changes to the application must be submitted to the Committee via an E2 amendment form. All studies are also required to notify the ethics committee of any serious adverse events which occur during the project via form E4. At the end of the study, please notify the committee via form E5.

Yours sincerely,

Professor John DH Porter
Chair
ethics@lshtm.ac.uk
http://intra.lshtm.ac.uk/management/committees/ethics/

GOVERNMENT OF SIERRA LEONE
Office of the Sierra Leone Ethics and Scientific Review Committee
Directorate of Training, Non-Communicable Diseases and Research
Connaught Hospital
Ministry of Health and Sanitation

6th August, 2013

Ms. Maria Paola Bertone (PhD Candidate LSHTM)
Department of Global Health and Development
London School of Hygiene and Tropical Medicine
Tavistock Place, London WC1H 9SH

Dear Ms. Bertone,

The Renumeration Structure of Health Workers: Effects on Incentives, Performance and Accountability In Sierra Leone

This letter refers to the above proposed study submitted for review.

The Committee hereby grants Ethical and Scientific clearance for this study to be conducted in Sierra Leone.

The Committee stipulates as follows: that,

1. It must be notified in advance, if you decide to amend the research design and/or methodology at any time during the conduct of the study.
2. It must be informed if for any reason, the study is terminated prematurely.
3. On the conclusion of the study, you submit a report or any publication based on the study.

Yours sincerely,

Professor Hector G. Morgan
Chairman, SLESRC

Email: hgmorg2007@yahoo.com / williettav@yahoo.com

LSTM
LIVERPOOL SCHOOL
OF TROPICAL MEDICINE

Pembroke Place,
Liverpool, L3 5QA, UK
Tel: +44 (0)151 705 3100
Fax: +44 (0)151 705 3370

www.liv.ac.uk/lstm

Tim Martineau
Liverpool School of Tropical Medicine
Pembroke Place
Liverpool
L3 5QA

Wednesday, 16 May 2012

Dear Tim Martineau

Re: Research Protocol (12.16) Understanding health worker incentives in post conflict settings: Uganda, Zimbabwe and Sierra Leone

Thank you for your letter dated 10th May 2012 responding to the points raised by the Research Ethics Committee. The protocol now has formal ethical approval from the Chair of LSTM Research Ethics Committee.

The approval is for a fixed period of three years, renewable annually thereafter. The committee may suspend or withdraw ethical approval at any time if appropriate.

Approval is conditional upon:

- Submission of ethical approval from other ethics committees.
- Notification of all amendments to the protocol for approval before implementation.
- Notification of when the project actually starts.
- Provision of an annual update to the Committee. Failure to do so could result in suspension of the study without further notice.
- Reporting of all severe unexpected Adverse Events to the Committee
- Reporting of new information relevant to patient safety to the Committee
- Provision of Data Monitoring Committee reports (if applicable) to the Committee

Failure to comply with these requirements will result in withdrawal of approval. The Committee would also like to receive copies of the final report once the study is completed.

Yours sincerely

Dr Angela Obasi
Chair, Research Ethics Committee

GOVERNMENT OF SIERRA LEONE
Office of the Sierra Leone Ethics and Scientific Review Committee
Directorate of Training, Non-Communicable Diseases and Research
Connaught Hospital
Ministry of Health and Sanitation

25th May, 2012

Dr. M. Samai
College of Medicine and Allied Health Sciences
University of Sierra Leone
Freetown.

Dear Dr. Samai,

Ethical Clearance

This letter refers to the under-mentioned proposed studies submitted for review.

1. **Understanding Health Worker Incentives in Post Conflict Settings**
2. **Analysis of Health Expenditure in the Poorest Households in Sierra Leone**
3. **The Impact of Decentralization and Contracting in the Health Service Delivery System in Sierra Leone**

The Committee hereby grants Ethical and Scientific clearance for these studies to be conducted in Sierra Leone.

The Committee stipulates as follows: that,

1. It must be notified in advance, if you decide to amend the research design and/or methodology at any time during the conduct of any of these studies.
2. It must be informed if for any reason, a study is terminated / suspended before its anticipated completion.
3. On conclusion of a study, or any part thereof, you submit a report or any publication based on the study for its archive.

Yours sincerely,

Professor Hector G. Morgan
Chairman, SLESRC

Email: hgmorg2007@yahoo.com / williettav@yahoo.com

Appendix 2 - Information sheets and consent forms

Appendix 2.1 - Information sheet and consent form for key informant interviews at central level

Policies to attract and retain health workers in Sierra Leone particularly in rural areas-a review of policy drivers, implementation and effectiveness in post-conflict Sierra Leone

PARTICIPANT INFORMATION SHEET

The College of Medicine and Allied Health Sciences (COMAHS) is conducting a study on *"Policies to attract and retain health workers in rural areas-a review of policy drivers, implementation and effectiveness in post-conflict Sierra Leone"*. This study has received Ethical Approval from the Sierra Leone Ethics and Scientific Committee (National Ethical Committee) and the Liverpool School of Tropical Medicine Ethical Committee.

You have been identified as someone who could make a valuable contribution to this study. We hope that you will be willing to participate. Please take time to read the following information carefully.

What is the purpose of the study?

The study aims to obtain your perceptions with regard to human resource for health policies from the post conflict period to the present.

What are the possible benefits of the study?

The results of the study will provide valuable information for the Ministry of Health and Sanitation about its human resources policy in Sierra Leone.

Why have I been invited to participate?

You have been invited to participate because you have experience of either implementing human resource policies or the effects of these policies on your career. It is important that we gain the views of a wide range of people from across the health care sector.

Do I have to take part?

It is entirely voluntary. It is up to you to decide. We will be happy to go through this information sheet with you. You are free to withdraw from the study at any time, without giving a reason. If you choose not to participate this will not affect your work or career. You do not have to answer any question with which you do not feel comfortable.

What will I have to do?

You will be asked to take part in an interview that will last approximately 40 minutes. You will be asked about your experiences and perceptions of policies related to health workers incentives and how these have changed over time.

Confidentiality

All the information you give us during the course of this study will be kept strictly confidential. Only you will have the right to access the data you provide in order to check its accuracy and correct any errors. Your personal details will be destroyed at the end of the study. The data will be stored in an anonymous form. The data will only be analysed by researchers from COMAHS and its partner organisations on the ReBUILD project. These include the Liverpool School of Tropical Medicine and Queen Margaret University, both based in the UK. Any data transferred outside COMAHS will be anonymised and unidentifiable.

Will you participate in this study? [_____] Yes or [_____] No

If yes, please complete two copies of the consent form attached. Keep one copy for your records and give one copy to the COMAHS staff member who explained the study to you.

For further details, contact Dr. Mohamed Samai at COMAHS on 033-841262

Policies to attract and retain health workers in Sierra Leone particularly in rural areas-a review of policy drivers, implementation and effectiveness in post-conflict Sierra Leone

CONSENT FORM

Participant Identification Number: [___ ___ ___ ___]

Please initial box

1. I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. ☐

3. I understand that the personal information obtained during the course of this study, may be seen by researchers from the COMAHS but no-one else. I give permission for these individuals to have access to my responses. ☐

4. I understand that personal information will be destroyed at the end of the study but that data held against a Confidential Identification Number will be stored for future use by other researchers. ☐

4. I agree to take part in the above study.

_____ _____ _____

Health Worker Name Date Signature

Would it be possible to have a phone number to call you, in case of any gaps in the answers and also to assist in auditing of interviews? Thank you.

Phone number: _____

When completed, 1 for participant; 1 for researcher site file

Appendix 2.2 - Information sheet and consent form for key informant interviews at district level

Health Workers' remuneration and its implications in Sierra Leone
Key informant interviews

PARTICIPANT INFORMATION SHEET

Hello,

My name is Maria and I am a PhD student at the London School of Hygiene and Tropical Medicine in the UK. I am conducting a research project on the remuneration of Health Workers (HWs) in Sierra Leone. The project aims to understand the different sources of income for doctors and nurses, and what it means for the activities they undertake in their job. For this research, I will of course interview HWs, but I am also interested in understanding what the policies about HWs remunerations are. You have been identified as someone who could make a valuable contribution to this study component. I hope that you will be willing to participate. Please take time to read the following information carefully and feel free to ask any questions you may have regarding it.

What is the purpose of the study?
This part of the study aims to obtain your insights and views on how decisions regarding the pay of doctors and nurses in Sierra Leone are taken and who are the actors that contribute in making these decisions. Overall, the research project aims at better understanding the different components of the HWs remuneration in Sierra Leone and its implications on the performance of the health workforce.

What are the possible benefits of the study?
The results of the study will provide valuable information for the Ministry of Health and Sanitation about its human resources policy in Sierra Leone.

Why have I been invited to participate?
You have been invited to participate because you have experience of the decision-making processes on human resources policies and on activities that involve human resources in the field. It is important that we gain the views of many different actors from across the healthcare sector.

Do I have to take part?
It is entirely up to you to decide whether or not you want to be interviewed. I will be happy to go through this information sheet with you, before the interview. You are free to withdraw from the interview at any time, without giving a reason. You do not have to answer any question with which you do not feel comfortable.

What will I have to do?
You will be asked to respond to some questions on your experience on what are the activities that involve health workers that you/your organisation contributes in, and on how the pay of health workers in Sierra Leone is determined and by whom, both within your organisation and outside. The interview should last approximately 1 hour to 1.5 hour.

Confidentiality and anonymity
All the information you give us during the course of this interview will be kept strictly confidential. Only you will have the right to access the data you provide in order to check its accuracy and correct any errors. Under no circumstance, this information will be passed on to any of your colleagues or superiors, or others you collaborate with.

The interview will be recorded and transcribed, but transcripts will be stored in an anonymous form, which means that no name will be included there, but only a code or fictitious name. Recordings will

be destroyed after transcription. We may use quotes from your interview in publications about the study, but they will not include any personal information other than the type of organization you work or worked for. To make sure this will not lead to your identification, we will use broad categories of "government agency", "donor", "NGO", "consultant".

Transcripts will be read and analysed only by researchers from the London School of Hygiene and Tropical Medicine, based in the UK. In case you have questions, the contacts details for the main researcher and the study supervisor are provided in the consent form.

Ethical approval
This research study has obtained ethical approval from the London School of Hygiene and Tropical Medicine, as well as from the Sierra Leone Ethics and Scientific Review Committee. You can contact the SL Ethics and Scientific Review Committee to report any issues you may have with the researchers.

If you are willing to participate in this study, please complete two copies of the consent form attached. Keep one copy for your records and give one copy to the researcher who explained the study to you.

CONSENT FORM

Health Workers' remuneration and its implications in Sierra Leone
KEY INFORMANT INTERVIEWS

1. I have read the information sheet concerning this study and I understood what will be required of me and what will happen to me if I take part in it.

2. My questions regarding this study have been answered by: Maria Bertone

3. I understand that at any time I may withdraw from the study without giving a reason and without affecting my professional position.

4. I agree to be quoted anonymously in any publications arising from the study

5. I agree to the type of organisation for which I worked to be named

6. I agree to take part in the study

_____	_____	_____
Name of Participant	Date	Signature

CONTACT DETAILS

Researcher: Maria Bertone (maria.bertone@lshtm.ac.uk, +232.76445353)

Supervisor: Dr Mylene Lagarde (mylene.lagarde@lshtm.ac.uk)

SL Ethics and Scientific Review Committee (williettav@yahoo.com)

When completed: leave 1 copy for participant; 1 for researcher site file.

Participant identification number: [__ __ __ __ __ __ __]

Appendix 2.3 - Information sheet and consent form for cohort study (cross-sectional survey and logbooks)

Health Workers' remuneration and its implications in Sierra Leone
Cohort study

PARTICIPANT INFORMATION SHEET

Good morning,

My name is [ ] and work for a study undertaken by Maria Bertone from the London School of Hygiene and Tropical Medicine in the UK. The project is about the remuneration of Health Workers in Sierra Leone. It seeks to understand the workload and different activities undertaken by health workers, as well as the different sources of income they have.

We hope that you will be willing to participate. Please take time to read the following information carefully and feel free to ask any questions you may have regarding it.

What is the purpose of the study?
The research project aims at better understanding the remuneration of health workers in Sierra Leone and its implications on the performance of the health workforce. This part of the study aims to obtain information on the different daily activities, workload, responsibilities, as well as the related payments of nurses and doctors working in public facilities in Sierra Leone.

What are the possible benefits of the study?
The results of the study will provide more information on the activities, workload and payment of nurses and doctors in Sierra Leone, and the challenges they face in their professional life. This could help design better human resources policies in the future.

Do I have to take part?
No. Your participation is entirely voluntary. It is up to you to decide. I will be happy to go through this information sheet with you. You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any question with which you do not feel comfortable.

What will I have to do?
You will be asked to take part in three types of activities:

1- Respond to a survey which I will carry out right now. It will last about **30 minutes** and would first ask you some personal information (such as your age, gender, diploma, etc.). A second set of questions focuses on the income you make from different activities.

2- Fill in a logbook or diary (I will show it to you) on your own every day for 8 weeks. In the logbook, you will report your activities in broad categories, such as clinical activities or administrative work, meetings, etc. You will also state for how long you did them every day, and where (in the health centre, at the District Office, elsewhere). It should not take you more than **10 minutes** every day to fill in the logbook. Finally, at the end of the logbook there is a question about the different payments you may have received during each week, such as for example an allowance for a night shift, or a PBF bonus, or a DSA for a meeting, etc.

3- We will regularly come to collect the logbooks and help you fill them in. After 9 weeks, we will ask you some short questions on how much effort you think each activity requires. This should last about **20 minutes**. We will also answer any remaining questions you may have.

Will I be paid for this?
We understand that, although the completion of the logbook takes only a few minutes if done daily, this may add to your daily work. So every three weeks, we will give you a token to compensate for your time, if you have completed the three weekly logbooks.

Anonymity and confidentiality
Data will be stored in an anonymous form, which means that there will be no name attached to them, but only a code. No-one else other than the researchers from the London School of Hygiene and Tropical Medicine, will have access to your personal details and these details will be destroyed at the end of the study. Data will be analysed in an aggregated way, for example, by presenting the average salary for all nurses of a certain cadre in a district, so that individuals will not be identifiable.

All the information you give us in the diary and the questionnaire will be kept strictly confidential, which means that, under no circumstance, information will be passed on to any of your colleagues or superiors. If you have any questions after you have finished the diaries and interviews, you can still contact the main researcher. Contacts details for the main researcher and the study supervisor are provided in the consent form.

Ethical approval
This study has obtained ethical approval from the London School of Hygiene and Tropical Medicine, as well as from the Sierra Leone Ethics and Scientific Review Committee. You can contact the SL Ethics and Scientific Review Committee to report any issues you may have with the researchers.

If you are willing to participate in this study, please complete two copies of the consent form attached. Keep one copy for your records and give one copy to the researcher who explained the study to you.

CONSENT FORM

Health Workers' remuneration and its implications in Sierra Leone
COHORT STUDY

1. I have read the information sheet concerning this study and I understand what will be required of me
and what will happen to me if I take part in it.

2. My questions regarding this study have been answered by .....

3. I understand that at any time I may withdraw from the study without giving a reason and without affecting my career.

4. I agree to provide my contact mobile number, so that the researchers can send me reminder texts, can contact me to schedule the collection of the logbooks.

Phone number: _____

5. I agree to take part in the study

_____	_____	_____
Name of Participant	Date	Signature

CONTACT DETAILS

Researcher: Maria Bertone (maria.bertone@lshtm.ac.uk, +232.76445353)

Supervisor: Dr Mylene Lagarde (mylene.lagarde@lshtm.ac.uk)

SL Ethics and Scientific Review Committee (williettav@yahoo.com)

When completed: leave 1 copy for participant; 1 for researcher file.

Participant identification number: [__ __ __ __]

Appendix 2.4 - Information sheet and consent form for in-depth interviews with HWs

Health Workers' remuneration and its implications in Sierra Leone
HWs qualitative interviews

PARTICIPANT INFORMATION SHEET

Hello,

My name is Maria and I am a PhD student at the London School of Hygiene and Tropical Medicine in the UK. I am conducting a research project on the remuneration of Health Workers (HWs) in Sierra Leone. As you know, the project aims to understand the different sources of income for doctors and nurses, and what it means for the activities they undertake in their job. For this reason, I have asked to some nurses and doctors to fill in diaries and questionnaires on this. Now, I want to better understand the information you provided us. So I am asking a smaller number of health workers to participate to an interview on their activities, workload, payments, as well as the challenges in their professional life.

I am grateful for your help with the previous phase of this study and I hope that you will be willing to participate to this second one too. Please take time to read the following information carefully and feel free to ask any questions you may have regarding it.

What is the purpose of the study?
As you may remember from the previous phase of the study, this research project aims at better understanding the remuneration of nurses and doctors in Sierra Leone and its implications on the performance of the health workforce. Following up on the diary on activities and the questionnaire on remuneration that you filled in, we are now trying to go beyond numbers and better understand your professional experience, how you organise your day and what are the activities you carry out, what are the challenges you face, who supports you, etc.

What are the possible benefits of the study?
Together with the other parts of the study, this study would help to have a better view of the real situation and the professional challenges of health workers in Sierra Leone. This may help design better human resources policies in the future.

Do I have to take part?
It is entirely voluntary. It is up to you to decide. I will be happy to go through this information sheet with you. You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any question with which you do not feel comfortable.

What will I have to do?
You will be asked to take part in an interview that will last approximately one to two hours. It will not be based on a precise questionnaire, but you will be able to talk in a free and open way of the issues that the researcher will ask about.

Confidentiality and anonymity
All the information you give us during the course of this interview will be kept strictly confidential, which means that this information will **never** be passed on to any of your colleagues or superiors, or others you collaborate with.

The interview will be recorded and transcribed, but transcripts will be stored in an anonymous form, which means that no name will be included there, but only a code or fictitious name. Recordings will be destroyed after transcription. We may use quotes, such as a sentence that you said in the interview, for publications about the study, but we will not include any personal information about you other than perhaps the district you work in and your general qualification (nurse, doctor). Transcripts will be read

and analysed only by researchers from the London School of Hygiene and Tropical Medicine, based in the UK. In case you have questions, the contacts details for the main researcher and the study supervisor are provided in the consent form.

Ethical approval
This study has obtained ethical approval from the London School of Hygiene and Tropical Medicine, as well as from the Sierra Leone Ethics and Scientific Review Committee. You can contact the SL Ethics and Scientific Review Committee to report any issues you may have with the researchers.

If you are willing to participate in this study, please complete two copies of the consent form attached. Keep one copy for your records and give one copy to the researcher who explained the study to you.

CONSENT FORM

Health Workers' remuneration and its implications in Sierra Leone
HWs QUALITATIVE INTERVIEWS

1. I have read the information sheet concerning this study and I understood what will be required of me and what will happen to me if I take part in it.

2. My questions regarding this study have been answered by Maria Bertone

3. I understand that at any time I may withdraw from the study without giving a reason and without affecting my career.

4. I agree to be quoted anonymously in any publications arising from the study

5. I agree to the district where I work and my general qualification (e.g., doctor, nurse) to be disclosed

6. I agree to take part in the study

_____	_____	_____
Name of Participant	Date	Signature

CONTACT DETAILS

Researcher: Maria Bertone (maria.bertone@lshtm.ac.uk, +232.76445353)

Supervisor: Dr Mylene Lagarde (mylene.lagarde@lshtm.ac.uk)

SL Ethics and Scientific Review Committee (williettav@yahoo.com)

When completed: leave 1 copy for participant; 1 for researcher site file.

Participant identification number: [__ __ __ __ __ __ __]

Appendix 3 - List of all documents retrieved for documentary review

(Documents in bold are those with some reference to HRH policies)

ACC & HFAC. (2012). MoU between the Anti-Corruption Commission and Health for All Coalition. Freetown: Memorandum of Understanding.

AHWO. (2011). *HRH Country Profile - Sierra Leone*. Freetown: African Health Workforce Observatory.

Awareness Times. (2011). 2011 State Opening of Parliament - Address by HE the President. Freetown: Awareness Times - Sierra Leone News and Information.

Canavan, A., & Coolen, A. (2010). *Assessment for a District Based Performance Incentives Approach for MRC in Sierra Leone*. Amsterdam: KIT.

Canavan, A., Rothmann, I., & Coolen, A. (2009). *Assessment of readiness for a Sector Wide Approach for Health in Sierra Leone KIT*. Amsterdam: KIT.

Charlie Goldsmith Associates. (n.d.). MoHS Remote Allowance. Freetown: Charlie Goldsmith Associates - extract of presentation.

Charlie Goldsmith Associates. (2012). Attendance and Pay Monitoring Support to Ministry of Health and Sanitation. Freetown: Charlie Goldsmith Associates – presentation.

DfID Sierra Leone. (2011). *Operational Plan 2011-2015*. Freetown: Department for International Development.

Donnelly, J. (2011). How did Sierra Leone provide free health care? (Special Report). *Lancet*, *377*(9775), 1393–1396.

Ensor, T., Lievens, T., & Naylor, M. (2008). *Review of Financing of Health in Sierra Leone and the Development of Policy Options*. Oxford: Oxford Policy Management.

GoSL. (n.d.). *Poverty Reduction Strategy Paper (PRSP) 2008-2012: An Agenda for Economic and Social Empowerment*. Freetown: Government of Sierra Leone.

GoSL. (2004). *The Local Government Act, 2004* (Vol. CXXXV). Freetown: Supplement to the Sierra Leone Gazette Extraordinary Vol. CXXXV, No. 14 dated 1st March, 2004.

GoSL. (2008). *Civil Service Code Regulations and Rules 2008*. Freetown: Government of Sierra Leone.

GoSL. (2009). *Free healthcare services for pregnant and lactating women and young children in Sierra Leone*. Freetown: Government of Sierra Leone.

GoSL. (2011). *Health Compact*. Freetown: Government of Sierra Leone.

GoSL. (2011). *Sierra Leone Simple Performance-Based Financing Scheme for Primary Healthcare - Operational Manual*. Freetown: Government of Sierra Leone.

GoSL. (2011). MoU between GoSL, GF and DfID. Freetown: Government of Sierra Leone.

GoSL. (2012). *Staff Performance Appraisal Report Form B: GRADES 7-10*. Freetown: Government of Sierra Leone.

Health for All Coalition. (2011). *Drugs Monitoring Update - May-July 2011*. Freetown: Health for All Coalition - Sierra Leone.

Herschderfer, K., De Koning, K., M'balu Sam, E., Walker, P., Jalloh-Vos, H., & Detmar, S. (n.d.). *Barriers and Promising Interventions for Improving Maternal and Newborn Health in Sierra Leone*. Amsterdam: KIT.

Heywood, T. (2010). *Report of the short term Technical Assistant in Human Resources for Health - March-April 2010*. Freetown: Ministry of Health and Sanitation & Concern Worldwide.

HFAC, & Save the Children. (2011). Free Health Care in Sierra Leone One Year On: National Public and Stakeholder's Perceptions of the FHCI. Freetown: Health for All Coalition & Save the Children.

Kellya, D., & Barrieb, M. B. (2010). Global health: will positive changes for Sierra Leone's health professionals mean the end of its Brain Drain? *Journal of Public Health Policy*, *31*(1), 112–114.

Krisifoe, B. (2011). *Exploring factors that influence attraction of nursing graduates to work in rural and remote areas of Sierra Leone.* Liverpool: LSTM - MSc Dissertation.

Krisifoe, S. E. (2011). *Change Management of the Health Workforce During the Introduction of the Free Health Care Policy in Sierra Leone.* Liverpool: LSTM - MSc Dissertation.

Lai, K. (2011). *A case study exploring the factors determining motivation of nurses, one year after the implementation of the Free Healthcare policy in Sierra.* London: LSHTM - MSc dissertation.

Martineau, T., & Tapera, S. (2012). *Support to Reproductive and Child Health Sierra Leone systems: A rapid assessment of staff performance management systems*. London: Options.

McPake, B., Witter, S., Ensor, T., Fustukian, S., Newlands, D., & Martineau, T. (2011). *Removing financial barriers to access reproductive , maternal and newborn health services : the challenges and policy implications for Human Resources for Health (HRH)*. Edinburgh: Queen Margaret University.

MoF. (2010). *Decentralized Service Delivery Program (A World Bank Funded Program) - Operations Manual*. Freetown: Ministry of Finance and Economic Development.

MoHS. (n.d.). *Human Resources Capacity Challenges in the Health Sector in Sierra Leone*. Freetown: Ministry of Health and Sanitation.

MoHS. (n.d.). *Retention Mechanisms for Health Personnel - The Human Resource for Health Situation in Sierra Leone: Stemming the Brain Drain*. Freetown: Ministry of Health and Sanitation - memorandum by the Manager, Human Resources for Health.

MoHS. (n.d.). Scheme of Services. Freetown: Ministry of Health and Sanitation - extract of document.

MoHS. (n.d.). *Primary Health Care Handbook*. Freetown: Ministry of Health and Sanitation.

MoHS. (n.d.). Job Descriptions of MoHS Staff. Freetown: Ministry of Health and Sanitation - extract of document.

MoHS. (n.d.). Health Sector Coordinating Committee (HSCC) - New Members. Freetown: Ministry of Health and Sanitation.

MoHS. (2002). *National Health Policy*. Freetown: Ministry of Health and Sanitation.

MoHS. (2006). *Human Resources For Health Policy in Sierra Leone for the Ministry of Health and Sanitation*. Freetown: Ministry of Health and Sanitation.

MoHS. (2006). *Revised Human Resource for Health Development Plan 2004-2008*. Freetown: Ministry of Health and Sanitation.

MoHS. (2007). *Human Resources for Health Situation in Sierra Leone - The Consequences of Brain Drain*. Freetown: Ministry of Health and Sanitation - Minister's communication to the Cabinet.

MoHS. (2009). *National Health Sector Strategic Plan 2010-2015. Abridged Version*. Freetown: Ministry of Health and Sanitation.

MoHS. (2009). *National Health Sector Strategic Plan 2010-2015*. Freetown: Ministry of Health and Sanitation.

MoHS. (2009). *Health Information Bulletin - April-June 2009*. Freetown: Ministry of Health and Sanitation.

MoHS. (2010). *Basic Package of Essential Health Services for Sierra Leone*. Freetown: Ministry of Health and Sanitation.

MoHS. (2011). Actions from Presidential Health Stocktake - Feb. 2011. Freetown: Ministry of Health and Sanitation.

MoHS. (2011). *Sierra Leone Simple Performance Based Financing Scheme for Primary Healthcare - Operational Manual 2011 (draft, March 2011)*. Freetown: Ministry of Health and Sanitation.

MoHS. (2011). MoHS Conduct and Sanctions Framework and Implementation. Freetown: Ministry of Health and Sanitation - Chief Medical Officer's communication to Minister.

MoHS. (2011). Presidential Stocktake - Update to HRH Attendance Monitoring Target. Freetown: Ministry of Health and Sanitation - HRH Support Unit.

MoHS. (2011). *Health Information Bulletin - January-December 2011*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). Advertisement of Mobile/District Recruitment. Freetown: Standard Times (ad page - March,16).

MoHS. (2012). *Operational Guidelines for District Health Coordinating Committees*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Service Availability and Readiness Assessment 2011: Report*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Results and Accountability Framework 2010 - 2015*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Joint Program of Work and Funding (JPWF) 2012 – 2014*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Human Resources For Health Policy*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Human Resource for Health Strategic Plan 2012-2016*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Sierra Leone Health Sector Performance Report 2011 (Draft)*. Freetown: Ministry of Health and Sanitation.

MoHS. (2012). *Health Information Bulletin - January-March 2012*. Freetown: Ministry of Health and Sanitation.

Newlands, D., Ensor, T., & McPake, B. (2011). *Removing financial barriers to access reproductive, maternal and newborn health services: the challenges and policy implications for Human Resources for Health (HRH): Sierra Leone case study*. Edinburgh: Queen Margaret University.

Obermann, K. (2011). Free health care in Sierra Leone: a mite too optimistic? *Lancet*, *378*(9789), 400–401. doi:10.1016/S0140-6736(11)61209-9

Office of the President. (2011). Performance Management Contract between Chief Medical Officer and Director, Reproductive and Child Health - 2011. Freetown: Sierra Leone Office of the President.

Phiri, M., & Ahmat, A. (2011). *Report: Situation Analysis of the Human Resource Information System (HRIS)*. Freetown: Ministry of Health and Sanitation & WHO.

ReBUILD. (n.d.). *Country's Health Situational Analysis (CSA) - Sierra Leone*. Edinburgh & Freetown: ReBUILD Consortium.

ReBUILD & COMAHS. (2012). *Research Proposal - Project 2: Health Workers Incentives in Sierra Leone*. Freetown: ReBUILD Consortium & College for Medical and Allied Health Sciences.

Sandi, A. (n.d.). Human Resources Status in MoHS. Freetown: Ministry of Health and Sanitation - annual presentation.

Sandi, A. (2007). Overview of HR status in MoHS. Freetown: Ministry of Health and Sanitation - annual presentation.

Scharff, M. (2012). *Delivering on a Presidential Agenda: Sierra Leone's strategy and Policy Unit, 2010-2011*. Princeton, NJ: Princeton University - Innovations for Successful Societies.

Scharff, M. (2012). *A Promise Kept: How Sierra Leone's President introduced free health care in one of the poorest nations on earth, 2009-2010*. Princeton, NJ: Princeton University - Innovations for Successful Societies.

Sierra Leone CCM. (2009). Proposal Form - Round 9: Sierra Leone. Freetown: Sierra Leone Country Coordinating Mechanism - Global Fund.

Statistics Sierra Leone. (2009). *Sierra Leone - Demographic and Health Survey 2008*. Freetown and Calverton, MA: Statistics Sierra Leone & Ministry of Health and Sanitation & ICF Macro.

Stevenson, D., Kinyeki, C., & Wheeler, M. (2012). Evaluation of DFID Support to Healthcare Workers Salaries in Sierra Leone. London, UK: DfID Human Development Resource Centre.

Thompson, F. (2010). Now it's free, how to pay for it? Sierra Leone's dilemma. *Bulletin of the World Health Organization*, *88*(12), 883–4.

UNICEF. (2007). *Sierra Leone - Multiple Indicator Cluster Survey 2005*. Freetown: UNICEF & Statistics Sierra Leone.

UNICEF. (2011). *Sierra Leone - Multiple Indicator Cluster Survey 2010*. Freetown: UNICEF & Statistics Sierra Leone.

VSO. (2011). *Valuing Health Workers: VSO's Research and Advocacy Initiative*. London: VSO.

WHO. (n.d.). Regional staffing data comparison.

WHO. (2008). *Study on Human Resources for Health (HRH) and Aid Effectiveness in Sierra Leone*. Freetown: World Health Organization.

Appendix 4 - Topic guide for key informant interviews at central level

Objectives: To obtain the perceptions of key stakeholders on the policies relating to health worker retention which have been introduced in the post-conflict period, why they were introduced, how they were implemented, how they are connected and what impact they have had.

A. Note details of participants before interview:

1. Interviewee ID	
2. Date of Interview	
3. Gender	Male ☐ Female ☐
4. Title interviewee	
5. Institution/facility	
6. Region & District	

Ask some general questions about how long the person has been in post etc, to help with adapting the questions.

Questions (tailor according to background of KI)

1. Context and challenges

Looking back to 2000, during the conflict, what was the situation of health workers in Sierra Leone?

What were the main challenges in relation to the workforce?

Probes:

- Particularly focus on challenges relating to:
  i. Ability to recruit enough staff
  ii. Ability to post enough staff to rural areas
  iii. Ability to keep them in those areas
  iv. Ability to manage them and motivate them to work effectively
- Which staffs were most challenging?

How did the challenges vary across the period (2000 to present day)? What are the main challenges now?

Same probes:

- Particularly focus on challenges relating to:
  i. Ability to recruit enough staff
  ii. Ability to post enough staff to rural areas
  iii. Ability to keep them in those areas
  iv. Ability to manage them and motivate them to work effectively
- Which staffs are most challenging?

2. Responses to challenges

Can you explain to us what main changes have come in since, which have affected the main groups of health workers?
(Focus on period of which the KI has direct experience)

Probe for changes relating to policy and practice in relation to:

- Recruitment policies
- Management of staff
- Workload and working hours
- Remuneration (of all kinds, including rules about private practice, for example)
- Working conditions of staff and other non-financial benefits
- Systems of promotion and career progression
- Training opportunities
- Job security
- Retirement benefits etc.

3. Drivers of changes (high-level informants only)

1. What were the main factors which influenced the changes in policy? (Discuss for each main policy change described)
2. Which factors do you think are most influential in policy change? Please explain how and why
   a. Specific people?
   b. Specific organisations?

c. Funding?
d. Political factors?
e. Evidence?
f. Other factors?

3. Have these factors changed over the period?
    a. If so, describe how, and why?
4. Who were the main actors involved in the process of developing policies on HRH?
5. Describe how the main players are positioned
    a. How did and do the actors (government, experts, donors, researchers etc.) relate to one another?
    b. What is their focus of work and interest?
    c. How much influence do they have?
    d. How has this been used?
    e. Describe how this has changed or not over the post-war period

4. Implementation/operational issues

Taking each of the responses in turn, can you describe to me how they were implemented?
- What were the mechanisms?
- Over what areas of the country? *(high-level KI only)*
- Focussed on which health workers?
- Implemented by whom?

What were the implementation challenges?
- Were they overcome? How?

What were the strengths and weaknesses in relation to implementation?
Overall, how effective was the implementation?

5. Effects of the policy or practice change(s)

(1) Health worker remuneration

- What was the effect of the policy/intervention/programme on the remuneration of health workers?
- Did it succeed in boosting pay (if that was its aim)?
- If so, how?
- If not, why not?

(2) Health worker recruitment

- What was the effect of the policy/intervention/programme on the number of health workers taking up posts in public service?
- Did it succeed in boosting numbers (if that was its aim)?
- If so, how?
- If not, why not?

(3) Health worker retention

- What was the effect of the policy/intervention/programme on the number of health workers staying in public service?
- Did it succeed in reducing attrition (people leaving the public services) (if that was its aim)?
- If so, how?
- If not, why not?

(4) Distribution

- What was the effect of the policy/intervention/programme on the distribution of health workers across the country and across the different facility types?
- Did it succeed in attracting people to work in areas which are underserved (if that was its aim)?
- If so, how?
- If not, why not?

(5) Performance

What was the effect of the policy/intervention/programme on the way that health workers work?
- Did it affect the way that they provide care to patients? If so, how?
- Did it affect their motivation? If so, how?
- How about their working practices – how have they changed as a result of the policy?

(6) Improved access to services

- Has the policy enabled people, especially in poorer areas, to access services at reasonable cost and quality (or had the opposite effect)?
- Explain your answer

(7) Systems effects

Has the policy affected the wider health system?

    - How?
    - Any positive or negative effects (whether intended or not)? Please describe them

6. Your recommendations

- What are the lessons which were learned during these experiences?
- Based on these experiences, what do you think should be done to improve the situation and work of health workers in Sierra Leone?
- Which strategies should be adopted in the future to address the current challenges for health workers in Sierra Leone?

Thank you for your time!

Appendix 5 - Topic guide for key informant interviews at district level

- Introduction

- General description of interviewee's (and his/her organization's) work in relation to HRH.

- **HRH activities of the interviewee's organization**:
- What type of HRH-related project and activities does your organisation funds/carries out? (including details over disease/program/service specific activities)
- Did you organize any in the **past month**?
- Are you planning any for the **next two months**?

- Do these activities entail payment for HWs?
    - If so, what are the level of payment, type of contract and payment methods, and the activities required for them?
    - What are the accountability obligations for HWs involved, in terms of demands for answers (e.g., reporting mechanisms, oversight, supervision, etc.) and possible sanctions?
- How are the HWs participating to those activities and/or receiving remuneration selected?

- What are the internal decision-making processes on HRH activities to support?
    - How are decisions on HRH-related activities to support, fund and/or organize made within your organization?
    - Who sets the priorities and takes decisions?
    - What constrains do you face? (e.g., lack of information and data, HQ's policies and directives, IMF cap on salary, etc.)
    - How effective do you think this internal decision-making process is? Do you have any positive or negative examples?

- What is the impact of your organization's HRH activities on HWs and on the health system?
- How could the impact of your organization's HRH activities be improved?

Appendix 6 - Topic guides for in-depth interviews with HWs

- Introduction
- General questions on the interviewee's role in the health centre and overview of his/her tasks and remuneration structure (based on the *logbook*)
    - what are the day-to-day challenges that they face in their practice,
    - how they feel about their professional role,
    - what influences shape *what* they do in their professional role,
    - what are their perceptions around supervision, reporting, sanctions, ...

PICKING UP FROM POINTS FROM THE PREVIOUS QUESTIONS, discuss *some* of the following questions in relation with the possible actors/principals to which HWs may be accountable:

- Government/MoH
- Other payers (NGO, donors, etc.)
- Public / patients
- Others

- Accountability: answerability
- Do you have written *Terms of Reference* for your job?
    - Do you know clearly what you are supposed to do (tasks and responsibilities) in your post?
- Who do you *report* to about the activities/tasks you perform, why and how? Who checks that you accomplished the tasks you were supposed to? (one or more than one person/agency)
    - How does this reporting take place (e.g., written, orally, through direct supervision or written reporting)? Where (in a separate room, in the wards, etc.)? How often?
- Who *supervise* your works and provide guidance and advice on your tasks and the choice of tasks?
- Is anyone else entitled to *ask you explanations* on what tasks/activities you did and how?
    - How and how often do they ask you for explanations and results?
- Do you go to anyone to discuss about your work and receive *guidance and advice*?

- Accountability: sanctions
- What happens if you don't perform the tasks/activities you are required to?
- What happens if you don't provide explanations when asked to?
- Are there any sanctions envisaged within your contracts? [discuss for each 'contract']
- Do you ever incurred in such sanctions? Or heard of anyone who did?

- Multiple accountabilities:
    - Do you feel like you have a *choice on the type of task/activities* you can perform over the day?
        - [Probes: examples based on the different possibilities: activities inside or outside of the health centre (e.g., trainings/workshops, private practice, etc.); choice of activities within the health centre (e.g., provision of services included in PBF payments, paid by patients, etc.)]
        - Ask for examples
    - How do you make your daily choice about which tasks/activities to perform? What *factors* do you take into consideration?
        - [Probes: formal answerability and sanctions requirements, accountability for results/PBF, management/division of tasks within the facility, earning possibilities, less demanding activities, patients needs or personal needs (including training needs), mentoring and guidance, ...]
        - Can you provide examples?

    - Does it ever happen that you have to report about the activities you performed to more than one person/agency?
        - Are these person/agencies requesting you to report on the same activities or different ones?
        - Are their reporting requirements similar, or in conflict?
        - Ask for examples

    - What happens when different persons/agencies (under different contracts or agreement with you) ask you perform to different tasks during the day?
        - Can you describe how do you go about to prioritize them (i.e. decide which activity to perform) when they are conflicting?
        - Can you provide examples of positive or negative experiences?

- Do you ever feel that you should have given priority to certain activities/task, but it was not possible in practice?
    - Can you provide example
    - Why was it not possible to do what you felt you should?

Revised topic guide - April 2014

1. Remuneration structure and individual financial coping strategies / livelihood strategies.

Level of income and sources

- What is your main source of income?
- What are other sources? (use logbook and survey data to start the conversation)
- Are these incomes sufficient to support you and your family?
    - Do you receive a salary? (how long without a salary?)
    - Is your salary sufficient to support you and your family? (ask if there are other income sources in the household etc)
    - Do you have other sources of income? What are they? (ask for examples) – remind them the income earned within the facility (use logbook)
    - Probe: within facility; **remote allowance, PBF, DSA, share of User Fees, gifts. Outside of the facility: private practice, other IGA** (ask examples for each and to elaborate)

Strategies to maximize income

- How do you balance your incomes and expenditures?
- What happens when your salary doesn't cover your expenses? What other incomes you get, how and when? (for example, in terms of time you spend on different income-generating activities).
- How do you feel about having to find a balance between the different activities?
    - how important are these sources compared to the salary? (see list)
    - [again, another way of asking for more] What else do you do to earn money? When do you do it? (ask for examples, use logbook to facilitate discussion)

  [hint: do HWs immediately think of activities outside of the facility? Remind them of sources of income other than salary linked to their work WITHIN the facility]
    - How do you balance the time dedicated to these activities? Time in facility and time out? Ask for examples (use logbook).
    - How do you feel about the different tasks and having to find a balance between them?

[bottom line is: do the income maximizing strategies have an impact on the time you spend in the facility and in the tasks you do?]

Spending your income

- How do you use your different incomes? (e.g. do you "earmark"/keep some incomes for some expenditures?)
- Do you keep the salary separate from day-to-day incomes (gifts, DSA, IGA, etc.)?
    - Where do you get your salary? Where is your bank account?
    - How often do you have access to it?
    - What else is paid into your bank account? (if any – RA should be the only one)
    - What are your first expenditures, once you have access to it out of the bank? (e.g. first you spend on food, on family)
    - Are you living with your family/household? if not, do you send them a regular part of your salary? How do you do this? (e.g. send all salary)
    - What about the other incomes? What do you do with them? Ask one by one what they do with them: PBF, DSA, gifts, IGA, private practice, etc
    - What do you live on while in the facility? What is the role of the community around the facility regarding the support to PHU staff?
    - Can you save money sometimes? What do you do with your savings?

  [what comes out of the first interviews is that HWs send their salary home and live only out of the other incomes or gifts/food from the village]

Strategies to deal with variability

- Does your income vary from month to month?
- Does this have an impact on the way you spend or plan your expenditures?
    - Do you know when your income is the highest? and the lowest?
    - Can you plan expenditures on the basis of the income you will have at the end of the month? For example, how do you plan recurrent expenditure that you can foresee (school fees, etc.). What about emergencies / exceptional expenditures?

- Do you have to incur in debts sometimes? What for? In some months in particular? Ask for examples. What do you do to earn extra income to repay debts?

Internal dynamics about income redistribution and share of workload

- How is the money received in the facility shared among the team (user fees, PBF, DSA)? Are you happy with this? Do you think it's fair?
- Are you allowed to leave the facility for dealing with private matters (including IGA)? How do you organize this with your colleagues?
  - Do you receive user fees from patients? For which services? How much by type of service and in total?
  - How are these revenues used? Are they shared between the team?
  - How? and how often? who decides about this division?
  - Do you think this process is fair or not? Do you have complains or positive examples?
  - Have you ever received a PBF bonus? What do you think of it? Is it helping or not? Could it be improved?
  - How is PBF money used? How is it shared within the facility? (ask for examples).
  - Do you think this process is fair or unfair? Do you have complaints? Or positive examples?
  - Do you often go for training/workshop? Do you receive DSA?
  - Who decide who goes to the training/workshops? Do you have a say in this
  - How are the DSA spent? Is there any left for you to spend as you want/save?
  - Probe if necessary: does it ever happen that you share DSA with your co-workers at the facility? (ask for examples).
  - Are you happy to do it? Do you think it's fair or unfair? (probe for kickbacks)
  - Are you allowed to leave the facility for dealing with private matters? (including IGA – if the HWs have mentioned them).
  - What happens when you or your colleague are out of the facility? Who takes up the work?
  - Do you take turns to leave? (for MCHPs) // who is allowed to leave and when (for CHC/CHPs)?
  - Do you think this is fair or unfair?

HIV clinics

Some of the CHCs included in the study are also HIV clinics. In some of these clinics, staff working on HIV is not included in the MoHS payroll and paid separately – although, because of the 2010 salary increase and other allowances, they seem to be paid less than MoHS staff. It would be interesting to analyze the internal dynamics between the different staff in these larger clinics.

- Are there HWs paid by NAS? how is the work shared in the facility?
- How is income shared (PBF, UF, DSA)?
  - Is there any staff not on MoHS payroll in this clinic? What about HIV staff? (other staff: family planning, TB, etc…)
  - Is the HIV clinic separate from the rest of the PHU? Is the staff different?
  - Do you work/collaborate with them? How? do you have good relations? Or bad? Or none at all?
  - Is the PBF bonus shared also with them? Is this fair?
  - Does HIV staff only go to HIV workshops and meetings? Do they get DSA?
  - What do you think of the money they are making?

2. Internal and external (f)actors and service delivery

Service delivery

- How is your week organized? [Ask for the **schedule** (often posted on the wall)]. Can you tell me a bit about what you do every day / describe each day work schedule?
- When during the day/week do you do admin work / paperwork?
  - Who decided about this schedule?
  - How is the work shared between the team within the facility? Who does what?
  - When is it the busiest for you and when is less busy for you? Why?
  - Are you happy with this schedule and organization of work? Does it allow you to carry out all the work you want within and outside of the facility?
  - Where does the admin work fit in? is it an extra burden for you, or ok? Do you have enough time off clinical activities to do it, or do you struggle to balance the two?
  - Do you have an annual or monthly work plan? How do you prioritize activities and how do you decide to spend the funds available?

Actors and "accountability requirements"

- Do you receive visits from DHMT, NGOs and others during the week? When (if regular)? [ask for **guestbook** and discuss the following questions with reference to the entries in it]
- What do they do? What do they provide you (supervision, training, inputs, funds, etc.)? what do they ask you to do (reporting, monthly meetings, supervise other facilities, specific tasks/service delivery, etc.)? (what happens if you don't do it?)
  - Who comes and visits you in the facility? How often? Is it always the same person(s) that come?
  - What they do? What they provide you?
  - What do they ask you to do? (**for both, see list in bullet points above**)
  - Does your work depend on them? How? (e.g. do you have to wait for them for some activities?)
  - What could they do if you/your colleague have not done what they asked you to? (sanctions)
  - Do they ever carry out joint visits? Who does? How do these take place?
  - When and where do you go for the monthly meetings? (i.e. in district capital or sub-district) Who coordinates them? (probe: role of DHTM. Do they hare staff at sub-district level? Are CHOs in charge of supervising some PHUs)

Consequences of the network of actors, influences and accountabilities

- Do you have a good relationship with each of them? (ask for each of the visitors mentioned) Do you appreciate their support? (Does it motivate you?)
- How do these visitors help you respond better to the needs of the patients/community (if at all)? How does their support change the way you work? Do you depend on them for your work? (ask for examples)

At individual level:

- What is your relationship with these people? Are you in good terms with them? (do you know them by name or by organization)?
- Do you think you receive enough support? Who is the most helpful?
- Who do you call in case of need? For example, for a complicated case or a referral? (if anyone)
- Are they timely in their support, provision of support/advice, inputs and funding? (e.g. providing drugs, vaccines, etc.) Do they do what they promised to do?
- Do you have enough discretion/autonomy or do you depend on others to carry out your work? Are these actors of help or hindrance for you to carry out your work? how would you do without them? (give examples)
- Do they and the support that motivate you? does it give you better reason to work or just more workload?
- How do you feel about their requests (reporting, other admin work, etc.)? Do you ever have conflicting demands / did they ever asked you to do two different things?

For service delivery: responsiveness to patients and communities

- How do these actors and elements influence your work? in a positive or negative way? give examples.
- Have any of these ever changed the way you provide services?
- How do these visitors help you respond better to the needs of the patients/community? (if at all)
- *What is your relation with the community?*
- *Do you feel you provide the services they need, in the way they need?*
- *Is your work appreciated? How? (give examples)*

Appendix 7 - Coding frameworks for analysis of in-depth interviews

Appendix 7.1 - Coding framework for Chapter 9

General topic		Themes	Sub-themes/codes
Personal details		Individual	Sex
			Marital status
			Age
			District of origin
			Level of education
			Cadre
			In-charge or staff
		Facility	Name of facility
			Type of facility
			Number of staff
			Ruralness
		District	District
Income categories	Salary	Features of income	Level / Satisfaction
			Timeliness / Regularity
			Effort
			Motivation gained
		Income max strategies	Income max strategies in facility
			Income max strategies in HH
			Other/outside
			Dealing with variability
			Views / feelings on income max strategies
		Income use / livelihoods	Access to income
			Spending vs. saving
			HH redistribution dynamics
			Facility redistribution dynamics
			Other coping strategies
			Views / feelings on livelihoods
	Remote allowance		
	Share of user fees		
	PBF	Features of income	Level / Satisfaction
			Timeliness / Regularity
			Effort
			Motivation gained
		Income max strategies	Income max strategies in facility
			Income max strategies in HH
			Other/outside
			Dealing with variability
			Views / feelings on income max strategies
		Income use / livelihoods	Access to income
			Spending vs. saving
			HH redistribution dynamics
			Facility redistribution dynamics
			Other coping strategies
			Views / feelings on livelihoods

Top ups		
DSA / per diems	Features of income	Level / Satisfaction
		Timeliness / Regularity
		Effort
		Motivation gained
	Income max strategies	Income max strategies in facility
		Income max strategies in HH
		Other/outside
		Dealing with variability
		Views / feelings on income max strategies
	Income use / livelihoods	Access to income
		Spending vs. saving
		HH redistribution dynamics
		Facility redistribution dynamics
		Other coping strategies
		Views / feelings on livelihoods
Income generating activities (non-health)	Features of income	Level / Satisfaction
		Timeliness / Regularity
		Effort
		Motivation gained
	Income max strategies	Income max strategies in facility
		Income max strategies in HH
		Other/outside
		Dealing with variability
		Views / feelings on income max strategies
	Income use / livelihoods	Access to income
		Spending vs. saving
		HH redistribution dynamics
		Facility redistribution dynamics
		Other coping strategies
		Views / feelings on livelihoods
private practice		
sale of drugs		Incl. the possibility of it (extra drugs)
Gifts from patients	Features of income	Level / Satisfaction
		Timeliness / Regularity
		Effort
		Motivation gained
	Income max strategies	Income max strategies in facility
		Income max strategies in HH
		Other/outside
		Dealing with variability
		Views / feelings on income max strategies
	Income use / livelihoods	Access to income
		Spending vs. saving
		HH redistribution dynamics
		Facility redistribution dynamics
		Other coping strategies
		Views / feelings on livelihoods
Total income	Features of income	Level / Satisfaction
		Timeliness / Regularity
		Effort
		Motivation gained

	Income max strategies	Income max strategies in facility Income max strategies in HH Other/outside Dealing with variability Views / feelings on income max strategies
	Income use / livelihoods	Access to income Spending vs. saving HH redistribution dynamics Facility redistribution dynamics Other coping strategies Views / feelings on livelihoods
Income-generating activities	Type of activity	e.g. routine/specific, campaign, training etc.
	Who does it?	e.g. take turns, always one
	Feelings/views about it	
Non-financial motivation and demotivation factors		Career prospects Views on future Other (non-financial) motivation factors Other (non-financial) demotivation factors

Appendix 7.2 - Coding framework for Chapter 10

General topic	Theme/code
Personal details	Sex Marital status Age Cadre In-charge or staff Type of Facility Ruralness Districts
Weekly schedule	MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY Who decides the schedule
Visits and purpose of visits	Who visits the facility Answerability (supply information: e.g. reports, records etc) Sanctions Supervision / support / clinical guidance / coaching Direct support to service delivery Inputs (drugs, equipment, nutritional supplements, fuel, etc)

Appendix 8 - Cross-sectional survey on remunerations

INITIAL QUESTIONNAIRE – COHORT STUDY

Respondent code: [__ __ __ __] *(District code + enumerator code + HW number according to sequence of interviewing)*
District:
Type and name of facility:
Date of interview:

1. RESPONDENT DETAILS:

I would like to start by asking some general questions about you:

1.1	Mark respondents' sex	01 [___] Male 02 [___] Female
1.2	What is your marital status? 01 [___] Single 02 [___] Co-habiting 03 [___] Married 04 [___] Divorced 05 [___] Widowed	
1.3	How old are you?	[___ ___] *99 = Don't Know*
1.4	What is your district of origin?	[_____]
1.5	What is the last grade of formal education you completed? 01 [___] MCH Aide certificate 02 [___] Certificate in Nursing 03 [___] Diploma in Nursing 04 [___] Degree in Nursing 05 [___] Certificate in Midwifery (SRN) 06 [___] Certificate in Midwifery (SECHN) 07 [___] CHO Diploma 08 [___] CHA Certificate 09 [___] Other. Specify: [_____]	
1.6	What type of facility do you work in? 01 [___] CHC 02 [___] CHP 03 [___] MCHP 04 [___] Other. Specify: [_____]	
1.7	What is your professional title? 01 [___] CHO 02 [___] CHA 03 [___] Nurse (RN) 04 [___] Midwife (RN) 05 [___] Nurse (SECHN) 06 [___] Midwife (SECHN) 07 [___] MCH Aide/Nurse 08 [___] Other (specify:) [_____]	
1.8	What is your Grade? [*should be between 2 and 5*] [___] [*don't know = 99*]	
1.9	What is your post or title within the facility? 01 [___] In-charge 02 [___] Staff member 03 [___] Other. Specify: [_____]	

1.10	Do you have a specific role or duty within the facility? For example, you focus on specific services or wards? 01 [__] No, I work on all services/wards every day → *go to question 11* 02 [__] I rotate between services and wards → *go to question 11* 03 [__] Yes, I work ONLY on some specific services / wards → *go to question 10b*
1.10b	If you work only on SOME specific services / wards, please list them: [*tick **all** relevant*] [__] HIV/AIDS [__] Malaria [__] TB [__] Family Planning [__] ANC / PoNC (antenatal care and post-natal care – pregnant and lactating women) [__] IMCI (integrated management of child illnesses – children) [__] EPI (vaccines) [__] Nutrition [__] Other. Please, specify: [_____]
1.11	How many professional health staff work in this facility (ie. do not count the guards/helpers/cleaners)? [*fill in the number*] [__ __ __]

2. INCOME COMPONENTS

		When? (mm / yyyy)	Amount received (Le.)	For which period?
2.1	**Salary** *(last received)*			
2.2	**Remote Area Allowance** *(last received)*			01 [___] One off 02 [___] Previous week 03 [___] Previous month 04 [___] Previous quarter 05 [___] Other (specify):
2.3	**Performance-based Financing (PBF)** *[individual bonus!]* *(last received)*			01 [___] One off 02 [___] Previous week 03 [___] Previous month 04 [___] Previous quarter 05 [___] Other (specify):
2.4	**Payment from facility revenues distributed to staff** *(last received)*			01 [___] One off 02 [___] Previous week 03 [___] Previous month 04 [___] Previous quarter 05 [___] Other (specify):
2.5	**Top-up / salary supplementations** *(last received)*			01 [___] One off 02 [___] Previous week 03 [___] Previous month 04 [___] Previous quarter 05 [___] Other (specify):

		Amount received (last month) - Le.
2.6	**DSA for training, workshops, etc.** *(received last month) [entire amount received]*	
2.7	**Income-generating activities <u>outside</u> the health sector** *(received last month)* [*for ex, trading or selling business, farming, etc.]*	

3. INDIRECT QUESTIONING <u>WITH THE DICE</u>

Questions (*all questions refer to <u>last month</u>*):

		Number as given by respondent *(does not correspond to real amount)*
3.1	How much did you receive in **gifts in kind and cash from patients**? (*convert in Le. all gifts*)	[_____]
3.2	How much did you make **selling drugs or other items to patients** <u>within</u> the health facility?	[_____]
3.3	How much did you earn from **private practice** last month? (*can be in a private clinic or at your home, or patients' home*)	[_____]

→ Thank the respondent. Now introduce and explain the logbook.

Appendix 9 - Self-administered longitudinal logbook on remunerations and activities

WEEKLY LOGBOOK - COHORT STUDY

Respondent code: *(District code + enumerator code + HW number according to sequence of interviewing)*
District:
Type and name of facility:
Date when logbook was left with the respondent:

Thank you for your cooperation.

We are interested in better understanding your **work management** (i.e., the way you divide your time between activities) and **workload** throughout the day.
Don't forget this is an **anonymous** questionnaire and all information you provide will be kept **confidential** – for more information on this ask the enumerator (contact below).

INSTRUCTIONS:

1. Begin filling in this logbook ***today*** and continue to record your activities and income until the end of the week.
2. Fill in the table daily, **at the end of each day of work**.
3. Once finished a booklet, use a new one. Use **one logbook per week** and record activities and income over the next ***9 weeks***.
4. For each time period you worked on an activity, you should fill in the logbook detailing the **activity,** the time spent on it and the amount earned (if any). **The list of activities is below**. Use it as a reference when filling in the logbook.
   ---------- ***There is an example overleaf to guide you*** ----------
5. If you have any queries or doubt, do not hesitate to call us or send a text (you will be called back) to :

   [_____] *Add name and phone num of enumerator*

LIST of TYPES OF ACTIVITIES

Activities WITHIN the health facility

- General (integrated) clinical activities (covering different problems of a patient. For ex: outpatient visits, visits of children or pregnant women)
- Disease/service/program specific activities (for ex: Family Planning, TB, HIV/AIDS, etc) → *Please, specify in the logbook which disease/service/program.*
- General administrative work (for example HIS reports, pharmacy records, etc.)
- Disease/service/program specific administrative work (for example, HIV or other disease specific information reports). *Please, specify which disease/service/program.*
- Meetings within the facility (for ex: meeting with the staff to agree on shifts, etc.)
- Night guards

Activities OUTSIDE the health facility

- Outreach activities in the community
- Meeting outside of the facility. *Please, specify type/topic of meeting, organiser and meeting place*
- Training, workshop, etc. *Please, specify topic of workshop, organiser and place*
- Private practice (health-related work that you do in a clinic, at home or at the home of a patient)
- Other non-medical activities that generate income (for ex: trading, business, farming). *Please, specify.*

EXAMPLE **Daily activity logbook – WEEK # *1*** **EXAMPLE**

Fill in the date on which you started recording: Monday, September 16th_____

TIME	Monday	Amount earned	Tuesday	Amount earned
7am				
8am	Meeting in facility: planning of week			
9am				
10am				
11am	Outpatient consultations	Gifts: 20,000 Le.		
12pm	Consultations: Family Planning		Training: - Family Planning - Funded by UNFPA - at DHMT Office	DSA: 50,000 Le.
1pm				
2pm				
3pm				
4pm	Private practice	30,000 Le.		
5pm				
6pm	Work in shop	10,000 Le.		5,000 Le.
7pm			Work in shop	

Daily activity logbook – WEEK #_____

*Date on which you started recording:*_____

TIME	Monday	Amount earned	Tuesday	Amount earned
Early morning				
7am				
8am				
9am				
10am				
11am				
12pm				
1pm				
2pm				
3pm				
4pm				
5pm				
6pm				
7pm				
8pm				
Night				

TIME	Wednesday	Amount earned	Thursday	Amount earned
Early morning				
7am				
8am				
9am				
10am				
11am				
12pm				
1pm				
2pm				
3pm				
4pm				
5pm				
6pm				
7pm				
8pm				
Night				

TIME	Friday	Amount earned	Saturday	Amount earned	Sunday	Amount earned
Early morning						
7am						
8am						
9am						
10am						
11am						
12pm						
1pm						
2pm						
3pm						
4pm						
5pm						
6pm						
7pm						
8pm						
Night						