

**Malnutrition, food insecurity and poverty in older
persons from Mexico City**

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Abstract

The relationship between malnutrition, food insecurity, and poverty in older persons from urban Latin America has, to date, received relatively little attention. This thesis aims to address this important issue in the setting of Mexico City and its Metropolitan Zone. A theoretical framework has been developed to understand the causal linkages between the determinants of malnutrition, food insecurity and poverty, and current data are then used to describe how this public health concern manifests itself in urban Latin American contexts. This is followed by a discussion of recent social policy interventions aimed at improving nutrition, access to food and well-being in older people in Latin America.

The quantitative part of the thesis presents a study which assessed indicators of nutritional status, food security, health, quality of life and living conditions among 1,263 households with residents aged 70 and over from socio-geographically-defined poor areas of Mexico City and its Metropolitan Zone. The literature suggests that a regular source of economic resources is important to ensure food security during old age; thus the impact of an ongoing old-age monetary-transfer programme on nutrition-related indicators, food security and poverty was assessed at the levels of both older persons and households. This was carried out through a quasi-experimental study using an *ex-post* comparison of intervention and control groups with no baseline measures.

Overall, results suggest differential access to food, quality of life and living conditions according to socioeconomic stratum among older persons and their household contexts. Differences in dietary diversity and food insecurity among

older persons were also found, when data were disaggregated by monetary-transfer eligibility status. The old-age intervention analysed in this thesis showed little impact on access to food and other indicators of well-being at household level. There was, however, a high prevalence of people being overweight and obese among the older population under study.

Given that this thesis is the first approach to food insecurity ever carried out among urban older populations in Mexico and Latin America, the conclusions emphasise the magnitude of uncertain access to food during old age, and they suggest guidelines for policy makers at different levels of government, stimulating further research on issues related to old age in the region.

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Statement of own work

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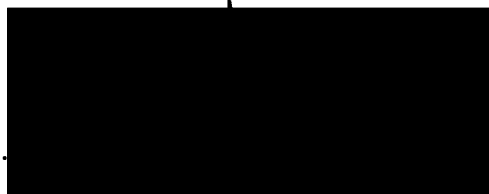
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Introduction

The accelerated ageing process observed in various countries of Latin America has progressively attracted the attention of governments, academic circles, non-governmental organisations and society as a whole. Demographic ageing, characterised by the growth of the proportion of subjects 60 years of age and over with respect to the total population, is attributed to a sustained decline in fertility rates, resulting from a number of birth control campaigns, increasing longevity and technological improvements in health care, among other factors. However, ageing patterns are not homogeneous in all Latin American societies.

In the developing world, as well as in some middle-income countries where demographic transition has been completed, individuals are more likely to have more opportunities to age successfully. Broadly speaking, these societies are better prepared with *ad hoc* health care and social security systems, and both governments and the community are aware of old-age concerns. Despite regional differences, Argentina, Chile, Cuba and Uruguay are good examples of Latin American countries with high standards of well-being during late life. In less developed areas of the region, where demographic transition is still taking place, the possibilities of ageing successfully are limited for many, as both older persons and younger cohorts cannot easily meet their basic needs, and societies are less prepared to face the challenges of a rapid and sustained ageing process. Such could well be the case of Bolivia, Brazil, Colombia, Mexico or Venezuela, all of them countries undergoing medium or advanced stages of demographic transition, where there is much room for improvement as far as the quality of life of older populations is concerned.

Demographic ageing is particularly relevant in Latin American cities. Around three quarters of the total older population from the region were estimated to live in urban areas during 2000, and 80 percent are expected to do so in 2025. But the way in which contemporary urban societies in Latin America deal with the ageing of their populations may vary from one city to another, and from a given socioeconomic reality to another within the same urban area. The quality of the ageing process in urban Latin America depends a great deal on the real possibilities of subjects to meet their needs by generating economic resources, or counting on a regular source of income; the availability of social support networks and social safety nets, a safe and healthy environment, adequate health care services, and the possibilities of functioning as independently as possible. Participating in decisions concerning the organisation and dynamics of the household also ensures quality of life during old age.

Nutrition and health are two of the most important issues in late life. As individuals get older, both the function of the organism and food needs tend to decrease progressively, becoming a life-threatening condition if not treated adequately. The risk of old-age malnutrition and disease may increase as a result of both limited access to resources and restricted opportunities for older people to transform them. Food insecurity, that is limited or uncertain access to food, is a direct consequence of poverty in combination with other factors which limit an older person's well-being.

Studies conducted among urban older populations living in the United States of America, illustrate the existence of food insecurity during old age, and warn about its potential negative consequences on health and other aspects of quality of life. However, no data on this matter has been produced in urban areas of Latin America to date. Therefore, this study focuses both on identifying associations between malnutrition, food insecurity and poverty, and on analysing how a secure source of economic resources impact the above-mentioned dimensions; it is the first study of its kind ever carried out among older subjects from Mexico City and its Metropolitan Zone, one of the world's largest urban concentrations.

The study is organised into seven chapters. Chapter 1 develops a theoretical framework aimed at understanding causal linkages between malnutrition, food insecurity and poverty in older people from urban Latin-American contexts. Chapter 2 describes general demographic characteristics of the ageing process in urban Latin America, followed by an analysis of available data on nutrition, health and socioeconomic indicators of urban older populations in the region. Chapter 3 provides illustrative examples of interventions designed to improve one or more specific areas of the relationship between malnutrition, food insecurity and poverty in older persons from Latin America and other parts of the world. In Chapter 4, a methodological approach to the empirical study of the relationships between malnutrition, food insecurity and poverty during old age in older people from Mexico City and its Metropolitan Zone is constructed. Chapter 5 presents the results of an analysis based on a consumption poverty approach, showing socioeconomic differentials of selected indicators of malnutrition, food insecurity and poverty in older persons living in geographically-targeted neighbourhoods of

Mexico City and its Metropolitan Zone, when disaggregated by quintiles of median monthly *per capita* expenditure. The second data analysis chapter, Chapter 6, examines how a set of selected outcomes of old-age malnutrition, food insecurity and poverty differ between beneficiaries of an old-age monetary transfer run by the Government of Mexico City and a comparison group. Finally, Chapter 7 concludes the study with a discussion of main findings, contributions, strengths and weaknesses, lessons learnt and recommendations derived from the entire research process.

Chapter 1. Malnutrition, food insecurity and poverty in old age: a theoretical framework

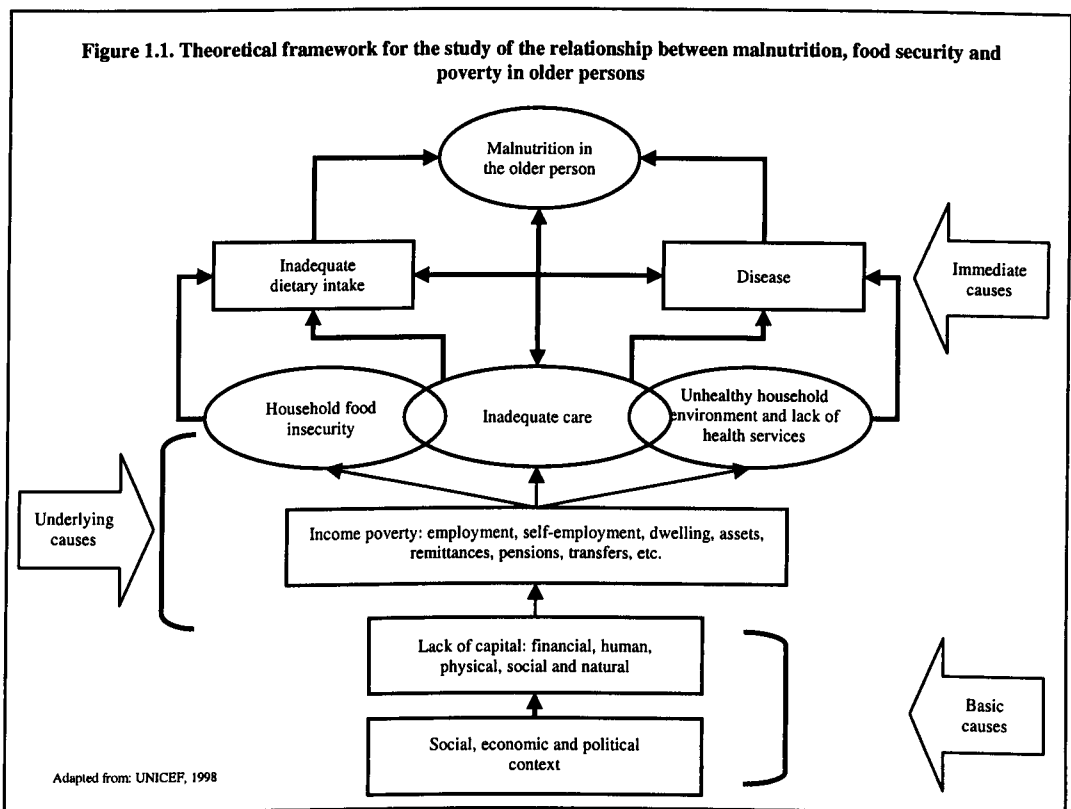
In the developing world, much nutrition research and many nutrition programmes focus on children, pregnant women and other population groups undergoing critical physiological processes under less favourable circumstances. However, there is an increasing realisation that older people also constitute a vulnerable group in both biological and socioeconomic terms. The purpose of this chapter is to develop a theoretical understanding of causal linkages between malnutrition, food insecurity and poverty in old age from urban Latin-American contexts. Given that such a framework does not currently exist, an adaptation of the *Child Malnutrition Causes Framework*, first developed by the United Nations Children's Fund (UNICEF) in 1990 (UNICEF, 1990 and 1998), will be carried out. Given its potential adaptability, a number of works elsewhere have used UNICEF's theoretical framework aiming at comprehensively interpreting concrete expressions of malnutrition at different levels of complexity (Maxwell & Frankenberger, 1992; Haddad *et al*, 1996; Morris, 1999; Smith & Haddad, 1999).

This framework arranges determinants of both a biological and a socioeconomic nature into three major levels of causality corresponding to immediate, underlying, and basic causes. Dietary intake and health status are proposed as the immediate causes of malnutrition, given that they affect individuals in a direct way. These causes are influenced by household food insecurity, inadequate care for older individuals, an unhealthy household environment and a lack of access to health services during late stages of life. Income poverty is crucial for

understanding the above-mentioned components of the underlying level of causality. Basic determinants are essentially potential resources whose availability and utilisation may be affected by political, economic, cultural, and social factors. Basic causes of malnutrition take place at community, regional or national levels. For each linkage and component of this theoretical framework, relevant literature has been reviewed to clarify definitions and operationalise concepts.

Figure 1.1 is an adaptation of UNICEF's theoretical framework, based on the proposed relationship between malnutrition, food insecurity and poverty during old age. It should be noted that the main focus of this thesis is not malnutrition in older people itself, but the determinants of uncertain access to food. Nonetheless, its inclusion as an outcome variable is crucial, given that it represents the ultimate consequence of food insecurity. Basic causes of malnutrition will not be the focus of this work either. However, there is full awareness of their explanatory importance. The study of health and nutritional problems in older persons, as well as designing effective public health interventions to improve nutritional outcomes in old age, require a comprehensive understanding of the causes of malnutrition at different levels. As urban societies get older, both household living arrangements and communities are transformed. The demand for a wide range of services like social security, mobility and housing, increase as a result of the ageing of populations, because both the needs and problems of older cohorts are different from those younger people. This demographic phenomenon also implies a number of challenges in terms of public health. Older people face unique health conditions requiring special attention from the state, the family and the community. Public action is hence meant to be adapted accordingly (Martínez-

Almanza *et al*, 1999; CEPAL, 2000; UN, 2000*b*). The Pan-American Health Organisation (PAHO) has expressed concern about the fact that over the next few decades interventions addressed at subjects who are 60 years of age and older will become yet more complex (PAHO, 2004). Programmes will have to continue to reduce premature mortality, ensuring adequate health conditions and improving quality of life in a population group that is currently growing rapidly and will continue to do so over the next few decades.



1.1. Malnutrition in older persons: the ultimate consequence of food insecurity

The term malnutrition is used to define a number of complex health conditions. On the one hand, protein energy malnutrition (PEM) is a potentially fatal body-depletion disorder characterised by insufficient consumption of protein and

energy to satisfy the body's nutritional needs. On the other hand, malnutrition also refers to inadequate intake of micronutrients that may result in severe health problems. Frequent infections and chronic disease are closely linked to these two major forms of malnutrition. However, malnutrition does not only denote a lack of food or poor intake. At the other end of the scale, malnutrition encompasses two direct consequences of excessive food intake: being overweight and its more extreme manifestation, obesity (WHO, 2001a and 2003a).

The World Health Organisation (WHO) has recognised that older persons are highly prone to malnutrition (WHO, 2003b). Due to its age-related multifactorial nature, malnutrition can be considered as a geriatric syndrome affecting balances between food needs and nutritional intake. A decrease in muscle mass is expected to occur during ageing. In addition, lower basal metabolic rates together with a decrease in activity-related energy spent results in reduced overall energy expenditure in this stage of life (Chernoff, 1995 and 2001; Mathys & Finnin, 2003). Hence, fewer calories are required for daily body maintenance. However, impairments in the ability to control nutrient intake after undereating or overeating are likely to occur (Blanc *et al*, 2004). Malnutrition-related causes are major contributors to increased morbidity and mortality, dysregulation of the immune response and declines in functionality in this population group. Both somatic and mental conditions are associated with the presence of malnutrition (Rikkert & Rigaud, 2003; Ahluwalia, 2004).

Undereating, often resulting from limited access to food and from depression, is a major contributor to undernutrition in older persons. Socioeconomic constraints

and demographic changes occurring in less developed regions are also crucial in the understanding of food insecurity and poor nutritional status during old age (Tucker & Buranapin, 2001). For example, an assessment of the diets of highly socially vulnerable older adults from the metropolitan zone of Santiago carried out by Atalah *et al* (1998) found that median consumption of practically all food groups was below recommended levels. Clarke (1998) suggests that in developed countries, 10 to 20 percent of older adults at home, and up to 60 percent of those in long-term care institutions or hospitals, suffer from undernutrition. These figures would actually be higher if accurate diagnosis of undernutrition itself or weight loss were made. In the United States of America (USA), for example, 50 percent or more of older adults with undernutrition are incorrectly recorded or treated by general practitioners (HMO Workgroup on Care Management, 2002). Food intake below recommendations, as well as both macronutrient and micronutrient deficiencies, have been reported in older adults from western countries. Overall, the most common deficiencies are protein, vitamin D, calcium, vitamin B₁₂ and B₆, folic acid, iron and zinc deficiencies (Gerrior, 2002; Martins *et al*, 2002; Sharkey *et al*, 2002; del Pozo *et al*, 2003; Van Grevenhof & Funderburg, 2003)

Even though body weight tends to decrease during ageing, fat mass is not the major contributor to this loss. Failure to lessen caloric intake, together with a decreased caloric expenditure, may even result in weight gain. Furthermore, in older persons, fat tends to be redistributed towards the abdomen (Seidell & Visscher, 2000, Elia 2001). Abdominal obesity is associated with coronary artery disease (CAD), insulin resistance, dyslipidemia and more broadly speaking, with

a poor health status (Mathys & Finnin, 2003). In industrialised countries, prevalence of obesity in older people ranges from 15 to 20 percent (Kaplan *et al*, 2003). Obesity-related medical conditions are, similarly, becoming major public health concerns in developing countries. Prevalences are particularly high in Latin America and the Caribbean (Tucker & Buranapin, 2001). Data from a study on health and living conditions of adults aged 70 and over from seven urban areas of Latin America and the Caribbean show that, on average, 43 percent of older men and 71.5 percent of older women are overweight to some extent (see Chapter 2). In addition to its implication for older persons' quality of life, being overweight and obesity have negative economic impacts. Economic costs derived from treating obesity-related conditions may vary from one country to another, but they have been thought to represent up to 5 percent of total health care costs in developing countries. In the USA, for example, these costs have been estimated at US\$ 117 billion, accounting for 4.7 percent of health care expenditure in 2000 (Kuchler & Ballenger, 2002).

During ageing, the double burden of disease overall (i.e. communicable and non-communicable diseases) and malnutrition (represented by undernutrition and obesity) is one of the most complex challenges that health sectors in developing countries are facing (Tucker & Buranapin, 2001; WHO, 2001a). Their social and economic consequences have led to several researchers warning about the need to carry out more research on nutrition-related issues during ageing (Ahmed 1992; Velázquez-Alva *et al*, 1996; Allain *et al*, 1997; Fletcher and Rake, 1998; Lee and Frongillo 2001 *a* and *b*). Linkages between ageing, health, quality of life and nutrition are well documented (White, 1991; Ahmed, 1992; Rolls *et al*, 1995;

Evans and Cry-Campbell, 1997; Riobo-Servan *et al*, 1999; Vetta *et al*, 1999; Omran and Morley, 2000; McGee and Jensen 2000; Spark and Frongillo, 2000).

1.2. The immediate causes of malnutrition: inadequate dietary intake and disease

1.2.1. Inadequate dietary intake

Inadequate dietary intake and disease have been suggested as the immediate causes of malnutrition because they manifest themselves at the individual level (Smith & Haddad, 1999). There is a reciprocal relationship between these two determinants. The lack of food, or a diet not including enough food items and nutrients from different sources, will restrict the human body's ability to carry out essential functions to survive. Dietary inadequacy is associated with an increased risk of infectious diseases which, in turn, may interfere with appetite and nutrient absorption. Excessive food intake may also become a cause of life-threatening medical conditions.

Food needs are not the same throughout the life cycle. Variability regarding nutrient requirements depends on a number of biological characteristics, such as age, sex and health status, among others. With age, nutritional-related changes in body composition, physical activity and physiological processes take place in both a unique and a complex way. These changes are, among others, a decline of lean body mass resulting from reductions in total body protein, a decrease in energy metabolism, a redistribution of fat stores, a loss in bone density, a reduction in total body water, low appetite, as well as both impaired feeding drive and gastrointestinal function (Chernoff, 1995; Clarke *et al*, 1998; Van Grevenhof

& Funderbur, 2003). Food needs are thus expected to be adjusted accordingly, so that individuals have a near-optimal nutritional status. But as happens with other health outcomes, the nutritional status of older people may be affected by or may lead to disorders of a psychological nature, impairments or disabilities (Galanos *et al*, 1994; Cattin *et al*, 1997; Ortega *et al*, 1997; Clarke, 1998; Clarke *et al*, 1999; Romagnoni *et al*, 1999; Lee *et al*, 2001).

Defining what constitutes an adequate dietary intake during ageing is not easy and has not been achieved to date. For some nutrients, recommendations continue to be those for younger adults. For other nutrients, some changes are suggested. Table 1.1 summarises general guidelines, as well as potential health consequences of the failure to follow these guidelines. The information shown in this table is useful for understanding linkages between the highest level of the theoretical framework — that is, malnutrition — and the two components of the immediate causality: dietary intake and disease. All these conditions may change if, for example, older persons abuse alcohol, are under medication, are sedentary or have mobility problems.

Another consideration of a social nature critical to the understanding of malnutrition, dietary intake and disease is the inability of older persons to utilise food properly, which means that, though available in the household, food could not be easily prepared due to functional impairments, health problems and limited access to information, among other factors (Coe & Miller, 1984; Frongillo *et al*, 1992; Watson *et al*, 1995; Olson *et al*, 1996; Lee & Frongillo 2000*a, b* and *c*; Spark & Frongillo, 2000).

Table 1.1. General guidelines, adverse characteristics, potential health consequences and population groups at risk regarding dietary intake in older persons

Condition or nutrient	General recommendations	Adverse characteristics/Potential health risks
Diet itself	<ul style="list-style-type: none"> • Sufficient in quantity and quality • Appropriate combinations of nutrients • Appropriate for particular physiological and physical needs • Do not skip breakfast • Eat at a low and comfortable speed • Make meals attractive • Make meal times as pleasant and comfortable as possible • Include healthy snacks between meals • Follow reasonable eating schedules • Do not abuse alcohol • Eat small meals 	<ul style="list-style-type: none"> • Failure to follow these general recommendations may lead to disease and malnutrition and may exacerbate previous medical conditions
Energy	<ul style="list-style-type: none"> • Lower requirements than in earlier stages of life: both time spent on and intensity of physical activity, as well as a decrease in basal metabolic rate 	<ul style="list-style-type: none"> • PEM, if less than required • If calorie intake is below recommended levels, the quality of diet may also be poor • Low-income older persons and those aged 85 and over are at greater risk of PEM • Obesity, if more energy than required • Obesity is associated with diabetes mellitus, high blood pressure, coronary heart disease, cerebrovascular disease, osteoarthritis, some forms of cancer, decreased functional status and emotional problems
Carbohydrate	<ul style="list-style-type: none"> • 55 to 65 percent of total energy intake • Complex carbohydrates should be included; fibre has positive impacts on health 	<ul style="list-style-type: none"> • Inadequate intake is associated with malnutrition • Ability to metabolise carbohydrates decrease (i.e. lactose intolerance) • Poor fibre intake impacts negatively on glucose tolerance, contributes to the formation of colonic diverticuli and increase the risk of constipation • The loss of dentition may make chewing fresh fruits and vegetables hard

Table 1.1. General guidelines, adverse characteristics, potential health consequences and population groups at risk regarding dietary intake in older persons

(continued)

Condition or nutrient	General recommendations	Adverse characteristics / Potential health risks
Protein	<ul style="list-style-type: none"> For healthy, independent older persons protein requirements are usually estimated from those of younger adults Higher protein dietary intake may be required for those who are bed-bound, wheelchair-bound or suffering from other mobility problems 	<ul style="list-style-type: none"> PEM if less than required Retarding loss of muscle and bone mass; achieving an adequate nitrogen balance may require greater protein intake Low-income older persons and those aged 85 and over are at greater risk of PEM
Fat	<ul style="list-style-type: none"> Small amounts to provide essential fatty acids and fat-soluble vitamins:* at least 10 percent of total energy intake 	<ul style="list-style-type: none"> Excessive intake of dietary fat is associated with obesity (see energy section above); colon, pancreas and prostate cancer (among others) and glucose intolerance Heart disease risks decrease if dietary fat intake is 30 percent or less of total energy Older persons tend to have an excessive consumption of fat and cholesterol
Vitamins	<p>Water-soluble vitamins</p> <ul style="list-style-type: none"> Special attention should be paid to vitamins B6 and B12 Controversy on recommendations of vitamin C during old age; however it is important to maintain adequate levels of ascorbic acid to prevent vitamin C-related health risks <p>Fat-soluble vitamins</p> <ul style="list-style-type: none"> Prudent to maintain vitamin A levels the same as in younger adults Great risk of deficiency for vitamin D, particularly if home-bound or institutionalised. Supplementation is recommended Poor evidence for vitamin E and K inadequacies (under normal circumstances) 	<ul style="list-style-type: none"> Frail older people and those aged 85 and over are at a great risk of vitamin B6 deficiency Frail older persons are at great risk of vitamin C deficiency Deficiency of antioxidant vitamins (i.e. C and E) may result in defective defence reactions against cancer, cataracts and Alzheimer's disease, for example Low levels of vitamin D are associated with osteoporosis
Minerals	<ul style="list-style-type: none"> Special attention should be paid to the following minerals: calcium, iron, magnesium and zinc Sodium and potassium intake may influence acute or chronic medical conditions themselves, as well as their treatments 	<ul style="list-style-type: none"> Low-income older persons are at greater risk of mineral deficiencies (Ca, Mg and Zn) Iron deficiency is the most frequent cause of anaemia in older people Zinc deficiency may result in impairment of cellular immunity Poor calcium intake increases the risk of osteoporosis Frail older adults commonly have a poor intake of all minerals Older persons tend to have an excessive consumption of sodium

Table 1.1. General guidelines, adverse characteristics, potential health consequences and population groups at risk regarding dietary intake in older persons

(continued)

Condition or nutrient	General recommendations	Adverse characteristics / Potential health risks
Fluid	<ul style="list-style-type: none"> • Minimum average intake (normal circumstances): 1500 ml/day • May be taken as water, juices, tea, coffee, etc. 	<ul style="list-style-type: none"> • Dehydration occurs frequently in older persons • Hypotension, increase in body temperature, constipation, nausea and vomiting, mucosal dryness, decreased urine output and mental confusion may occur with dehydration

* Fat-soluble vitamins may be taken from other sources.

Source: Chernhoff, 1995; Klein & Bloom, 1997; Weimer, 1997; Allen, 1998; Tucker & Buranapin, 2001; Gerrior, 2002; Martins *et al.*, 2002; Sharkey *et al.*, 2002; Kaplan *et al.*, 2003; Van Grevenhof & Funderbur, 2003; Ahluwalia, 2004; Blanc *et al.*, 2004; Bogden, 2004; WHO, 2003b.

In addition to life-stage related changes in food intake that affects all cohorts of aging individuals, there are also historic trends specific to those entering old age, such as the evolution of dietary patterns in the developing world over the last few years. The so-called *westernisation of diets* has to some extent been counter-productive, since households use their limited income to replace traditional products and eating behaviours with fashionable and more expensive food styles. For instance, from a low fat and high fibre diet, populations have progressively turned to a diet rich in saturated fats, simple carbohydrates and refined products. Modern food consumption patterns are, on the other hand, characterised by low fibre dietary intake. In high-income countries from Latin America and the Caribbean, for example, a high intake of animal products and total fat, plus a low intake of fruits, vegetables, roots and tubers is increasingly found. These changes are often accompanied by an increased variety of food items but, paradoxically, they are not the most adequate ones for healthy living. The constant re-composition of food patterns is being accompanied by shifts in body composition, health profiles and lifestyles, resulting in new and more complex challenges of

public health interest (Popkin *et al*, 1993; Drewnowski & Popkin, 1997; Popkin, 1998; Guo *et al*, 1999). These changes, termed nutrition transition, have been defined as “...a sequence of characteristic dietary and nutritional patterns resulting from large shifts in overall dietary structure, related to changing economic, social, demographic, and health factors...” (Kim *et al*, 2000:44). Nutrition transition accompanies urbanisation processes in developing regions (Garret, 2000; Popkin, 2000).

1.2.2. Disease

Changes in health and functionality may occur during the so-called *normal or successful ageing* process. However, defining this condition is practically impossible, given that the meaning of normality and success may differ from one person to another, from culture to culture, and at different historical moments. It has been suggested, nonetheless, that successful ageing should be defined in accordance with:

“...a life span perspective, with its multidimensional and multidirectional conception of development...[where]...adaptability is regarded as the efficacious functioning of the individual in an identified system (biological, social, psychological), domain (family, work, sports, leisure, etc), or task (cognitive performance, social integration, self actualisation, etc). The domain or goal of successful adaptation is not prescribed nor is it measured against a universal standard. Rather the interplay, the fit, between personal and environmental resources and situational demands is the yardstick, using a functional, ideal or individual norm.” [Baltes, 1996:164].

The operative definition of *active ageing* proposed by the World Health Organisation (WHO) shows another angle of what ageing in adequate conditions implies, taking into account that older persons constitute a heterogeneous

population group with specific needs determined by more than biological variables. Thus, for the WHO:

“...Increasing life expectancy in and of itself is not necessarily an indicator of progress with respect to ageing. Instead, if ageing is to be a positive experience, longer life must be accompanied by improvements of the quality of life of those who reach old age. This requires policies and strategies that value older people's contributions to their families, communities and economies and that enable them to maintain an optimal level of well-being...WHO has adopted the term Active Ageing [which is]...the process of optimising opportunities for physical, social and mental wellbeing throughout the life course in order to extend healthy life expectancy and the quality of life in older age. The concept of Active Ageing reflects WHO's commitment to maintaining and enhancing independence, societal involvement, emotional wellbeing, and physical health. Health is key to Active Ageing. Maintaining good health throughout one's life span is essential to extend healthy life expectancy and maintain quality of life in old age...Active Ageing will ensure that older citizens continue to make vital and positive contributions to their families, communities, and societies. Promotion of Active Ageing will aid in building intergenerational solidarity and a global society for all ages...”
[WHO, 2001b]

Theories revolving around normal or successful ageing consider that: a) ageing is a universal process (meaning that it affects all human beings), b) the function of cells, organs and the organism itself diminish progressively and, c) homeostasis is broken down when changes in the body are extreme or when stress severely affects the whole system (Allen, 1998). Furthermore, these theories assume that socioeconomic, psychological, cultural and moral issues influence quality of life during old age (George, 1989; Sidell, 1994; Vellas, 1996; Klein & Bloom, 1997; Moody, 1998; Morgan & Kunkel, 1998; Lloyd-Sherlock, 2000; Fernández-Ballesteros *et al*, 2001; WHO, 2001a).

Even though ageing itself is not a synonym of disease and frailty, as no intrinsic mechanisms in this process trigger poor health (Klein & Bloom, 1997), a number

of health conditions may be life-threatening if not prevented, delayed or treated adequately. This could be the case of sarcopenia, which is a condition resulting from the loss of muscle mass as humans get older. Physical inactivity may lead to high degrees of sarcopenia, meaning that older persons could become frail at one point. Psychological and social stressors may also result in acute or chronic disease in late stages of life. For instance, the loss of friends and relatives, as well as a number of losses in terms of identity (associated with retirement), independence, autonomy, dignity, privacy, confidence and self-esteem may be crucial in the understanding of both acute and chronic disease in late stages of life (Sidell, 1994; Iglarsh, 1995; Fernández-Ballesteros *et al*, 2001). Table 1.2 summarises common nutritional and non-nutritional-related health conditions appearing during old age that may become major geriatric public health concerns if ignored. Some conditions are not shown in this table because they have already been mentioned in previous paragraphs. Other examples may be repeated for emphasis.

In short, the better the dietary intake and the better the internal and external mechanisms to cope with disease both throughout the life cycle and during old age, the better the quality of life, nutritional status and health in older persons. But health and the satisfaction of food needs are mediated by complex relationships between the underlying causes of malnutrition: household food insecurity, inadequate care for older persons and the presence of an unhealthy environment including a lack of health and social services.

Table 1.2. Summary of common health conditions appearing in late stages of life

Condition	Characteristics or sub-conditions
Cerebral syndromes (brain disease)	<ul style="list-style-type: none">• Microvascular brain disease, cerebral arteriosclerosis and multi-infract dementia, transient ischemic attacks, stroke, Parkinson's disease
Peripheral vascular disease	<ul style="list-style-type: none">• Atherosclerosis, venous thrombosis, chronic leg ulcers
Musculoskeletal disease	<ul style="list-style-type: none">• Osteoarthritis, rheumatoid arthritis
Mental confusion (brain failure)	<ul style="list-style-type: none">• Mild: distracted and forgetful• Moderate: no physical disability• Moderate: with physical disability• Severe: with physical disability
Disorders of the autonomic system	<ul style="list-style-type: none">• Impairments of thermoregulation (hypothermia and hyperthermia)
Urinary incontinence	<ul style="list-style-type: none">• Disorders of the pelvic diaphragm, urethra and bladder outlet, and of the bladder itself
Faecal incontinence	<ul style="list-style-type: none">• Secondary to faecal impaction• Associated with colo-rectal disease or diarrhoea• Neurogenic faecal incontinence
Bone disease and fractures	<ul style="list-style-type: none">• Osteoporosis, osteomalacia, Paget's disease of bone, fractures• Falls
Heart disease	<ul style="list-style-type: none">• Myocardial infarction, angina, cardiac failure, orthostatic hypotension, hypertension, disturbances of heart rate and rhythm
Alimentary disorders	<ul style="list-style-type: none">• Oral candidiasis• Acute parotitis (associated with poor oral hygiene)• Dysphagia• Hiatus hernia• Reflux oesophagitis• Age-related changes in gastric secretion• Peptic ulcer• Diverticular disease and diverticulosis of the upper alimentary tract• Colon and rectum cancer• Ulcerative and ischemic colitis• Pancreatitis• Malabsorption syndrome• Megacolon
Respiratory disease	<ul style="list-style-type: none">• Pneumonia, asthma, tuberculosis
Sensory and communication problems	<ul style="list-style-type: none">• Eye: blindness, cataract, glaucoma, macular degeneration, diabetic retinopathy• Hearing: presbycusis, abnormal loudness perception, impairment of sound localisation, Ménière's disease• Impaired speech due to respiratory problems, phonation, resonance and articulation• Language comprehension deficiencies• Diminished taste and smell

Table 1.2. Summary of common health conditions appearing in late stages of life
(continued)

Condition	Characteristics or sub-conditions
Limitations of activities of daily living (ADL) and instrumental activities of daily living (IADL)	<ul style="list-style-type: none"> • With age, a loss of functionality may appear resulting in difficulties for older persons to cope with common activities associated with eating, dressing, toileting, getting in and out of bed (ADL), as well as with more complex ones such as taking one's own medicine, cooking, handling one's own money, going to places within walking distance, making telephone calls, doing the shopping etc. (IADL)

Source: Allen, 1998; Bernstein, 1995; Cherney, 1995; Maguire, 1995a and b; WHO, 2001a

1.3. Underlying causes of malnutrition in older persons: household food security, inadequate care, unhealthy household environment and lack of access to health services

The immediate causes of malnutrition affecting late stages of life (i.e. inadequate dietary intake and disease) are influenced by three underlying determinants: household food insecurity, inadequate care for the older person, as well as an unhealthy household environment with a lack of access to health services. These determinants manifest themselves at the household level (Smith & Haddad, 1999). The household is a difficult-to-measure concept, involving a great number of dimensions, and susceptible of being studied from diverse scientific angles. As suggested by Johnson *et al* (1990:3):

“Individuals can, and usually do, belong to several overlapping networks of social units at the same time. Nuclear and extended families are two such units while the household is another...[A household unit includes:]... members who have a common source of major income, live under the same roof or within the same compound, and have a common provision for other essentials of living. [Broadly speaking, a household can be defined as]... a group of people who live and eat together. While this is clear as regards the distinction between households and families, there are significant problems concerning individuals who just board (eat with the household) or only lodge (live with the household). [It has been suggested that]... a boarder who does not lodge should be included but the lodger who

does not board should be excluded, implying that the common pot dominates the common roof for household membership purposes. A further consequence is that those who board and lodge, such as domestic servants, should be regarded as household members. However, such a household unit could be too heterogeneous in its composition and may not in any sense be a single economic and social unit.”

For the United Nations, households consist of a network of arrangements established by individuals or groups, aiming at meeting a wide range of needs.

Two type of households are distinguished according to the number of members:

“(a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and may, to a greater or lesser extent, have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated.” [UN, 1997:50]

This work adopts the most used operative definition of the household in national surveys carried out in Mexico, derived from the above-mentioned theoretical and methodological positions. According to the Mexican National Institute of Statistics, Geography and Informatics (INEGI, to use its Spanish acronym), a household is a group of persons, either joined by ties of consanguinity or not, living regularly in the same dwelling and eating from the same pot. A person living on her or his own constitutes a household by her or himself, whereas someone sharing a common food budget but not living in the same dwelling is considered a member of a given household (INEGI, 2001a). When households experience uncertain or limited access to food (i.e. food insecurity), dietary inadequacies for more biologically vulnerable members may appear. Such is the case of older persons. Being unable to afford enough food, buying cheap low-

quality and/or high-density food items or, paradoxically, using the scarce economic resources available to follow fashionable and expensive food styles, are just a few concrete expressions of inadequate access to food at the household level. This may lead to acute and/or chronic disease, as well as malnutrition during old age (see Figure 1.1).

An overview of the concepts of food security and insecurity will illustrate the mechanisms by which households and older persons may experience uncertain or limited access to food. Subsequently, the importance of inadequate care for older persons, unhealthy household environment and a lack of access to health services, as determinants of malnutrition and food insecurity in old age, will be discussed.

1.3.1. Food insecurity at the household level

The concept of *food security* has been used for the study of hunger, access to food and their impacts on nutritional status. Since the World Food Conference of 1974 held in Rome, various definitions have been proposed, with three major overlapping paradigmatic shifts regarding the conceptual development of food security emerging (Maxwell, 1996 *a*).

The first paradigmatic shift evolved from a general concern over how food supplies responded to changes in both food and non-food productive systems at different geopolitical levels, to a perspective focusing on *access to food* and *food entitlements* by households and individuals forming socially defined groups (Valdés & Siamwalla, 1981; Sen, 1981; Desai, 1982; Duval, 1986 and 1996; García *et al*, 1988 *a* and *b*; Drèze & Sen, 1989; Fuentes *et al*, 1992; Maxwell,

1996 *a* and *b*; Lorenzana and Sanjur, 1999). The second shift in paradigm assumed food to be a primary need — the *food first* perspective — and moved on to *livelihood security* as a necessary (and sufficient) condition for food security. Thus, food security depends directly on the viability of the household as both a productive and a reproductive unit (Oshaug, 1985; Chambers, 1989; Foster, 1992; Frankenberger & Coyle, 1993; Davies, 1996). The third paradigm shift is away from *objective* estimations of food security, including levels of food consumption or nutritional adequacy for individuals, groups and households, towards the use of *subjective* indicators. Subjective approaches in food insecurity usually refer to people's own perception of uncertain or limited access to food, based on one or more of the situations shown in Table 1.3.

Perceptions of food deprivation, anxiety resulting from not having enough money to afford food, running out of food or monotonous eating patterns resulting from scarce food availability, to mention just a few examples, have been the cornerstone of subjective measures of food security and insecurity (Radimer *et al*, 1992; Kendall *et al*, 1995 and 1996; Kendall & Kennedy, 1998; Maxwell *et al*, 1999). These measures have been enhanced by the inclusion of concepts such as sustainability, cultural acceptability, autonomy, self-reliance and human rights, contributing to a more integral study of food security and insecurity at different levels (Maxwell & Frankenberger, 1992; Maxwell, 1996 *b*; Maxwell, 1998; Haddad & Oshaug, 1998; Haddad, 2000).

Table 1.3. Examples of subjective indicators of food insecurity experiences

Cornell-Radimer Items	
Household Level: Food Anxiety component	I worry whether my food will run out before I get money to buy more
	I worry about whether the food that I can afford to buy for my household will be enough.
Household Level: Qualitative component	We eat the same thing for several days in a row because we only have a few different kinds of food on hand and don't have money to buy more.
Household Level: Quantitative component	The food that I bought didn't last and I didn't have money to buy more. I ran out of the foods that I needed to put together a meal and I didn't have money to get more.
Individual Level: Qualitative component	I can't afford to eat properly.
Individual Level: Quantitative component	I am often hungry but I don't eat because I can't afford enough food. I eat less than I think I should because I don't have enough money for food. In the past year, did you lose weight because there wasn't enough food? In the past year, have you had hunger pangs but couldn't eat because you couldn't afford food?
Cornell-Frongillo Item	Did you ever not eat for a whole day because you had no food or money to buy food?
CCHIP Items	
Household Level	Thinking about the past year, did you and your household ever run out of money to buy food? Did you ever rely on a limited number of foods to eat because you were running out of money to buy food?
Individual Level	Did you ever cut the size of meals because there was not enough food in the house? Did you ever skip meals because there was not enough food in the house? Did you ever eat less than you felt you should because there was not enough money for food?
USDA Items	
	Thinking about the past year, which of the following statements best describes the <i>amount</i> of food eaten in your household: Enough food to eat Sometimes not enough to eat Often not enough to eat

Source: Adapted from Olson *et al.*, 1996: 31-33.

The most cited definition of food security to date, being at the same time the starting point for the construction of its most used indicators, is that proposed by the World Bank in 1986. For the latter organisation food security is "...access by

all people at all times to enough food for an active healthy life.” (World Bank, 1986:1). Works by Anderson (1990), Radimer *et al* (1990), Kendall *et al* (1995), Maxwell (1996b and 1999), Olson *et al* (1996), Haddad (2000) and Derrickson (2001) are illustrative examples of the use of the World Bank’s proposal.

The ambiguity of notions such as *enough food*, *active healthy life* and *nutritionally adequate*, as well as the high degree of generalisation underlying expressions such as *ability to acquire acceptable foods* or *socially acceptable ways* through which food is thought be acquired by both individuals and households, are clear examples of the need to construct more accurate definitions in this regard. Trimmer (2000) has suggested that ambiguities of this nature are characteristic of ideal conceptions of food security that no country can possibly attain.

On the other hand, *food insecurity*, as the conceptual counterpart — or the *inverse* — of food security describes situations where either limited or uncertain access to food is present in individuals and households. In 1990, an expert panel of The American Institute of Nutrition (AIN) suggested that food insecurity appears “...*whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain...*” (Anderson, 1990:1576). Authors like Kendall *et al* (1995 and 1996) and Kendall and Kennedy (1998) have not only used this concept in various works, but have also contributed significantly to its development. For some, this is a comprehensive definition given that:

“...*explicitly ... [includes] ... every person at all times ... [and differentiates two principal] ... dimensions: the availability of food*

and the ability to acquire the available food in socially acceptable ways; “ready” and “assured” are included as qualifiers to ensure access “at all times”. Anxiety about where the next meal is coming from is contrary to the notion of food accessible, conveniently obtainable, always at hand. “Enough food for an active, healthy life” implies a diet of safe foods with sufficient energy and nutritional quality to prevent diet-mediated malnutrition or limitations in activity levels ... “Socially acceptable ways” refer to conventional food sources such as grocery stores, restaurants, and government assistance programs. Thus food pantries, soup kitchens and the like, although inherently helpful for persons with food emergencies, can not be considered socially acceptable, i.e. desirable by all people as a means of obtaining food...” [Physicians for Human Rights, 2000: 10].

Access to food involves the availability of financial resources. Items from the most commonly used food security and insecurity scales are based on the relationship between economic resources and hunger satisfaction over time. Hence, the poorer the household and the individual, the higher the food insecurity. However, in an analysis of the 1995, 1996 and 1997 Current Population Survey (CPS) Food Security Supplements, Nord and Brent (2002) found that food insecurity was also present in middle and high-income households in the USA. In fact, these households accounted for a fifth of all food-insecure households and 17 percent of those reporting hunger (n = 57 million). This finding raises some concerns about the conceptualisation and measurement of access to food.

The definition of food security by the World Bank has also inspired the notion of food security at the household level. This latter condition has been suggested as “...*secure and permanent access of households to foods, sufficient in kinds and amounts to enable all individuals to live a healthy, active and productive life*” (Lorenzana and Sanjur, 1999:687). Limited capability of households to produce assets, generate income and, consequently, to afford food may lead to nutritional deficiencies in nutritionally vulnerable members, such as children, pregnant and

breast-feeding women and older members. The importance of the household in terms of food security is given by the fact that it is:

“...the logical social unit through which to view the question of food...[However, this]...demands not only a knowledge of overall household needs and consumption, but also an understanding of intrahousehold dynamics affecting procurement and distribution of food...[Food security]...must be understood in terms of the rationality and logic of the persons or social units involved.” (Maxwell, 1996b).

In contemporary urban societies neither the satisfaction of food needs nor the concrete biological expressions resulting from inadequate food intake (i.e. nutritional and health status), occur completely away from the realm of the market. This means that, just as happens with other basic needs, the quantity and quality of food mostly depends on the availability of financial resources in the household. Access to food can hence be assumed not only as the key element of food security, but also as the point where both the biological basis and the social dimensions of hunger satisfaction converge. That urban households count on a secure source of income to afford food is a preliminary condition for both their survival and reproduction. In other words, households able to afford food will hence be more likely to be food secure (Garret, 2000; González de la Rocha, 2000; Mercado-Suárez & Lorenzana-Albert, 2000).

Where household income is higher, food diversity tends to increase (Thiele & Weiss, 2003), thus giving members the possibility of accessing a healthier diet and achieving better nutritional conditions (Hoddinott & Yohannes, 2002; Ruel, 2003). Paradoxically, more diverse food consumption patterns are not necessarily healthier (Kennedy, 2004). Urban populations from developing regions of the world tend to eat a wide range of fashionable and expensive food items that put

their health at high risk of chronic conditions. Food consumption is nonetheless possible when cash and other subsistence elements are integrated (Lourenco-Lindell, 1995a and b). Running down savings — that is, *dissaving* — is one of these other ways through which food can be accessed by urban households. Another method is via exchanging food for labour.

Access to food is closely related to food consumption and expenditure patterns at the household level. Several authors have pointed out that the study of food expenditure patterns at the household level provides a good estimate of both food accessibility and dietary habits (Hartog & van Staveren, 1979; Martorell, 1982; Flores & Nelson, 1988; Gibson, 1990; Levin, 1991; MAFF, 1996). It has been observed that, in poor households, the higher the food budget share — defined as the proportion of household income allocated to food items (Karg 1988) — the greater the risk of food insecurity. Conversely, as household income increases, the food budget share may decrease, and the proportion of expenditure on other items such as clothing, rent and electricity may increase (Maliwichi *et al*, 2003).

In addition to chronic problems, the lack of food security in urban households from developing countries has been broadly attributed to the negative impacts of recurrent economic crises and macroeconomic reforms implemented in response to recession, which have presumably resulted in poverty among diverse layers of the society (Lorenzana & Sanjur, 1999; Fouéré *et al*, 2000; Lorenzana & Mercado, 2002 *a* and *b*; Piaseu & Mitchell, 2004). The association between poverty, low income and deteriorating food security status at the household level has been widely studied (Kendall *et al*, 1996; Derrickson *et al*, 2000; Lorenzana

& Mercado, 2002*a* and *b*; Charlton & Rose, 2002; Tingay *et al*, 2003). It has been suggested that poor urban households depend greatly on cash income, often count on low and insecure financial resources, and have both precarious working conditions and insecure job tenure (Frankenberger *et al*, 2000).

Oswald (1991), for instance, has pointed out that in the 80s, economic instability and structural adjustment programmes induced poor urban households from Mexico City to modify their expenditure patterns. While rent, transportation, electricity and water costs became the highest priorities, nutrition and health were placed at a second level of importance. A number of descriptive studies on food consumption found that, during the 80s and early 90s, food patterns in poor Mexican families changed as a consequence of economic instability and the negative effects of adjustment programmes performed to minimise the crises (INCO, 1989; CCPNS, 1991; Chávez *et al*, 1993 and 1994; Rivera-Márquez & Pérez-Gil Romo, 1994; INNSZ, 1995; Ruiz-Arregui & Rivera-Márquez, 1996).

Food security at the household level is not exclusively determined by the availability of economic resources. Sociodemographic variables of a diverse nature and level of complexity are crucial in the understanding of food consumption patterns. Education, for instance, influences food choices at the household level in a significant way. For Worsley *et al* (2004), the benefits of access to food and health information are sooner taken up by highly educated people than the less educated strata of society. These authors suggest that the higher the educational level, the healthier the dietary habits, whereas, in contrast, lower education is often associated with inadequate food intake and poorer

consumption of fruit and vegetables. The size and composition of the household in terms of age, sex and biological stage; the gender of the head of the household and the role that every member plays within the household also account for food security at this point (Mercado-Suárez & Lorenzana-Albert, 2000). Decisions concerning food consumption, food expenditure patterns and access to food itself respond to a number of complex interactions between members with different characteristics, preferences and levels of hierarchy within the household.

Food insecurity affects individuals in critical stages of the life cycle. Older people living under constrained socioeconomic circumstances are, for instance, more likely to become food insecure. Research by Lee and Frongillo (2001 *a, b* and *c*), Spark and Frongillo (2000) and Olson *et al* (1996) demonstrate strong linkages between hunger and a lack of financial resources in older persons from the USA. Socioeconomic inequalities, as well as differential access to social safety nets play a determinant role in the configuration of heterogeneous patterns of health and quality of life among older populations (Lloyd Sherlock, 2000; WHO, 2001*a*).

However, food insecurity and malnutrition during senescence is not only a consequence of a lack of economic resources. Health problems and limitations of activities of daily living may result in altered food use if older adults are not able to buy their own food or prepare their own meals. Medication can interfere with micronutrient absorption in certain diseases. An inadequate health status may also increase medical costs while reducing the household food budget. As Sidell (1994) points out, the relationship between ageing and deteriorated health

involves a number of losses in terms of independence, autonomy, dignity, privacy, confidence and self-esteem, among other factors. A lack of support from relatives, friends and other members of the community is a cause of food insecurity during ageing, given that many older persons depend on others to have a meal prepared or to be taken to food shops. In short, social isolation, limited financial resources and a lack of access to social safety nets creates a predisposition to malnutrition and disease during old age (Olson *et al*, 1996; Spark & Frongillo, 2000; Lee & Frongillo, 2001*a, b* and *c*, Garret, 2001).

Even though older people have been considered as a population group at great risk of suffering from food insecurity and hunger, little is still known about how to conceptualise and accurately measure these conditions (Olson, 1996; Wolfe *et al*, 2003). This explains why there is no agreement regarding the number and type of scales to be applied or the questions to be addressed to older persons and their households. It has been suggested that:

*The lack of an agreed-upon definition of hunger and the measures with which to estimate its prevalence, however, remain a major difficulty for those concerned with its alleviation. Hunger and food insecurity among...[older persons]... have been little studied, yet given the low incomes, limited mobility, and poor health of many individuals, they are likely to be at greater risk of hunger than the general population. The limited evidence available supports this supposition, yet to determine the exact nature and extent of the problem, we need tools that accurately measure the phenomenon of hunger among...[older persons]. To do so, we need to understand how hunger is experienced by the elderly, and we need an assessment of how...[older persons]... interpret items commonly used to measure hunger and food insecurity. (Olson *et al*, 1996: 1)*

This theoretical framework seeks to integrate variables that have been suggested by others in order to show that uncertain access to food in late stages of life is a multidimensional problem.

1.3.2. Inadequate care for older persons

1.3.2.1. Care for older persons: a general perspective

Care involves the provision of time, attention and support for members of the household, so that they meet physical, mental and social needs. The quality of care provided to a member of a given household depends on the caregiver's control of economic resources, decision-making capacity and bargaining power *vis-à-vis* other members of the household, physical and mental status, level of knowledge and beliefs (Smith & Haddad, 1999). Caring practices addressed to older persons should particularly include help and companionship, looking after their health, taking them into account for important decisions, being patient, treating them with respect, and making them feel that they have an important position within the community, among other factors. However, older people should not be conceived as passive individuals unable to organise their lives and immediate environment. The WHO (2001:20) has coined the term *long-term care* for older adults as

"...the system of activities undertaken by informal caregivers (family, friends and or neighbours) and/or professionals (health and social services) to ensure that a person who is not fully capable of self-care can maintain the highest possible quality of life, according to his or her individual preferences, with the greatest possible degree of independence, autonomy, participation, personal fulfillment and human dignity ... Long-term care includes both informal and formal support systems. The latter may include a broad range of community and public health, primary care, palliative care and rehabilitation services as well as institutional care in supportive housing, nursing homes, hospices, etc. and treatments to halt or reverse the course of disease and disability. Mental health services should be an integral part of long term care..."

Inadequate care for older persons manifests itself as abuse, violence, lack of support and social assistance, isolation and abandonment, loss of autonomy and other obstacles to successful ageing. Mistreatment of older people does not only

stems from the household or the community; institutions can also be the cause of this condition (WHO, 2001a). The intersection between inadequate care for older persons and household food insecurity shown in Figure 1.1 can be illustrated when, for example, as a consequence of having not enough food to eat at the household level, some members may spend more time in procuring food, thus paying less attention to specific needs of older adults (or other nutritionally vulnerable members).

1.3.2.2. Living arrangements

A direct consequence of the ageing process is the re-composition of the households dynamic, meaning that, as some members get older, younger members (women, in particular) assume greater responsibility in taking care of those more economically dependent and frail. Living arrangements have proved to be a key determinant of well-being during ageing, particularly among the poor in developing countries (Lloyd-Sherlock, 2000). In less developed areas of Latin America, for example, economic dependency makes poor older people live in multi-generational households (CEPAL, 2000; Collard, 2000a and b). Coresidence has traditionally been one of the most important sources of care-giving as well as support not only for older persons, but also for younger members of the household. Children, for example, often benefit from coresiding with grandparents (UN, 2000; WHO, 2001a; Gorman & Heslop, 2002). Older women are more likely to be dependent on coresidence than men, because the low participation rates of the former in the labour market makes them more economically vulnerable (UN, 2000).

Murad-Saad (1999) points out that the living arrangements of older persons constitute a series of decisions taken by different people over time, responding considerably to changes in marital status, employment history, savings and investments, migration, housing and health-related behaviour, among others things. For this author, living arrangements are a constant juxtaposition of preferences between older people and other members of the household.

1.3.2.3. Social support

Social support is crucial to the understanding of adequate care for older persons. Connecting with family members, neighbours, work colleagues and community members account for successful ageing (Vellas, 1996). It also has strong relationships with life satisfaction, health and activity (Fernández-Ballesteros *et al*, 2001; WHO, 2001a); psychological well-being (George, 1989), and food security (Lee and Frongillo, 2001 *a*; Spark and Frongillo, 2000). According to George (1989:247), social support is:

“...the provision and receipt of tangible and intangible goods, services, and benefits in the context of informal relationships (e.g. family and friends)...Examples of tangible (or instrumental) services include transportation, help when sick, and household repairs. More intangible forms of social support include advice, companionship, and feedback promoting feelings of self-worth.”

Support is required when, for instance, distances tend to diminish contact between older persons and their children; when company is needed, when disease and disabling conditions and sensory deprivation limiting mobility appear, and during retirement, as this latter condition often implies a number of losses in terms of financial resources, status and social relationships (Allen, 1998).

The household has been suggested as the principal source of support for older persons. The promotion of greater family responsibility for providing care to older persons has become a priority in social agendas all over the world. On the whole, stimulating awareness of care-giving to this population group by both the family unit and the community is, without any doubt, an obligation of the state. However, idealising the concept of a caring family or community in societies whose authorities do not implement direct actions aimed at meeting specific needs of older persons can be interpreted as a lack of social commitment. Transferring the obligations of the state to individuals may certainly be convenient for governments under constant budgetary constraints. In this context, people are expected to receive protection from relatives, neighbours or friends in an environment with minimal or no access to social security (CEPAL, 2000; Varley & Blasco, 2000 *a* and *b* and 2003).

In the developing world, traditional sources of family support for older persons may be undermined as a consequence of multiple factors such as urbanisation, increasing numbers of nuclear families, reduced availability of housing and increasing numbers of caregivers (particularly women) involved in the labour market (Tracy, 1991).

1.3.2.4. Bargaining power

Older peoples' well-being may be influenced by their bargaining power *vis-à-vis* other members of the household. Participating actively in key decisions concerning the running of the household — such as resource allocation or preparing meals — is likely to make older persons feel useful and respected.

Collard (2000a) argues that bargaining power in this population group is directly proportional to an effective asset ownership and/or to the availability of *significant amounts* of one's own income. Thus, contributing to overcoming economic constraints in the household may empower older people (Barrientos & Lloyd-Sherlock, 2002). In contrast, not counting on a source of income, and not even being allowed to make decisions about one's own needs or preferences, makes older persons live in isolation feel depressed and renders them constantly dependent on others. Dunn (1999) has referred to the latter situation as the loss of *self-governance*. Limited bargaining power could hence be a risk factor for food insecurity during old age. That others decide what foods an older person has to buy, prepare and eat, due to a lack of income and assets, might be unfavourable for her or his nutritional status.

1.3.3. Unhealthy household environment and lack of access to health services

The third underlying cause of malnutrition in old age encompasses living in an unhealthy household environment and not having adequate access to health services. This group of determinants are linked to inadequate care (Figure 1.1), because being surrounded by an unfavourable environment and having no medical protection constitute to a great extent a form of abandonment for older persons. For instance, a lack of clean water and sanitation overall increases the risk of infectious diseases (e.g. acute gastrointestinal and respiratory diseases) (Allen, 1998), which may result in malnutrition (Beaudry, 1996; Perdomo-Victoria, 1999; Smith & Haddad, 1999; WHO, 2001a). The availability of accessible, secure and safe spaces at both the household and the community level also play a crucial role in the quality of life of older people (Allen, 1998).

As major consumers of social and health services (Allen, 1998), older persons with low income and no access to social security may be at a greater risk of disease and death because they are not always able to cope with unexpected expenses derived from a loss of healthy life, or they spend a large proportion of their meagre incomes on treatment and medication (WHO, 2001a).

1.4. Poverty and the underlying causes of malnutrition and food insecurity

The underlying causes of malnutrition in older persons are affected by poverty. Both persons and households are poor when basic needs, such as food, health, water, shelter, education and community participation cannot be met adequately. Limited access to services and resources is also a characteristic of poverty (Frankerberger, 1996; Smith and Haddad, 1999; Coudouel *et al*, 2002; Duclos & Grégoire, 2003). Traditionally, the idea of poverty was one of material deprivation, encompassing two main dimensions: income and consumption. Nonetheless, a lack of income and inadequate levels of consumption are often associated with a more complex situation, usually defined as human poverty which, according to the United Nations Development Program (UNDP), involves the denial of opportunities to develop a life with quality (UNDP, 1997). The debate around the definition and measurement of well-being has currently led to a broader concept of poverty as a multidimensional process including both monetary and non-monetary variables, as well as both objective and subjective variables, where time must be an important dimension to be taken into consideration (Maxwell, 1999; Soubbotina, 2004).

Despite the fact that *money* income on its own has been criticised as an imperfect and unrealistic measure of welfare (Maxwell, 1999), limited access to income clearly cannot be ignored as an important component of poverty. Judgments over deprivation must consider the role played by real income inadequacies (Reddy, 2005) in understanding, for instance, poverty and food insecurity in urban areas. Income poverty is usually understood as the number of households or individuals living below a given threshold, which may vary from one country to another. To allow comparisons between regions, the World Bank has defined an international income poverty line of US\$ 1 a day per person. A line of US\$ 2 a day per person is commonly used to estimate poverty in middle-income countries (Soubotina, 2004).

Some have nonetheless suggested that the value of goods and services — that is, consumption — is a better outcome indicator than income, given that the former express more clearly people's well-being standards. For those supporting this point of view, when adequately designed, household surveys offer valuable information on how current needs are being met. Overall, consumption analysis is useful to find out how households access goods and services, credit markets or savings (Coudouel *et al*, 2002).

Assessing poverty through income measures has nonetheless its own advantages. When it is possible to disaggregate sources of income, comparisons between different sources of data can be made. The term income can involve different meanings depending on what is to be estimated. Its components can also vary from one context to another. Income comprises money received as salary, wages

or tips, profit from finances and other elements. Common property and state-provided commodities (i.e. social welfare payments) are also considered as income. Table 1.4 summarise the different components of income.

Table 1.4. Income aggregates at the household level

1. Income from employment and self-employment	<p>a) from employment:</p> <ul style="list-style-type: none"> • wage payment in a monetary form • bonuses, tips, • the value of payments received in kind <p>b) from self-employment:</p> <ul style="list-style-type: none"> • agricultural activity • non-agricultural activity
2. Household agricultural income	<p>a) revenues</p> <ul style="list-style-type: none"> • from sale of crops • from sale of processed crop products • other agricultural revenue • value of consumption of home-produced food <p><i>net of..</i></p> <p>b) costs: expenditure on</p> <ul style="list-style-type: none"> • crop inputs • inputs for crop processing • livestock inputs • land • depreciation of agricultural equipment
3. Non-farm self-employment income	<p>a) revenues</p> <ul style="list-style-type: none"> • received in money • received in kind • value of domestic consumption of output <p><i>net of..</i></p> <p>b) costs: expenditure on</p> <ul style="list-style-type: none"> • current expenditure on inputs • depreciation of capital assets
4. Income from rent	<ul style="list-style-type: none"> • comprises both monetary and imputed elements • rent can be either in money or in kind • rent accrues through the ownership and supply of assets of various descriptions • rent includes: land, draught animals, agricultural equipment, assets of non-farm enterprises, from renting dwellings

Table 1.4. Income aggregates at the household level
(continued)

5. Remittances received	<ul style="list-style-type: none"> • current transfer from other households (in money or in kind)
6. Other income	<ul style="list-style-type: none"> • transfers received from the government • bank accounts, dividends and income from gambling

Source: Johnson *et al*, 1990

Wage income is the major contributor to household income, even in countries where subsistence livelihoods prevail and formal employment is scarce. But even though labour is still considered as the principal asset for the poor, there are limited opportunities for them to count on stable jobs. Particularly in urban areas, so-called informal activities and casual labour, mostly carried out in unsafe working conditions during long working hours, provide the poor with very low, irregular and unreliable wage income. Poor households tend to respond to socioeconomic vulnerability by performing innovative strategies, including the diversification of their sources of income, performing informal trading and carrying out services-related activities. Survival also relies on production for sale and subsistence production. Doing domestic work, relying on claims and entitlements or counting on social networks are other ways of facing poverty in urban areas. Cutting food costs and food consumption patterns are common expenditure lowering activities in deprived environments. However, an acute or a chronic crisis can seriously impact on the quality of life of individuals, households or groups. Growing unemployment rates or relying on scarce opportunities to diversify sources of income either for survival or to protect

consumption levels, makes livelihood strategies less successful in alleviating poverty. It has been suggested that:

“Due to differences in size, composition, stage in the domestic cycle and other factors, households are equipped differently to cope with deteriorating conditions and crises. Nevertheless, regardless of whether they are adapting successfully or not, there are increasing signs that the pressures faced by households in a context of shrinking opportunities are not sustainable over the long run. Many short-term coping strategies are proving insufficient to offset the consequences of economic change and may even undermine households’ ability to recover and move permanently from vulnerability to self-sufficiency. There are also increasing signs of breakdown of family and community support systems, social isolation, alcoholism and drug abuse, which should pose serious concerns to policy-makers.”
[González de la Rocha, 2000: 4]

Livelihood strategies depend greatly on how available income, assets or capital are managed. The greater the endowments and the more the assets a household can count on, the less vulnerable it is to trends, shocks and factors related to seasonality. Trends involve changes in demographic processes, resource availability, national and international issues, governance and technological development. Though mostly predictable, trends affect people’s livelihoods and assets because of their rates of return to chosen livelihood strategies. Shocks, on the other hand, can destroy assets or force people to use them before they expected to have to cope with particular difficulties. Shocks may be health-related, natural and economic, amongst others. Seasonality refers to shifts in prices, production, health and employment opportunities, which are considered as one of the most severe causes of hardship among the poor in developing countries. Trends, shocks and factors related to seasonality impede the ability of poor households to save for the future. Available income is usually used up to meet current and urgent needs (DFID, 1999; DPU-UCL, 1999; González de la Rocha, 2000; Soubbotina, 2004). Woodward (1992) has suggested that once

households undergo a decline in real income, the first response is to draw on savings or to borrow, aiming at softening the immediate impacts of economic shocks. However, pitfalls emerge for families when savings are running out or when no more possibilities for borrowing are available. Low saving capabilities account for low investment in physical and human capital. Poverty is not a static phenomenon though. Moving in and out of deprivation may increase the possibilities of improving well-being over long periods (DFID, 1999; Baulch & Hoddinott, 2000), although limited capabilities of poor urban households to make choices account for higher social exclusion (Sen, 2000; Bradshaw, 2001).

In this study, elements from both income and consumption frameworks are used to study the relationship between malnutrition, food insecurity and poverty during old age. Poverty is assumed to be a multidimensional process, although no in depth analysis of all its components is carried out. Nonetheless, it is worth noting that the theoretical framework developed in this research is broad and sufficiently multidimensional to understand poverty as a complex process.

1.4.1. Poverty and old age: an unfinished debate

Older adults are considered a highly vulnerable population group to poverty (Castañeda & Aldaz-Carroll, 1999; Samuel, 2000), given the serious threats that this condition represents to their quality of life (Peláez, 1999; Petersen, 1999). As poverty grows, more negative impacts on the health and the ability to function in a satisfactory manner have been observed among older persons from developing countries (Palloni *et al*, 2002; Palloni & Peláez, 2004).

In Latin America and the Caribbean, for example, the majority of older persons living in multigenerational urban households are poor and, consequently, limited resources make the provision of care available to them insufficient. In this region, there seems to be evidence for differentials in the incidence and extent of poverty between urban households with older adults and those composed of younger members. The former households appear to be better off. However, no convincing explanations for these findings have been provided to date, apart from the fact that, in the past, labour markets may not have been as saturated or as highly demanding in terms of educational levels as they are today. It is assumed that the prevailing socioeconomic system, when current older cohorts were younger, could have benefited more households from low and medium layers of society, allowing individuals to accumulate assets (del Popolo, 2001).

But the argument that older adults may have had opportunities to cumulate social, physical and financial capital sometime during the past and, hence, be better off in comparison with younger population groups, has, to some extent, been used by some to support the idea that old age poverty is less significant than poverty which occurs in earlier stages of the life cycle. This rationale has led to the conclusion that investing in social programmes for older people is less valuable than investing in education or health for other members of the community. In other terms, anti-poverty programmes for children or mothers have a greater social payoff than those addressed to older persons, simply because the former groups signify higher returns to investment (Barrientos, 2002).

Old age poverty is, in this sense, underestimated if measured through standard income-related methods that infer individual welfare from household consumption patterns. Authors like Barrientos (2002) suggest, therefore, that the view that the incidence of poverty is lower among older populations be reconsidered. Wu (2003), points out that older people are less likely to escape from poverty than younger persons. Deaton & Paxson (1995), recognise that data used to make official calculations do not say much about individual poverty, since they focus on the household as the unit of analysis. Coming up with conclusions about poverty among older persons based upon household analysis requires a number of assumptions about intra-household allocation of resources, economies of scale, the different age-related needs of members, and the type of living arrangements in each particular case.

Haddad *et al* (1997), consider that there is still a long way to go in the study of poverty during old age and, therefore, no conclusive statements should be made for the moment. But despite controversial commentary about the relationship between poverty and ageing, scarce economic resources, a lack of opportunities to generate own income, restricted saving capacity and limited availability of safety net programmes account for social and economic vulnerability during late life (WHO, 2000). Broadly speaking, the easier it is for older people to access a secure source of income, the greater the possibilities for them to meet their basic needs. In Dunn's (1999:14) words, wealthy older persons...

"...have always been able to enjoy more autonomy than the poor, for wealth brings with power [...] autonomy, dignity, respect and the provision of basic social and medical services, which should be taken as a right in a civilised society, appear to be becoming the prerogative of those with [...] consumer power. Thus, the poor are increasingly seen as a problem; they are not just relatively worse off,

but may well lack decent living conditions and an adequate income to enable them to eat well and keep warm enough. They may have to wait for a very long time for medical treatments [...] that will greatly improve the quality of their lives; their social life may be limited or non-existent as a result of poverty and lack of mobility. [...] The poor are increasingly condemned to a life of being grateful for seemingly reluctantly given charity, while the wealthy have the right to have their needs met by virtue of their consumer spending power.”

Older persons, particularly older women, help in bringing up and educating children, play a central role in ensuring opportunities for other members of the household, and are usually in charge of housework (Gorman & Heslop, 2002). Contributing to the household income represents a way in which older people can improve relationships with other household members (HelpAge International, 1999 and 2000). For example, in South Africa, there is evidence of improvements in health, nutritional status and overall socioeconomic conditions of grandchildren, grown-up children and even other residents of households which have beneficiaries of the old-age pension (Ferreira, 1999; Case, 2001), in particular if the pension-holders are female (Duflo, 2003). However, with retirement, income tends to be insufficient and, hence, other mechanisms of economic resource transfer are necessary for survival. In contemporary societies, these transfers usually come from social security, the family or from assets accumulated in the past (Del Popolo, 2001).

1.5. An overview of the basic causes of malnutrition, food insecurity and poverty

The availability of potential human, economic and organisational resources at both country and community levels constitutes the essence of basic causes of old-age-related malnutrition. Control over these resources and over the manner in

which they are transformed into resources for food security are determined by factors of a political, economic, cultural and social nature. The natural environment, access to technology and the quality of human resources themselves are critical for the understanding of the availability, utilisation and transformation of these resources (Beaudry, 1996; Smith & Haddad, 1999). Poverty is a direct consequence of insecure and limited use of capital. According to the WHO (2000), marginalisation, exclusion and poverty are three of the most important determinants of low quality of life during old age. There is evidence that these conditions are to a great extent the result of crises and structural adjustment experienced in developing countries, where potential achievements in economic development — if any — do not seem to have substantially reduced older people's poverty risk as expected (Barrientos, 2002).

Five types of capital upon which livelihoods are built can be identified: human, natural, financial, physical and social capital. Human capital refers to skills, knowledge, ability to work and good health. Natural capital refers to the natural resource stocks. Financial capital comprises the availability of cash or equivalent, savings, pensions and other transfers from the state and remittances, just to mention a few examples. Physical capital includes basic infrastructure (i.e. transport, shelter, water supply and sanitation, access to information, etc.), and *producer goods*, what is meant by this is instruments and equipment allowing people to function more productively. Finally, social capital has been identified with networks and connectedness, membership of more formalised groups and relationships of trust, reciprocity and exchanges (DFID, 1999).

Access to financial capital during late life, particularly through pension benefits, is crucial for this work, as much of the analysis presented in further chapters is based on the availability of cash income by households with older people from Mexico City and its Metropolitan Zone. In various countries, governments have implemented measures aimed at protecting the well-being of this segment of the population, given that there are no other ways for them to make a living. However, in many cases, social welfare seems to be under constant pressure due to scarce financial resources, administrative obstacles and higher government prioritisation for other programmes (Tracy, 1991; CEPAL, 2000). Protecting older persons from poverty is, however, a fundamental duty of an ethical society. The implementation of comprehensive social policies taking into account that older adults constitute a heterogeneous group, socially and economically vulnerable, and exposed to multiple health risks could help to reduce poverty in this stage of life. For Lloyd-Sherlock (2000):

“Unless policy priorities change, however, population ageing in developing countries may just mean an extension of privation and misery, rather than an enrichment of lifetime opportunities” (Lloyd-Sherlock, 2000:2166).

Over recent years, pensions systems and social policy all over the world have been undergoing a number of reforms that, in some cases, have not benefited poor households as expected (Coward & Serrow, 1998). Pensions often become the only means through which older people and their households can access food and meet other basic needs. A history of employment in the formal sector is a *sine qua non* for being entitled to retirement benefits. Unfortunately, large numbers of people around the world cannot look forward to secure arrangements during old

age, as their occupational history in the formal sector could have been unstable or inexistent.

Although Chapter 3 reviews a full range of social assistance schemes available to older people, particularly in Latin America, it is important at this point to mention that it is not only through pensions or other types of monetary transfer that this population group can achieve adequate access to food. In-kind benefit programmes are also common sources of social assistance available to older persons, as they ensure that hot meals, food items or baskets are handed out, as well as supplements, either on a regular or on a one-off basis. On the other hand, policies aimed at offering discounts or free access to products and services of a diverse nature account for better food security conditions during old age, since either the beneficiaries themselves or their households would not have to spend money on what they are receiving, at least temporarily. The direct impact of these latter interventions on the household food budget may be considerable. Discounts or free access to transport, cultural activities, health services and drugs, among others, are common in many countries.

In recent times, the predominant concept of providing social assistance has been that of implementing measures to allow the poorest societal groups to survive. This ideology, entirely supported by international agencies promoting structural reforms in less developed areas of the world, is the cornerstone of public intervention in economically dependent countries. Ensuring a minimum level of well-being for the most needy will thus depend on how sensitively limited financial resources are redistributed. However, in many cases, targeting social

assistance has not yet proved to be effective enough to cover all those people living in less favourable socioeconomic conditions. This lack of success has historically been attributed to a government's lack of will or technical competence. In particular, it may be attributed to poor selection of vulnerable groups and potential recipients, little interinstitutional coordination, poor communication between different levels of government, limited knowledge of the nature of the benefit delivered, as well as a lack of skills among operative staff, just to mention a few examples. These problems usually result in duplicated deliveries and a leakage of benefits to individuals not entitled to assistance, consequently leading to unnecessary costs (Arcia, 1999).

1.6. Concluding remarks

The theoretical framework presented in this chapter constitutes a preliminary elucidation of determinants involved in the relationship between malnutrition, food insecurity and poverty during old age in urban contexts of Latin America and, possibly, other areas of the developing world. It has incorporated elements of both a biological and a social nature, organised into micro and macro explanatory levels of causality, as proposed in the literature on child malnutrition. More than focusing on one aspect or causal linkage, this approach has comprehensively illustrated the complexity of a multidimensional problem affecting older populations in contemporary urban societies. Just as happens with the current debate on old-age food insecurity, this thesis has not completely filled theoretical gaps and methodological limitations. The lack of studies on food security among urban Latin-American older populations, along with the scarcity of works in other parts of the world, are major concerns, since there are no really comparable

standards available for this research so far. Urban Latin-American older adults do not constitute a homogeneous group, despite the many cultural convergences between countries. However, by using this theoretical framework, concrete geographical or socioeconomic expressions of malnutrition, food insecurity and poverty can be initially explained. Finally, it is important to point out that other approaches are needed. The use of anthropological categories regarding food and nutrition (such as concerns, perceptions, preferences, habits, etc.), along with the search for more qualitative measures, would expand the explanatory potential of further research on this topic.

Following this theoretical discussion, Chapter 2 presents empirical evidence for the levels and components of the theoretical framework developed in this chapter. It is, in essence, an attempt to describe the extent to which the relationship between malnutrition, food insecurity and poverty manifests itself in older people from particular contexts of urban Latin America, using currently available data.

Chapter 2. Malnutrition, food insecurity and poverty in older people from Latin American urban contexts

In the previous chapter, a theoretical framework for the study of the relationship between malnutrition, food insecurity and poverty in older people from urban areas of Latin America was developed. This was essentially the interpretation of causal linkages between variables of different natures, hierarchically ordered in three levels. The next step to approach this relationship is to provide empirical evidence as to how these relationships express themselves in older adults from particular contexts of the region, especially Mexico. Data on older persons and their households are neither abundant nor regularly updated in most Latin-American countries. Nonetheless, with the information currently available, possible scenarios of the magnitude of nutrition, health, uncertain access to food and other core aspects mediating quality of life during old age have been outlined. The growing interest in the demographic and socioeconomic impacts of ageing on contemporary Latin American and Caribbean urban societies has led international organisations, as well as regional governments and research groups to be more concerned about the current situation and the future challenges regarding this matter.

This chapter begins with a description of general demographic characteristics of the ageing process in urban Latin America. The aim of this first section is to point out the relevance of older people in contemporary urban societies of the region, through identifying main factors contributing to its growth, recognising both differences among countries and possible scenarios in the short term, observing

the distribution of households with older persons and indicating sex differences within the region. Following the structure of the theoretical framework, a second section of Chapter 2 describes how currently available data on body mass index (BMI) in older persons from selected cities of Latin America, can be used as a way to infer malnutrition. BMI is the most commonly used indicator of nutritional status in late life. Secondly, information and data on the immediate causes of malnutrition in old age (i.e. inadequate diet and disease) are presented, followed by a discussion of existing evidence on indicators of the underlying causes of malnutrition (i.e. household food insecurity, inadequate care to older persons and an unhealthy household environment and a lack of access to health services). At the end of the chapter, a reconstruction of general aspects of poverty and the basic causes of the relationship between malnutrition and food insecurity in late stages of life is carried out drawing on available sources.

It should be noted that, due to a lack of information on Latin American older people, some aspects of this analysis could be insufficiently covered. However, the data currently available are essential for carrying out comparisons with descriptive results in this thesis. Much of what will be presented in this chapter derives from a recent multicentre study carried out among urban older populations from Latin America and the Caribbean. This is the project entitled *Salud, Bienestar y Envejecimiento en América Latina y el Caribe* (SABE) (Health, Ageing and Well-being in Latin America and the Caribbean; hereafter SABE project), co-ordinated by the Pan American Health Organisation (PAHO), and

conducted by research groups from participating cities.¹ The main objectives of the SABE project were to describe the health conditions and health-related needs of individuals who were 60 years of age and older from urban areas of Latin America and the Caribbean; to evaluate access to and use of health-care services, and to analyse differentials in self-assessment of health conditions, declared access to health, and sources of support with respect to a number of demographic and socioeconomic variables. Although this research officially began in 1997, it was not until 1999 and 2000 that data were first collected. Older populations studied as part of the SABE project were from Buenos Aires (Argentina), Bridgetown (Barbados), Sao Paulo (Brazil), Santiago (Chile), San Jose (Costa Rica), Havana (Cuba), Mexico City (Mexico) and Montevideo (Uruguay).

The SABE project constitutes the greatest regional effort ever made in the study of older people's health conditions and quality of life-related issues. According to Palloni (1999), this project is comparative in nature. For this author, participating cities are representative of the socioeconomic, demographic and political diversity of contemporary Latin American urban societies. Furthermore, they are also good examples of areas undergoing advanced stages of the ageing process in the region. A multistage stratified clustered design was used to sample the populations under study. First, large aggregations within each metropolitan zone (e.g. municipalities, boroughs, counties, councils, etc.) were identified thus becoming the sampling units. Rural and semi-rural zones, as well as clusters too distant from the urban centre and too sparsely populated were excluded. Sampling units were stratified

¹ The author of this thesis analysed the SABE project database to produce tables and figures in this chapter.

according to three variables at the household level: income of the head of the household, educational level of the head of the household and age distribution in the household. In the third place, a map of each sampling unit was used to enumerate households within the cluster and obtain a list of them. Existing households were finally selected from the list through systematic sampling. Overall, researchers estimated a minimum sample size of 1,500 households in each participating city.

For the purposes of this thesis, data on Buenos Aires, Sao Paulo, Santiago, Mexico City and Montevideo from the SABE project database have been used to describe general aspects of the relationship between malnutrition, food insecurity and poverty in older populations from urban Latin America. These cities are among the largest urban areas of the region and, in the cases of both Mexico City and Sao Paulo, they are among the largest cities in the world. Furthermore, these five urban areas share a number of socioeconomic and cultural characteristics. Comparisons not only provide evidence of similarities and differences between them, but also show the role of Mexico City in the regional arena with respect to older people's well-being. Other sources have been employed in the construction of this general panorama. In essence, it is a review of available literature on Latin American older people's health, nutrition and living conditions and, on the other hand, a review of literature focused on households with older persons from this region. Literature not necessarily addressing urban Latin American older population issues or their households has also been reviewed, given the very limited information available on malnutrition, food insecurity and poverty in late life from the region.

2.1. An overview of the ageing process in urban Latin America

Over the last few decades, one of the most remarkable demographic transformations experienced in Latin America and in many other parts of the developing world, has been the ageing of populations (Kalache, 1996; Kalache & Sen, 1998; Palloni, 1999; Martínez-Almanza *et al*, 1999; Lloyd-Sherlock, 1997 and 2000; Palloni & Peláez, 2004).² This characteristic of the so-called demographic transition, consisting of an increase in the proportion of persons aged 60 and over with respect to the overall population, has been attributed to a number of factors. Among those factors are a sustained decline in fertility rates, resulting from a number of birth control campaigns, and increasing longevity (Grigsby, 1991; Kinsella & Suzman, 1992; Kanaiaupuni, 2000). Overall, Argentina, Brazil, Chile, Mexico, Paraguay, and Uruguay together concentrate two thirds of the total older population in the region, whereas half of all adults 60 years of age and older live in Brazil and Mexico alone. It has been suggested that over the next 20 years there will be at least one older person per two subjects under 15 years of age in all of these countries, with the exception of Paraguay. Meanwhile, in Uruguay there will be as many older persons as children (PAHO, 2004).

The way in which the proportion of older populations has been growing in the region, especially in its urban areas, depicts a panorama nearly similar to that of

² Despite the diversity of existing criteria to consider a subject as an older person, the use of chronological age is common in sociodemographic approaches. According to the United Nations Population Fund (UNFPA), any subject aged 60 and over is considered as an older adult (Villa & Rivadeneira, 2000). However, a number of official sources aggregate data in such a way that it is not possible to analyse trends for 60 and over population. Very frequently, this type of source excludes individuals aged 60 to 64 when referring to older persons.

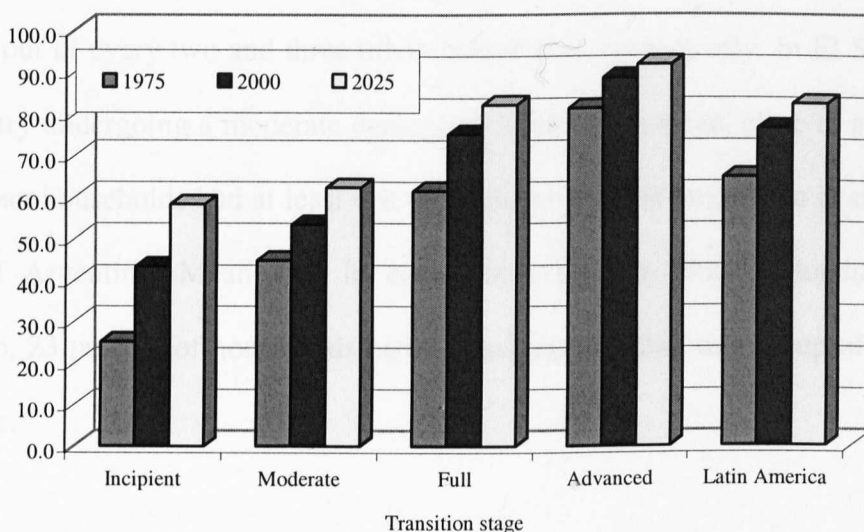
the industrialised world (Restrepo & Rozental, 1994), although a faster growth in less developed countries may be expected over the next few decades (Shrestha, 2000; UN, 2000a). Argentina, Brazil, Chile, Mexico, Paraguay, and Uruguay are among the most urbanized countries in Latin America. More than 80 percent of older people in the southern cone live in urban areas while three quarters of those from Mexico and Brazil live in cities (PAHO, 2004). For the Pan-American Health Organisation (PAHO), this growth will take place in Latin America and the Caribbean in the midst of:

“...fragile economies, rising poverty levels, expanding rather than contracting social and economic inequalities, and contracting rather than expanding access to collectively financed services and resources.” (PAHO, 2004:II).

Villa and Rivadeneira (2000), for example, give evidence for the demographic importance of this population group in urban Latin America between 1975 and 2025. According to the authors' estimations shown in Figure 2.1, in 1975, around 64 percent of all Latin American older persons lived in urban areas, whereas nearly 75 percent did so in 2000. It is expected that more than 80 percent of people 60 years of age and older in Latin America will live in cities in 2025. Differences by stage of demographic transition are appreciable. In incipient-transition countries, the percentage of urban older adults is set to increase 2.3 times between 1975 and 2025 (25.2 to 58.4 percent, respectively). In moderate-transition countries it is around 1.4 times (44.9 to 62.4 percent), 1.3 times in full-transition countries (61.6 to 82.2 percent), and 1.1 times in advanced-transition countries (64.8 to 82.3 percent).

The main characteristics of each stage of demographic transition, as well as a list of selected Latin American and Caribbean countries in each category are shown in Table 2.1.

Figure 2.1. Distribution of older population in Latin America by demographic transition stage, 1975-2025.
(percent of total population)



Source: Villa & Rivadeneira, 2000

Table 2.1. Demographic transition stages: typology for selected Latin American and Caribbean countries

Stage	Countries	Characteristics
Incipient	Bolivia, Haiti	High birth rate; high mortality; moderate natural growth (2.5 percent)
Moderate	El Salvador, Guatemala, Honduras, Nicaragua, Paraguay	High birth rate; moderate mortality; high natural growth (3 percent)
Full	Brazil, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, Dominican Republic, Venezuela	Moderate birth rate; moderate or low mortality; moderate natural growth (2 percent)
Advanced	Argentina, Chile, Cuba, Uruguay	Moderate or low birth rate and mortality; low natural growth (1 percent)

Source: Castillo-Salgado, 2000; CEPAL, 2000; Villa & Rivadeneira, 2000.

The United Nations Economic Commission for Latin America and the Caribbean (ECLAC) (CEPAL, 2000) estimated that, in 1997, there was on average at least one person 60 years of age and older in more than 25 percent of urban households

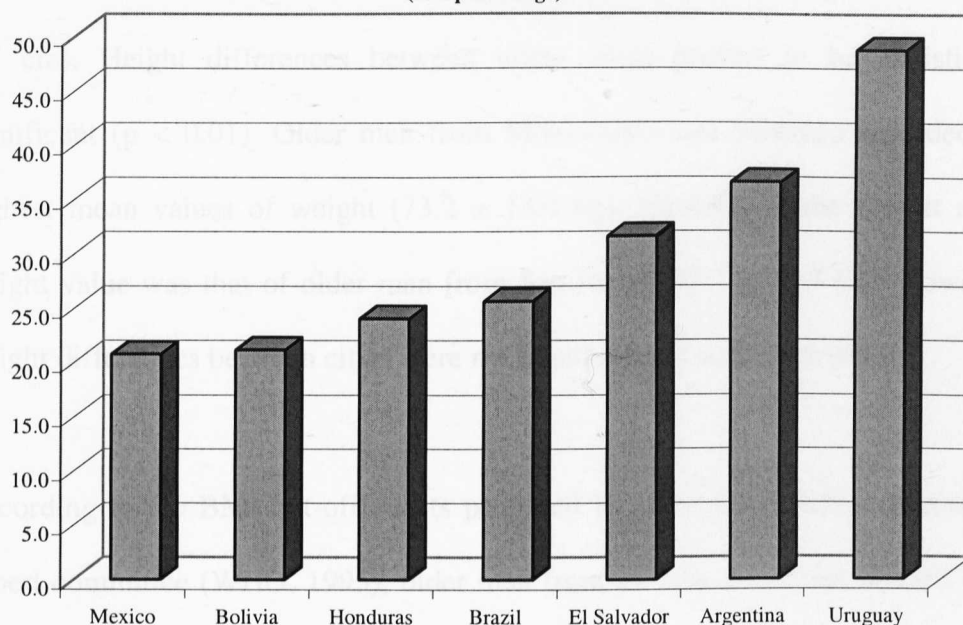
in the region. Figure 2.2 shows the distribution of households with older members in urban areas of Bolivia, El Salvador, Honduras, Brazil, Mexico, Argentina and Uruguay. It was only in advanced-demographic transition countries Uruguay and Argentina where a foreseeable scenario seemed to take place: the higher the degree of demographic transition experienced, the more the households with members aged 60 and over. In these countries there was one or more older adult in one out of every two and three urban households, respectively. In El Salvador, a country undergoing a moderate demographic transition stage, close to a third of the urban households had at least one older member. This proportion is similar to that of Argentina. Meanwhile in cities from Bolivia, Brazil, Honduras and Mexico, 23 percent of households had at least one member this group of age, on average.

A second characteristic of the ageing process in urban Latin America is given by a higher proportion of women in comparison to men (Barbot-Coldevin, 2000; PAHO, 2004). The so-called *feminisation* of the ageing process taking place in the developing world has been widely documented (Restrepo & Rozental, 1994; CEPAL, 2000; Villa & Rivadeneira, 2000; WHO, 2001a; UN, 2000b).

Table 2.2 shows that, in 1990, around 57.5 percent of the overall urban population aged 60 and over from selected Latin American countries was female.³ A similar proportion is expected in 2020.

³ This selection includes at least one country of each category of demographic transition stage (see Table 2.1).

Figure 2.2 Distribution of households with older members in urban areas of selected Latin American countries, 1997. (as a percentage).



Source: CEPAL, 2000

Table 2.2. Female urban population aged 60 and over as a percentage of the overall older urban population in selected countries of Latin America, 1999-2020.

Region/Country	1990	2020
Latin America	56.7	57.1
Argentina	57.9	58.2
Bolivia	55.8	56.1
Brazil	56.3	58.0
El Salvador	59.1	59.2
Honduras	58.6	57.2
Mexico	56.5	56.4
Uruguay	58.8	59.3

Source: CEPAL, 1999.

2.2. Malnutrition in older persons

Anthropometric parameters, particularly body mass index (BMI), are commonly used to assess nutritional status in older persons. These data were available in four of the five cities selected from the SABE project: Sao Paulo, Santiago, Mexico City and Montevideo. According to Table 2.3, mean height values reveal that

older men from Montevideo constitute the tallest population (169.1 ± 7.3 cm),⁴ whereas individuals from Mexico City constituted the shortest population (162 ± 6.7 cm). Height differences between urban areas proved to be statistically significant ($p < 0.01$). Older men from Montevideo and Santiago recorded the highest mean values of weight (73.2 ± 13.0 kg). Meanwhile, the lowest mean weight value was that of older men from Sao Paulo (67.7 ± 12.7 kg). However, weight differences between cities were not significant in statistical terms.

According to the BMI cut-off points proposed by a World Health Organisation expert committee (WHO, 1995), older men from all four cities had a mean BMI value equal to or greater than 25 kg/m^2 , falling into the Overweight Grade I category. The highest BMI mean values were reported in Santiago and Mexico City (around 27 kg/m^2 in both cases). BMI differences between cities showed high statistical significance ($p < 0.01$). Just as in the case of older men, women aged 60 and over were taller in Montevideo (159 ± 7.3 cm) and shorter in Mexico City (148 ± 6.6 cm). Height differences were statistically significant ($p < 0.01$). Older women from Montevideo were also heavier than those from the other three cities (71.2 ± 15.4 kg), whereas those from Sao Paulo reported the lowest mean weight value (62.5 ± 13.0). However, no significant differences were observed in weight. BMI mean values in older women from the four urban areas can also be classified into the first degree of overweight (i.e. $\geq 25 \text{ kg/m}^2$). Between-city BMI differences proved to be highly statistically significant ($p < 0.01$).

⁴ mean \pm standard deviation.

Table 2.3. Anthropometric indicators and Body Mass Index of older persons by urban area and gender. SABE project, 1999-2000.

	Sao Paulo	Santiago	Mexico City	Montevideo				
Men								
Height (cm), <i>Mean ± SD (No.)</i> *	164.4 ± 6.9 (733)	164.6 ± 7.1 (413)	162.2 ± 6.7 (414)	169.1 ± 7.3 (502)				
Weight (kg), <i>Mean ± SD (No.)</i>	67.7 ± 12.7 (734)	73.1 ± 13.0 (413)	70.8 ± 11.4 (415)	73.4 ± 14.8 (510)				
Body Mass Index, <i>Mean ± SD (No.)</i> *	25.0 ± 4.1 (732)	27.0 ± 4.2 (412)	26.9 ± 3.9 (414)	25.7 ± 5.1 (492)				
Body Mass Index*†	%	N	%	N	%	N	%	N
Underweight	4.6	34	1.5	6	0.7	3	6.1	30
Normal	46.6	341	30.6	126	31.6	131	40.0	197
Overweight I	39.2	287	45.1	186	48.1	199	34.6	170
Overweight II	9.2	67	22.6	93	19.3	80	18.5	91
Overweight III	0.4	3	0.2	1	0.2	1	0.8	4
	100.0	732	100.0	412	100.0	414	100.0	492
Women								
Height (cm), <i>Mean ± SD (No.)</i> *	151.2 ± 6.8 (1066)	149.8 ± 6.3 (810)	148.5 ± 6.6 (630)	155.2 ± 7.3 (851)				
Weight (kg), <i>Mean ± SD (No.)</i>	62.5 ± 13.0 (1071)	63.6 ± 13.4 (812)	63.2 ± 12.0 (628)	71.2 ± 15.4 (880)				
Body Mass Index, <i>Mean ± SD (No.)</i> *	27.3 ± 5.2 (1064)	28.3 ± 5.4 (809)	28.7 ± 5.1 (626)	29.7 ± 6.8 (828)				
Body Mass Index*†	%	N	%	N	%	N	%	N
Underweight	3.3	35	1.7	14	1.0	6	2.1	17
Normal	31.2	332	25.2	204	24.8	155	25.0	207
Overweight I	37.5	399	39.2	317	37.4	234	30.6	253
Overweight II	26.5	282	31.4	254	34.2	214	33.1	274
Overweight III	1.5	16	2.5	20	2.7	17	9.3	77
	100.0	1064	100.0	809	100.0	626	100.0	828

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

† < 0.01 for intra-city differences between sexes (T-test was estimated for significance)

Source: Author's estimations from the SABE project database

Being overweight is a real health problem among older adults from the SABE project, particularly among older women, since they show not only higher BMI mean values, but also greater prevalences than men ($p < 0.01$). The average prevalence of older men being overweight (all degrees) from the entire sample is nearly 43 percent, in comparison with 71.5 percent in older women. The worst scenarios in terms of men being overweight can be observed in Santiago and Mexico City, where practically 68 out of 100 individuals in each case have a BMI

value equals to or greater than 25 kg/m². In turn, 74 percent of women in Mexico City were overweight to some extent. An analysis by gender and category of BMI shows that Overweight I is more prevalent in men than in women. But Overweight II is more frequent in women than in men: around 3 times higher in Sao Paulo, nearly twice as high in Mexico City and Montevideo and 1.4 times higher in Santiago. Finally, Overweight III is prevalent in less than 1 percent of older men. Older women, on the other hand, showed higher percentages of Overweight III, particularly in Montevideo, where 9 out of 100 individuals suffered from this.

Data from different sources show that mean height, weight and BMI values for older men and women from Mexico City (Velázquez-Alva *et al*, 1996; Ortíz-Hernández *et al*, 2002) and urban Brazil (WHO, 1995) are similar to those observed in the SABE project (Table 2.4). With some exceptions, Overweight Grade I is also the most prevailing situation among the samples from each study. Being overweight and obese are increasingly prevalent in older adults from both developed and developing countries (Gutiérrez-Fisac *et al*, 2004).

2.3. The immediate causes of malnutrition: inadequate dietary intake and disease

2.3.1. Inadequate dietary intake

It is only through a few available studies that some descriptive information on food habits and dietary intake among older adults from Latin America can be presented. In fact, several authors have pointed out that more research on food and nutrition issues during ageing is needed all over the world (Ahmed 1992;

Velázquez-Alva *et al*, 1996; Allain *et al*, 1997; Fletcher & Rake, 1998; Lee & Frongillo 2001 *a* and *c*).

In 1995, the Mexican “Instituto Nacional de Ciencias Médicas y de la Nutrición, Salvador Zubirán” (Salvador Zubirán’s National Institute of Medical and Nutrition Sciences) conducted the Food and Nutrition Survey for the Metropolitan Zone of Mexico City (ENURBAL, to use its Spanish acronym) (INNSZ, 1995). Its main objective was to study food patterns and nutritional conditions in socioeconomic groups, aiming simultaneously at establishing the guidelines for prevention programmes for both non-communicable chronic diseases and nutritional deficiencies. The final report showed results only for households, children and individuals aged between 18 to 59 years of age. Though collected, data on older people and other population groups were not published. However, authors stated that risky food habits among the households under study are good estimates of unhealthy eating patterns among members aged 60 and over. According to this survey, a high intake of foods derived from animal sources, a high proportion of fats, a poor amount of fibre and an excessive energy intake characterised the food patterns of the higher socioeconomic stratum. In the lower income groups there were no uniform food patterns, although their overall dietary behaviours were similar to those in higher-income households.

Table 2.4. Mean BMI values of older populations from urban areas of Latin America

	Men			Women				
	Height	Weight	BMI	N	Height	Weight	BMI	N
Mexico City: Ortiz-Hernández <i>et al</i> , 2002								
≥ 60 years	161.8 ± 5.8	65.5 ± 11.4	25.3 ± 4.0	24	145.7 ± 8.35	57.7 ± 10.9	27.2 ± 4.96	64
Mexico City: Velázquez-Alva <i>et al</i> , 1996								
60 - 64 years	164.0 ± 6.3	71.3 ± 8.9	26.5 ± 3.0	111	151.2 ± 5.6	63.6 ± 9.7	27.8 ± 4.0	129
65 - 69 years	164.7 ± 6.7	71.4 ± 11.4	26.3 ± 3.4	53	149.8 ± 6.0	60.8 ± 10.4	27.2 ± 4.6	60
70 - 74 years	163.3 ± 7.9	71.1 ± 10.6	27.8 ± 6.2	33	149.0 ± 5.7	58.1 ± 6.3	26.1 ± 2.3	45
75 - 79 years	162.8 ± 5.4	68.4 ± 11.3	25.8 ± 3.5	20	148.8 ± 5.0	55.6 ± 8.1	25.4 ± 3.2	24
80 - 89 years	162.2 ± 5.1	66.0 ± 6.3	25.1 ± 1.8	13	145.7 ± 6.5	55.1 ± 11.8	25.7 ± 4.7	20
Brazil: WHO Expert Committee, 1995*								
60 - 69 years	165.0 ± 11.0	n.k	23.7 ± 5.4	n.k	152.0 ± 7.4	n.k	25.8 ± 6.7	n.k
70 - 79 years	163.0 ± 10.0	n.k	22.9 ± 5.0	n.k	150.0 ± 7.0	n.k	25.0 ± 7.4	n.k
≥ 80 years	162.0 ± 8.2	n.k	22.4 ± 4.1	n.k	149.0 ± 8.9	n.k	23.9 ± 4.9	n.k

* National sample = 4,419 individuals aged 60 and over from both sexes.
n.k = not known

In a cross-sectional study analysing associations between dyslipidemias and food patterns, Aguilar-Salinas *et al* (2001) found that Mexican urban subjects aged 60 and over from middle and low-income strata, had a lower intake of fibre and carbohydrates than their rural counterparts. A higher fat intake was also found in the former group. To a great extent, these findings coincide with studies carried out by Najas *et al* (1994), Monteiro *et al* (1995) and De Oliveira (1997) in older adults from urban areas of Brazil.

2.3.2. Food insecurity in older persons

Food security is closely related to health and quality of life during old age. Unfortunately, research on this topic are nonexistent in Latin America. Authors like Lareo *et al* (1990) in Colombia, Gay (1997) in Cuba, and Dehollain (1995), Lorenzana & Sanjur (1999) and Mercado-Suárez & Lorenzana-Albert (2000) in Venezuela, have compiled a vast amount of data relating to the definition of the concept, the analysis of its indicators or the study of its expressions at both the household and individual levels in the region. However, there is no research focusing on urban older populations (nor on rural populations).⁵ Therefore, little is still known about the determinants and concrete expressions of uncertain access to food in later life in this region.

Research by Lee and Frongillo (2001*a, b* and *c*) suggest that food insecurity is a persistent problem among older persons in the USA. Using data from the Third

⁵ A search through MEDLINE, POPLINE, SIGLE, WoS, and HMIC bibliographic databases between 1966 to 2004 was carried out and no records were found. Terms used included: food security, food insecurity, limited or uncertain access to food, urban areas, developing world, Latin America, older populations and the elderly among others.

National Health and Nutrition Examination Survey (1988-94) (NHANES III) and the Nutrition Survey of the Elderly in New York State (1994) (NSENY), these authors found general prevalences of food insecurity in adults aged 60 and over as high as 16.1 percent. But the prevalence of food insecurity among older persons living in poverty was 20 percent or higher. Experiences of uncertain access to food affected up to 61 percent of Hispanic and Black older people. Less than 1 percent of older adults with high school education or more were classified as food insecure. Meanwhile, the prevalence of food insecurity among older participants in food programmes was 24 percent or less. Up to 35 percent of subjects with limitations of activities of daily living (ADL) were food-insecure. Significant associations were found between food insecurity and a younger age (i.e. 60-69) (OR = 2.39, 95% CI = 1.33-4.29), poverty (OR = 3.47, 95% CI = 1.70-7.06), Hispanic background (OR = 4.04, 95% CI = 2.46-6.65), high school education and more (OR = 2.36, 95% CI = 1.34-4.16), participation in food assistance programmes (OR = 2.53, 95% CI = 1.56-4.09), and limitations of ADL (2.8, 95% CI = 1.04-4.56).

In other study, Olson *et al* (1996) interviewed a purposive sample of 41 adults aged 60 to 69 living in 35 households. Nearly half were Black and lived in an urban area of New York State, whereas the other half were White and were residents of a rural area from the same state. Broadly speaking, worse conditions in terms of access to food were observed among urban Black participants. A follow-up telephone interview was conducted of 24 out of those 35 households some time after in-depth interviews took place. Results showed that 45.8 percent (n = 11) of older adults could not afford to eat properly, and nearly 17 percent (n =

4) reported eating less than usual because they did not have enough money for food. Other findings at the individual level reveal that a third of older adults (n = 8) had cut the size of meals because there was not enough money for food in the house, whereas 21.2 percent (n = 7) eat less than they felt they should because there was not enough money for food.

Despite their limitations, data from the above-mentioned studies are useful for illustrating the complex causality of late life food insecurity. Uncertain access to food experienced by older adults depends not only on a lack of economic resources, but also on a number of interactions between education, availability of social safety nets and health-related variables.

2.3.3. Disease and other health-related conditions

Although not necessarily as scarce as data on food insecurity, there are few current data available on the health conditions of Latin American urban populations aged 60 and over with which a fully reliable epidemiologic profile could be depicted. Moreover, research on health differences as a consequence of social inequalities among older persons is literally rare (Bowling, 2004). Despite this lack of information, works by numerous authors suggest that the epidemiological profiles of older persons from developing countries are complex (Rocabruno & Prieto, 1992; Durán-Arenas *et al*, 1996; Palloni, 1999; Lloyd-Sherlock, 2000; Peláez, 2003). These profiles are composed of an appreciable presence of communicable diseases, together with an increasing burden of morbidity, comorbidity and mortality derived from both chronic and external causes (Martínez-Almanza, 1999; WHO, 2001a). Such a combination has been

attributed to urbanisation, the *lifestyles of modern cities* and socioeconomic inequalities, typical from poor urban areas all over the world (Stephens, 2000). In major Latin American cities, modernisation commonly coexists with an unmanageable urban growth, inadequate sanitation, environmental pollution and increasing rates of violence among other problems (Woodward, 1992; Kasarda & Parnell, 1993; Mohan, 1995), contributing significantly to the health conditions of this population group.

The study of mortality provides a good indirect estimate of the health conditions of both older and younger populations, and the risk of death has been proved to be greater in extreme stages of life (Perdomo-Victoria *et al*, 1999). Table 2.5. shows main causes of death and disease among urban Latin American older people during 1998, from countries where data were available: Argentina, Brazil, El Salvador, Mexico and Uruguay. Even though data are purely descriptive, not exclusively limited to urban areas and, furthermore, both the distribution and the magnitude of each cause may have varied from country to country, they may provide an approximate idea of the leading causes of mortality and morbidity among older persons at the end of the twentieth century. While problems with the circulatory and respiratory systems were the main causes of death and disease among this population group during 1998, malignant tumours were the second leading cause of mortality. Pneumonia and influenza, as well as nutritional deficiencies, often associated with precarious socioeconomic conditions, were other important health problems affecting individuals aged 60 and older. Diabetes mellitus was also playing a critical role in patterns of mortality and morbidity during old age. Main causes of death in the above-mentioned countries coincide,

for instance, with those found in the urban municipality of Habana Vieja (Cuba) between 1994 and 1996 (Perdomo-Victoria *et al*, 1999).

Table 2.5. Main causes of disease and death among older persons from selected Latin American countries, 1998.*

Main causes of death	Main causes of disease †
Heart diseases	Diseases of the circulatory system
Malignant tumours	Diseases of the genitourinary system
Stroke	Diseases of the digestive system
Diseases of the circulatory system	Chronic obstructive pulmonary diseases
Diseases of the respiratory system	Stroke
Diabetes mellitus	Renal insufficiency
Pneumonia and influenza	Pneumonia and influenza
Nutritional deficiencies	Diabetes mellitus
	Musculoskeletal diseases
	Cardiopulmonary diseases
	Endocrine and metabolic diseases

* Information was found for the following countries only: Argentina, Brazil, El Salvador, Mexico and Uruguay

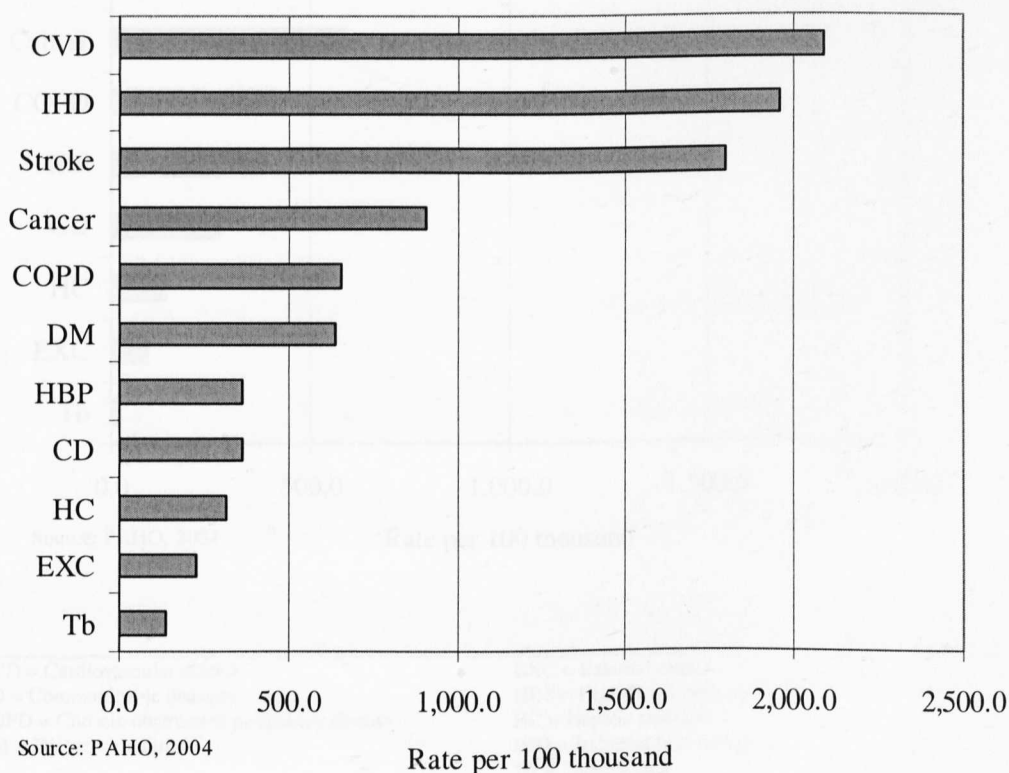
† Corresponds to the main reasons for discharge

Source: PAHO, 1999.

A more detailed panorama of mortality in older men and women from Latin America and the Caribbean over the last decade is shown in Figures 2.3a and 2.3b. The three main contributors to the burden of death for both men and women were cardiovascular diseases (CVD), ischemic heart diseases (IHD) and stroke. There were higher mortality rates for men linked to the above-mentioned causes than for women: 1.3, 1.6 and 1.5 times higher, respectively. The fourth, fifth and sixth causes of death were the same for both sexes, only differing by the order of appearance. For men, this was cancer, chronic obstructive pulmonary disease (COPD) and diabetes mellitus (DM), whereas for women, these causes were diabetes mellitus, cancer and chronic obstructive pulmonary disease, respectively. While the risk of dying from cancer and COPD was, on average, 1.5 times greater in older men than in older women, the risk of dying from diabetes mellitus was 1.1 times greater in women. The remaining group of causes have exactly the same

order in both populations. With similar rates in both sexes, death attributed to high blood pressure appeared as the seventh cause of mortality in older persons from the region. It is followed by communicable diseases (CD), strongly related to poverty and unhealthy environment; hepatic cirrhosis (HC), associated with abuse of alcohol consumption; external causes (EXC), such as accidents, violence, suicide or falls, and tuberculosis (Tb), also linked to unfavourable living conditions. For these latter causes, older men had a risk of dying 1.3, 2.3, 2.5 and 6.0 times greater than older women.

Figure 2.3a. Main causes of mortality in men aged 60 and over from Latin America and the Caribbean. End of the 1990s.

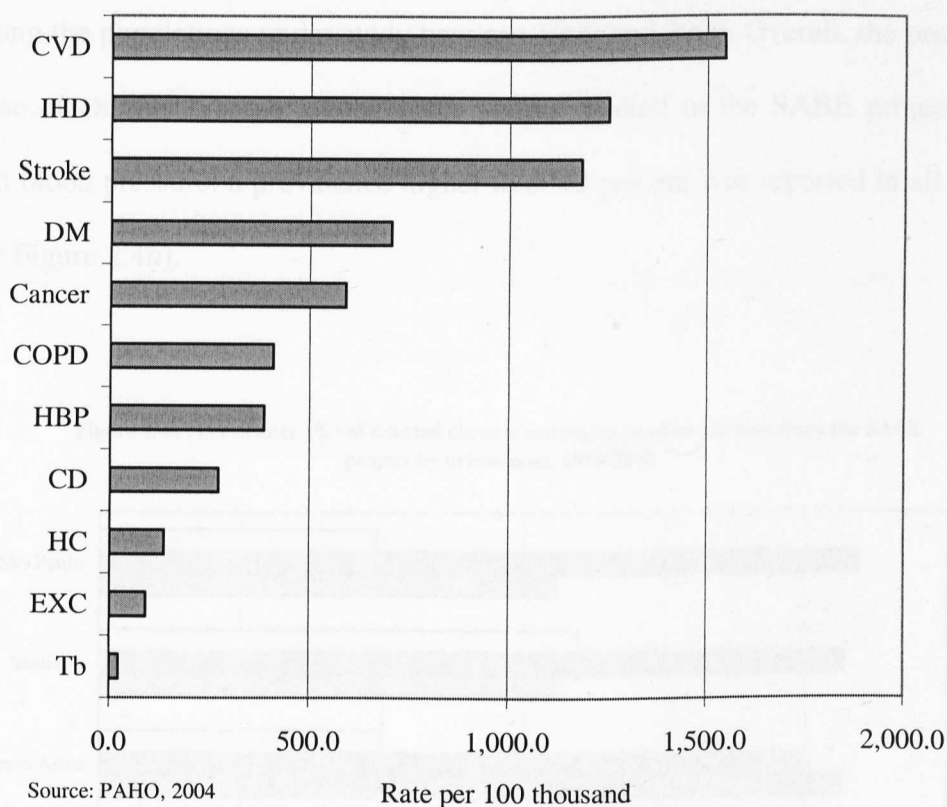


CVD = Cardiovascular disease
 CD = Communicable diseases
 COPD = Chronic obstructive pulmonary disease
 DM = Diabetes mellitus

EXC = External causes
 HBP = High blood pressure
 HC = Hepatic cirrhosis
 IHD = Ischemic heart diseases
 Tb = Tuberculosis

Research elsewhere has confirmed a higher risk of mortality among men at any age. Longer longevity observed in the female population has been attributed to greater biological advantages achieved by women. Others believe that, throughout the life cycle, men are over exposed to risks for which women are not that much (Perdomo-Victoria *et al*, 1999).

Figure 2.3b . Main causes of of mortality in women aged 60 and over from Latin America and the Caribbean. End of the 1990s.



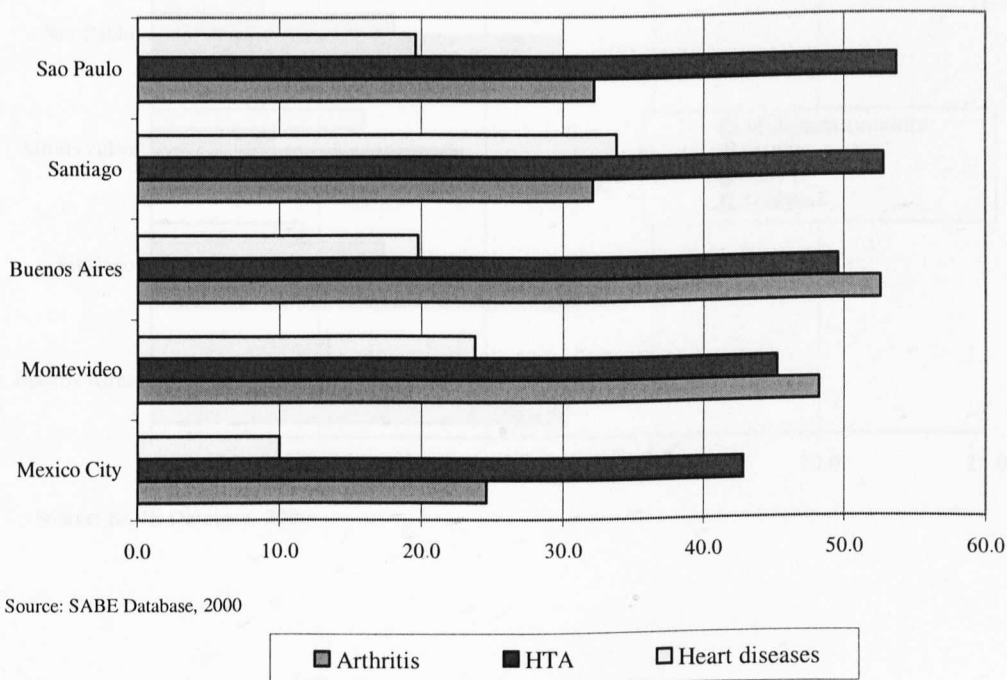
CVD = Cardiovascular disease	EXC = External causes
CD = Communicable diseases	HBP = High blood pressure
COPD = Chronic obstructive pulmonary disease	HC = Hepatic cirrhosis
DM = Diabetes mellitus	IHD = Ischemic heart diseases
	Tb = Tuberculosis

The study of morbidity in older populations from Latin America and the Caribbean has its own limitations owing to an absence of up-to-date information,

as is the case for mortality studies. Efforts made by research groups participating in the SABE project to obtain prevalences of self-reported disease, help to configure an approximate image of the health conditions at this stage of the life cycle. Chronic diseases are the most important contributors to the loss of healthy life. PAHO (2004) has pointed out, for instance, that this group of causes are considerably more prevalent in this region than in the United States and Canada.

Figures 2.4a and 2.4b show the distribution of seven chronic conditions explored among the populations under study between 1999 and 2000. Overall, the principal cause of chronic disease among older people studied in the SABE project was high blood pressure: a prevalence higher than 40 percent was reported in all cases (see Figure 2.4a).

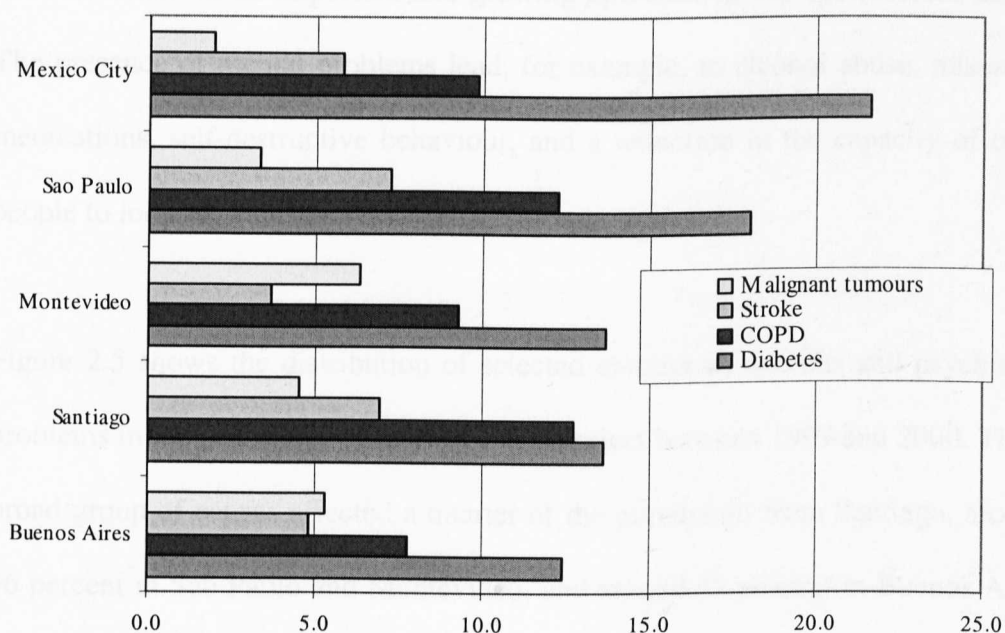
Figure 2.4a . Prevalence (%) of selected chronic conditions in older persons from the SABE project by urban area, 1999-2000



Source: SABE Database, 2000

The second leading cause of morbidity was hypertension. Close to half of the population or more was affected by this cause in Buenos Aires, Sao Paulo and Santiago, whereas it affected between 43 and 45 percent of older persons from Mexico City and Montevideo. High blood pressure is considered to be the most important risk factor for stroke and ischemic heart diseases, among other problems of the circulatory system. The broad group of causes known as heart diseases affected 34 percent of individuals from Santiago, between 20 and 24 percent of those from Buenos Aires, Sao Paulo and Montevideo, and around a tenth of older adults from Mexico City.

Figure 2.4b . Prevalence (%) of selected chronic conditions in older persons from the SABE project by urban area, 1999-2000



Source: SABE Database, 2000

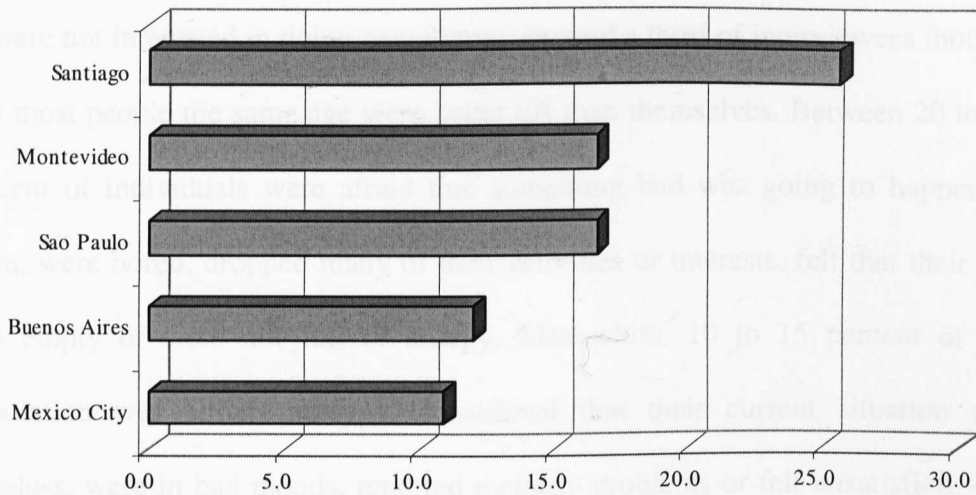
The highest prevalence of diabetes mellitus was reported in Mexico City: around 22 percent (see Figure 2.4b). In Sao Paulo, this cause was present in 18 out of

every 100 subjects. Meanwhile, this problem affected between 12 and 14 percent of older people from Buenos Aires, Santiago and Montevideo. Diabetes mellitus is associated with blindness, which is a condition contributing importantly to disability during old age. COPD is the fifth major contributor to the loss of healthy life — in Santiago and Sao Paulo, around 13 percent of this population group suffered from this. In comparison with the causes of disease mentioned above, stroke and malignant tumours are less frequent. Both causes affected 7 percent or less of the population from the five cities studied. The relatively low percentages of both stroke and malignant tumours may be due to the fact that most people suffering from them may have died younger.

Depression and other mental conditions have not been entirely acknowledged in Latin America as an important and growing epidemic in old age (PAHO, 2004). The presence of mental problems lead, for example, to alcohol abuse, misuse of medications, self-destructive behaviour, and a reduction in the capacity of older people to look after themselves.

Figure 2.5 shows the distribution of selected emotional, nervous and psychiatric problems in the population from the SABE project between 1999 and 2000. These broad group of causes affected a quarter of the population from Santiago, around 16 percent in Sao Paulo and Montevideo, and around 11 percent in Buenos Aires and Mexico City, on average.

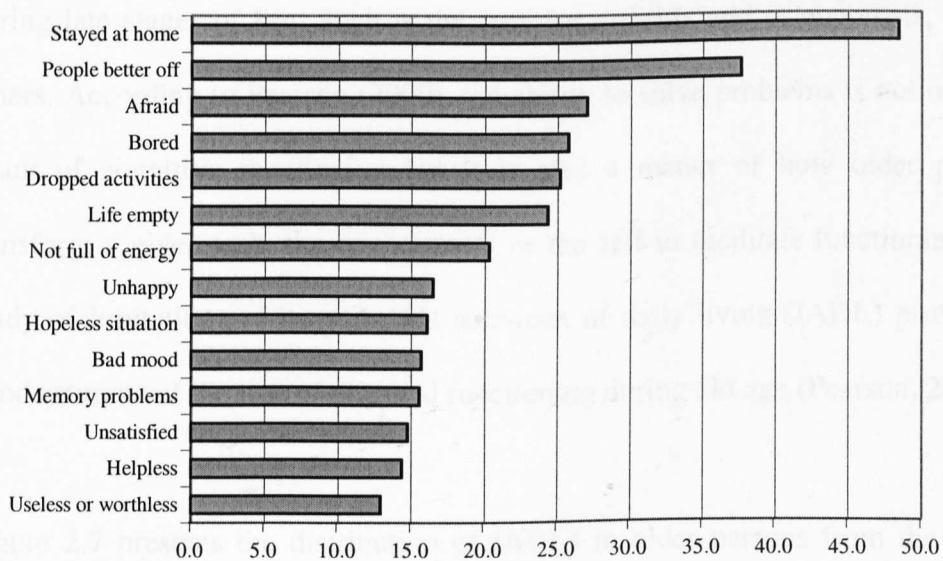
Figure 2.5. Prevalence (%) of emotional, nervous and psychiatric problems in older persons from the SABE project by urban area, 1999-2000



Source: SABE Database, 2000

Figure 2.6 presents, on the other hand, the average distribution of a number of indicators of emotional conditions collected in the SABE project.

Figure 2.6. Prevalence of indicators of emotional problems in older persons from the SABE project, 1999-2000. (as a percentage)



Source: SABE Database,

Nearly half of the subjects stayed at home because they did not feel like going out or were not interested in doing new things. Around a third of interviewees thought that most people the same age were better off than themselves. Between 20 to 25 percent of individuals were afraid that something bad was going to happen to them, were bored, dropped many of their activities or interests, felt that their life was empty or were not full of energy. Meanwhile, 10 to 15 percent of the population was either unhappy, considered that their current situation was hopeless, were in bad moods, reported memory problems or felt unsatisfied with their life, helpless, useless or worthless. Finally, it was not wonderful to be alive for 5 percent of the population under study.

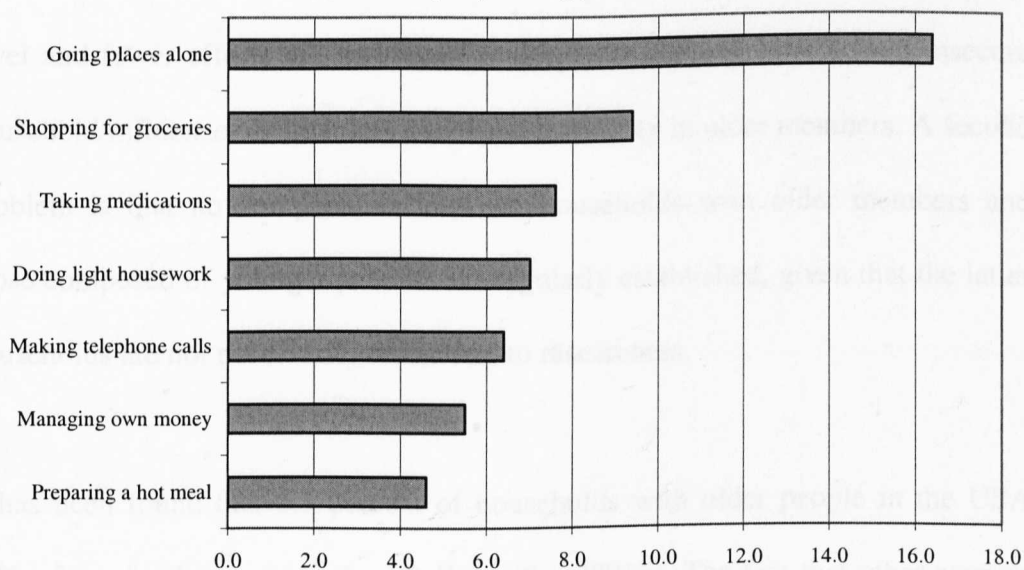
Impairments and disabilities have also gained importance as a matter of public health concern, as urban Latin American and Caribbean societies get older (Rocabruno and Prieto, 1992; Durán-Arenas *et al*, 1996; Palloni, 1999). For example, reductions in physical functioning are closely related to chronic disease during late stages of life. Such is the case for arthritis and osteoporosis, among others. According to Pearson (2000), the ability to solve problems is not only the result of cognitive functioning but it is also a matter of how older persons transform a given task, the environment or the self to facilitate functioning. The study of limitations of instrumental activities of daily living (IADL) provides a good estimate of the loss of physical functioning during old age (Pearson, 2000).

Figure 2.7 presents the distribution of IADLs in older persons from the SABE project between 1999 and 2000. The leading limitation of IADLs was being

unable to go to places alone (around 16 percent), followed by being unable to go shopping (around 9 percent). A second group of limitations of IADLs was constituted by not being able to take medication, doing light housework and making telephone calls (between 6 and 8 percent). Less than 6 percent of older adults from the SABE project were unable to manage their own money or prepare a hot meal.

As discussed in Chapter 1, disease and other health-related conditions are strongly linked to food insecurity and malnutrition during old age. In this section, most causes of death, disease and disability affecting older populations from selected areas of urban Latin America may, in this sense, result in a poor quality of life and, to a great extent, be associated with uncertain access to food.

Figure 2.7. Distribution of limitations of instrumental activities of daily living in older persons from the SABE project, 1999-2000. (as a percentage)



Source: SABE Database, 2000

2.4. Underlying causes of malnutrition: household food insecurity, inadequate care for older persons, unhealthy household environment and lack of access to health services

2.4.1. Household food insecurity

Studies of food insecurity in households with older persons from urban areas are literally nonexistent in Latin America, making it difficult to estimate the magnitude of problems involving limited or uncertain access to food and their impacts on nutrition, health and quality of life. Research carried out in the USA provides to date the only available reference for this matter, in spite of the differences between, for example, Hispanic older people from New York City and older people in Mexico City. Potential differences may include those of a cultural and socioeconomic nature or those regarding own perceptions of inadequate access to food. Comprehensive works focusing on old age food insecurity explore problems in access to food at the household level, though. One limitation observed in this type of approach is that more attention is paid to the individual level and fewer efforts are addressed at deeply explaining how a food insecure household influences or interacts with food insecurity in older members. A second problem is that no comparisons between households with older members and those composed of younger persons are regularly established, given that the latter households are not necessarily of interest to researchers.

It has been found that 5.5 percent of households with older people in the USA suffer from food insecurity (Lee & Frongillo, 2001*b*). The fact that other sources reveal that food insecurity is less prevalent in households where the head is an older person than in those where the head is a younger adult, suggest limitations

in the concepts and measures used to analyse the problem, however (Lee & Frongillo, 2001a).

Olson *et al* (1996) conducted a follow-up telephone interview of 24 older persons aged from 60 to 69 from New York State (USA) shortly after participating in an in-depth interview on one's own perceptions of food insecurity. Even though the number of participants was small, these findings show how households with older persons find the experience of food insecurity. Overall, a third of households (n = 8) reported food insecurity-related anxiety by being worried whether food runs out before getting money to buy more, and nearly 42 percent (n = 10) by being worried about whether the food that they can afford to buy for the household is enough. In qualitative terms, close to 42 percent of households interviewed (n = 10) stated that they ate the same thing for several days in a row because they only had a few different types of food on hand and did not have money to buy more. In turn, 37.5 (n = 9) percent of households perceived that the food that they bought did not last and they did not have money to buy more. The same proportion mentioned running out of the food that they needed to put together a meal and having no money to get more. While half of the households (n = 12) run out of money to buy food in the previous year at least once, it was just a third (n = 8) relying on a limited number of foods to eat because they were running out of money to buy food during the same period. A third of households (n = 8) also reported not having enough food to eat over the last twelve months.

Research conducted in other parts of the world focusing on a diverse range of households composed of younger members can be, with some precautions, used to

infer possible scenarios that may take place in households with older persons from urban Latin America. For example, in a study conducted among 238 female-headed poor and extremely poor households in an urban area of Caracas, Lorenzana & Sanjur (1999) found that around 78 percent (185) of the interviewees perceived some degree of household food insecurity. The authors also found a strong association between poverty and inadequate access to food ($p < 0.001$): the poorer the household, the greater the food insecurity level perceived. Around 72 percent (118) of poor households and close to 90 percent (67) of those classified as extremely poor were perceived as food insecure. Monthly income per person, considered as a proxy for a household's spending power, proved to be a strong predictor of self-perceived food insecurity (< 0.001 and 0.009 , respectively).

Despite being conducted in rural New York State (USA), a study carried out by Kendall *et al* (1996) provides important information on the impacts of food insecurity at the household level. It was found that food supplies, as well as the consumption of fruit and vegetables declined as food insecurity worsens. Furthermore, the greater the food insecurity, the more there are eating disorders among household members. From 193 households under study, around 53 percent reported some manifestation of food insecurity and 63 percent had low income. Around 60 percent of interviewees (all of them women) had no more than high school education, whereas 36 percent of respondents and 28 percent of their husbands or partners were unemployed. Much of what affects the latter households could actually occur in a similar way to those with older persons living in poor areas of urban Latin America. A decline in food supplies, low

consumption of vitamins and minerals and increased food insecurity could also be explained in these households as a consequence of low income and low educational levels.

Food insecurity leads poor urban households to develop coping strategies of diverse types. For example, currency devaluation experienced in the 1990s lead urban households from francophone West Africa to modify dietary patterns in order to face nutritional vulnerability. Food-related strategies to cope with economic difficulties included the reduction of meal preparation frequency and, in the worst cases, the limitation of meal sharing. Breakfast was reported as the first option to eliminate or modify because of the high prices of the items included. The preparation of evening meals was stopped, and leftovers from lunch were used for dinner instead. For households experiencing extreme poverty conditions, meal preparation frequency was often arranged on a daily basis, since financial resources or food items were nor regularly available (Fouéré *et al*, 2000). In urban Latin America, where currency devaluations have occurred historically, households might also develop this type of food-related strategy aimed at reducing the effects of nutritional vulnerability, particularly in those members at critical stages of the biological cycle. There is evidence that currency devaluation and other problems derived from the economic crises of the early 1980s and 1990s resulted in poor and middle-income households in Mexico changing their food consumption patterns (INCO, 1989; CCPNS, 1991; Oswald, 1991; Chávez *et al*, 1993 and 1994; Rivera-Márquez & Pérez-Gil Romo, 1994; INNSZ, 1995; Ruiz-Arregui & Rivera-Márquez, 1996).

The experience of food insecurity at the household level involves some form of emotional problem. For instance, Hamelin *et al* (1999) studied concerns about not having enough food to eat and the reactions of these concerns in 98 low income households from Quebec City and rural surroundings. Close to 41 percent of households associated fatigue and other health conditions with insufficient food. Uncertain access to food was linked to stress, feelings of exclusion, powerlessness and pessimism, as well as with the perception of not being able to overcome difficulties and going against held social norms and values. Psychological suffering regarding food insecurity was observed in 41 percent of households. A fifth of the households reported having disrupted relationships as a consequence of the incapacity of parents to feed their children adequately or the more time spent in procuring food. As a consequence of food insecurity, more than 51 percent of households modified their eating patterns, including food items that were considered as non adequate according to their own perceptions of adequate nutrition and dietary intake. For 16 percent of households, experiences of food insecurity was also a determinant of no longer being able to invite friends home for dinner and mealtimes no longer being an opportunity for the members of the household to gather happily. These problems may also affect poor households in urban areas of Latin America.

Food insecurity does not exclusively mean hunger, though. The relationship between inadequate access to food and nutritional deficits is relatively straightforward: the lower the available income, the poorer the dietary intake at the household level. Nonetheless, there is evidence for a close relationship between food insecurity and being overweight. Using data from the USA 1994-

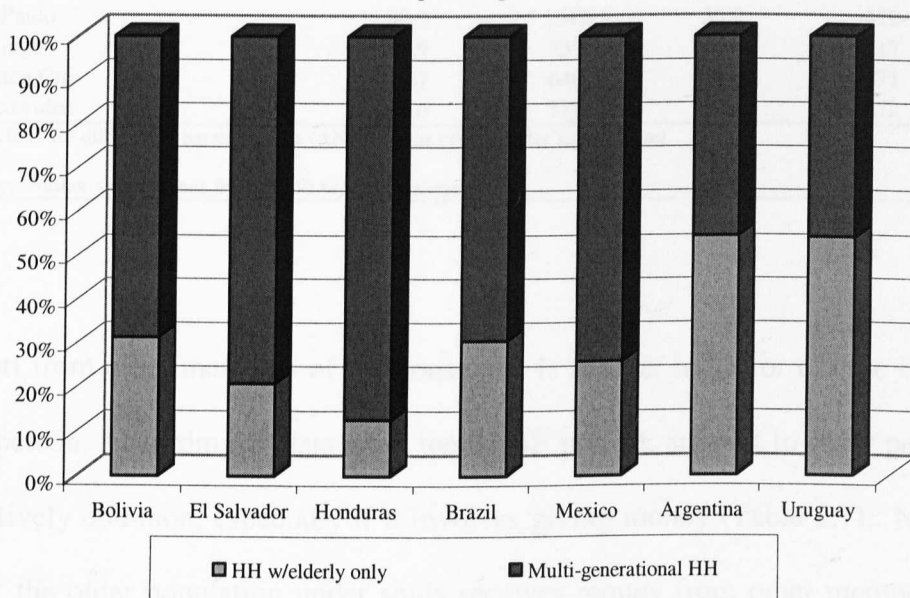
1996 Continuing Survey of Food Intakes by Individuals (CSFII), Townsend *et al* (2001) found that food insecurity was strongly related with being female and having a body mass index (BMI) $> 27.3 \text{ kg/m}^2$ ($n = 4509$, $P < 0.001$). The prevalence of being overweight among women increased as food insecurity did: 34 percent for those who were food secure ($n = 3447$), 41 percent for those who were mildly food-insecure ($n = 966$) and to 52 percent for those who were moderately food-insecure ($n = 86$). In another study carried out in a random sample of 8169 women aged 18 and over from California, Adams *et al* (2003) found that obesity (BMI $\geq 30 \text{ kg/m}^2$) was more prevalent in food-insecure than in food secure women: 31.0 vs. 16.2 percent, respectively. Results showed that food insecurity with hunger was associated with increased risk of obesity for Asian, Black and Hispanic women (OR = 2.81). Even though the association between food insecurity and obesity has not been sufficiently studied, it has been observed that food insecure households rely on a limited variety of foods and their diets are mostly composed of high energy, low cost food items, poor in fibre and deficient in a variety of nutrients (Adams *et al*, 2003; Darmon *et al*, 2003; Ruel 2003; Kennedy, 2004).

A strong link has also been suggested between being overweight and involuntary, temporary food restriction in food insecure households. Highly palatable and rich foods have been found to be overeaten during the few days or weeks that resources for food are available in low income households. In this sense, binge eating can result in weight gain (Townsend *et al*, 2001). Latin American urban households with older people may experience similar problems when resources for food are limited.

2.4.2. Inadequate care for older persons

That an older person has companionship or lives with someone can be assumed as a potential source of care for her or him. With the exception of Argentina and Uruguay, in 1997, most older residents of urban areas from the seven countries appearing in Figure 2.8 lived in multi-generational households, meaning that there was someone nearby them. Living on one's own during old age may, on the other hand, mean enough resources to afford an independent life (CEPAL, 2000).

Figure 2.8. Distribution of multi-generational and older people only households from the total number of households with elderly members in urban areas of selected Latin American countries, 1997. (as a percentage)



Source: CEPAL, 2000

Table 2.6 presents two indicators of care for older persons from the SABE project: living with someone and availability of a partner. Practically, 70 percent or more of older populations from the five selected cities live with someone. However, sex differences are significant ($p < 0.01$): more women live on their own, in

comparison with men. Similarly, the proportions of women without a partner are greater than those of men ($p < 0.01$). According to PAHO (2004), while more men live with a spouse or partner, more women live with a child or another relative.

Table 2.6. Living with someone and availability of a partner for older persons from the SABE project by sex and urban area, 1999-2000

Urban area / sex	Lives w/ someone *		Counts on a partner *	
	%	N	%	N
<i>Men</i>				
Buenos Aires	79.9	306	60.6	220
Sao Paulo	90.1	794	68.7	582
Santiago	90.0	403	54.8	234
Mexico City	90.7	457	67.4	335
Montevideo	87.5	463	58.7	299
<i>Women</i>				
Buenos Aires	68.9	455	27.5	171
Sao Paulo	80.2	1012	35.2	420
Santiago	85.9	737	27.9	217
Mexico City	86.7	640	38.9	271
Montevideo	77.6	711	30.7	272

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

Support from other members of the household is another indicator of care for the older person. According to data from the SABE project, support to older persons is relatively common, especially if it involves giving money (Table 2.7). Nearly half of the older population under study receives money from other members of the household who are 12 years of age and older. Mexico City is the urban area where the most older people are helped with money (57 percent), whereas Buenos Aires is the city where the smallest number of older people are supported by this means (36 percent). Differences observed in providing help through giving money to older members proved to be highly statistically significant ($p < 0.01$). The second most common way in which older members are helped is through offering them services such as transportation or housework. Around 38 percent of the

households from the SABE project help their older members in this way. Sao Paulo reported the highest proportion of help to older people by this means (45 percent), whereas the lowest one was that of Montevideo (30 percent). Local differences were also highly statistically significant ($p < 0.01$). Thirdly, older people are given things they may need like food or clothing. However, the proportion of individuals supported in this way is much lower in comparison with the other two. On average, only 7.5 percent of older persons receiving things. Regional differences were significant in statistical terms ($p < 0.05$). Finally, helping older people by other means did not show statistically significant results.

Table 2.7. Help provided to the older person by members of the household aged 12 and over by urban area. SABE project, 1999-2000

	Money*		Services*		Things †		Other		Total
	%	N	%	N	%	N	%	N	
Buenos Aires	36.0	376	36.5	381	4.6	48	3.9	41	1043
Sao Paulo	44.1	946	45.1	967	7.8	167	9.3	200	2143
Santiago	55.4	723	36.7	479	11.1	145	8.1	106	1306
Mexico City	57.1	712	41.3	515	9.1	114	4.3	53	1247
Montevideo	51.7	749	30.3	439	4.8	69	5.2	76	1450

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

† $p < 0.05$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

2.4.3. Unhealthy household environment and lack of access to health services

According to data from Table 2.8, the household environment seems to be relatively adequate for older persons from the SABE project, when two indicators are analysed: crowding (this is three or more persons sleeping in the same room) and availability of main services in the dwelling (electricity, running water, proper sewage system, proper materials in floors, and toilet). With the exception of Mexico City and Santiago, crowding is prevalent in 5.1 percent or fewer of the

households. Crowding is not only important in terms of transmission of diseases from one member to another, but also in terms of a lack of privacy and the presence of a stressful environment. Most dwellings were, nonetheless, equipped with basic services, except for Buenos Aires and Mexico City where nearly 15 percent did not count on all of them.

Table 2.8. Selected indicators of an unhealthy household environment in older persons from the SABE by urban area, 1999-2000.*

	Crowding		Dwellings with inadequate basic services	
	%	N	%	N
Buenos Aires	3.7	38	14.6	149
Sao Paulo	4.9	104	3.8	80
Santiago	8.8	114	6.5	84
Mexico City	12.4	152	14.2	281
Montevideo	5.1	74	6.3	90

* p < 0.01 for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

A comparative analysis of the five cities selected from the SABE project reveals that a lack of access to health services does not seem to be a major problem in older persons from Montevideo and Sao Paulo, as less than 3 percent of their respective older populations report no coverage (Table 2.9). Whilst Buenos Aires and Santiago are placed in the second and third worst coverage rates, Mexico City showed the highest figure with a quarter of older persons with no access to health services.

Table 2.9. Lack of access to health services in older persons from the SABE project by urban area, 1999-2000.*

	%	N
Buenos Aires	17.3	180
Sao Paulo	2.5	54
Santiago	11.1	145
Mexico City	25.6	318
Montevideo	2.1	30

* p < 0.01 for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

2.5. Indicators of income poverty and the basic causes of malnutrition

Despite methodological limitations, the analysis of both the SABE project database and data from the ECLAC provides useful information on a number of socioeconomic indicators associated with income poverty. Although essentially descriptive, this approach depicts an overview of well-being and living conditions in Latin American urban households with older members between the late 1990s and the beginning of the new millennium. The proportion of households with no source of economic resources from employment coming from a member 12 years of age and older, was relatively low in the five selected cities from the SABE project. Around 13 percent or less of cases had no such source of income; Buenos Aires, Santiago and Mexico City were the three urban areas with the highest proportions reported: 10 percent or more. It was not possible to find out, for instance, the number of providers per household, how much they regularly made per month or what the overall amount of wage income entering the households was (Table 2.10). Nonetheless, information on the amount of monthly wage income in older people is provided.

Table 2.10. Unavailability of income from employment in households from the SABE project by urban area, 1999-2000.*

	%	N
Buenos Aires	13.4	140
Sao Paulo	4.5	97
Santiago	10.2	133
Mexico City	11.2	138
Montevideo	6.6	95

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

Heterogeneous conditions of income from employment among older persons from the five cities of the SABE project are observed in Table 2.11. In Buenos Aires and Montevideo, both cities with two of the highest living standards of urban Latin America during the SABE data collection, and with a demographical transition process completed, most older persons reported incomes of £800 or more during the last month. On the other hand, 50 to 75 percent of older people from Sao Paulo, Santiago and Mexico City reporting a source of wage income, counted on less than £200 during the last month. These differences proved to be highly statistically significant ($p < 0.05$).

Table 2.11. Monthly personal income from employment in older persons from the SABE project by urban area, 1999-2000.*
(in GBP of 2000)

	Buenos Aires		Sao Paulo		Santiago		Mexico City		Montevideo	
	%	N	%	N	%	N	%	N	%	N
< £100	1.7	13	41.1	723	50.2	577	43.8	331	8.1	99
£100 - < £200	2.4	19	26.5	466	24.9	286	25.8	195	3.3	40
£200 - < £400	4.6	36	19.2	337	17.1	196	16.9	128	4.5	55
£400 - < £600	4.6	36	5.3	93	3.5	40	5.6	42	6.0	74
£600 - < £800	3.3	26	2.8	50	1.6	18	2.4	18	4.2	51
≥ £800	83.4	655	5.1	89	2.8	32	5.6	42	74.0	907
	100.0	785	100.0	1758	100.0	1149	100.0	756	100.0	1226

* $p < 0.05$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from the SABE project databases

Ownership of dwellings and other assets available in the household constitute one of the most important indicators of living conditions (Grundy & Holt, 2001). Not owning a house, a piece of land, a means of transport, as well as domestic or entertainment appliances accounts for income poverty in urban households. With the exception of Buenos Aires, around 16 percent or more of dwellings from the selected cities of the SABE project were not owned. The highest proportion is that of Montevideo, with nearly 20 percent of cases in such a condition (Table 2.12).

Table 2.12. Non-owned dwellings in the SABE project by urban area, 1999-2000.*

	%	N
Buenos Aires	9.8	101
Sao Paulo	16.6	355
Santiago	12.1	157
Mexico City	12.0	148
Montevideo	18.6	270

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

Table 2.13 presents the distribution of three means of transport that households often own: car or other type of vehicle, bicycle and motorcycle. Differences found were highly statistically significant ($p < 0.01$). In the first place, a car or other type of vehicle was owned by a quarter or more of households from the five selected cities of the SABE project. Cars or other types of vehicle are by far the most expensive means of transport and, hence, their ownership may provide an approximate idea of people's purchasing power. Differences observed between urban areas might well suggest socioeconomic differentials. The high proportions

observed in Sao Paulo and Mexico City can however be explained by the fact that these are two of the biggest urban areas of the world, and people need this means of transport to travel long distances.

In the second place, bicycles are owned by a quarter of the households. In comparison with a car or a motorcycle, this means of transport is cheaper and can be easily owned by anyone. It contributes to good health and does not pollute the environment. The relatively low percentage of bicycle owners reported in Sao Paulo can be explained by the fact that traffic-related risks discourage people from using them. However, in Mexico City, where traffic accidents could be as frequent as in Sao Paulo, the proportion of household with this means of transport is 2.4 times higher. Finally, motorcycles, a means of transport that could actually be as expensive as a car, are owned by less than 7 percent of the households studied in the SABE.

Table 2.13. Means of transport available in households from the SABE project by urban area, 1999-2000.*

Urban area	Vehicle: car / other		Bicycle		Motorcycle	
	%	N	%	N	%	N
Buenos Aires	27.2	279	26.5	272	1.7	17
Sao Paulo	40.9	875	12.3	263	1.2	26
Santiago	26.1	341	26.4	345	1.2	16
Mexico City	38.8	478	29.3	361	2.1	26
Montevideo	30.9	446	35.4	511	6.7	97

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

Other assets included in the SABE project were those reported in Table 2.14.⁶ For illustrative purposes, the list of assets were divided into domestic appliances and entertainment equipment. From the first category, the fridge is the most common: 89 percent or more of households own this appliance. With the exception of Montevideo, washing machines are owned by 70 percent of households. There is at least one microwave in a quarter or more of households from the five cities, except for Buenos Aires, where 16 percent own one of this kitchen appliances. Differences between cities are considerable ($p < 0.01$). With regards to those appliances used for entertainment, the highest average proportion is that of the television (97 percent), followed by radios, CD players, Hi-Fi systems (88 percent) and video cassette recorders (VCR) (40 percent).

Table 2.14. Availability of selected assets in households studied in the SABE project by urban area, 1999-2000.*

	Fridge		Washing machine		Microwave	
	%	N	%	N	%	N
Buenos Aires	98.8	1016	73.2	753	16.4	168
Sao Paulo	98.2	2102	72.7	1556	42.2	902
Santiago	94.1	1226	82.4	1074	30.5	397
Mexico City	89.6	1106	72.4	894	33.4	412
Montevideo	97.2	1407	62.3	902	26.2	379

	Television		VCR		Radio, CD, Hi-Fi	
	%	N	%	N	%	N
Buenos Aires	98.1	1008	38.2	392	92.3	947
Sao Paulo	96.2	2058	43.4	928	89.9	1925
Santiago	97.9	1275	30.2	393	76.3	994
Mexico City	96.0	1186	51.0	630	87.0	1075
Montevideo	97.9	1417	38.2	553	96.3	1393

* $p < 0.01$ for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

⁶ Although the full list of domestic appliances from the SABE questionnaire included heating, air conditioning and fans, in this document it has been restricted to the most frequent ones.

Lack of economic resources is one of the most common problems for the 60 and over population throughout urban Latin America. According to the ECLAC (CEPAL, 2000), in 1997, between 40 and 60 percent of older persons from this region had no secure source of income either from a pension or directly from a paid job. Being an older person is certainly not a synonymous with being dependent and frail (Kono, 2001). However, given income uncertainty, dependency on other members of the household — and (where available) on assistance provided by the state or organisations of a diverse nature — may occur (del Popolo, 2001), and may additionally account for social vulnerability (CEPAL, 2000). Financial dependency may limit an older person's bargaining power *vis-à-vis* other members of the household and, hence, her or his quality of life.

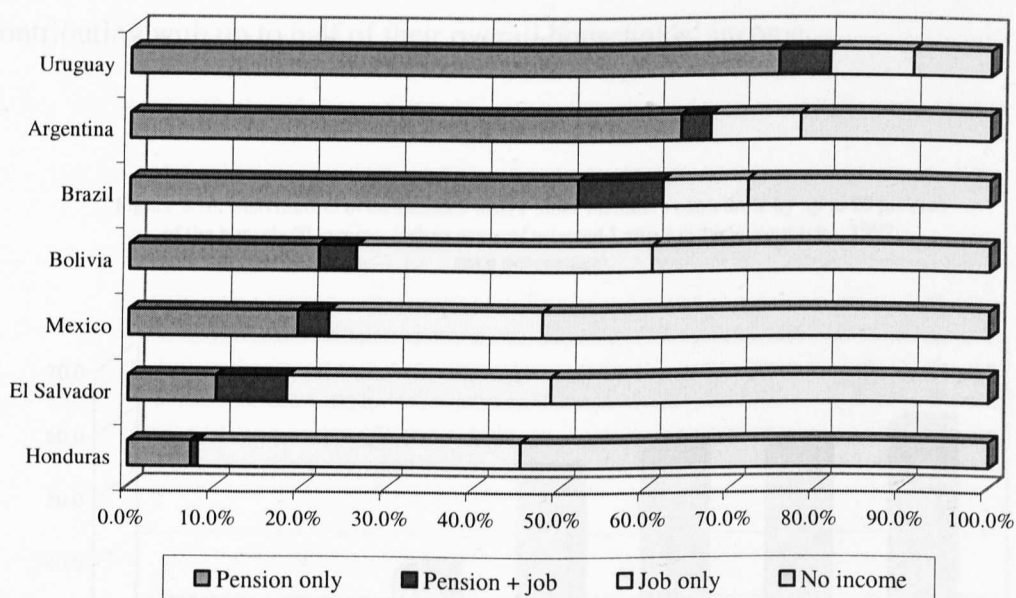
According to Figure 2.9, only in urban areas of Argentina and Uruguay were more than 60 percent of older adults entitled to pension benefits during 1997. This gives provides of better security systems in both countries during the reported year. Furthermore, this coincides with better socioeconomic indicators expected in those regions where demographic transition has reached its highest level. Some contradictions among the other examples can be noted, however. In urban Brazil, around half of older people counted on a pension as a main source of income, whereas in Mexico, which, like Brazil, is undergoing a stage of full demographic transition, only around 20 percent of this population group lives in these conditions. On the other hand, in Bolivia, where demographic transition is still incipient, pension benefits reached practically the same proportion of urban older

people as in Mexico. Honduras and El Salvador, which both experienced a moderate demographic transition, were below both the Bolivian and Mexican levels of pension provision. Despite the fact that, on average, many Latin American pensions surpass the nominal or official poverty line, they are not often enough to fully meet the basic needs of recipients (UN, 1999; CEPAL, 2000). Pension systems all over the world have lived a long-term crisis despite a number of reforms (Tracy, 1991; Cowart & Serrow, 1998; CEPAL, 2000). In Latin America, these reforms to pensions systems took place particularly between the early eighties (the Chilean case) and the first half of the nineties (e.g. Peru, Colombia, Argentina, Uruguay, Mexico, Bolivia and El Salvador) (Murad-Saad, 1999).

Figure 2.9 also shows that, in 1997, 10 percent or less of the urban older people from seven Latin American countries selected received a pension and had a job at the same time. This figure does not only give proof of how unusual counting on two sources of income during old age is, but also of the few individuals that might have had the opportunities to somehow improve their income level. The proportion of adults aged 60 and over with a job as their only source of income was much greater in countries where demographic transition had not been fully completed, not necessarily meaning that these subjects participate in the workforce surrounded by the best conditions in terms of environment, payment and working hours. Such is the case of Honduras (37 percent), Bolivia (34 percent) and El Salvador (31 percent). In Mexico, a quarter of the urban older population had a job during the same year. Gender differences in terms of occupation during old age have been pointed out by PAHO (2004): over the last

few years, only 8 percent of women aged 60 and over count on paid employment. On the other hand, around half of the Mexican urban older people had no income whatsoever. This percentage was similar to that in Honduras and El Salvador. Meanwhile, in urban areas of Brazil, Argentina and Uruguay, countries with a higher proportion of pensioners in comparison with the other four examples, around 1 out of every 10 adults aged 60 and over had a job in 1997. These three countries, particularly Argentina and Uruguay, also had the lowest percentages of older people with no sources of income.

Figure 2.9. Sources of income in older persons from urban areas of selected Latin American countries, 1997.
(as a percentage)



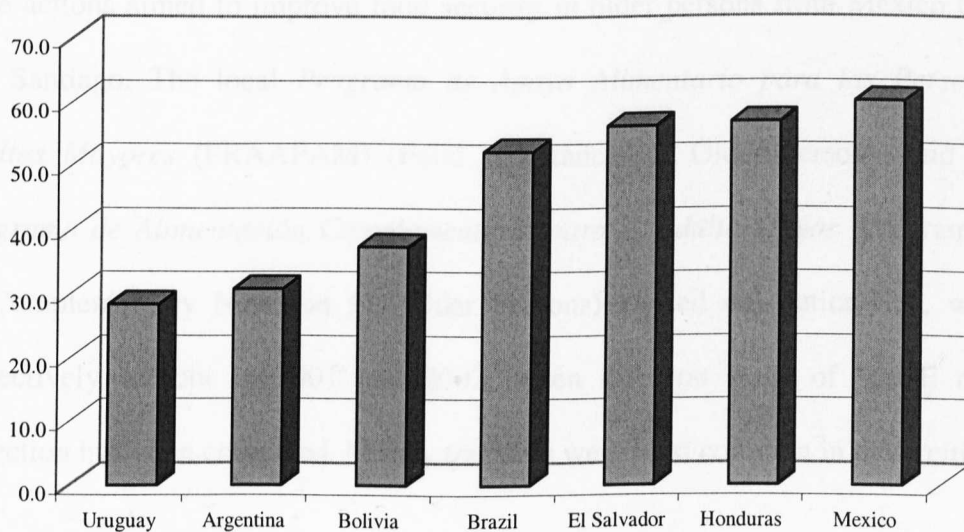
Source: CEPAL, 2000

Shifts in living arrangements derived from the ageing process in urban societies from developing countries, does not necessarily mean economic dependence for older persons. It is common that some individuals play a crucial role in the provision of economic resources for their households regardless of the amount or

type of earnings they get (HelpAge International, 1999; Gorman & Heslop, 2002). Though sometimes scarce, these resources may help to lessen both inequalities in the distribution of income within the household and the incidence of poverty (CEPAL, 2000). In other cases, shortage of resources in the household is so extreme that, even though extra income coming from an older member is pooled, the basic needs of the unit are only heterogeneously or partially met. Either way, data currently available do not say much about the intra-household allocation of resources.

Figure 2.10 presents a distribution of adults aged 60 and older living in multigenerational urban households from selected Latin American countries contributing with up to half of their overall households' income.

Figure 2.10. Distribution of households where older members contribute by up to 50 percent of the household income. Urban areas of selected Latin American countries, 1997. (as a percentage)



Source: CEPAL, 2000

In 1997, more than 50 percent of the older adults from urban areas of El Salvador, Honduras, Brazil and Mexico contributed to their households' income with the above-mentioned proportion, whereas in the other three countries it was less than 40 percent of subjects whose share to the household income was that high.

The presence of social safety nets among older people from the SABE project is not very common. On average, between 1999 and 2000, only 5.4 percent of subjects benefited from interventions run by local or national governments, senior citizens' centres, home-care services, churches or temples, among others (Table 2.15). If analysed by urban area, Santiago had the highest proportion of households with older persons receiving some type of assistance (around 10 percent), whereas in Mexico City, only 3 households with older persons out of every 100 participating in social programmes receive some type of assistance. Overall, food programmes were the most frequent interventions in the SABE project. It is worth mentioning that, between 1999 and 2000, there were no large-scale actions aimed to improve food security in older persons from Mexico City and Santiago. The local *Programa de Apoyo Alimentario para las Personas Adultas Mayores* (PRAAPAM) (Food Assistance for Older Persons) and the *Programa de Alimentación Complementaria para el Adulto Mayor* (Programme of Complementary Nutrition for Older Persons) carried out nationwide, were respectively set out in 2001 and 2002, when the first stage of SABE data collection had been completed. Money transfers were least common in these cities.

Table 2.15. Availability of social safety nets in households studied in the SABE project by urban area, 1999-2000.*

Urban area	Availability of safety nets	
	%	N
Buenos Aires	7.0	73
Sao Paulo	4.0	86
Santiago	9.6	125
Mexico City	3.0	38
Montevideo	3.6	52

* p < 0.01 for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

The third way by which older people studied in the SABE project received help was from people not living in the household. External help was classified into three main categories: no help, money only or money plus other type of help; and services, food, clothing or anything except money (Table 2.16).

Table 2.16. Help given to older persons by people not living in the household. SABE project, 1999-2000*

Urban area	No help		Money only or money + other help		Services, things, etc., but no money		Total
	%	N	%	N	%	N	
Buenos Aires	48.5	506	24.6	257	26.8	280	1043
Sao Paulo	41.2	883	27.7	593	31.1	667	2143
Santiago	46.6	608	29.0	379	24.4	319	1306
Mexico City	45.5	568	42.9	535	11.5	144	1247
Montevideo	56.7	822	14.5	210	28.8	418	1450

* p < 0.01 for differences between cities (ANOVA was estimated for significance)

Source: Author's estimations from SABE project databases.

On average, 47 percent of the entire sample was not helped in any way by anyone not living in the household. Montevideo has the highest proportion of individuals aged 60 and over in this latter stratum with around 57 percent. While there is an average proportion of 30 percent of older people being helped with money only or

with money plus other things (i.e. food, clothing, housework, personal care, transportation, etc.) coming from outside the household, in Mexico City, 43 out of 100 older subjects receive this type of external help. Finally, Sao Paulo and Montevideo are the urban areas where more older adults are helped with anything except money. In Mexico City, where more older adults receive money from external sources of help, things, services or help of different a nature are not that frequent (11 percent). Regional differences proved to be highly statistically significant ($p < 0.01$).

2.6. Concluding remarks

Despite the lack of up-to-date data on most aspects regarding the linkages between malnutrition, food insecurity and poverty in older persons from urban Latin America, it has been possible to outline throughout this chapter a basic descriptive panorama of how the different components of such a nexus express themselves in representative metropolitan areas from the region. With some precautions, much of what has been presented in this chapter could also be extrapolated to other urban scenarios sharing similar characteristics. From an empirical point of view, this description gives proof of the demographic, socioeconomic, nutritional and quality of life-related diversity among older populations from this part of the world, illustrating, at the same time, common denominators of getting old within its boundaries.

Broadly speaking, data have shown that the more consolidated the stage of demographic transition, the greater the proportion of urban households with at least one member aged 60 and over, and the lower the percentage of multi-

generational households. Furthermore, the smaller the proportion of older individuals living with someone, the larger the percentage of those having no partner. Higher stages of demographic transition have traditionally accounted for better living standards. Santiago is probably the best example of this. Meanwhile, such might have been the case of Buenos Aires and Montevideo, at least before economic shocks struck Argentina and Uruguay between 2001 and 2002. With some exceptions, the fact that older adults can afford to live on their own may hence be an expression of wealth. Paradoxically, in Mexico City where increasing rates of demographic ageing have been taking place over the last few decades, the fact that some older adults live on their own may be a synonym of exclusion and poverty.

Through analysing the different income-related indicators, poverty seems to be common in older persons from urban areas of Latin America in one way or another. Either owing to limited access to wage income at both the household and at the individual level, or to the unavailability of assets, households with older persons experience some degree of deprivation. Consistently, Mexico City appears to be one of the urban areas with the worst conditions in this sense. Contemporary urban societies of the region continue to be supportive towards older populations, however. The provision of help, services and, mainly, money by relatives, friends and other people is high in practically all selected cities. In Mexico City, for instance, remittances account for an important share of the total household income. More details on remittances will be provided in Chapter 3.

Even though a lack of health services, along with the presence of an unhealthy environment affects older people's quality of life in the five selected urban areas, Mexico City registered greater proportions of both negative conditions.

Unfortunately, food insecurity in late stages of life itself cannot be easily estimated, given the limited availability of works. Inferences through observing some of the determinants suggested in Chapter 1 and brought up to the empirical discussion in this chapter can, nonetheless, be made. For instance, by focusing on the high prevalences of people being overweight and obese (particularly among older women), the complexity of epidemiologic profiles, the unavailability of a partner in many cases, the lack of support from others or an inadequate access to resources and assets, it would be valid to presuppose that uncertain access to food and malnutrition affects many older adults. Furthermore, the existence of regional differences means that old age food insecurity in urban Latin American should be analysed both as a whole, and on a country-by-country basis.

The lack of information systems on older people's nutrition and food security is, on the other hand, a major limitation for decision-makers to implement programmes all over the region according to the specific needs of a given older population group (Palloni, 1999; Martínez-Almanza *et al*, 1999). However, the data analysed in this chapter also gives evidence for the magnitude of the challenges that governments, societies and older people themselves are already facing and will continue to face over the next decades. The predicted growth in the proportions of urban adults aged 60 and over in comparison with the general population as a whole, together with the accompanying shifts in the patterns of

death and disease that such a demographic phenomenon produces, have already started to demand more accurate actions from policy planners, as well as more accurate information for diverse actors to cope with a number of potential scenarios concerning public health and socioeconomic problems derived from the ageing of contemporary societies in Latin America. Providing health care and social welfare to older people should be a priority not only for countries where the process of epidemiological transition is completed or in advanced stages, but also for those set to experience a rapid aging of their populations in the future. In sum, this holistic picture of the particular expressions of ageing in Latin American urban areas can well be a valid justification for the study of uncertain access to food during old age.

Following the same structure of the theoretical framework, Chapter 3 presents a review of current social programmes that may positively impact on the relationship between malnutrition, food insecurity and poverty in older people in diverse ways. It is mostly a discussion of interventions carried out in Latin America based on different schemes and responding to different socioeconomic and cultural contexts.

Chapter 3. Improving nutrition and food security in old age: a review of interventions in Latin America and other contexts

Previous chapters presented two complementary approaches to the study of malnutrition, food insecurity and poverty in old age within Latin-American urban areas. In Chapter 1, a theoretical framework to understand the above-mentioned relationship was developed, whereas in Chapter 2, despite some limitations, current available information on older people from the region was used as a way of showing how the various determinants of inadequate nutrition, uncertain access to food and a lack of resources manifest themselves in particular ageing contexts. This chapter presents information on a number of programmes and actions aimed at improving older people's well-being by focusing on one or more specific areas of the relationship between malnutrition, food insecurity and poverty during old age. The selection of programmes and actions was not random, but rather chosen following the structure of the theoretical framework. Where possible, the examples selected for discussion relate to ongoing interventions carried out in Mexico City, other parts of Mexico or other parts of Latin America.⁷ A few examples from other parts of the world were presented where no suitable Latin American examples could be identified.

⁷ The information referred to the Chilean case is the result of a number of interviews addressed to operative health and nutrition staff, as well as to civil servants in the Ministry of Health at different levels. Carried out between March and April 2003 by the author of this thesis together with Dr. Alan Dangour from the London School of Hygiene and Tropical Medicine, the interviews took place in the Ministry of Health itself and in health centres, rural health posts and hospitals from Santiago and its metropolitan region, Valparaíso and Concepción. Two interviews were addressed to beneficiaries as well. This information was collected as part of a proposal for the evaluation of PACAM to be carried out by the London School of Hygiene and Tropical Medicine in co-ordination with the *Instituto de Nutrición y Tecnología de Alimentos* (Institute of Nutrition and Food Technology) (INTA). Other sources consulted were Ministry of Health (2001 and 2002). Data on the Argentinian case, was mainly obtained through direct interviews that the author of this work conducted in September 2003 with civil servants of both the *Ministerio de Desarrollo Social* (Ministry of Social Development) and the *Instituto Nacional de Servicios Sociales para Jubilados y Pensionados* (INSSJP) (National Institute of Social Services for the Retired and Pensioners).

3.1. Tackling malnutrition and its immediate causes

At present, governments in some middle-income Latin American countries focus much of the social policy addressed to older persons on the delivery of in-kind benefits. This is the case for food assistance. With regional differences, Chile, Argentina and Mexico provide older populations with either supplementary meals, food baskets or hot meals, to mention just a few examples, all of which aim at improving individual food security and nutritional status. These actions are not designed to be carried out in isolation, however. In-kind food assistance is commonly accompanied by concomitant interventions on health and other quality of life-related aspects, such as the surveillance of chronic medical conditions, assessment of functioning, free prescriptions, periodical health check-ups or a continuous assessment of the nutritional status, among others. Other programmes stimulate older persons participation in their community or in leisure activities while benefiting from in-kind food assistance.

In short, by combined intervention *packages*, some governments tackle malnutrition, inadequate dietary intake and disease, namely the immediate causes of the object of interest of this thesis previously discussed in Chapter 1. Although technically similar, the three examples presented in the following sections differ on some characteristics like degree of consolidation, specific type of benefits, accompanying interventions and costs.

3.1.1. Nutrition interventions. The Chilean *Programa de Alimentación Complementaria para el Adulto Mayor* (PACAM)

As a country undergoing one of the most advanced stages of demographic transition in Latin America (see Chapter 2), Chile has a long tradition of providing health care to older people. However, it was not until the approval of the Official Guidelines for Care to Older Persons, in 2002, that one of the most important programmes of its type was launched, making health policies for this population group a priority within the social agenda: the *Programa de Salud del Adulto Mayor* (PSAM) (Health Programme for Older Persons). PSAM promotes successful ageing, comprises a number of actions in health promotion and care, and is linked to public programmes addressed at alleviating poverty. Given that the government was also interested in improving access to a healthy diet and nutritional status during late life, the *Programa de Alimentación Complementaria para el Adulto Mayor* (Programme of Supplementary Nutrition for Older Persons, hereafter PACAM) emerged as a core component of the social assistance addressed at older people.

PACAM is officially defined as a group of actions in nutrition contributing to improvements in health and quality of life among this population. First conducted as a pilot programme between 1998 and 2000, PACAM started benefiting older people aged 70 and over registered in 87 selected health centres of the metropolitan region of Santiago, as well as the fifth and the eighth regions that correspond to the provinces of Valparaíso and Concepción, respectively. The fact that individuals from the latter age group are the principal recipients was at first owing to purely economic reasons. Then, research carried out by both the

Ministry of Health and the *Instituto de Nutrición y Tecnología de Alimentos* (Institute of Nutrition and Food Technology) (INTA) revealed that this is the time of significant declines in physiological and cognitive function, health and other aspects of life. An evaluation of this pilot programme revealed high levels of satisfaction, 70 percent compliance with the take-up, as well as good tolerance and acceptance of PACAM's main feature: the *Crema Puré Años Dorados* (Golden Years Mix)⁸. By 2001, PACAM had national coverage and extended the benefit to other older persons in addition to those aged 70 and over. The main characteristics of PACAM are shown in Table 3.1.

Table 3.1. Main characteristics of PACAM

Issue	Description
Benefit	<ul style="list-style-type: none"> • Two one-kilo sachets of <i>Años Dorados</i> delivered on a monthly basis • Four flavours are available: lentils, pea, asparagus, mixed vegetables
Use of the benefit	<ul style="list-style-type: none"> • <i>Años Dorados</i> can be prepared with water or hot milk and may be eaten as a soup, cream or purée, and can be combined with other foods • A recipe book is often handed out to beneficiaries so that they can prepare the meal in different ways
Eligibility	<ul style="list-style-type: none"> • Adults aged 70 and over nationwide • Persons aged 65 and over undergoing anti-tuberculosis treatment nationwide • Persons aged 65 and over living in homes for destitute people run by the <i>Hogar de Cristo</i> charity organisation nationwide
Budget (2003)	<ul style="list-style-type: none"> • CL\$ 30.5 million (£28 million) • Chilean Government pays roughly CL\$ 1,500 (£1.4) for every one-kilo package of meal
Partnership	<ul style="list-style-type: none"> • Ministry of Health • Private food firms (Nestlé, IPAL, SODECSO and PROEXA, etc.) participate in public bidding processes to make <i>Años Dorados</i> • National Supply Centre (CENABAST)
Other characteristics	<ul style="list-style-type: none"> • Nutritional assessment and counselling • Links to PSAM

Source: Interviews by Rivera-Marquez, J.A., and Dangour, A. from the London School of Hygiene and Tropical Medicine; Ministry of Health (2001 and 2002)

⁸ Information provided by Mrs Alicia Villalobos, Director-General of PSAM.

Crema Puré “Años Dorados” (hereafter, *Años Dorados*) consists of a pre-cooked instant meal made out of cereals and legumes, and fortified with vitamins and minerals. Broadly speaking, 50g of *Años Dorados* supplies 25 percent of daily micronutrient requirements (Ministerio de Salud, 2001). Every beneficiary (or a previously authorised relative) is entitled to collect two one-kilo sachets of the mix on a monthly basis. Collection points are located in rural health posts, health centres or hospitals. Other components of PACAM are a monthly nutritional status assessment and counselling. Attendance at the latter is mandatory — no beneficiary is allowed to collect the meal unless she or he is first evaluated by the nutritionists. It is worth mentioning that, in Chile, there is one chief nutritionist per health service (28 all across the country) that co-ordinates nutritionists from every hospital, health centre and rural health post of their corresponding service. Nutritionists, general practitioners, nurses, other paramedic staff, social workers, community volunteers, undergraduate and post-graduate students, as well as the staff in charge of handing out the meal at the collection points are all responsible for linking PACAM and PSAM actions. An older person cannot be a beneficiary of PACAM without being under medical supervision by PSAM. Thus, for instance, if an older person is to collect the two sachets of *Años Dorados*, she or he will first have their blood pressure taken, be checked for diabetes and have a nutritional assessment, as well as body mass index evaluation. Data are then recorded and subjects are told when they are due for the next appointment.

At present, PACAM is supposed to cover 100 percent of the country, which is achieved using the network for the distribution of milk powder for children, a

long-standing national programme. This is made possible as the decreased fertility rate has reduced the number of children requiring milk; therefore, the Ministry of Health was able to launch *Años Dorados*. At the start, there were large amounts of older people waiting for the introduction of the meal. However, the response from the government was not that fast, bureaucratic hold-ups delayed the delivery process, making beneficiaries wait for more than a month on occasions. As the programme has been consolidated, however, distribution is getting more efficient.

Health authorities acknowledge that the current take-up rate of *Años Dorados* is rather low, averaging 50 percent across the country. The record sheets that every health centre, rural health post or hospital send on a monthly basis to the health services, and subsequently forwarded to the Ministry of Health in Santiago, show that take-up varies enormously among communities within a region and, sometimes, from one health centre to another. Higher response rates are commonly registered in the poorest zones and/or in rural areas, whereas in highly urbanised concentrations and/or wealthier settlements take-up is lower. Either way, a lack of strategies for increasing compliance *per se* is not an obstacle for the health authorities to pursue instead “higher standards of quality” by aiming at reaching the goal concerning the consumption of 100g/day per beneficiary, which theoretically would guarantee optimal nutritional conditions. It is worth mentioning that the important role that milk programmes played in decreasing the prevalence of undernutrition among children in the 70s and 80s, created a strong feeling of trust towards this drink all over the country, especially in the poorest sectors of society. At present, Chileans all over the country still think of milk as one of the healthiest food items, and of the milk programme as one of the

strongest pillars of social policy. PACAM beneficiaries are not the exception, and constantly expressed a preference for at least one kilo of instant milk every month and just one kilo of *Años Dorados*. Fully aware of this preference, which in some cases turned into a recurrent complaint by some beneficiaries, the health authorities consider that a change of this nature might raise the take-up rate of PACAM. In July 2005, the milk component of PACAM *Bebida Lactea* was introduced.

Whatever the reasons for non-attendance, there is practically no follow-up of people who do not turn up regularly to collect their *Años Dorados*. Very little is also done by the clinics regarding the recruitment of new beneficiaries, with staff informing potential recipients about PACAM *in situ* but not making home visits or telephone calls. At the beginning, PACAM was advertised on posters outside health centres, but currently, staff feel that the existence of PACAM is well known among older people. Potential beneficiaries are also informed about the programme when they attend social clubs for older people.

There is a strong belief that if staff were better trained to deal with older people, carrying out their duties according to the official guidelines, compliance would increase significantly. Nonetheless, no real attempts to increase take-up have been made so far. On the whole, no further actions other than giving out leaflets, encouraging people who miss distribution at the collection points, giving very basic instructions or organising sporadic demonstration sessions to show how to prepare *Años Dorados* are carried out. Moreover, none of these actions take place on a regular basis. It gives the impression that every health service, with its

associated health centres, rural health posts and hospitals, are rather autonomous in deciding what they consider necessary to do or what they can do according to their resources. Some civil servants staff think that coverage would increase if decision makers were more committed to the programme and communities were more supportive towards government efforts.

People often get bored of having to eat the same meal every day and having no more choices than the same one or two flavours available every month at the collection points. Poor knowledge about different ways of preparing *Años Dorados* other than just by adding water or milk accounts for the loss of interest in attendance. Inappropriate ways of preparing it resulting from a lack of education from PACAM staff (e.g. less or more water or milk per portion than suggested), as well as an unhealthy environment (e.g. water or cookware) at the household level, are causes of discomfort and may turn into serious health problems for recipients. Usually, beneficiaries share the so-called *sopita* (“little soup”) with other members of the household, with relatives, neighbours or friends, but it is not rare for some of them to feed their pets on *Años Dorados*. Accumulation of stocks is also common, especially among couples formed by older people and households with two or more beneficiaries: four or more kilos of the mix seems to be too much to eat in a month. Other problems concerning the beneficiaries are, for instance, homebound individuals with no assistance that cannot attend clinics, or recipients who forget to collect the meal on a regular-basis. It appears that wealthier older people do not use the programme because they “do not want to take food from poorer people”.

Half-kilo packages of *Años Dorados* used to be sold in supermarkets nationwide at £0.97 each. The intention of this measure was, on the one hand, that non-older people — as well as older people that run out of the mix — could access it at convenient prices. On the other hand, it was acknowledged that if the meal was sold it was because it was of value. Hence, people did not see the benefit as a low-quality “gift” from the government.

Finally, it is important to mention that no rigorous impact evaluations of PACAM have been carried out to date. However, health authorities are confident that through the *Encuesta de Funcionalidad del Adulto Mayor* (Survey on Older Person’s Functionality) (EFAM, to use its Spanish acronym), which was set up in 2003, they will get enough information to detect the progress of the programme. EFAM will be the instrument by which all interventions for older persons will be measured, and its results will constitute a means through which to negotiate funding increases. EFAM is also thought to be the means to obtain information on older people who have stopped attending health centres and rural health posts. Despite a lack of impact evaluation, both staff and beneficiaries consider that PACAM is beneficial and improves the health of the older population.

3.1.2. Facing inadequate dietary intake and disease: The Argentinian *Beneficio de Complemento Alimentario* (BCA)

One of the means by which the Argentinian Government has tried to improve nutrition and food access for older persons is by delivering in-kind food benefits. The most representative example of such a scheme is the *Beneficio de Complemento Alimentario* (Supplementary Food Benefit, hereafter BCA), which

is an initiative derived from the large-scale *Programa de Promoción del Bienestar de los Mayores* (Programme for the Promotion of Well-being in Older Persons, hereafter Pro-Bienestar). The main characteristics of Pro-Bienestar are shown in Table 3.2.

Table 3.2. Main characteristics of Pro-Bienestar

Issue	Description
Objectives	<ul style="list-style-type: none"> • To meet nutritional needs of low-income beneficiaries • To combat solitude and isolation in older beneficiaries • To promote actions to make older people feel valued • To improve the quality of life of beneficiaries
Benefits	<ul style="list-style-type: none"> • Food and nutrition-related benefits through the <i>Beneficio de Complemento Alimentario</i> (BCA) (Supplementary Food Benefit) • Preventive health care actions, health promotion • Physical activity programmes • Leisure and cultural activities • Help in cases of domestic violence • Creation of social networks among beneficiaries
Eligibility	<ul style="list-style-type: none"> • Pensioners aged 70 and over receiving the minimum pension rate by INSSJP: between AR\$ 200.0 to AR\$ 250.0 (£43.0 and £54.0) • Disabled persons and female pensioners with children aged 14 or under • No other source of income available • No economic support from relatives • Exceptionally, those not fulfilling the previous requisites but living at <i>social risk</i> might be eligible
Budget (2001)	<ul style="list-style-type: none"> • Around AR\$ 95,000,000 (£20,474,137)
Partnership	<ul style="list-style-type: none"> • Federal and municipal governments and institutions • Red Cross (international), Caritas (Argentina) and other NGOs • Universities and other academic institutions • <i>Instituto Nacional de Tecnología Agropecuaria</i> (INTA) (National Institute of Agricultural Technology) • <i>Ministerio de Trabajo de la Nación</i> (Ministry of Labour)

Source: Direct interviews, INSSJP, 1992a; Giordiano *et al*, 2002.

Both *Pro-Bienestar* and BCA were designed to provide extra benefits to older people receiving the minimum pension rate and living in extreme poverty throughout the country. In 2003, *Pro-Bienestar* attended around 480,000

beneficiaries nationwide, corresponding to approximately 14 percent of all the beneficiaries of the Ministry of Health's *Instituto Nacional de Servicios Sociales para Jubilados y Pensionados* (National Institute of Social Services for Retired People and Pensioners) (INSSJP). It is worth noting that the principal programme run by this latter institution is the *Programa de Atención Médica Integral* (Programme of Comprehensive Medical Care) (PAMI, to use its Spanish acronym), which provides a wide range of health and social services for around 3.5 million beneficiaries. This figure represents approximately 72 percent of the Argentinian population aged 60 and over. The presence of this *obra social* (social initiative) is so important for Argentinians that literally nobody refers to the INSSJP by its own name but by PAMI's. For this reason PAMI will be used instead of INSSJP, hereafter.

BCA is a food-oriented programme consisting of either hot meals prepared and served on a daily basis in *comedores* (refectories), a daily provision of hot meals to take away or a monthly delivery of food baskets (Table 3.3). Beneficiaries are those pensioners aged 70 and over receiving the minimum pension rate (AR\$ 200 to 250, approximately £43 to £45), with no other source of income and no economic support from relatives and friends. Priority is given to older people living alone, disabled persons and their dependents, female pensioners with children aged 14 or under or with seven children or more. Exceptionally, those not fulfilling the above-mentioned criteria but living at social risk can benefit from BCA.

Table 3.3. Modalities and characteristics of the *Beneficio de Complemento Alimentario*.

Modality	Characteristic
<i>Comedores</i> (refectories)	
- Benefit	<ul style="list-style-type: none"> • Lunch prepared, served and consumed on the premises of the <i>Centros de Jubilados</i> (Centres for Retired People) • Set menu consists of a starter, main course and fruit or dessert • Each lunch provides 1000 to 1200 kcal
- Specific eligibility requirements for individual programme beneficiaries	<ul style="list-style-type: none"> • Beneficiaries of INSSJP able to go out and turn up to the refectory of their local <i>Centros de Jubilados</i>: • Priority is given to those living alone
- Eligibility requirements for the <i>Centro de Jubilados</i>	<ul style="list-style-type: none"> • Own kitchen, storage facilities and a refectory or should count on <i>ad hoc</i> premises lent by other organisations
<i>Viandas</i> (meals to take away):	
- Benefit	<ul style="list-style-type: none"> • <i>Viandas</i> (e.g. lunch) consist of a starter, a main course, a desert or fruit served in proper containers so that beneficiaries can easily take them away and warm them up at home if necessary
- Specific eligibility requirements for individual programme beneficiaries	<ul style="list-style-type: none"> • Homebound beneficiaries
- Eligibility requirements for the <i>Centro de Jubilados</i>	<ul style="list-style-type: none"> • Proper kitchen but no facilities to eat in • An organised system to deliver <i>viandas</i> at lunchtime
Food baskets	
- Benefit	<ul style="list-style-type: none"> • A number of non-perishable foods (e.g. cooking oil, sugar, milk powder, dried chickpeas, chicken stock cubes, tea, noodles, wheat flour, rice, etc.) • There are food baskets for 1, 2 and 3 people
- Specific eligibility requirements for individual programme beneficiaries	<ul style="list-style-type: none"> • Food baskets are handed over to beneficiaries where their monthly meetings take place (i.e. <i>Centro de Jubilados</i>, community schools, social clubs, chapels, etc.)
- Eligibility requirements for the <i>Centro de Jubilados</i>	<ul style="list-style-type: none"> • Food baskets are convenient when neither a kitchen nor a refectory are available

Source: Torres *et al.*, 2001; Giordiano *et al.*, 2002; PAMI-INSSJP, 1994 *a, b* and *c*; INSSJP, 1992*b* and 2000

As discussed in Chapter 2, with respect to its total population, Argentina has one of the highest proportions of people aged 60 and over in Latin America, together with Uruguay and Chile. This expression of a full demographic transition explains

why the Argentinian government decided to tackle the health and social challenges of an ageing society through comprehensive programmes aimed at improving the quality of life of older persons. In this context, food assistance for this population group has been provided over recent years by the *Ministerio de Desarrollo Social* (MDS) (Ministry of Social Development) and the INSSJP. While the MDS attends food and other needs of older people with no benefits from contributory pensions, the INSSJP covers those living in poverty who receive a low-rate contributory pension.

Since 1992, when both *Pro-Bienestar* and BCA were launched, actions addressed at improving food security in those older people entitled to minimum pension benefits have changed. The provision of *meriendas reforzadas* (light dinners) at the refectories and the weekly delivery of supplementary food baskets composed of perishable foods such as meat, fruit and vegetables are no longer available. These changes may have responded to the definition of different priorities from one administration of PAMI to another, which is common attitude in social policy all across Latin America. A lack of interest by people involved in the programme may have also account for the interruption of some benefits. Commissions organising the delivery of benefits may have not be willing to participate any more due to the big efforts that this task implies, especially if the same group of people is in charge of it for a long time. More particularly, however, the lack of resources resulting from the recent economic collapse may have caused the current two-month delivery of food baskets instead of a monthly one as planned. The collapse of the Argentinian economy meant a drastic reduction in the amount of money that the government spent on the two hot meal modalities and,

particularly, on the food baskets. Between 1992 and 1993, AR\$ 60 — around £40 — was spent on every beneficiary of BCA. In 2003, both *comedores* and *viandas* (food to take away) modalities still represent around AR\$ 60 per beneficiary, but this amount of money has come to be worth approximately £13. Current food baskets, on the other hand, cost around AR\$ 26 (£5.60).

Given that BCA is based on prior existence of functioning groups, the more organised the community, the better the quality of food assistance. The availability of a given food scheme depends greatly on the facilities that older people count on at the place where they regularly meet up to discuss different topics and carry out activities of diverse types. This place, known as *Centro de Jubilados* (Centre for Retired People), can be defined as an organisation that gathers and represents older persons benefiting from PAMI interested in working for themselves and for the community. A *Centro de Jubilados* is created when a number of older beneficiaries of PAMI from a determined area (i.e. neighbourhoods, villages, regions etc.) wish to take part in important decisions regarding the community, facts related to its condition as senior citizens and leisure activities, among others. Once a *Centro de Jubilados* is formally constituted — this is, when a directive board is elected from those older people willing to participate — it has to be registered in PAMI so that BCA, as well as other *Pro-Bienestar* benefits, are available. PAMI then makes a direct money transfer to each *Centro de Jubilados*, and the directive board is the body in charge of administering the resources of the food assistance. At present, there are around 5,000 *Centros de Jubilados* all over the country, from which 2,700 (54.0 per cent) receive benefits from *Pro-Bienestar*. Decisions over how the money will be used

are taken by both the directive board and the official members of a particular *Centro de Jubilados*. *Pro-Bienestar* provides assistance and technical support through fieldworkers known as *Técnicos de Campo*. The directive board assisted by *Técnicos de Campo* select those who will be benefited by BCA — this is the most needy. While some *Centros de Jubilados* have their own premises, others borrow a place for a few hours and/or for specific activities from schools, NGOs or other type of organisations. Each *Centro de Jubilados* elects a commission responsible for delivering the modality of BCA available. This commission is composed of one member of the directive board and some members of the *Centro de Jubilados*. When a refectory is available, the so-called *comisión de comedor* (refectory commission) will be in charge of updating the list of users, setting the rules to observe on the premises, arranging the refectory itself, planning the menu, doing the food shopping and making a record of expenses. Activities such as helping with the preparation of meals, washing the dishes, doing the cleaning and serving the tables are carried out by volunteers. A list of 10 or 14 different set meals are planned depending on the days a week that each *comedor* opens, guaranteeing a lunch plan for two weeks. Information on hygienic management of food and nutrition facts is provided by *Pro-Bienestar* field technicians. Similar activities are carried out by the commission in charge of *viandas* where available. On the other hand, an *ad hoc* commission organises the bulk purchases, the selection of recipients and the distribution of the benefit where food baskets are delivered.

3.1.3. The Mexican case: an overview of *Contigo*.

At present, the Mexican Federal Government is implementing an initiative called *Contigo* (literally, With You), which is the nation's unique but comprehensive social policy strategy. It groups 212 ongoing programmes, divided into four main strategic lines: 1) improvement of capabilities, 2) income generation opportunities, 3) accumulation of assets and, 4) universal social security. Through this initiative, beneficiaries access food, health and education, and benefit from income generation, local development and credit programmes. Even though *Contigo* is not exclusively addressed to a particular segment of the population, it comprises specific actions for those groups at socioeconomic risk and at critical stages of the life cycle.

Table 3.4 shows *Contigo's* principal actions addressed at older people's health and well-being. By observing the actions concerning older people's food security and health included in the previous table, it is possible to come up with the conclusion that *Contigo* is an example of political will towards gathering a number of actions in a comprehensive national large-scale programme, failing to overcome evident administrative and bureaucratic obstacles that may even make this intervention less cost-effective. In essence, the three programmes facing the basic causes of malnutrition, food insecurity and poverty in older Mexican adults give away similar benefits, presumably recruiting recipients with limited access to economic resources, basically concentrated in major urban areas of the country. The potential duplicity of actions derived from the above-mentioned programmes increases the possibility that someone receives more than one benefit while others

may not receive any. Thus, an initiative designed to improve the quality of life of older persons nationwide may not be doing it so in an even way.

Table 3.4. Programmes and actions addressed at older Mexican persons conducted by *Contigo*, 2003

Programme or action	Main features
Programme of Attention to a Successful Ageing	<p>Beneficiaries: active or retired civil servants and their dependents</p> <p>Characteristics:</p> <ul style="list-style-type: none"> • Comprehensive health care, promotion and education • Detection and control of chronic diseases • Actions towards reducing effects of disability • Improvement of quality of life
Action Programme for the Attention of Ageing	<p>Beneficiaries: older persons with no social security</p> <p>Characteristics:</p> <ul style="list-style-type: none"> • Health care, prevention and control of diseases and disability • Improvement of quality of life <p>Important features and ongoing activities:</p> <ul style="list-style-type: none"> • Drawing up of the Official Guidelines for Care to Older People • Promotion of successful ageing • Promotion of the Older Adult National Health Record • National Week of Older Persons' Health • Campaigns against communicable diseases
National Institute for Older Persons (INAPAM, to use its Spanish acronym) (more details further on)	<ul style="list-style-type: none"> • 4 health care centres in Mexico City and 13 geriatric care units in the same number of states • No long waiting times for most services • After a general check-up, patients are referred to specialists • Use of the Older Adults National Health Card • Promotion and participative activities on preventive health care
<i>Albergues Adultos Mayores</i> (Old Age Shelters) run by the System for Integrated Development of the Family (DIF, to use its Spanish acronym)	<p>Beneficiaries</p> <ul style="list-style-type: none"> • Adults 60 and over living in poverty, with no assistance from the government or other institutions, with no help from others and living alone or abandoned. • 4 <i>Albergues</i>: 2 in Mexico City, 1 in Morelos and 1 in Oaxaca, attending 1,950 beneficiaries <p>Benefits</p> <ul style="list-style-type: none"> • Hot meals and clothes • Cultural, leisure and physical activity programmes • Specialised health and psychological care • Legal assistance • Day only care for those who are alone most of the day • Actions aimed at creating public awareness in the general population regarding older people and ageing issues <p>Eligibility</p> <ul style="list-style-type: none"> • Older persons willing to benefit from this service • Relatives and neighbours can apply on behalf of the potential beneficiary as long as older the person agrees • Older people referred by other institutions • Socioeconomic evaluation is required prior to admittance • Evaluation of mental and health status is required to be accepted

Table 3.4. Programmes and actions addressed at older Mexican persons conducted by *Contigo*, 2003
(continued)

Programme or action	Main features
<i>Albergues Adultos Mayores</i>	<p>Obligations</p> <ul style="list-style-type: none"> • Relatives (when applicable) are required to visit the beneficiary and are obliged to take care of her or him during visits • In case of decease, relatives will assume the corresponding costs <p>Monthly cost of the benefit</p> <ul style="list-style-type: none"> • From MX\$ 114 to MX\$ 912 (£5.57 to 44.6, respectively), according to both the older person's household income and the number of members • For those beneficiaries with no family, source of income or help of any kind, the service is free

Source: Gobierno de la República, 2001; DIF, 2001.

3.2. Programmes focusing on the underlying causes of malnutrition

Just as happens with programmes based on in-kind benefits for older adults, interventions seeking to eradicate food insecurity at the household level are commonly accompanied by other non-food-related actions including volunteering, consolidation of social networks, health conditions and monitoring of nutritional status, environmental protection or education programmes, among others. Some interventions at this level are implemented under complex socioeconomic pressures, for which there must be rapid responses in order to avoid nutritional or health catastrophes. Other are focused rather on preventing households' food consumption level diminishing, within broader poverty alleviation strategies. Two examples of how food assistance to households may positively impact the underlying causes of malnutrition, food insecurity and poverty in households with older adults are presented in this section. Broadly speaking, these interventions are mainly focused on one component of this level of causality: uncertain access to food by households (see Chapter 1).

3.2.1. Improving household food security in Argentina: lessons from the recent economic crises

In the past, interventions by the Argentinian Government guaranteed more than minimum standards of food security to older people and households living in poverty. But the economic crisis of 2001 affected the country in such a way that not only a large proportion of households fell into levels of poverty never seen before in the recent history of Argentina, but also the effectiveness of social programmes was seriously threatened. Having to optimise the scarce resources available whilst maintaining the unavoidable commitment to the most needy, the government declared a state of food emergency. In addition, both health and unemployment emergencies were declared. Derived from the *Ley Nacional de Alimentación* (Food and Nutrition Act), the *Plan Nacional de Seguridad Alimentaria* is conceived as a federal system on food security in which each province and municipality have the autonomy to decide on the best way of improving the nutritional conditions of their respective populations. In addition, it acknowledges the diversity of foods and the existence of different consumption patterns throughout the country. Its beneficiaries are those not entitled to pension benefits. The *Plan Nacional de Seguridad Alimentaria* substitutes the former *Programa de Emergencia Alimentaria* (PEA) (National Programme of Food Emergency), which was the government's response to overcoming the food emergency until December 2003.

Table 3.5. shows the main characteristics of both the *Plan Nacional de Seguridad Alimentaria* and the PEA. It is worth mentioning that neither the forthcoming

Plan Nacional de Seguridad Alimentaria nor the PEA were specifically designed for older people but for the family as a whole. However, improving the quality of life of individuals aged 70 and over through meeting their nutritional needs are within their explicit and implicit goals. In the aftermath of the crisis, but still facing the late effects of the recession, much of the social policy for poor older people in Argentina still relies on BCA.

Table 3.5. *Plan Nacional de Seguridad Alimentaria* and *Programa de Emergencia Alimentaria*.

<i>Plan Nacional de Seguridad Alimentaria</i>	<i>Programa de Emergencia Alimentaria</i>
<p><u>Beneficiaries:</u> Households with children aged 14 or under, pregnant women, undernourished people, disabled people and older adults living in poverty who are nutritionally vulnerable</p>	<p><u>Beneficiaries:</u> Households at nutritional risk as a consequence of the economic crisis</p>
<p><u>Actions and/or benefits:</u></p> <ul style="list-style-type: none"> • Direct food assistance to households and community refectories • Promotion of food production at both the household and the community level • Reinforcement of the mother-child programme • Promotion of nutrition education and health care • Promotion of social networks through which groups, households and individuals can participate actively in the improvement of the nutritional conditions of the population • Actions guaranteeing food access for all • Surveillance of the nutritional status of the population • Evaluation of the programme 	<p><u>Actions and/or benefits:</u> Delivery of food baskets to households at a nutritional risk as a consequence of the economic crisis</p>
<p><u>Origin of economic resources:</u></p> <ul style="list-style-type: none"> • <i>Fondo Nacional de Alimentación y Nutrición</i> (National Fund for Food and Nutrition) • Provincial and municipal budgets • NGOs and donors • Budget: information unavailable 	<p><u>Resources:</u> AR\$ 350,000,000 (£75,431,034) from the Federal Government, distributed to provinces and municipalities according to their level of unmet basic needs</p>

Source: Direct interviews; Ministerio de Desarrollo Social, 2003.

Prior to the crisis, all social programmes including food assistance components had already been merged in the *Programa Unidos* (Programme *United*), allowing the authorities better management plus a more optimal allocation of resources. Another important characteristic of this fusion was the wide range of autonomy

given that decisions were taken at the three different levels of government: national, *provincial* (regional) and municipal. This initiative gathered *Pro-Huerta*, whose main objective was to promote food production at the household and at the community level; *Programa de Alimentación y Nutrición Infantil* (PRANI) (Programme of Food and Nutrition for Children) and *Apoyo Solidario a los Mayores* (ASOMA) (Solidarity Support for Older Persons). *Unidos* had nonetheless a short life (from 2000 to 2001).

3.2.2. Improving household food security in Mexico: *Contigo* and its sub-programmes

As the largest and unique social programme in Mexico, *Contigo* involves diverse actions focused on poor households, a few of which are presented in this work. As a sub-programme of *Contigo*, The *Programa de Asistencia Social Alimentaria a Familias* (Programme of Social Food Assistance for Families, hereafter PASAF), operated by the *Sistema Integral para el Desarrollo de la Familia* (System for the Comprehensive Development of the Family, hereafter DIF), has been designed to improve food security for poor families living in deprived areas or in municipalities considered as a priority for the state's intervention. Beneficiaries of PASAF are thought principally to be children aged 5 or under, pregnant or breastfeeding women, adults aged 60 and over, disabled people, as well as farm labourers, migrant workers or repatriated families at socioeconomic risk. The benefit consists of a low-price food basket delivered on a monthly basis. Targeted communities are given the food assistance only for one year. The main characteristics of PASAF are shown in Table 3.6.

Table 3.6. Programa de Asistencia Social Alimentaria (PASAF). Mexico, 2003

Objective	<ul style="list-style-type: none"> Improving food access and nutrition of families at socioeconomic risk
Benefit	<ul style="list-style-type: none"> A food basket consisting of: <ul style="list-style-type: none"> 1 litre of cooking oil 1 pack of pasta (200 g) 1 kilo of beans 500 g of lentils 2 kilos of rice 1 tin of tuna
Cost of the benefit per month	<ul style="list-style-type: none"> Between MX\$ 1 to MX\$ 5 (£0.05 to £0.25), depending on the municipality or area
Restrictions	<ul style="list-style-type: none"> Beneficiaries are required to count on an income sufficient enough to be able to access other services or be helped by relatives or institutions.
Federal resources allocated to PASAF (2002)	<ul style="list-style-type: none"> MX\$ 805 million (approx. £40 million)
Coverage	<ul style="list-style-type: none"> National level (2003): 22,347,854 food baskets delivered (annual average) and 1,862,321 families benefited (monthly average) Mexico City: 1,543,035 food baskets delivered

Source: DIF, 2001.

With information on official prices of foods and other basic products by PROFECO, it was possible to estimate how much the Federal Government is contributing to subsidising PASAF's food basket. Broadly speaking, the average cost of the benefit could be fixed at MX\$ 36 (£1.80), if components are purchased in shops selling them at the lowest prices. Thus, if all families hypothetically paid MX\$ 3 (£0.14) on average, DIF would actually be supporting beneficiaries with close to 92 percent of the total cost of the food basket; this is, MX\$ 33.7 (£1.65). According to the data on the number of benefits delivered in 2002, the government would be spending approximately MX\$ 753.1 million (£36.8 million) to cover national demand and MX\$ 52 million (£2.5 million) to cover the needs of Mexico City. Therefore, the money spent on families from Mexico City represents roughly 7 percent of PASAF's total budget.

Another food assistance programme which has been run by DIF since 1989 is the *Cocinas Populares y Unidades de Servicios Integrales* (Popular Kitchens and Units of Integrated Services, hereafter COPUSIs), through which prepared meals are sold at low prices for members of benefiting communities. COPUSIs aim at improving the habitual diet of the community, promoting healthy eating habits, providing beneficiaries with adequate facilities and equipment for the best development of a community service, and providing the community with a place for meetings, so that people get more actively involved in the discussion and resolution of problems affecting them.

Similar to what happens in the Argentinian *Pro-Bienestar's* BCA programme, a COPUSI unit is set up when a community group is interested in developing actions towards the improvement of food and nutritional conditions of its members. First, the community group is trained in delivering the service; secondly, once DIF has approved the premises in which the unit will be functioning, the installation of equipment is requested and carried out. The community thus elects a COPUSI commission and a directive board, which will be in charge of all the actions involved in the delivery of meals. On the other hand, educational, health promotion, as well as leisure and cultural activities, for instance, are expected to take place on the premises. At every stage of the consolidation process of a given unit, DIF provides technical assistance to the staff. Differences concerning the degree of consolidation of units can be observed all across the country. For Durán-Vidaurre (2000), most of the COPUSIs have been organised by groups of older people. Although COPUSIs can be used by any

resident of a community in which the programme is operating, scholars and older people are two groups of main concern. Breakfast and/or lunch are usually served.

From data shown in Table 3.7, it is possible to obtain an estimate of how much COPUSIs earned from the delivery of meals in 2001. If all the beneficiaries had paid an average fee of MX\$ 5.5 (£0.27) per meal, it would have made it approximately MX\$ 740 millions (£36 millions) for more than 134 millions of meals served reported. Unfortunately, there is no further information on where this money goes, how it is re-invested or how DIF finances units to prepare meals.

Table 3.7. Programme Cocinas Populares y Unidades de Servicios Integrales (COPUSIs). Mexico, 2003

Benefit	<ul style="list-style-type: none"> • Breakfast and/or lunch served • No information on what is the composition of breakfast • Lunch usually consists of: soup, rice or pasta, main dish, bread, desert and water
Cost of the benefit per month	<ul style="list-style-type: none"> • Meals cost MX\$ 3 to MX\$ 8 (£0.15 to £0.40) • Special fares apply to children and older people: MX\$ 2 (£0.10) • Free meals are handed out to those who work in COPUSIs (however, staff must be a member of the community)
Coverage	<ul style="list-style-type: none"> • 269,129 families accounting for 831,331 beneficiaries in 2003 • 134,417,256 meals served in 2001 • 8,991 COPUSIs distributed in 1,513 municipalities all across the country and 14 boroughs of Mexico City • 2,697 units distributed in urban areas and 6,294 in rural areas

Source: DIF, 2001.

Finally, *Contigo's* major social programmes, such as *Oportunidades* (Opportunities), *Abasto Social de Leche* (Milk Social Assistance Programme) and *Abasto Social de Tortilla* (Tortilla Social Assistance Programme), are only a few examples of interventions addressed to the household overall. Broadly speaking, *Oportunidades*, first launched as *Programa de Educación, Salud y Alimentación*

(*Progres*a, to use its Spanish acronym) (Education, Health and Food Programme) during Ernesto Zedillo's administration (1994-2000) and, to some extent, derived from Carlos Salinas de Gortari's (1988-1994) *Programa Nacional de Solidaridad* (PRONASOL) (National Programme of Solidarity) was one of the largest social interventions in Latin America. As with the former ones, *Oportunidades* aims at meeting the educational, health and food needs of the poorest sectors of Mexican society. But unlike *Progres*a, *Oportunidades* also benefits population groups in deprived urban areas too.

3.3. Programmes that address poverty in households with older persons

As a consequence of economic crises, limited control over resources hampers households and individuals from achieving food security and health. This is, in essence, what explains poverty among urban households. But just as happens with interventions at the upper levels of causality, programmes attempting to stimulate the generation of capital or which make it easier to use and transform available resources, are not implemented in isolation. Usually, actions relating to social policy on poverty include benefits targeting other areas of interest. Interventions dealing with capital also help improve the well-being of non-recipients. Such is the case of the non-contributory pensions in South Africa and, presumably, in Mexico City. Most of what is presented in what follows focuses on access to financial capital which, in turn, may also allow people to develop both human and social capital.

3.3.1. Job opportunities for older people

That a decrease in both physical and cognitive functions occurs with age does not necessarily mean that older people are unable to work. In both developed and developing countries, many adults aged 60 and over continue to be active, usually occupied in sectors from which no pension benefits are received or for which no retirement age is specified, doing monotonous low paid work in unfavourable conditions (Chanana & Talwar, 1987; Fletcher, 2001; Palloni & Paláez, 2004). The creation of job opportunities for the old, with flexibility of wage setting and working-time arrangements, is not included in the social agendas of practically any country. However, some governments, for example in Indonesia, have expressed their commitment to developing employment opportunities for senior citizens, in international summits such as the Second World Assembly on Ageing (Minister for Social Affairs of the Republic of Indonesia, 2002). In Singapore, the government has implemented specific employment programmes for older people through the Ministry of Manpower. The Singapore Action Group of Elders (SAGE), self-defined as a non-profit, non-religious and multi-ethnic voluntary welfare organisation, is useful for older people finding a job. Another example of commitment to the creation of job opportunities for older persons is provided by the Japanese Association of Employment for Older and Disable Persons, starting on October 2003. This organisation provides consultant and support services for employers, along with advice and guidance for older persons looking for a job (JEED, 2002). In the United Kingdom, Age Concern is an organisation through which older people may find a job, but also can obtain information and advice on a wide spectrum of issues such as pensions, retirement or volunteering (Age

Concern, 2002). Job opportunities are advertised both on their premises and on their website.

In Mexico, the *Instituto Nacional de las Personas Adultas Mayores* (National Institute for Older People, hereafter INAPAM) provides education and training to reinforce skills in older people so that they count on better opportunities to find a job. Priority is given to those activities aiming at the production of diverse types of goods made by beneficiaries, so that they themselves sell these articles. By doing this, both an increase in their income and the use of free time in a productive way are achieved. In addition, this institution helps older people find suitable jobs according to their abilities, mental health and physical conditions. Between 2002 and 2003, the *Programa de Empleo para Adultos Mayores* (Employment Programme for Older People), consisting of an alliance between the government and 800 private firms, created job opportunities for more than 8,000 individuals. On the other hand, the creation or improvement of small-scale businesses run by older people are financed by specific loan programmes, providing beneficiaries with MX\$ 500 to MX\$ 5,000 (£25 to £250) (INAPAM, 2005).

3.3.2. Contributory pensions

Even though pension systems have faced long-term crises all over the world, there are still some countries with schemes covering high proportions of retired populations. Argentina, along with Chile and Uruguay, are the Latin American countries with the highest coverage rates in this regard. Data from the Economic Commission for Latin America and the Caribbean (ECLAC) show that, for

instance, in 2000, more than 65 percent of Argentinian older people received pension benefits (CEPAL, 2000). PAMI (i.e. INSSJP), as the national body in charge of providing retirement benefits to those who contributed during their productive life, reported having benefited more than 3 million older adults during 2003, representing close to three quarters of the population aged 60 and over. Unfortunately, not all Latin American countries can count on retirement benefits to such an extent. In Chapter 2, it was shown that pension systems in Mexico cover around 20 percent of its older population. This proportion is similar to those of Honduras and El Salvador, which are countries with two of the lowest levels of development in the region and undergoing lower demographic transition stages than Mexico overall.

It seems to be contradictory that, at present, Mexico has so many older people with no pension benefits, holding at the same time one of the strongest traditions regarding social policy all over Latin America. Briefly speaking, the Mexican revolution of 1910 set the basis of a new era of benefits for workers and deprived groups throughout the country. Inspired by the ideals of this movement, the constitution of 1917 gave birth to the government's strong commitment to providing social security and health services through a universal, comprehensive system. However, it was not until the next decade that the first social security system was established, restricting its benefits to federal civil servants. Between 1926 and 1928, coverage was extended to the army and federal school teachers. In 1959, social security for federal civil servants and school teachers was revamped by the government through the creation of the *Instituto de Servicios y Seguridad Social para los Trabajadores del Estado* (ISSSTE) (Institute of Services and

Social Security for Civil Servants). For non-government employees, social security and health care did not come until 1943, with the approval of the *Ley Federal del Seguro Social* (Federal Act of Social Security), from which the *Instituto Mexicano del Seguro Social* (IMSS) (Mexican Social Security Institute) emerged. Despite repeated economic shocks experienced in Mexico over the last few decades, resulting in massive layoffs and the loss of social security for many, IMSS is still the institution with the most beneficiaries in Mexico. The state-owned oil company *Petróleos Mexicanos* (Mexican Oil, PEMEX, to use its Spanish acronym) workers and the armed forces continue to be served by their own systems (Tracy, 1991).

3.3.3. Income transfer programmes

Income transfer programmes for older people have had positive results in preventing old age poverty and vulnerability in developing countries (Barrientos & Lloyd-Sherlock, 2002). Also known as cash transfers or non-contributory pensions, this exogenous way of improving the overall household income does not only account for better health of beneficiaries and other members of their households, but also for increases in human capital in poor regions (Duflo, 2003). For older people, especially for those living in poverty, interventions of this nature provide a secure source of income to make it possible to afford a living. Income transfer programmes are common in Latin America and other parts of the world. In the former region these schemes are/have been implemented in Costa Rica, Honduras, Argentina, Chile, Brazil, Uruguay and Bolivia. African examples of such schemes include Botswana, Mauritius, Namibia and South Africa. With the

exception of Botswana, Mauritius, Namibia and Bolivia that are universal all of them are based on a means-tested scheme.

3.3.3.1. The Brazilian Social Assistance Pension

The non-contributory Brazilian Social Assistance Pension (SAP) was introduced in December 1993, but it has its origins in the early 1970s when the military regime first implemented the *Fundo de Assistência Previdência do Trabalhador Rural* (Pension for the Rural Worker) and the *Renda Mensal Vitalícia* (Lifelong Monthly Income). With the promulgation of the new constitution in 1988 both plans underwent major changes, but it was not until the beginning of the following decade that it was proclaimed that all citizens were entitled to social security. Political controversy around the implementation of the pension, civil servants not trained sufficiently to face this new challenge, as well as disagreement from some sectors of the society in funding those who had not contributed before, delayed the implementation of the SAP. Eventually, in January 1996, the National Social Security Institute (INSS) started paying out the benefit. According to the Social Assistance Act (LOAS), a household whose income is lower than a quarter of a minimum salary is not capable of meeting the needs of an older or a disabled member. The Brazilian minimum monthly wage is R\$ 240.0 (approximately £51). Applicants are therefore required to report the number of members of the household plus everyone's income (Barrientos & Lloyd-Sherlock, 2002; Schwarzer & Delgado, 2002; Legido-Quigley, 2003).

By law, every two years an evaluation of the SAP is co-ordinated and carried out by the three levels of government: federal, state-wide and municipal. Funds are

fully provided by the National Assistance Fund (FNAS). On the one hand, social workers explore the socioeconomic condition of both older adults and the household and, on the other hand, a doctor from the INSS checks up on disabled persons *in situ*.⁹ Broadly speaking, the main purposes of these evaluations are to keep control of resources, to benefit those where needs are greatest, to identify the impact of the allowance on both recipients and their households, and to collect as much information as possible on community needs. An internal evaluation of the SAP carried out among older people between 1999 and 2001 shows that half of the population under study had an overall household monthly income lower than R\$ 60.0 (£12.80) — that is, below a quarter of the minimum salary — and only 6 percent had an income higher than this cut-off point. However, no information could be obtained from 40 percent of the sampled households. Of more than 18 thousand older people included in the evaluation, 60 percent lived with other members of the family, 33 percent lived alone and only 7 percent lived in a house with only old people. A third of respondents reported spending the benefit on food, a quarter on medicine and 15 percent on medical treatments. For 55 percent of older people, medicine was the most urgent need. More than two fifths of older people reported that their pension contributed to the household expenses, but only around a quarter noticed improvements in their well-being, particularly in their self-esteem (Legido-Quigley, 2003).

3.3.3.2. The South African State Old-Age Pension

One of the most consolidated pension systems in the developing world dating from the late 1920s, the first one ever to be implemented in Africa, and perhaps

⁹ It is important to bear in mind that SAP benefits not only older people but also disabled people.

the first one to introduce means testing, is the South African State Old-Age Pension (SOAP). This programme started out as a benefit for White and Black citizens or residents of the Union of South Africa aged 65 and over, and it was mainly conceived as a safety net for workers not covered by any occupational pension. Throughout its history, a number of modifications have been made to SOAP. For instance, the age of eligibility for women was lowered from 65 to 60 years of age in 1937. Eligible individuals from different ethnic backgrounds other than White South Africans, that is Indians and Africans, as well as residents of the former territory of West South Africa (currently Namibia), were first recruited back in the 1940s. However, during the *apartheid* era extremely rigorous and discriminatory means-testing applied. Hence, until the early 1990s, dissimilar allowances were distributed to pensioners depending on their ethnic group and area of residence, with the White population benefiting far more than non-White residents. But in 1994, when the African National Congress came to power, the government started making the pensions more equal throughout the country by enforcing means testing, where *means* is defined as “...*income plus an income value assigned to assets...*” (Deveraux, 2001:6). As a result, both the number of claimants and the payments made to individuals on low income experienced considerable reductions. Nevertheless, this enforcement was reasonably effective in excluding the wealthier. At present, the scheme continues to be non-contributory and means tested, and literature shows a consensus on this matter. Contradictorily, authors like Ferreira (1999) and Duflo (2003) have claimed that SOAP has a universal profile. This consideration is incorrect because means testing and universality are mutually exclusive. A programme either benefits the

entire population irrespective of the degree of poverty or well-being of each subject, or defines recruitment criteria based on income level and assets owned.

The SOAP experience has stimulated interest in the economic implications of alleviating poverty by targeting enormous amounts of social expenditure, as well as stimulating interest in the impact of income transfers on the quality of life of both older persons and their households. Case and Deaton (1996), for instance, have found that the grant from SOAP is spent much the same as any other income; whereas for Maitra & Ray (2003) transfer and non-transfer incomes are used in different ways. In any case, expenditure patterns seem to vary according to variables such as: condition of poverty and composition of the household, as well as the sex of the head of the household. Households with pensioners are poorer and have heads of households less educated than households with non-pensioners. According to Ferreira (1999), SOAP is frequently the only source of cash income in the most deprived households.

The impact of income transfers on food security might be expected considering that authors like Maitra & Ray (2003) have found that the budgetary share spent on food is larger in poor than in non-poor households. In another study, Case (2001) shows that the pension has protective effects on both the nutritional status and health of older and adult members, especially if income is pooled. This author also points out that SOAP contributes to reducing the levels of stress in both groups. In households headed by women, expenses in tobacco, alcohol, transportation and housing are lower than in those headed by men. On average,

older members spend less on the above-mentioned expenditure categories (Case & Deaton, 1996).

Means-testing has been effective in reaching the poorest households, particularly those with children. But in South Africa, African households with older people usually contain three generations, which explains the large number of children who benefit from SOAP. Nonetheless, higher expenditure on food and schooling for grandchildren in these households is common (Ferreira, 1999). Being a female pensioner leads to greater improvements in children's nutritional status and health, particularly among girls (Duflo, 2003). It is true that sex differences in life expectancy, as in the age eligibility criteria, make women three times more likely to be beneficiaries than men. However, there is evidence that the income transfer has more impact on children's health and nutrition if pensions are handed over to women.

Even though SOAP provides a good example of how a simple targeting indicator like age correlates well with poverty, authors like Case and Deaton (1996) have suggested that it is still necessary to deepen not only the analysis of such a relationship, but also the study of the behavioural consequences of this type of intervention at both individual and household level.

3.3.3.3. An overview of social policy for Mexican older persons with no access to pension benefits

Over the last decades, the Mexican Federal Government has played a major role in providing social benefits to older people not entitled to contributory pensions.

At present, the centrally administered comprehensive initiative *Contigo*, along with a number of specific programmes run by both the INAPAM and the DIF, constitute the main sources of social benefits for older people living in poverty all across the country. Initially, INAPAM's main aims were to provide health care to people aged 60 and over all across Mexico and, secondly, to deal with other aspects related to the ageing process. But as soon as both the specific needs of this population and the particular expressions of the demographic transition in the country became more complex, the government started carrying out major transformations to this entity. Table 3.8 shows the diversity of services provided by this institution, providing evidence that there is significant concentration of them in Mexico City. It is not possible from this data to deduce how some benefits could be concentrated in other cities like Guadalajara or Monterrey, though it is very likely that to some extent this occurs.

The central objective of INAPAM is “...to protect, attend, assist and give guidance to older persons, as well as to comprehend and to analyse their problems in order to find proper solutions. Hence...[INAPAM]...efforts are focused on providing health care, legal advice and job opportunities for this population...” (INAPAM, 2005). Regardless of their socioeconomic status, adults aged 60 and over from all across the country are eligible to benefit from a wide range of services offered by INAPAM. Once they sign up at any local, regional or federal office, beneficiaries are given a photo card for which they are charged MX\$ 10 (around £0.50). Benefits can only be accessed by producing this photo card.

Table 3.8. Main characteristics of INAPAM

Benefit	Characteristics
Old Age social clubs	<ul style="list-style-type: none"> • 4,720 Old Age social clubs • Assistants carry out diverse educative, cultural, physical, leisure and productive activities • Older persons are trained to carry out diverse handyman jobs, as well as to make handicrafts and other goods so that they can sell them and, thus, increase their income
Cultural centres	<ul style="list-style-type: none"> • 4 centres operate exclusively in Mexico City, offering a wide range of options for older people to enhance their academic background or to initiate formal education • Languages, humanistic disciplines, computing courses, among others, are offered • Educational activities are also offered at the provincial and municipal levels
Legal advisory	<ul style="list-style-type: none"> • 5 major departments of legal advisory in the country and a number of offices providing this service at both the provincial and the municipal levels
Subsidies and discounts	<ul style="list-style-type: none"> • By producing the photo card, older people have a full range of discounts on public transport, coaches, trains and flight fares; theatres and other cultural venues, shops, etc. • Around 20,000 establishments throughout Mexico accept the card
Infrastructure	<ul style="list-style-type: none"> • 1 central headquarters (in Mexico City) • 31 provincial bureaus • 139 co-ordinations and 1,342 offices at the municipal level • 7 Old Age homes • 3 mobile units (to bring a full range of services to the community)

Source: INAPAM, 2005

Even though it was not developed to exclusively meet the needs of older people, DIF is the second largest provider of social benefits for this population group at the national level. Since 1977, when it was created by official decree, its interventions, reaching households, communities, individuals at different stages of the life cycle, as well as disabled people, cover a wide spectrum of aspects either through specific or integrated actions. For example, older people with no pension benefits, and households overall, are eligible to access the *Programa de Atención a Población en Desamparo* (PAPD) (Programme of Assistance to Population Groups in Social Abandonment). PAPD provides economic support, in-kind benefits and job opportunities to poor households spending big amounts of money

on health care, with older and disabled members or those whose main provider is imprisoned or severely ill. Other beneficiaries are single women with children and with little chances to look for a job; pregnant women with no support from a partner or relatives; poor families placed in custody of abandoned or orphan children, as well as poor older people and disabled people with no social security, home and support from relatives or friends.

It is relatively common that it is not exclusively the poorest sectors of the older population who can actually benefit from all these initiatives. Non-poor older persons receive a wide range of subsidies. But unlike the local government of Mexico City, the Federal Government does not transfer large cash sums to the beneficiaries of the programmes themselves. Resources are mainly allocated to subsidise transport, health care, staple foods, basic products and drugs; tourism, leisure and cultural activities, as well as those actions aimed at providing social support and stimulating the re-integration of older people to the community through the development of a productive activity or through volunteering. Subsidies tend to be more concentrated in urban areas with better availability of services and infrastructure, however. In some cases, older persons may receive benefits from more than one source. This occurs, for example, in Mexico City where older people are not only entitled to programmes from the Federal Government, but also from local interventions. In contrast, scattered rural villages could not have the same opportunities to receive assistance from any level of government, since they are too far away from delivery points or count on no health services, sanitation infrastructure, schools, social centres for older persons,

supermarket chains, etc. But the implementation of the current Mexican social policy addressed to older people living in poverty is not easy to understand.

3.3.3.4. Mexico City's *Programa de Apoyo Alimentario para Personas Adultas Mayores*

After the second free elections in the modern history of Mexico City, but the first ones voting for a six-year-term mayor, Andrés Manuel López Obrador, from the centre-left wing *Partido de la Revolución Democrática* (PRD) (Democratic Revolution Party), became head of the local government in December 2000.¹⁰ López Obrador set out a local social policy framework based under the precepts of social security universality, where the state has the ultimate responsibility of meeting basic human needs (GDF, 2000 and 2001*a* and *b*). This philosophy of the so-called welfare state, which was the cornerstone of Latin America's social policy in the past, is still widely accepted in diverse sectors of the region (Tracy, 1991).

The social policy agenda for the 2000-2006 administration of the Government of the Federal District of Mexico (GDF in Spanish) can be summed up as follows (GDF, 2000*b*):

- Political will and equitable resource allocation for satisfying food, health, education and popular housing among the poor and extremely poor

¹⁰ During the first democratic elections of Mexico City's modern history, Cuauhtémoc Cárdenas Solórzano, from the PRD, was installed as the city mayor for a three-year period. However, Cárdenas Solórzano resigned approximately nine months before completing his term, since he decided going on campaign for the forthcoming elections for the presidency of the republic. His substitute, Mrs Rosario Robles Berlanga, Mexico City's secretary of internal affairs, from the same political party, thus became the second head of the Federal District. Broadly speaking, Cuauhtémoc Cárdenas, Rosario Robles and Andrés Manuel López Obrador have shared similar points of view with respect to how social programmes are carried out.

- Popular participation and monitoring of social development programmes through neighbourhood committees
- Invitation to different groups to participate in social development programmes (e.g. Non-governmental organisations, advocacy groups and social actors from diverse areas of the society)
- Transparency in the allocation of resources as well as in the selection of beneficiaries of social development programmes

In accordance with the above, the GDF decided to tackle the unmet needs of what has been considered the most historically neglected population sectors in Mexico City (and in the country overall): children, adolescents, women, indigenous people, disabled people, the destitute and those aged 70 and over. Between 2001 and 2006, these population groups will have been somehow covered by at least one of the ongoing major programmes described in Table 3.9. The government has recognised that, unfortunately, multiple factors still carry on constraining its capacities and there is still a long way to go in the development of a strong social policy for the most needy.

From the beginning, the current administration was interested in facing health problems, as well as socioeconomic difficulties experienced by adults aged 70 and over — particularly of those living in less favourable conditions — through a number of actions based on the above-mentioned basic pillars of the social policy agenda. This was to be achieved, on the one hand, by expanding the coverage of subsidies, services and programmes; strengthening the administrative structures dealing with health and social care during old age, and encouraging academic

groups to do research on issues related to ageing. On the other hand by promoting the inclusion of senior citizens in a wide range of socioeconomic and cultural activities, it aimed to improve self-esteem and quality of life overall (GDF, 2001b).

Table 3.9. Major programmes of the Government of Mexico City, 2003.

<i>Programa para la Prevención y Combate al Crimen, Violencia y Adicciones</i>	Social Programme for the Prevention and Combat of Crime, Violence and Addictions
<i>Programa de Atención a Jóvenes en Situación de Riesgo</i>	Programme for Young People Living under Risky Circumstances,
<i>Programa de Protección a la Comunidad</i>	Programme for Community Protection
<i>Programa General de Salud</i>	General Health Programme
<i>Programa de Desayunos Escolares</i>	School Breakfasts ¹
<i>Programa de Apoyo para Madres Solteras</i>	Social Programme for Single Mothers
<i>Programa para Personas con Discapacidad</i>	Programme for Disabled People
<i>Programa de Apoyo Alimentario y Medicamentos Gratuitos para Adultos Mayores</i>	Programme of Food Assistance and Free Drugs for Older Persons

¹ Run by the local DIF

Source: GDF, 2005

As part of these actions, the comprehensive *Programa de Apoyo Alimentario y Medicamentos Gratuitos para Adultos Mayores* (Food Assistance and Free Drugs for Older Persons) was implemented. This large-scale programme consisting of a monthly income transfer of food expenses, as well as free health services and drugs is currently run by the *Secretaría de Salud del Distrito Federal* (Mexico City's Secretary of Health, hereafter SSDF). However, for practical reasons and since this study focuses on the relationship between a regular source income and food security in older people, the programme will be hereafter re-named as *Programa de Apoyo Alimentario para Personas Adultas Mayores* (Food

Assistance for Older Persons) (PRAAPAM), as SSDF staff, beneficiaries and the general population usually refer to it also. In addition, it is important to point out that, even though comprised in the same *package*, the two components of this intervention are administratively managed as independent units.

PRAAPAM has been designed to operate in two main coverage stages. The first one (analysed by this study) aimed at improving the food budget of subjects aged 70 and over living in poor and extremely poor Territorial Units (TUs) of Mexico City,¹¹ along with individuals from the same age group living in non-poor areas and proving that their income is less or equal to a minimum wage per month at Mexico City's rate. This is, MX\$ \leq 1,200 (\leq £59). The GDF is firmly convinced that through PRAAPAM money will not be a limitation for older adults to access an adequate diet any more, further assuming that the economic autonomy resulting from this benefit will positively impact on the quality of life of beneficiaries, particularly on their self-esteem.¹² As happened in the Chilean PACAM, some older people have rejected the benefit because "others with worse living conditions may need it more".

The main characteristics of PRAAPAM are described in Table 3.10. Following the signing of a contract with the GDF, beneficiaries are home-delivered a debit card with which staple foods and products can be bought at specific supermarket

¹¹ According to GDF estimates there are 767 poor and extremely poor TUs in Mexico City, which represents 56.7% of all TU (GDF, 2001c). For an extended definition of TU, see Chapter 4.

¹² Personal communication from Åsa Cristina Laurell, the Secretary of Health of the Federal District.

outlets all over Mexico City. From March 2001 to late 2004, more than 325,000 beneficiaries have been recruited.

Table 3.10. Main characteristics of PRAAPAM - Mexico City, 2003

Issue	Description
Benefit	<ul style="list-style-type: none"> • A monthly-based cash-transfer of MX\$ 668 (£32.70) is provided • Money is paid in personal bank accounts and are available the first working day of each month
Beneficiaries and cost	<ul style="list-style-type: none"> • More than 325,000 beneficiaries (corresponding to 85% of adults aged 70 and over living in Mexico City)
Use of the benefit	<ul style="list-style-type: none"> • Beneficiaries are given a debit e-card which can only be used in selected supermarkets • The use of the e-card during the month is unlimited, as long as there is money in the account • Purchases can be made up to the amount available at the moment of payment • No cash withdrawals can be done in any form since beneficiaries are not given a PIN number
Restrictions	<ul style="list-style-type: none"> • The card should be exclusively used to buy staple foods and basic products • The card can only be used by the beneficiary or by her/his main caregiver
Eligibility	<ul style="list-style-type: none"> • Persons of both sexes aged 70 and over • Residents of poor neighbourhoods • Persons who have lived permanently in Mexico City for at least 3 years at the time of recruitment
Shopping centres	<ul style="list-style-type: none"> • 300 outlets in principal supermarket chains
PRAAPAM partnerships	<ul style="list-style-type: none"> • Mexico City's Health Secretariat (SSDF) • National Association of Supermarkets and Department Stores (ANTAD) • <i>Prestaciones Universales, SA de CV</i> (Universal Benefits Co.) • Scotiabank-Inverlat Bank

Source: GDF (2001a, b, c and d); Cardoso (2001); Llanos-Samaniego (2001).

The second stage of PRAAPAM (not analysed in this study) involves the process of upgrading this initiative into a social pension with universal coverage. Since the beginning of his administration, Mayor López Obrador has constantly emphasised the government's strong commitment to promoting in the local parliament the transition of the programme from its current scheme (i.e. food

assistance and free health services and drugs intervention to selected individuals) to a new one where all adults aged 70 and over demanding the benefit are eligible regardless of their TU of residence and level of income. The corresponding initiative of law that currently obliges the GDF to provide this benefit to all older adults who request it was sent to the local parliament in September 2003 and was approved at the end of 2004.

Between 2000 and 2004, main opposition parties at the local parliament — right-wing *Partido Acción Nacional* (PAN) (National Action Party) and central *Partido Revolucionario Institucional* (PRI) (Institutional Revolutionary Party) — did not fully back up the proposal of the *Ley General de los Adultos Mayores* (*General Act for Older People*) for various reasons. The most frequent arguments against this initiative were a supposed lack of financial viability of the pension, together with the disagreement of delivering the benefit to those who might not need it. The current local parliament opposition (2003-2006) is relatively more open to debate even though the former reasons still prevail. Nonetheless, practically no member has denied that a universal pension for older persons is a matter of social justice. Points of view from academic circles and private sectors of the society agree with the above, although doubts about the viability of the pension go in the same direction as those from the opposition in the local parliament.

To date, no formal external evaluations have been carried out to PRAAPAM. In 2001, the SSDF conducted an opinion survey of 2,200 beneficiaries. In short, food consumption patterns reportedly improved in 90 percent of the interviewees and 79 percent mentioned having bought food products that otherwise they would not

have acquired. Due to the benefit, 71 percent of respondents felt more secure, 61 percent thought that they were more independent and 38 percent reported better relationships with other members of their households. It was also found that around a quarter of beneficiaries went out more frequently (GDF, 2003 and 2004).

The cost of PRAAPAM for the GDF is high, as shown in Table 3.11. From MX\$ 600 (£29.30) per month per older person given in 2001, the transfer reached MX\$ 668 (£32.70) in 2003 and plateaued in 2004. The number of beneficiaries also increased between 2001 and 2002 (75,000 new recipients were recruited), stabilised in 2003 and increased again in 2004 (27,000 new beneficiaries). In nominal terms, the cost of PRAAPAM increased by MX\$ 1,021 million (£53 million) in its four years of operation. The share of total spending by the GDF accounted for by the programme has also increased, reaching 3.6 percent of the budget.

Table 3.11. PRAAPAM budget, Mexico City, 2001-2003.
(in MX\$ and £)

Year	GDF budget million MX\$ (million £)	Number of beneficiaries	Monthly benefit MX\$ (£)	Cost of the programme million MX\$ (million £)	Share (%) of GDF budget
2001	62,383.0 (3,050.5)	250,000	600 (29.3)	1,800.0 (88.0)	2.9
2002	73,189.9 (3,579.0)	325,000	636 (31.1)	2,480.4 (121.3)	3.4
2003	77,974.0 (3,813.0)	325,000	668 (32.7)	2,605.2 (127.4)	3.3
2004	77,363.2 (3,868.2)	352,000	668 (32.7)	2,821.6 (141.1)	3.6

Source: GDF, 2005

It is worth mentioning that PRAAPAM has so far been financed in part through austerity measures adopted by the GDF. These measures included a 15 percent reduction in the wages of some civil servants, the ending of bodyguard services

for some civil servants, the cancellation of some representation expenses,¹³ a reduction in trips and travel expenses, a restriction on the purchase and allocation of mobile phones, stricter controls for outgoing calls, an end to the purchases of new vehicles for civil servants and the cancellation of office refurbishments. It has been estimated that the GDF saved around MX\$ 1,980 million (£97 million) in 2001 and MX\$ 2,900 million (£142 million) in 2002. These savings have been used for PRAAPAM and other social programmes. The use of economic resources coming from taxes is seen by the local government as a second source of finances for this initiative. Broadly speaking, the GDF collects around MX\$ 135 million (£6.6 million) per day from tax payments, which mean that it would take around 20 days for the government to obtain an amount of money equivalent to the total cost of the programme in 2003 (Grupo Reforma Servicio Informativo, 2003).

In terms of both coverage and costs, PRAAPAM is undoubtedly one of the most ambitious social programmes addressed at older people in Latin America. This effort is valued not only by the recipients themselves, but also by large sectors of the population. Its acceptance among beneficiaries and the society as a whole is pushing other regional and local governments of Mexico either to reinforce their propaganda on current programmes or to start implementing programmes designed for this segment of the population. Such is the case of the states of Tabasco, Veracruz and Durango, to mention just a few examples. The GDF has recognised the socioeconomic and nutritional vulnerability of older people (especially those who are poor), mobilising a large sum of public resources to assure them a better quality of life. Thus, along with the delivery of direct

¹³ A monthly money allowance given to major civil servants for eating out, organising meetings, buying petrol, etc.

benefits, current public awareness campaigns towards this population group are configuring a new culture of ageing in Mexico City. The inclusion of older persons' needs in the social agenda and the implementation of this type of action itself are, on the other hand, increasing the GDF's political capital.

3.4. Remittances: Mexico's second largest source of foreign currency

Remittances are defined as money sent back home either from domestic or international migration, which is mostly used for family consumption expenses (Hulshof, 1991; McCabe Grimes, 1998 Koc & Onan, s/n). As an alternative source of income, remittances from grown-up children may account for food security in households with older people. Maitra & Ray (2003), for instance, have found that, in South African poor households with older persons, private transfers play a significant role in increasing the budget shares of both food and clothing. In countries like Mexico, where large numbers of adults of both sexes migrate to the United States, transferring resources either for altruistic reasons or as a means to invest in physical capital is common (Amuedo-Dorantes & Pozo, 2002). Mexican migrants are an important part of their household's economy, since they contribute to meeting day-to-day needs. Nonetheless, one of the main risks of migration to the United States is that older parents live alone, which may have negative consequences on their quality of life. Kanaiaupuni (2000), has suggested that, due to this risk, older parents prefer to be helped by single and non-migrant children.

Data from the 2000 Mexican *Encuesta Nacional de Ingreso y Gasto de los Hogares* (National Household Budget Survey)¹⁴ show that, with a few exceptions, the proportion of Mexican households with older persons receiving remittances is higher than that of households with younger members, regardless of the decile of income (Table 3.12). The median amount of remittances during the last three months were, nonetheless, much higher in households with no older members. Overall, the median proportion accounted for by remittances was also higher in these households. Furthermore, it seems somehow consistent that the wealthier the household, the more the amount received, and the higher the importance of this source of economic resources as a percentage of overall household income.

Table 3.12. Amount and proportion of remittances with respect to total household income in households with and without older persons receiving remittances. Mexico, 2000.

Decile of income	Households with no older persons					Households with older persons				
	%	No.	N	Median amount received in GBP	Median % accounted for by remittances	%	No.	N	Median amount received in GBP	Median % accounted for by remittances
I	4.0	28	695	100	39.4	5.3	17	322	53	22.0
II	6.1	46	755	164	39.2	11.5	30	262	103	25.9
III	7.6	63	831	220	46.2	7.5	14	186	194	36.7
IV	8.5	71	839	133	21.2	10.7	19	178	100	15.0
V	7.4	64	869	300	37.1	10.1	15	148	200	23.5
VI	6.3	53	837	223	23.1	16.1	29	180	215	22.2
VII	7.1	62	873	384	29.4	11.1	16	144	181	14.3
VIII	4.7	41	881	540	31.8	14.0	19	136	270	14.8
IX	5.2	44	842	400	16.6	9.1	16	175	221	9.6
X	3.4	30	880	817	16.2	7.3	10	137	647	13.9

Source: INEGI, 2001a

The proportion of households receiving money originating from within the country or from abroad are smaller in households with no older member from

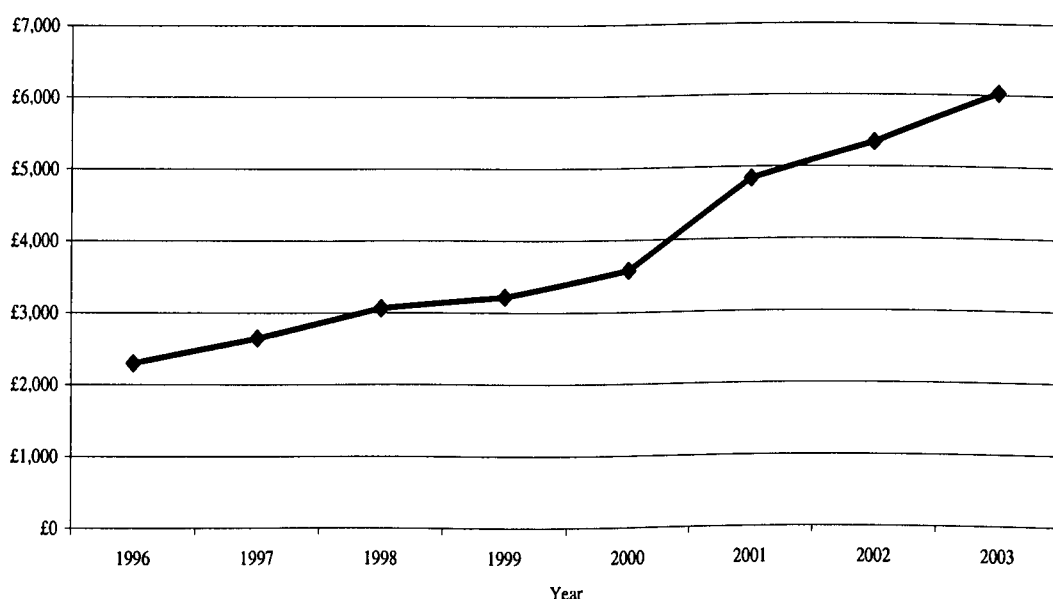
¹⁴ Own estimations on remittances in households with and without older persons in Mexico were carried out using the 2000 version of ENIGH database (INEGI, 2000).

deciles I, VIII, IX and X, and in deciles I, III and X among households with older members. The poorest socioeconomic groups may count on limited sources of remittances, whereas the wealthier strata may not have needed to receive this type of support. People sending money to households with no older members may use it all to bring up children, protect food consumption levels, invest in or accumulate physical and financial capital or accommodate day-to-day needs in their own unit. Remitters with older relatives back home may, conversely, have to make decisions as to how to divide money between their own households and their older parents.

Salazar and García (2003) have gathered recent data on remittances in Mexico from sources like the *Consejo Nacional de Población* (National Population Council), the Inter-American Development Bank (IDB), the Pew Hispanic Center (University of Southern California) and BBVA-Bancomer Bank. These authors estimated that the number of Mexican households benefiting from remittances from migrant members working in the United States increased from 659,000 in 1992 to 1.4 million in 2002, corresponding to 3.7 and 5.7 percent of total Mexican households, respectively. In the same decade, the average annual income from remittances increased from MX\$ 23,575 (£1,150) to MX\$ 28,905 (£1,410) in recipient households. Between 1996 and 2003, the *per capita* income coming from remittances varied from MX\$ 512 (£25) to MX\$ 1,189 (£58). Over the same time span, the total amount of money coming from remittances increased by a factor of 2.6, since it went from MX\$ 47,093 (£2,297 million) million to MX\$ 123,552 million (£6,027 million). Figure 3.1 shows the evolution of remittances in Mexico between 1996 and 2003.

Households receive around MX\$ 2,111 (£103) per remittance and, on average, every household receives money from this source seven times per year. To date, remittances account on average for 35 percent of the overall income of recipient households. Generally speaking, 2 out of every 10 Mexican adults receive money from remittances, and 85 percent of this income is spent on housing, food, health and education. Furthermore, 41 percent of adults living in Mexico count on at least one remitter member living in the United States. Remittances are thought to be received in practically all the states of the country and this money reaches nearly all layers of the society.

Figure 3.1. Remittances in Mexico, 1996-2003
(in thousand GBP)



Source: Salazar & García, 2003.

For households within the third to the tenth deciles of income, remittances represents on average 3.8 times the financial resources coming from the major Mexican income transfer programmes *Procampo* and *Oportunidades* (now

Contigo). On the other hand, there seems to be no significant differences between remitters and the total population in terms of age, education and income level, except for the fact that 63 percent of beneficiaries are women. With regards to the geographical distribution of households receiving remittances, 52 percent are concentrated in communities with less than 2,500 inhabitants, whereas close to 52 percent of the income coming from remittances is concentrated in the following entities: Michoacán (12.6 percent), Jalisco (10.1 percent), Guanajuato (9.2 percent), Estado de México (7.4 percent), Mexico City (6.7 percent), Puebla (5.9 percent). In November 2003, President Vicente Fox admitted that remittances play such an important role in the national economy that the amount of money obtained by them is much more than what the Federal Government is investing in the agricultural sector, as well as in education and social development Salazar and García (2003). It has been suggested that remittances constitute the second largest source of resources in Mexico.

Despite the importance of remittances not only for the households of migrants themselves, but for older parents and the overall national economy, the Mexican Government has not so far designed a formal programme to make anything more of these money transfers than an altruistic activity. However, through its programme *Quién es Quién en el Envío de Dinero* (literally, Who is Who Concerning Remittances), the Mexican Government is actively involved in giving advice to remitters and recipients on what to do concerning the use of money transfer companies (PROFECO, 2004; CONDUSEF, 2005; SRE, 2005). *Quién es Quién en el Envío de Dinero* has proved to be effective in defending consumer rights in Mexico. Thus, the Mexican Government has proved to be effective in

making companies reduce commission fees by suggesting remitters which provide the cheapest and quickest options and stimulate the creation of new providers, such as banks or telephone companies. Information on this programme can be accessed over the internet or by leaflets in consulates, airports, social clubs, etc.

On the other hand, through the *Certificado de Matrícula Consular* (Consular Register Certificate)¹⁵ issued by the Mexican consulates in the United States, migrants are allowed to open accounts in some banks from this latter country, since it is accepted as an official identity card. Sending money through banks may not only reduce the costs of this service, but may also make the transfer more secure. But even though both the programme by PROFECO and the use of the migrant card would make money transfers easier, there are still some obstacles for remitters and recipients. Migrants and their dependents are highly illiterate, have low or no access to the internet, are not used to banks and have a low reliance on the Mexican Government initiatives.

3.5. Concluding remarks

This chapter has presented a review of social policy actions by which older people from Latin America and other regions may achieve an adequate nutritional status, food security and access to resources. Overall, these interventions have the explicit purpose of improving the quality of life of a population group considered by many as socially, economically and nutritionally vulnerable, through stimulating the co-participation of both the state and society. However, from a

¹⁵ The *Certificado de Matrícula Consular* provides no proof of the migratory status of its holder. Its cost is approximately £15.

critical point of view, some doubts emerge regarding how anyone could possibly fulfill such an ambitious goal. Quality of life encompasses both objective and subjective aspects of human nature, and it is literally impossible to meet them all through implementing an initiative mainly focused on sorting out food needs. Tackling uncertain access to food in old age generates positive health externalities and *vice versa*. But other areas of quality of life such as the satisfaction derived from living in a safe environment or still being productive, for instance, might not necessarily be covered by making an older person food secure. Policy makers should hence be aware of the limitations of food assistance. That nutrition is both a determinant and an expression of quality of life, does not make it its unique component — food-related programmes may be effective in improving some dimensions of quality of life, but not all of them. Moreover, it is likely that income transfers and in-kind benefits impact differentially on the quality of life of recipients.

A second coincidence in most of the cases reviewed herein is that, in addition to the benefits delivered, programmes include specific objectives explicitly stimulating public awareness towards older people by either attracting the attention of the people towards the special needs and problems occurring during ageing, inviting the community to treat this population group respectfully or promoting either the creation or the reinforcement of social support networks dealing with older persons' concerns and interests.

One point in common between income transfer programmes and those handing over in-kind food benefits, is their high costs. This assumption is exclusively

based on simple estimates derived from multiplying, when available, the number of beneficiaries reported by the amount of money transferred or the cost of a benefit unit (e.g. a food basket or a food item) and, thus, by a given time unit (regularly, 12 months). Other important costs such as the salaries of civil servants working for the programme, consumables or transport expenses are not taken into account, since this information is rarely available. Overall, social pensions analysed in this chapter are particularly expensive —PRAAPAM is a good example of the above-mentioned.

Programmes and actions are heterogeneous in key aspects, such as coverage, targeting and the availability of resources. In essence, the cases presented in this chapter can be classified according to one of two categories: those selecting candidates according to the level of poverty experienced, normally measured by the availability of income and the ownership of assets (i.e. *means-testing* selection) and, on the other hand, those delivering benefits to anyone regardless of her or his previous socioeconomic status (i.e. universal eligibility). *Pro-Bienestar* and SOAP vs. PACAM and PRAAPAM are, respectively, examples of these two schemes. In addition to budgetary issues, the selection of a targeting method is also influenced by how decision makers take into account human rights, citizenship and society at any given moment. As mentioned previously, practically all programmes somehow look forward to improving the quality of life of their beneficiaries irrespective of the type of benefit delivered. However, one of the main differences regarding objectives is given by the definition of who is actually benefiting: the older person or households with older persons. An example of this is given by comparing PACAM, designed to exclusively benefit individuals aged

70 and over, with BCA, whose benefits can be extended to the dependents of an older person. Another difference emerges if programmes are integrated or specific. Some interventions include more than food assistance: BCA was more than a delivery of food baskets, PRAAPAM guarantees free drugs and health services in addition to a regular income, and through PACAM Chilean older people undergo regular check-ups.

With the exception of SOAP, little is still known about the impacts of all these programmes on older people's well-being, how their benefits are diluted within the household or who is actually benefiting. It is worth mentioning, nevertheless, that PACAM is currently in the process of being evaluated, and data on how PRAAPAM impacts on food security in older people from Mexico City is the topic of the next part of this thesis. These two programmes are starting to be at the centre of academic and political debates in Latin America and other parts of the world.

Chapter 4 presents a detailed description of the methods through which the study of the relationship between malnutrition, food insecurity and poverty in old age was carried out in selected areas of Mexico City and its Metropolitan Zone.

Chapter 4. Quantitative study of malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone: methods

Previous chapters presented a theoretical, empirical and social policy-related discussion of how malnutrition, food insecurity and poverty can be explained and how they are usually tackled in older populations from Latin American urban areas, particularly in Mexico City, as this is the socioterritorial environment on which this thesis focuses.

However, limitations of a diverse nature have surrounded the development of a more objective approach to these old-age matters. The lack of research and concrete data on food insecurity among older adults from the region has resulted in some speculation. This is in part due to the absence of comparison parameters regarding uncertain access to food and its impact on the nutritional status of older populations living in poverty. To date, it has only been possible to make a few inferences, often derived from information on younger individuals, households with different living arrangements or experiences from developed countries. In Latin America, research on malnutrition, food insecurity and poverty during old stages of life faces not only theoretical barriers, but also methodological gaps that may make it harder to explore these public health concerns from the correct angle.

Mostly derived from the theoretical framework presented in Chapter 1, the following sections of this chapter outline a methodological approach to the empirical study of the relationship between malnutrition, food insecurity and

poverty during old age in older people from Mexico City and its Metropolitan Zone.

As mentioned in previous sections of this work, the capital of the Mexican Republic can be seen as an illustrative example of urban growth, social and economic heterogeneity, cultural diversity, epidemiological complexity and demographic evolution of Latin American major urban areas. This chapter is divided into seven sections. First, the hypothesis and objectives behind this thesis are presented. The second section draws out the main features of the study design. A discussion of the specific sets of questions addressed to both older persons and their households, pointing out the main reasons for choosing them, is developed according to the structure of the theoretical framework presented in Chapter 1, rather than following the order of the questionnaire administered to sample households. Procedures regarding the sample size, along with the sampling strategy are described in the fourth place. Section five focuses on ethical issues, both those regarding the institutional level and those involving households and individuals during data collection. Since poverty is a major concern of this thesis, a special section on its assessment is then developed through the operationalisation of concepts revolving around consumption, such as *per capita* household expenditure. Finally, a methodological approach for isolating the impact of the programme Food Assistance for Older Persons (PRAAPAM, to use its Spanish acronym), run by the local Government of Mexico City, is proposed, detailing both the process of matching in the design, and the multivariate analysis carried out subsequently.

4.1. Hypothesis and objectives

4.1.1. Hypothesis

As seen in Chapter 1, there is a strong relationship between malnutrition, food insecurity and poverty during later stages of life, mediated by complex causal linkages. Under this premise, the availability of economic resources, particularly cash, is a necessary condition for survival in urban areas. This is the case of Latin American major cities, where a secure source of cash income accounts importantly for an adequate nutritional status, better access to food, and less poverty in individuals, households and groups. However, in this region, many older adults cannot easily generate their own economic resources given the limited job opportunities available during late stages of life, and they are not entitled to benefit from contributory pensions either (see Chapter 2), leading to social exclusion in the later stages of life. For this reason, where available, non-contributory pensions play a crucial role in achieving of better quality of life among this segment of the population. Through them, it is not only cash income that is available to beneficiaries, but also the opportunity to participate fully in society that this brings. However, this type of social programmes do not impact on an older person's well-being in isolation — social pensions for older adults commonly impact on other members of their households too. In a context of household and individual poverty, limited or no opportunities to generate income, unavailability of diversified sources of income and social safety nets, economic dependence, unawareness of younger cohorts towards ageing, limited or weak social networks, low educational levels, and reduced bargaining power of the older person *vis-à-vis* other members of the household, among other factors, mean that there are strong reasons to support the hypothesis that interventions like

PRAAPAM would impact positively on an older person's quality of life.¹⁶ Therefore, the hypothesis to be tested in this study is that the presence of a secure source of economic resources coming from an old-age social pension should result in better nutrition-related indicators, better food security and reduced poverty among its beneficiaries.

Given the lack of work on these topics among older populations from major urban areas of Latin America, and considering the above-mentioned hypothesis, the specific objectives of this study are:

4.1.2. Objectives

4.1.2.1. To identify associations between malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone

4.1.2.2. To assess the specific contribution of a cash-transfer programme in improving selected indicators of malnutrition, food insecurity and poverty amongst older persons from Mexico City and its Metropolitan Zone

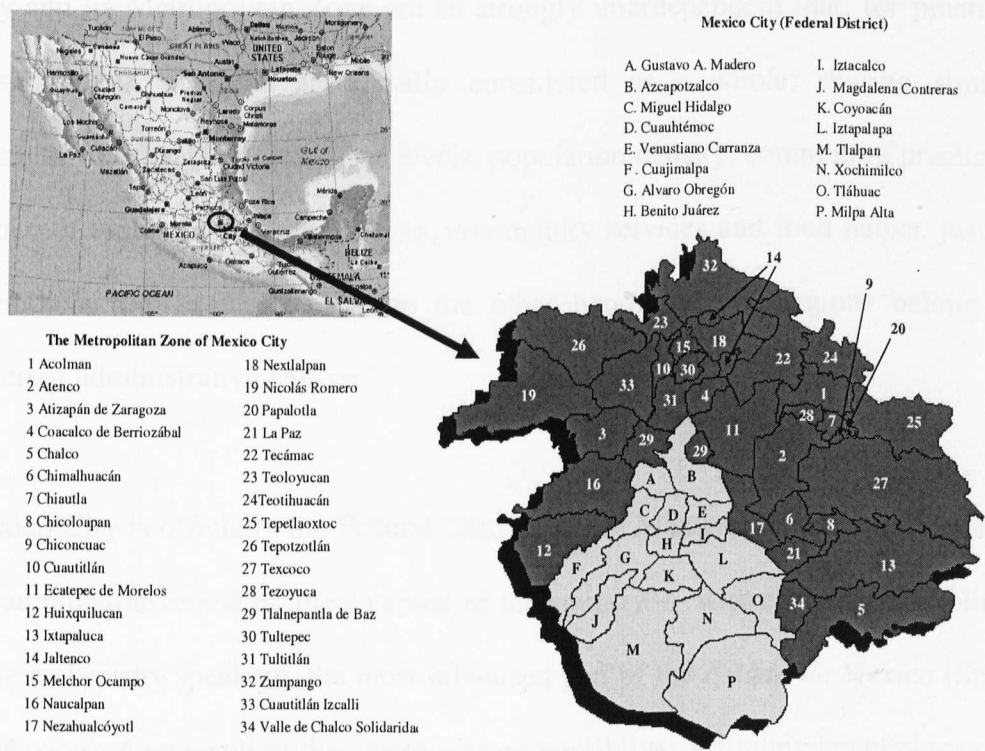
4.1.2.3. To determine whether an old-age monetary-transfer intervention impacts differentially on households and older persons

¹⁶ As explained in Chapter 3, PRAAPAM benefits consist of a monthly monetary transfer worth MX\$ 668 (£33) addressed to improve food security and other quality of life-related indicators in adults aged 70 and over living in poor, moderately poor and extremely poor neighbourhoods of Mexico City. This intervention is run by the Government of Mexico City (also known as the Government of the Federal District, or GDF, using its Spanish acronym).

4.2. Study design

An analysis of the relationship between malnutrition, food insecurity and poverty in older persons aged 70 and over and their household context from *socio-geographically*-defined poor neighbourhoods of Mexico City and its Metropolitan Zone (ZMCM, to use its Spanish acronym) was carried out through a quantitative survey. Figure 4.1 shows the area where this study was conducted.

Figure 4.1. Mexico City and the Metropolitan Zone of Mexico City



Given the importance of a secure source of cash income as a means of achieving an adequate nutritional status, access to food and better socioeconomic conditions during old age, a large multi-stage sample, stratified by PRAAPAM eligibility status was estimated. As seen in Chapter 3, PRAAPAM stands for *Programa de*

Apoyo Alimentario para Personas Adultas Mayores (Food Assistance for Older Persons, in Spanish), which is the large-scale intervention currently run by the local government of Mexico City. PRAAPAM eligibility status was, hence, used as the main criterion to classify subjects aged 70 and over into the intervention or the comparison group.

The use of area of residence as the variable through which beneficiaries and non-beneficiaries of PRAAPAM were selected requires some explanation. Mexico City and its Metropolitan Zone are so strongly interdependent that, for practical reasons, both of them are usually considered as a whole, sharing similar characteristics, such as, pollution levels, population density, commuting practices, degree of violence, cultural patterns, community services and food habits, just to mention a few examples. But on the other hand, the two regions belong to different administrative entities.

Mexico City is officially the Federal District of the Mexican Republic — namely the administrative and political capital of the country — whereas its Metropolitan Zone is, broadly speaking, the most urbanised part of the *Estado de Mexico* (State of Mexico). As a result of this, there was no possibility of finding beneficiaries of PRAAPAM in any area of this latter entity because its authorities were not implementing any programme based on a cash-transfer scheme. There was no possibility of selecting non-beneficiaries of PRAAPAM in Mexico City either, since all the subjects aged 70 and over living in poor neighbourhoods were, in theory, automatically recruited (or at least had the same chance of being recruited) by the Secretariat of Health of Mexico City (SSDF, to use its Spanish acronym).

In other words, whilst beneficiaries of PRAAPAM were residents of Mexico City 70 years of age and over, their counterparts (i.e. the comparison group) were those individuals from the same age group living in selected municipalities of the ZMCM. It is worth noting that the sample of individuals and their household context from Mexico City (i.e. the Federal District) was representative of PRAAPAM eligible older persons during the first stage of the intervention; this is, when the benefit was delivered on a *socio-geographical* basis. The main criteria for recipients and non-recipients selection is described in Table 4.1.

Table 4.1. Criteria for the definition of intervention and comparison groups

Intervention group	Comparison group
Individuals of both sexes aged 70 and over	Individuals of both sexes aged 70 and over
Residents of poor, moderately poor and extremely poor neighbourhoods of Mexico City	Residents of poor, moderately poor and extremely poor neighbourhoods of the ZMCM
Subjects permanently living in Mexico City at least the three previous years at the moment of recruitment by SSDF	Subjects permanently living in ZMCM at least since 1997 (which is the three previous years at the moment of PRAAPAM provision in Mexico City)
Actual or potential beneficiaries of PRAAPAM	Non-beneficiaries of any cash transfer for older persons

From a technical point of view, the most robust design to analyse the impacts of social interventions like PRAAPAM is thought to be a randomised controlled trial, widely acknowledged as a simple, powerful and revolutionary tool for epidemiological research (Jadad, 1998). Randomised controlled trials are commonly used to evaluate the efficacy — and less commonly effectiveness — of nutrition, health or social interventions. Participants are randomly allocated to

either an intervention or a control group, making it possible to measure and compare diverse outcomes between them.

Randomised allocation among eligible beneficiaries of a given intervention itself creates comparable, statistically equivalent beneficiary and control groups. In this research, the intervention group would logically be composed of potential (and actual) recipients of PRAAPAM, with a suitable standard of comparison expected to include adults aged 70 and over from Mexico City not receiving the social-pension. But given that the Government of the Federal District (GDF, to use its Spanish acronym) was supposed to have recruited all the residents of targeted poor neighbourhoods, there were no real possibilities of studying differences between individuals of the same area of residence attributed to PRAAPAM. Moreover, as the cash-transfer benefit was already being delivered, subjects from Mexico City would not have had equal chances of being in the intervention or the control group. Differences between beneficiaries of PRAAPAM and the few non-beneficiaries presumably found in Mexico City would hence not be due to chance and could have not been attributed to the intervention.

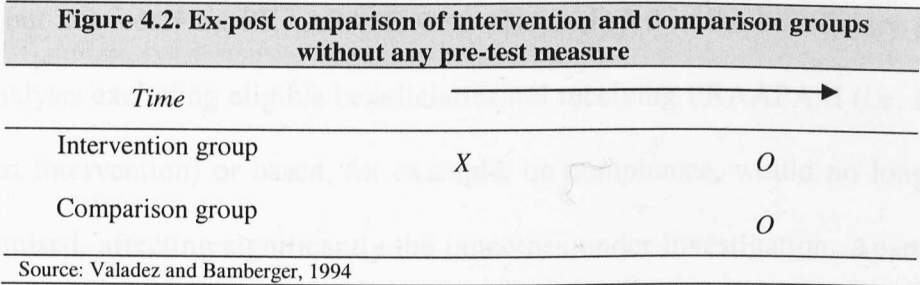
Furthermore, randomised allocation of benefits or services would probably have been unethical given that otherwise eligible participants would not have been recruited. In similar circumstances, non-beneficiaries may seek participation in programmes through alternative ways, or actual beneficiaries may not take up the intervention. Randomised control trials are often expensive. According to the department of Human Resources Development Canada:

"...Although experimental designs are as close to ideal as possible, in theory, they are seldom practical. By far the most common constraints

are program staff who refuse to comply because they consider randomized selection unethical or unacceptable, and evaluation timing: most often the evaluator enters the scene long after random assignment should have taken place. There are other problems as well. Most seriously, experimental methods are normally confined to a determination of the mean impact of the program; they cannot answer many other key policy questions, including the median impact of the program and the proportion of participants with a positive (or negative) impact from the program." [HRDC, 1998:7]

Concerns about how potential changes derived from PRAAPAM occurred in the target population, to which extent those changes can be attributed to the intervention, how other population groups are being impacted by this old-age cash-transfer or, overall, what differences exist between beneficiaries and non-beneficiaries were, hence in this case, assessed through a *quasi-experimental* design. Two methodologically rigorous quasi-experimental designs would have best suited this study: a) *pre-test* and *post-test* on intervention and control groups (i.e. the basic quasi-experimental design), and b) interrupted time-series analysis with a non-equivalent control group. In the first case, one observation is done (i.e. the baseline) in both beneficiaries and non-beneficiaries before PRAAPAM started running and another after the introduction of the programme, whereas in the second option, multiple observations before and after the intervention are proposed in both groups. However, this study comprises a design with an *ex-post* comparison of participants to PRAAPAM and a control group without a *pre-test* (Valadez & Bamberger, 1994: 261-263), as neither observations before the intervention were done nor a control group was previously defined by the Secretariat of Health of Mexico City (SSDF, to use its Spanish acronym). Figure 4.2. is a graphic representation of an *ex-post* comparison of intervention and comparison groups without any *pre-test* measure. In this design, *X* represents the moment of the intervention, while *O* means the moment when observations in

each group are carried out. In other words, beneficiaries of PRAAPAM and non-beneficiaries can be comparatively analysed after the benefit has already been provided.



There is full awareness about the potential limitations of an *ex-post* comparison of intervention and control groups without any *pre-test* measure. For instance, the lack of baseline observations is thought to limit the understanding of the magnitude and direction of expected changes in both groups, since it is difficult to estimate how closely the only measurement done in non-beneficiaries represents what would have been the situation of beneficiaries without the intervention. Nonetheless, this design should provide useful information on how PRAAPAM impacts its beneficiaries and how the characteristics of the beneficiaries might have been before the intervention given that the control group belongs to the same urban context. In order to ensure the highest degree of comparability between beneficiaries and non-beneficiaries, both groups were matched on the basis of 71 socioeconomic characteristics of their residential neighbourhoods believed to influence the programme outcomes. Data from the 2000 Mexican National Population and Household Census (hereafter, 2000 Census) were used in the matching process. More detail on this will be presented in later paragraphs.

It is worth noting that the comparison between beneficiaries and non-beneficiaries of PRAAPAM was carried out through an intention to treat analysis, which requires that all subjects from each group be included. Therefore, all adults aged 70 and over living for three or more years in targeted neighbourhoods of Mexico City, but not receiving PRAAPAM, were also included in the beneficiary group. An analysis excluding eligible beneficiaries not receiving PRAAPAM (i.e. failure to start intervention) or based, for example, on compliance, would no longer be randomised, affecting significantly the outcomes under investigation. Apart from random variation, intention to treat analysis aims at maintaining groups to be compared as similar as possible (Hollis & Campbell, 1999). On the other hand, this approach may also indicate the actual coverage of the monetary transfer.

4.3. Exploring malnutrition, food insecurity and poverty in older persons and their household context

As mentioned in previous paragraphs, a large survey was conducted to explore the relationship between malnutrition, food insecurity and poverty in households with older persons aged 70 and over from poor neighbourhoods of Mexico City and its Metropolitan Zone (see Appendix 1: Questionnaire). This survey included questions and items corresponding to the three levels of causality proposed in the theoretical framework developed in Chapter 1.

4.3.1. Old-age malnutrition and its immediate causes

4.3.1.1. The use of body mass index

Although there is still controversy about how best to estimate nutritional and health-related outcomes in older populations, the WHO strongly recommends the

use of anthropometry. BMI has proved to be useful in ascertaining both determinants and consequences of malnutrition, targeting interventions and assessing responses to food and health-related programmes in older populations. BMI has also been suggested as a good indicator for risk of morbidity and mortality in younger individuals. For example, U-shaped relationships between BMI and mortality have been reported among older Finnish people aged 60-79 years (WHO, 1995). Low BMI has been associated with tuberculosis, obstructive lung disease, and cancer of the lung and stomach (WHO, 1995), and type 2 diabetes, cardiovascular disease, musculoskeletal disorders, limitations of the respiratory function and reduced physical functioning are frequent sequelae of obesity and abdominal fat (WHO Expert Consultation, 2004).

Weight and height declines occurring with age may have different significance in older adults and in younger cohorts when BMI is estimated. A decrease in height is observed with age (WHO, 1995; Alemán-Mateo *et al*, 1999; Perissinotto *et al*, 2002). This loss has been attributed to diseases such as osteoporosis, changes in height and shape of vertebral discs (including compression), loss of muscle tone and postural changes (WHO, 1995; Bermúdez & Tucker, 2000). Declines in weight are also appreciable in late stages of life, with specific patterns of change by sex. Between 65 and 70 years, weight gains tend to stabilise in men and weight declines thereafter. In older women, increases in body weight are greater and plateaus approximately ten years later than in older men. Weight losses are often accompanied by a decline in muscle mass, being more evident in older men (WHO, 1995; Alemán-Mateo *et al*, 1999). The loss of weight and height experienced during old age leads to declines in BMI between 70 and 75 years of

age in both sexes. BMI may be higher in older adults aged 70 and over than in younger persons, however. However, the predictive power of BMI and other anthropometric indicators may vary with biological and sociodemographic factors, as well as with patterns of physical activity.

The way to explore malnutrition in older persons from the study sample was by estimating body mass index (BMI) from knee height and weight measures. Although arm-span and demi-span were also measured, they were finally not used because many individuals could not stand straight and found it difficult to extend their arms laterally. Knee height has been suggested as a reliable surrogate for stature in older people (Chumlea *et al*, 1985 and 1998; Roubenoff & Wilson, 1993; Bermúdez *et al*, 1999; Bermúdez & Tucker, 2000; Pini *et al*, 2001; Salvà *et al*, 2004; Palloni & Guend, 2005). Older individuals do not have to make exhausting physical efforts when this anthropometric indicator is being measured.

In 1988, Chumlea *et al* (1985) published a paper developing equations to derive stature from knee height in older people from the United States of America (USA). More recently, a new set of equations to estimate stature from knee height in older persons from different ethnic backgrounds living in north-eastern USA was proposed by Chumlea *et al* (1998). In this thesis, the stature of older persons living in poor neighbourhoods of Mexico City and its Metropolitan Zone was derived from the equations proposed by Chumlea *et al* (1998) for Mexican American older persons:

a) for men: $height (cm) = [1.83 \times knee\ height (cm)] - [0.16 \times age] + 82.77$

b) for women: $height (cm) = [1.82 \times knee\ height (cm)] - [0.26 \times age] + 84.25$

BMI thus resulted from dividing weight in kilos by estimated height (from knee height) in metres squared. This formula is used to evaluate if a person is at an unhealthy weight given a certain height. BMI cut-off points suggested by the WHO are shown in Table 4.2. Knee height and weight were measured according to international standards (Chumlea *et al*, 1988; Ismail & Manandhar, 1999) (See Appendix 2: Research logistics and fieldwork).¹⁷ As seen in Chapter 2, this classification has been widely used in works carried out, for instance, among older persons in Mexico City (Velázquez-Alva *et al*, 1996; Ortíz-Hernández *et al*, 2002) and urban areas of Brazil (WHO, 1995).

Table 4.2. BMI cut-off points for older populations suggested by WHO

Nutritional condition	Cut-off points (in kg/m ²)
Underweight	< 18.5
Normal weight	18.5 to 24.9
Overweight I	25.0 to 29.9
Overweight II	30.0 to 39.9
Overweight III	≥ 40

Source: WHO, 1995 and 1998.

Moreover, the universal use of the BMI cut-off points shown in Table 4.2 for all population and age groups has recently been questioned. For example, increased risks of cardiovascular disease, hypertension, type 2 diabetes and dyslipidaemia have been reported at absolutely lower BMI values among Asian adult populations (Pan *et al*, 2004; WHO Expert Consultation, 2004;). It has also been proposed that a modest degree of overweight may, for instance, be associated with

¹⁷ More details on what the author of this thesis did regarding the planning of the research process and fieldwork are provided in Appendix 2: Research logistics and fieldwork.

lower risk of mortality in older people (WHO 1995, Vischer *et al*, 2000; Price *et al*, 2005).

Even though experts suggest that current WHO BMI cut-off points should be retained as international classification, it is likely that they should not be used in isolation to estimate overweight but should be used in combination with other risks for both mortality and morbidity. Furthermore, cut-off points of 23, 27.5, 32.5 and 37.5 kg/m² are proposed as points for public health action. The WHO Expert Consultation has pointed out that:

“The purpose of a BMI cut-off point is to identify, within each population, the proportion of people with a high risk of an undesirable health state that warrants a public health or clinical intervention. When applied to a population, the purpose of anthropometric cut-off points is to identify independent and interactive risks of adverse health outcomes associated with different body compositions, so as to inform policy, trigger action, facilitate prevention programmes, and assess the effect of interventions. Reducing cut-off values for action on overweight and obesity would increase their prevalence rates overnight and, therefore, increase governmental and public awareness. However, such a change would require public health policies and clinical management guidelines to be changed, and could lead to increased costs for governments...[The expert consultation]... made no attempt to redefine BMI cut-off points for each population separately. Rather, they identified potential public health action points along the continuum of BMI and proposed the methods by which countries could make decisions about the definition of increased risk for their population.” [WHO Expert Consultation, 2004:161]

As a result of this debate, the use of other indicators, such as waist circumference or waist-hip ratio, have been suggested as alternate measures of body fat, giving better prediction of mortality and morbidity risk than BMI (WHO, 1998; Kalmijn *et al*, 1999; Price *et al*, 2005; Visscher *et al*, 2001; Yusuf *et al*, 2005).

4.3.1.2. Inadequate dietary intake and food insecurity in older persons

A decline in memory associated with age may interfere with the assessment of older people's diet-related indicators and other aspects of their quality of life (Patterson, 2003; de Groot *et al*, 2004). The longer and the more detailed the assessment of diet and other old age-related parameters take during the interviewing process, the more problematic the misclassification resulting from memory biases, and the more stressful the interview experience. Therefore, no in-depth approaches on the number and size of portions were asked of older subjects from the study sample. Respondents mentioned which food items had been consumed during the last 24 hours, from a list of the 58 most consumed food items in households with older persons from Mexico City and its Metropolitan Zone. Food items were chosen from those reported in the Mexican 2000 National Household Budget Survey (ENIGH, to use its Spanish acronym) (INEGI, 2001a), and were divided into seven major categories, according to the most representative food grouping suggestions all over the world (Painter *et al*, 2002): I. Bread, cereals, tubers, rice and pasta; II. Dairy products; III. Animal products and legumes; IV. Vegetables; V. Fruits; VI. Fats, sweets and desserts and VII. Drinks (Table 4.3). The non-quantitative information on food consumed by older people collected in this thesis was useful as a preliminary approach to dietary diversity, sometimes known as diet variety in the literature.

Dietary diversity, understood as the number of different food groups or food items consumed over a given reference period, has been proved to be a good estimate of food security (Hoddinott & Yohannes, 2002; Ruel, 2003; Swindale & Bilinski, 2005), nutrient adequacy (Hatløy *et al*, 1998; Torheim *et al*, 2004; Clausen *et al*,

2005; Dewey *et al*, 2005; Savy *et al*, 2005), and household *per capita* daily caloric availability from both staples and nonstaples (Hoddinott & Yohannes, 2002), among other nutrition-related variables.

Table 4.3. Food items consumed by older persons. Households from Mexico City and its Metropolitan Zone, 2000.

I. Bread, cereals, pasta, rice and tubers	V. Vegetables
Tortilla	Onion
Bread rolls	Tomato
Rice	Chili peppers
Sweet bread rolls	Tomatillo (green tomato)
Pasta	Carrot
Potatoes	Courgette
Bread loaf	Nopales
Other miازه products	Lettuce
Breakfast cereals	Chayote squash
	Green beans
II. Dairy products	Other vegetables
Fresh milk	Cucumber
Cheese	Frozen mixed vegetables
Yoghurt	Artichoke and radish
Other dairy products	
III. Animal products and legumes	VI. Fats and sugar
Beans	Cooking oil
Chicken	Sugar
Eggs	Soft drinks
Beef	Avocado
Lentils	Sweets and desserts
Canned tuna	Sour or double cream
Pork ham	Other fats
Pork	Fried pork skin and/or meat
Fresh fish	Chorizo
Other animal products	
Sausages	
IV. Fruit	VII. Drinks
Banana	Mineral water (still)
Lemon and lime	Other drinks
Apple	Beer, wine and spirits
Other fruits	
Papaya	
Apricot or peach	
Guava	
Orange	

Source: INEGI, 2001a

Varied diets are associated with health and nutrition outcomes, such as weight at birth (Rao *et al*, 2001); growth patterns in children no longer breast fed (Onyago *et al*, 1998); nutritional status of childbearing women (Savy *et al*, 2005) and adult women overall (Ogle *et al*, 2001); maternal nutrition and successful pregnancy (Wahlqvist, 2003), and nutritional conditions of teenagers (Torheim *et al*, 2004). Dietary diversity is also associated with better nutritional status, as well as with physical and cognitive functions during old age (Bernstein *et al*, 1999; Clausen *et al*, 2005).

Poor households from developing countries have been found to rely on monotonous diets predominantly based on starchy staples, including little or no animal products, with poor intakes of vegetables and fruits (Ruel, 2003). Lack of dietary diversity has proved to be associated with overall long-term health risks (Khan & Martorell, 1997), high blood pressure, abdominal fatness, diabetes mellitus type II, cardiovascular diseases, cancer and bone health in adulthood (Wahlqvist, 2003). On the other hand, variety in certain types of foods may contribute to inadequate nutritional conditions — for example, the consumption of diverse energy dense foods may in some cases lead to overweight and obesity (Kennedy, 2004). Some households may even think that food variety is desirable because it is a synonym of wealth rather than health (Coates *et al*, 2003).

To date, there is no agreed definition of dietary diversity. Methods to score food variety, as well as the development and validation of its indicators may differ from one study to another (Dangour, 1998; Ruel, 2003). However, the

operationalisation of dietary diversity through counting the number of different food items or food groups reported to have been consumed over a certain period of time, is a consensus among several authors. Whilst this approach seems to be relatively straightforward, nonintrusive, nor especially burdensome for respondents, researchers find it inexpensive, not complicated, nor time consuming (Dangour, 1998; Hoddinott & Yohannes, 2002; Ruel, 2003; Swindale & Bilinski, 2005). But the second limitation regarding the analysis of dietary diversity is the number of food groups to be taken into account, how to score diversity within and across food groups, and the recall period. For example, Savy *et al* (2005) suggest 14 food groups, Swindale and Bilinski (2005) suggest 12 food groups, and Hatløy *et al* (1998) suggest eight food groups. According to Swindale and Bilinski (2005:2): *“Knowing that households consume, for example, an average of four different food groups implies that their diets offer some diversity in both macro- and micronutrients.”* Meanwhile, Hoddinott and Yohannes (2002:10-11) point out that *“Knowing, for example, that a household consumes four food groups, as opposed to four different types of cereals, is more indicative of a diverse diet.”* Some scales of food diversity also consider the number of servings of different food groups and items (Khan & Martorell, 1997). Recall periods may also vary from one approach to another, usually ranging from 1 to 3 days, and from 7 to 15 days in some cases (Ruel, 2003).

In this study, two main estimates of dietary diversity in older people were constructed from the data. On the one hand, the diet of an older person was considered as diverse if it included the 6 food groups listed, partially diverse if included up to 5 food groups and non-diverse if reported ≤ 4 food groups. On the

other hand, dietary diversity was assessed by identifying the number of food items consumed per food group. An older person's diet was diverse if it included ≥ 2 food items of every food group, partially diverse if it included at least one food item per group, and non-diverse when no food item from at least one group was included in her or his diet. Drinks were excluded from the analysis of dietary diversity.

Old-age food insecurity current and past experiences were evaluated by asking older persons five questions corresponding to the quantitative and qualitative components of the Cornell-Radimer food insecurity scale discussed in Chapter 1 (Table 1.3). This information was summarised by calculating the number and proportion of older adults perceiving *at least one* current and one past experience of food insecurity. Radimer-Cornell items addressed to older people's perceptions of food insecurity have not been validated in older people from Latin American urban areas. They have, nevertheless, been used among Hispanic older populations from the USA (Olson *et al.*, 1996; Lee & Frongillo, 2001*a, b* and *c*). Questions and statements on individual food insecurity addressed to older persons included:

I. During the last week, the older person...

- a) *couldn't afford to eat properly*
- b) *was often hungry but didn't eat because she/he couldn't afford enough food*
- c) *ate less than she/he thought she/he should because she/he didn't have enough money for food*

II. During the last year, the older person...

a) *lost weight because there wasn't enough food*

b) *had hunger pangs but couldn't eat because she/he couldn't afford food*

4.3.1.3. Disease

Disease in older adults was explored through two main indicators: self-perception of health status and limitation of instrumental activities of daily living (IADL). The former indicator has been suggested as a good estimate of actual health conditions in older populations (Damián *et al*, 1999; Benyamini *et al*, 2003; Rahman & Barsky, 2003) and a strong predictor of mortality risk (Reindl-Benjamins *et al*, 2004). Self-reported health encompasses emotional and social dimensions of health and well-being during old age (USDA, 2000; Deeg & Bath, 2003). Older adults participating in the SABE project were asked how they considered their health at present, how it was in comparison with the previous year and how their health status was compared to other persons of their age. As seen in Chapter 2, Mexico City was one of the participating urban areas in the SABE project. Following similar criteria suggested by the literature (Liang *et al*, 2005), older adults studied in this thesis were asked how they perceived their health in comparison with other people of the same age. Possible responses were: better than others, as good as others, or not as good as others. The limitation of IADL is a good indicator of inadequate functioning during old age, which may be associated with poor health conditions. Functioning was also explored in older persons participating in the SABE project.

In this thesis, limitation of IADL was explored by creating an indicator suggesting how dependent or independent the older person's functioning was. The indicator of functioning included an older person's ability to use the phone, go out, go shopping, prepare their her or his own meals, do light housework, take medicines and manage their money. The three possible responses per limiting condition were "able to do it by her or himself", "does it if helped" and "not able to do it at all". Two points were given to the first answer, one to the second one and no points to the last one. Thus, the greater the score (up to 14 points), the more independent the older person with respect to ability to function (Pearson, 2000).

4.3.2. Household food insecurity, inadequate care, unhealthy environment and lack of health services: the underlying causality.

4.3.2.1. Household food insecurity

Food insecurity at the household level was explored by asking the member in charge of doing the food shopping or preparing the meals four different questions associated with past and present experiences on uncertain access to food at the household level. Recent or usual experiences on food insecurity focused on the amount of food eaten in the household, anxiety over not having enough food and money to buy more, and the perception of qualitative and quantitative components of uncertain access to food. A summarised indicator of current experiences of household food insecurity was constructed. Interviewees were also asked to remember whether they perceived four other experiences on household food insecurity from the Cornell-Frongillo and the CCHIP scales in the last year, in the last 30 days and how many times each one happened during the last month (Olson *et al*, 1996; Lee and Frongillo, 2001*a, b* and *c*). Where necessary, CCHIP items

addressed to individuals were adapted to the household unit. Items on household food insecurity, previously discussed in Chapter 1 (Table 1.3), were:

I. Current or usual experiences of household food insecurity:

- a) *Amount of food eaten in the household*
- b) *We worry whether our food will run out before we get money to buy more*
- c) *We eat the same thing for several days in a row because we only have few different kinds of food on hand and don't have money to buy more*
- d) *The food that we bought didn't last and we didn't have money to buy more*
- e) *We ran out of the food that we needed to put together a meal and we didn't have money to get more*

II. Past experiences of household food insecurity (including last year, last month and number of times in the last 30 days). Did you and your household ever...

- a) *run out of money to buy food?*
- b) *cut the size of meals because there was not enough food in the house?*
- c) *not eat for a whole day because there was no food or money to buy food?*
- d) *ever eat less than you/someone thought you/someone should because there was not enough money for food?*

Experiences relating to uncertain access to food at this level have not been validated for households with older persons in Latin American urban areas either.

However, Lorenzana & Sanjur (1999), validated CCHIP items in a sample of 238 poor and very poor households from Caracas, headed by younger women.

4.3.2.2. Inadequate care for older persons

Care for older persons involves not only a number of dimensions, but also complex relationships between members of the household. The approach taken to assess inadequate care in older persons from Mexico City and its Metropolitan Zone, was mainly by analysing indicators of loneliness and abandonment, lack of support from relatives and friends, and degree of bargaining power *vis-à-vis* other members of the household regarding food-related decisions.

Three aspects of loneliness in the older person were taken into account: unavailability of a living spouse or partner, not being visited by anyone, and eating alone most of the time. Lack of support was analysed through identifying older people not counting on anyone when they needed or wanted to talk, when they felt unwell or needed to take a medicine, needed to see the doctor, needed money or help, or needed something from the shop. The bivariate analysis of older people's participation in major decisions concerning food security (bargaining power) was carried out by exploring whether subjects were taken into account to decide what to eat, what foods or things to buy, and how to prepare their own meals or the household meals. Most of these indicators are a methodological innovation of this study.

4.3.2.3. Unhealthy household environment and lack of health services

The survey conducted in this research focused on the household as the older person's immediate social and physical environment. Inadequate physical conditions of the dwelling (i.e. poor infrastructure) may constitute a risk factor mainly for a number of communicable diseases. In this sense, questions regarding materials used in walls, roofs and floors, as well as questions aiming at finding out the conditions of water supplies, excreta disposal, management of rubbish and use of fuel for cooking were addressed to respondents. Concrete, brick, cement, or stone were considered as proper materials for walls; concrete tiles or blocks, concrete panels, or bricks were considered as proper materials for roofs, and floors made of concrete or covered with plastic or wooden tiles were considered as adequate.

The provision of water was not adequate when there was no connection to a piped supply, when it was unavailable inside the dwelling or not coming from the public system, and when it was not available 24 hours a day during 7 days. Having no sewage or pit latrine were the conditions to classify a household as inadequate in terms of excreta disposal, whereas not counting on rubbish collection or not having safe littering conditions constituted reasons to classify a household as unhealthy in terms of management of rubbish. Finally, households using fuel for cooking other than gas or electricity (in safe conditions) were considered as polluting. An aggregated measure of unhealthy household environment for the older person was obtained by adding these four indicators together. Data on the dwelling's basic infrastructure were used to create an overall indicator of unhealthy household environment.

Access to health services was explored through identifying which older persons counted on contributory pension benefits or received PRAAPAM. This linkage can be made because in Mexico, formal sector pensioners are entitled to health services from the social security institution they belong to, whereas PRAAPAM beneficiaries are, by definition, entitled to health services from the local health system in Mexico City. Those who receive either of these benefits were assumed to have access to health services.

4.3.2.4. Consumption poverty

As discussed in Chapter 1, indicators of consumption are thought to express more clearly people's well-being standards than income-based measures. According to Coudouel *et al* (2002:30):

Consumption is a better outcome indicator than income...[because it is]...more closely related to a person's well-being...that is, of having enough to meet current basic needs. On the other hand, income is only one of the elements that will allow consumption of goods; others include questions of access and availability. Consumption may be better measured than income...In urban economies with large informal sectors, income flows...may be erratic. This implies a potential difficulty for households in correctly recalling their income, in which case the information on income derived from...[a]...survey may be of low quality...Estimating consumption has its own difficulties, but it may be more reliable if the consumption module in the household survey is well designed. Consumption may better reflect a household's actual standard of living and ability to meet basic needs. Consumption expenditures reflect not only the goods and services that a household can command based on its current income, but also whether that household can access credit markets or household savings at times when current income is low or even negative...or other circumstances that cause income to fluctuate widely.

In this quantitative approach an aggregated measure of the value of goods and services consumed, as well as the actual or estimated value of rent, was

constructed as an indicator of consumption poverty in sampled households with older persons from Mexico City and the ZMCM. Consumption was divided into three major categories: 1) food expenditure, 2) non-food expenditure and, 3) actual or estimated value of rent. Questions on expenditure were addressed to the member or members of the household in charge of the food shopping and/or in charge of preparing the meals, provided that they were 18 years of age and older.

a) Food expenditure

Interviewees were asked to remember all the foods consumed, bought, produced, given as a gift, received as in-kind payment, or obtained through a social programme in the last 15 days, from a 58-food item list, corresponding to the most consumed food items by households with older persons reported in the 2000 version of the ENIGH (see Table 4.3). Other food items not included in this list were also included within food expenditures. Commonly, households in major urban areas of Mexico do the food shopping every fortnight, which is also the periodicity with which workers from the formal sector are paid. However, there was full awareness of purchases made on a weekly or on daily basis (such as tortillas, bread rolls or sweet bread rolls). The amount and the estimated or actual value of each food item was obtained. Data on the foods consumed outside the household were also collected. The sum of all the estimated or actual values for each food item from the list corresponded to the overall food expenditures in the household.

b) Non-food expenditure

Non-food expenditure included in this study are shown in Table 4.4. It is worth noting that not all goods or services included in this list are consumed, bought, given as a gift, received as an in-kind payment, or obtained through a social programme in the same period. The 34-item list was divided into five major groups, according to the most usual periods of consumption reported by the ENIGH: a) last 15 days, 2) last month, 3) last two months, 4) last three months and, 5) last five years. The actual or estimated value of each non-food item was obtained exactly in the same way as food expenditures were obtained. The sum of each value corresponded to the overall non-food expenditures in the household.

c) Value of the rent

The value of the rent is an important component of the consumption conditions of households. Information from people paying rent or from those knowing how much the rental value of their house was, was used to obtain the real value of rent. The value of the rent was predicted when people did not know this information or when they were not willing to respond to this question. There is a systematic relationship between the value of the rent and the characteristics of both the dwelling and the residents. In this study, log-linear regression adjusted for clustering was used to predict the value of the rent.¹⁸ The maximum educational level and the number of hours worked per week at the household level, as well as the number of residents in the household, the materials for floors and the availability of telephones were included in the model for predicting rent.

¹⁸ Log-linear regression models to predict the value of the rent were performed by Dr. Saul S. Morris from the UK Department for International Development (DFID), Honorary Senior Lecturer of the London School of Hygiene and Tropical Medicine, and co-supervisor of this thesis.

Table 4.4. Non-food goods, products and related services consumed in households with older persons from Mexico City and its Metropolitan Zone, 2000.

<i>In the last 15 days</i>	
Tobacco	Public transport (tickets, cards, passes, cab fares, etc.)
Shampoo, hair conditioners, shower gel, toothpaste, deodorant, razors, toothbrushes and other products for personal care	Newspapers and magazines Post, phone cards, mobile phone vouchers, etc.
Bleach, cleaning liquids, washing-up liquid, washing powder, and other products for house cleaning	Petrol, oil, lubricants and other products for vehicles
<i>In the last month: Telephone bill</i>	
<i>In the last two months: Electricity, water, gas and council tax</i>	
<i>In the last three months</i>	
Fabrics and clothes for children and adult members of the household	Leisure (film theatre, theatre, CD, DVD, video games, sports, etc)
Shoes and shoe repair for children and adult members of the household	Lottery and gambling
Maintenance and repair for the household's vehicles and other means of transport	Maintenance and repair for the dwelling Purchase, maintenance and repair of furniture, electric and electronic domestic appliances
Contraceptive methods	Linen, blankets, duvets, towels, pillows, pillow cases, curtains, mats, etc.
Health care (including doctor, dentist, prostheses, x-ray, laboratories, ambulances, etc.)	Ceramics, cookware, cutlery, kitchen tools, dishes, glasses, mugs, etc.
Medicines	Travels within Mexico and abroad
Books and subscription to magazines and newspapers	Food for pets
Housekeeping (domestic workers)	Veterinary and care for pets
Haircut, hairdresser, beauty parlours, etc.	Education
<i>In the last five years: Weddings, funerals and other ceremonies</i>	

Source: INEGI, 2001a

4.4. Sample size and sampling strategy

4.4.1. Sample size

The fact that the authorities of SSDF did not carry out any pre-test observations and never calculated approximately how much the programme would be expected to improve food security, nutrition status or any other aspect regarding the quality of life of PRAAPAM beneficiaries, made it difficult to estimate the sample size.

However, the sample size of this study is sufficient to detect as statistically significant any 10 percentage point difference between the intervention and the comparison group, in any outcome measure (Table 4.5). For its estimation, *alpha* and *power* have been set to 0.05 and 0.90, respectively. Thus, the risk of Type I error, or the probabilities of rejecting the null hypothesis when it is true, are low (i.e. finding that there are no differences between PRAAPAM beneficiaries and non-beneficiaries, when there are differences between the two population groups), and there is a high probability of correctly rejecting the null hypothesis (i.e. *power*).

Table 4.5. Sample size estimation: two-sample comparison of proportions.

Proportions to be compared (Ho : p1 – p2)	Beneficiaries (n1)	Non-beneficiaries (n2)
0.30 vs. 0.40	748	374
0.40 vs. 0.50	808	404
0.50 vs. 0.60	806	403
0.60 vs. 0.70	740	370
0.70 vs. 0.80	612	306
0.80 vs. 0.90	420	210
0.85 vs. 0.95	300	150

A 5 percent margin was added in case of refusals or repeated absence from the home. The final sample size of this study was set up as follows: 850 households with older adults in Mexico City and 425 households with older adults in ZMCM, which gives an overall sample size of 1275 households from this megalopolis. This 2:1 ratio between the intervention and the comparison group is justified by the better conditions for the investigator and fieldworkers to move across Mexico City, the lower the costs of the interviewing process and the closer the clusters

were in this latter area. The sample size was obtained by using the formula (Kirkwood & Sterne, 2003):

$$n > \frac{\{u\sqrt{\pi_1(1-\pi_1) + \pi_0(1-\pi_0)} + v\sqrt{2\bar{\pi}(1-\bar{\pi})}\}^2}{(\pi_0 - \pi_1)^2}$$

where:

n = required minimum sample size

π_0 = proportion 1

π_1 = proportion 2

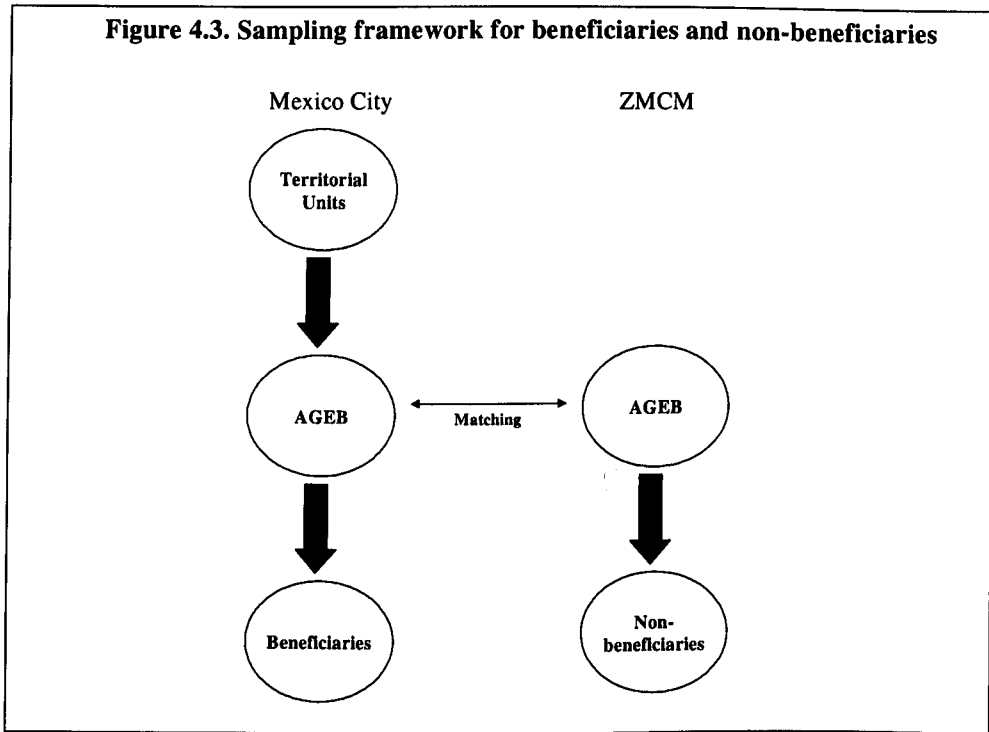
u = one-sided percentage point of the normal distribution corresponding to 100 percent – power

v = percentage point of the normal distribution corresponding to the (two-sided) significance level

4.4.2. Sampling strategy

A graphic representation of the sampling strategy is shown in Figure 4.3. The rationale by which GDF targeted PRAAPAM eligible neighbourhoods is not totally clear to date. In theory, a poverty index aiming at identifying aggregations of households, namely territorial units (TU), with potential beneficiaries was constructed using data from the 2000 Census. A territorial unit is an electoral ward created and used by the Federal Electorate Institute, for which census data are not reported. Mexican policy planners from the different levels of government rather use data from Basic Geo-statistical Areas (AGEB, to use its Spanish acronym) when interventions are geographically targeted.

Figure 4.3. Sampling framework for beneficiaries and non-beneficiaries



An AGEB corresponds to the smallest unit for which statistical information is available in Mexico. The main problem to sort out was, therefore, to find data at the same level of aggregation for targeted clusters in Mexico City and for their counterparts in the ZMCM. The only possible way to obtain similar information for the two areas under study, given the lack of census data for TUs in the ZMCM, was by disaggregating Mexico City's targeted TUs into AGEBs. Thus, socioeconomic characteristics of both benefited and non-benefited clusters were identified using the same level of aggregation. The importance of official statistics for AGEBs from Mexico City and the ZMCM will be more evident in further paragraphs, where cluster matching procedures are described.

4.4.2.1. Selection of the intervention group: Mexico City

For the selection of intervention group, multi-stage sampling was employed, in such a manner that each PRAAPAM-eligible resident aged 70 and over had an (approximately) equal probability of selection.

- a) *Primary sampling unit.* The PRAAPAM programme provided the investigator a list of beneficiaries according to Territorial Units (TU) in which they lived. All the TUs in Mexico City (The Federal District, DF) have been categorised according to socioeconomic level, and under their geographical targeting system, the programme only recruited beneficiaries living in TU defined as *extremely poor, poor* and *moderately poor*. A systematic sample of 85 territorial units (TU) was selected from the universe of targeted TUs with probability proportional to size, where *size* means the number of beneficiaries living in a given TU. The sample was drawn by first ordering the TUs by *delegación* (i.e. borough) and official code. After cumulating the number of beneficiaries, a systematic sample of TUs corresponding to every 2,816th beneficiary in the list was taken. The initial starting point was random.

- b) *Second-stage unit.* It was not possible to match TUs between DF and ZMCM since there are no data on TUs in the ZMCM. Furthermore, TUs were extremely unequally sized in the DF, making them unsuitable for geographic matching. Maps were used to determine which Basic Geo-statistical Areas (AGEBs) fell within each TU. Generally, each TU contained a discrete number of AGEBS. Again probability proportional to size was used to select one AGEBS within each TU. Since there was no perfect measure of *size* for the

AGEBs, the number of beneficiaries was approximated using the number of persons aged 65 and over from the 2000 Census.

- c) *Third stage.* Having the maps of every AGEB printed, all the blocks in a given AGEB were sequentially numbered, starting in the middle, and working outwards in a clockwise spiral. The corners of each block were also sequentially numbered, starting in the northwesternmost corner and proceeding clockwise. Using a random number generator, a block was selected to begin the house-by-house search for older persons. One corner of this block was also selected at random. Starting at this corner and moving clockwise around the block, fieldwork supervisors identified the first dwelling with an older person with the characteristics described above. They then selected for interviews every third dwelling, following a clockwise route around the block until ten households with older persons were successfully interviewed.
- d) *Sampling of individuals within households.* Fieldwork supervisors found out in every selected household if there was any person aged 70 and over who had lived in the visited urban area for three or more years. Then they asked if the household wanted to participate in the study and if any of the available older members were able and would agree to answer some questions. If so, they asked whether any of these older adults were physically able to be measured. Once all potential older respondents of a given household were identified and registered in the questionnaire, fieldworkers chose the one whose given name

appeared first in an alphabetically ascending order to be individually interviewed.

4.4.2.2. Selection of the control group: ZMCM

For the selection of non-beneficiaries, multi-stage sampling was also employed, in such a manner that each resident 70 and over had an (approximately) equal probability of selection.

- a) *Primary sampling unit.* For each selected AGEB in the DF, a similar AGEB was selected in ZMCM.
- b) *Second-stage unit.* Within each selected AGEB, the same as in the DF was exactly done, except that only five households with older persons aged 70 and over were selected.
- c) *Sampling of individuals within households.* This sampling was carried out in exactly the same way as in Mexico City.

4.4.2.3. Matching neighbourhoods

In order to achieve the highest degree of comparability between beneficiaries and non-beneficiaries, all the variables from the 2000 Census database were used to identify pairs of AGEBs composed of one AGEB from Mexico City and one from the Metropolitan Zone of Mexico City (ZMCM, to use its Spanish acronym) with similar characteristics. Many of these variables were highly correlated with one another. Factor analysis was employed, and after some experimentation of different combinations of variables, a single socioeconomic score variable was created using the variables marked with an asterisk in Table 4.6, making it

possible to identify overlapping subsets of AGEBs from both regions — namely, the area of support — from which the survey AGEBs were finally sampled.

Table 4.6. List of variables included in the factor analysis

Sociodemographic characteristics:	Education:
Male population	Illiterate population 15 and over *
Female population	Illiterate male population 15 and over
Dependency ratio	Illiterate female population 15 and over illiterate
Population without access to health services	Population 15 and over with no instruction *
Impaired population	Population 15 and over with primary school uncompleted
Residents in the municipality since 1995	Population 15 and over with secondary school uncompleted
Population 12 and over single	Population 15 and over with high school studies
Male population 12 and over single	Population 18 and over without high school studies
Female population 12 and over single	Population 18 and over without university studies
Population 12 and over married	
Male population 12 and over married	Dwellings with (household commodities):
Female population 12 and over married	Radio
Population 12 and over living in common-law	TV
	VCR *
Occupation:	Blender
Economically active population (EAP)	Fridge *
Economically inactive population (EIP)	Washing machine *
Unemployed population	Telephone *
EIP 12 and over studying	
EIP 12 and over occupied in house arrangements	
Population in the manufacturing sector	
Population occupied in the services sector	

The area of support contained those AGEBs of the ZMCM in which PRAAPAM could have been implemented since some of their conditions were similar to a group of AGEB from Mexico City where PRAAPAM is already running. Those AGEBs with less than 30 persons aged 65 and over in the census were dropped. In addition to the socioeconomic score variable, a variable identifying AGEBs with large proportions of immigrants from other regions of Mexico was also used in the matching procedure. This was because there was a strong prior hypothesis that food budgets and nutritional status would differ markedly between immigrant neighbourhoods and established urban areas. The variable was described as the

proportion of residents in the AGEB who were born in the same state. This resulted in the total exclusion from the sample of a number of municipalities in the ZMCM (such as *Nezahualcóyotl* and *Chalco Solidaridad*) which were famous for attracting migrants from poor rural areas of Mexico.

Table 4.6. List of variables included in the factor analysis
(continued)

Occupation:	Dwellings with (household commodities):
Workers or employees	Boiler *
Agricultural sector workers or daily-labourers	Car
Self-employed population	Computer
Occupied population with no income	All the above-mentioned commodities
Occupied population with < 1 minimum wage p/month	None of the above-mentioned commodities
Occupied population with up to 2 minimum wages p/month	
Occupied population with up to 5 minimum wages p/month	
Occupied population with > 5 minimum wages p/month	
Households and dwellings characteristics:	Dwellings with (rooms and physical characteristics):
Fully-paid dwellings	Rooftops made out of concrete or brick
Rental dwellings	Walls made out of brick, wood, concrete, etc.
Average number of persons in dwellings	Floors made out cement, tiles, wood, etc.
Average number of persons per room in dwellings	One room (excluding kitchen)
Household headed by a male	2 to 5 rooms (excluding kitchen)
Households headed by a female	One-room dwellings (kitchen in the same room)
	2 to 5 rooms (including kitchen)
	One bedroom
	2 to 4 bedrooms
	A especial room for kitchen
	No especial room for kitchen
	Using natural gas to cook
	A specific room for the toilette
	Excreta disposal system
	Electricity
	Water

The algorithm to match each DF AGEB to its most similar counterpart in the ZMCM was based on work by Rosenbaum and Rubin (1983 and 1985). Both matching variables were standardised so that they had a mean of zero and a

standard deviation of 1. Following this, the Euclidian distance¹⁹ between all possible pairs of AGEBs (one DF and one ZMCM) was calculated, and the best match on this measure was selected, provided that the absolute difference on the socioeconomic score did not exceed 0.2 standard deviations. This restriction is referred to in the literature as imposing a *caliper* on the matching. Once an AGEB in the ZMCM was selected as a match it was eliminated from the pool of available matches for the remaining AGEBs in the DF.²⁰

4.5. Data analysis

Two types of quantitative analyses were carried out in this study. A bivariate analysis between consumption level (as a proxy for socioeconomic status) and indicators of the relationships between malnutrition, food insecurity and poverty during old age was first carried out. No differentiation between beneficiaries and non-beneficiaries of PRAAPAM were made at this stage. Secondly, in order to investigate the hypothesis that a secure source of cash income has a crucial role in an older person's quality of life, multivariate approaches were used to isolate PRAAPAM impacts, differentiating beneficiaries from non-beneficiaries of this intervention. Both analyses were carried out using STATATM version 8.1 (STATA Corp, 1984-2005).

4.5.1. Socioeconomic gradients in the relationships between malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone

¹⁹ The Euclidean distance is the sum of the squared differences in the individual variables.

²⁰ Factor analysis and theorization on this procedure was mainly performed by Dr. Saul S. Morris from the UK Department for International Development (DFID), Honorary Senior Lecturer of the London School of Hygiene and Tropical Medicine, and co-supervisor of this thesis.

4.5.1.1. General characteristics of older persons under study and their household context

A broad way to characterise the older population under study was through describing commonly used sociodemographic variables in the literature. The distribution of the older population by sex, as well as its distribution by sex and age group were first presented. This was followed by the distribution of subjects by area of residence. Data on household headship, educational level, and the availability of a living spouse or partner in older persons by sex were also shown. For comparative purposes, all the above-mentioned variables were presented differentiating individually sampled and interviewed older persons ($n = 1,263$) from non-sampled older persons in the same households ($n = 318$). This comparison was essential to find out whether differences between both populations were statistically significant. Probit and ordered probit regression adjusted for design effect were used to test for significance,²¹ assuming a p values < 0.05 and < 0.01 as significant and highly significant, respectively. Household size was estimated by counting the number of members in the household, whereas household composition was based upon the presence and number of members aged 70 and over.

4.5.1.2. Construction of socioeconomic groups based on consumption poverty

Prior to the bivariate analysis of socioeconomic status and the variables under study, the median *per capita* monthly expenditure by quintile of total household

²¹ Probit regression is used when the outcome is dichotomous, whereas ordered probit regression is estimated when outcomes are continuous or have more than three categories. Probit and ordered probit regressions are recommended when differences in proportions are analysed, making it easy to adjust for design effects (in this case, clustering and stratifying). The use of probit and ordered probit regressions are more coherent with the hypothesis of this thesis.

expenditure was estimated, constituting a preliminary approach to consumption poverty in households with older persons from the study zone. As discussed in previous paragraphs, total household expenditure is the sum of both food and non-food expenditure, plus the actual or estimated value of rent. The median *per capita* monthly expenditure was obtained by dividing the total household expenditure by the number of members of a given household. Results were presented in MX\$ and GBP. A detailed description of median per capita monthly income including minimum and maximum values will be further presented in Chapter 5 (Table 5.2).

The analysis of variables under study was disaggregated by quintiles of median *per capita* household expenditure (namely, the bivariate analysis). Quintile I corresponded to the poorest socioeconomic group, whereas quintile V grouped the wealthiest households from the study sample.

4.5.1.3. Socioeconomic gradients of immediate and underlying causes of the relationships between malnutrition, food insecurity and poverty during old age

Mean values (and standard deviation) of age, estimated height based on knee height and weight in older persons by sex were first obtained, including mean values of BMI (and standard deviation) in the older population by age and sex. The classification of BMI according to the WHO was presented in Table 4.2. Differences by sex, and by age and sex (where appropriate) were estimated through probit and ordered probit regression, adjusting for design effect. *P* values < 0.05 and < 0.01 were respectively considered as significant and highly

significant. Secondly, bivariate analysis of BMI (using the cut-off points suggested by the WHO) by sex and socioeconomic status was carried out. It is worth noting that, from this point onwards, the analysis of socioeconomic gradients in the variables under study was carried out in the 1,263 individually sampled, interviewed and measured older persons. However, BMI values could be estimated in only 1,247 individuals, because 16 individuals refused to be measured.

Dietary diversity in older persons (in the last 24 hours) by quintiles of median *per capita* monthly expenditure was analysed exploring: a) proportion of older persons consuming each major food group, b) proportion of older persons consuming single food items from each major food group, c) number of food groups included in the diet and, d) number of items per food group included in the diet. Food groups and items explored were previously presented in Table 4.3.

Old-age food insecurity, self-perceived health status and limitation of IADL, considered as well as immediate causes of the relationships between malnutrition, food insecurity and poverty during old age, were also analysed by socioeconomic status (i.e. quintiles of median *per capita* monthly income). A cross tabulation between BMI, divided into categories *Non-overweight* and *Overweight*, and aggregated experiences on food insecurity was produced to observe the distribution of malnutrition by condition of uncertain access to food during old age. Socioeconomic differentials in current and past experiences of household food insecurity; inadequate care, unhealthy household environment and lack of access to health services in older persons were explored. The analysis of

inadequate care was repeated stratifying for household composition. Probit and ordered probit regressions (where appropriate) adjusted for design effect were performed in the analysis of immediate and underlying causes of the relationships between malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone, considering p values < 0.05 and < 0.01 as statistically and highly statistically significant, respectively.

4.5.1.4. Analysis of indicators of income poverty by quintiles of median monthly *per capita* expenditure

Three major groups of indicators of income at the individual and at the household level were constructed: a) income from employment and self-employment, b) assets and, c) income from pensions and other transfers in cash or kind. Each major group contained a number of single indicators (Table 4.5). Probit regression and ordered probit regression (where appropriate) adjusted for design effect were performed, considering p values < 0.05 and < 0.01 as significant and highly significant, respectively.

4.5.2. Isolating the impacts of PRAAPAM

4.5.2.1. First stage: the descriptive analysis

Bivariate and multivariate analyses were carried out to explore the impacts of PRAAPAM on old-age nutrition, health and quality of life-related indicators between the older population of Mexico City and its comparison group, composed of older subjects from the neighbouring Metropolitan Zone of Mexico City not receiving this cash transfer. It is worth noting that only 1,253 older persons were included in the multivariate analysis, because one selected AGEb from Mexico

City was excluded given that no older person from its pair in the ZMCM wanted to participate in this study. A comparison of sociodemographic characteristics between older adults from Mexico City and those from the ZMCM, was first carried out, aiming at identifying potential differences between these two population groups. Area of residence was considered as a proxy for receiving PRAAPAM.

The following descriptive analysis comparing the two areas of residence was that of selected indicators of income in older persons and their households. Thirdly, an analysis of indicators of unhealthy household environment for the older person by area of residence was performed. The indicator of a lack of access to health services was excluded from this analysis, given that this condition may actually change as a result of receiving PRAAPAM. Probit and ordered probit regressions (where appropriate) adjusted for clustering were performed and, as in previous analyses, p values < 0.05 and < 0.01 were respectively considered as significant and highly significant.

4.5.2.2 The second stage: bivariate and multivariate analyses

Indicators of nutritional status (i.e. age, estimated height based on knee height, weight and BMI); dietary diversity, old-age food insecurity, disease (self-perceived health status and limitation of IADL) and lack of access to health services, household food insecurity and inadequate care for older persons were analysed by area of residence.

Table 4.7. Selected indicators of income poverty in households with older persons from Mexico City and the ZMCM, 2002

I. Availability of income from employment or self-employment

- a) at the household level
- b) older persons

Source of income from employment and self-employment in the household

- From younger members only
- 50 % from older members
- From older persons only

II. Assets

Own dwelling

Availability of...

- Bicycle
- Blender
- Car, truck or motorcycle
- Computer
- Cooker
- Fan
- Fridge

II. Assets (continued)

Availability of...

- Iron
- Microwave oven
- Other entertainment assets (cable t.v., video games, etc.)
- Radio
- Sewing machine
- Sound system
- Television
- Vaccum cleaner
- VCR
- Washing machine
- Water boiler
- Water pump

III. Income from pensions and other transfers in cash or kind

Pensions

- a) at the household level
- b) older persons

Participation in food programmes

- Food Programme from Mexico City's Government *
- Milk
- Free food baskets, meals, food items, food banks, etc.
- Food vouchers as a benefit from job
- Older person's discount card from INAPAM
- School breakfast
- Subsidised foods
- Community kitchens, prepared meals
- Other cash transfers

Households with some kind of food assistance other than PRAAPAM

With the exception of the analysis between BMI and age group (for which ordered probit regression adjusted for clustering was performed), probit regressions adjusted for clustering were carried out to measure the differences between older persons from the two areas of residence, given that all the outcomes under study were transformed into dummy variables. According to the design of this study, differences found were essentially attributed to PRAAPAM. The bivariate analysis was carried out without adjusting the differences found.

The multivariate analysis included exactly the same indicators mentioned in the previous paragraph by area of residence, and controlling for confounding. Potential confounders of the relationships between malnutrition, food insecurity and poverty during old age were sex, age, old-age household headship, maximum educational level in the household, availability of a living spouse or partner, household size and composition, number of hours worked at the household level, participation in the labour force at the household level; participation of the older person in the labour force; dwelling ownership, availability of telephone, vehicle, motorcycle, van or pick-up truck and water pump; participation in the *Liconsa* milk programme, and availability of the INAPAM's older persons' card (Table 4.8). Potential confounders were not only identified a priori according to the theoretical framework (see Chapter 1), but also selected once differences between Mexico City and the ZMCM proved to be statistically significant, even if associations were weak (i.e. $p < 0.2$).

For both the bivariate and the multivariate analyses, probit and ordered probit regressions (where appropriate) were performed, considering p values < 0.05 and < 0.01 as significant and highly significant, respectively.

Table 4.8. Selected potential confounders in the multivariate analysis of the relationships between malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone.

Potential confounders	Characteristics / Justification
Sex	Old-age food insecurity is influenced not only by counting on a regular source of economic resources, but also by variables associated with gender. For example, older women may be less food insecure than older men, because they are more independent and have traditionally met not only their own food needs, but also those of other members of the household. Despite a very weak association between sex and area of residence ($p = 0.263$), sex was included as a potential confounder not only because it was selected a priori (according to the theoretical framework developed in Chapter 1), but also because most epidemiological studies control for this variable.
Age	Food insecurity is expected to increase with age — the older the person the more reduced her or his access to food. The association between age and area of residence was weak ($p = 0.105$). However, age was selected as a potential confounder for the same reasons mentioned in the previous paragraph.
Household headship: older person	Household heads are supposed to have a predominant role in major decisions concerning the household functioning and dynamics, including food security. This is expected to be the case of older persons considered as head of their households, who are in turn expected to have more control over the way that resources entering the household could best benefit all its members. Associations with food security outcomes may be confounded by the fact that there are more older adults considered as household heads in Mexico City than in the ZMCM.
Maximum educational level in the household	Money is not the only means through which malnutrition, food insecurity and poverty can be reduced. For instance, the higher the achievements in education at the household level, the better the knowledge on nutritional facts and, therefore, the higher the food security conditions. However, as it happens with old-age household headship, higher educational levels are reported in Mexico City.
Availability of living spouse or partner	The availability of a living spouse or partner can be assumed as an important source of help and support during old age, that may impact positively on nutrition and food security at the individual level. However, the fact that more older adults count on a living spouse or partner in the ZMCM could confound the associations between PRAAPAM eligibility status, malnutrition, access to food and poverty.
Household size and composition	Food insecurity indicators are expected to be influenced not only by income, but also by the ways income is shared. The number and age structure of the members of the household is crucial to understand access to food. Differences in household size and composition may confound the relationship between receiving PRAAPAM and access to food.

Table 4.8. Selected potential confounders in the multivariate analysis of the relationships between malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone.
(continued)

Potential confounders	Characteristics / Justification
Number of hours worked at the household level; participation in the labour force at the household level, and participation of the older person in the labour force	The more the opportunities to count on wage income, the better the food security in older persons and younger members of the household. Hence, households with more than one source of wage income and with beneficiaries of PRAAPAM may be likely to have better access to food. However, area differences in the proportions of households, older persons and other members with access to wage income may interfere the associations between receiving the monetary transfer by PRAAPAM and access to food.
Ownership of dwelling, telephone, car, motorcycle, van or pick-up truck (for the use of the household), and water pump	The ownership of expensive assets (or the availability of those for which high fees must be paid on a regular basis, like telephone), is an indicator of wealth. In this sense, the more expensive the assets owned by households, the higher their consumption level, and the more likely that households have a better access to food. But the way that PRAAPAM influences food security can be confounded by the distribution of households according to the ownership of assets (as a proxy for pre-programme spending power or as an indicator of availability of non-wage income).
Participation in <i>Liconsa</i> milk programme and availability of INAPAM's older persons' card	It is very likely that the more the food programmes benefit the household, the better the nutrition and food security of the older person and younger members. Access to <i>Liconsa</i> subsidised milk and to a number of discounts by using INAPAM's older person's card, may positively change indicators of nutrition, food insecurity and poverty in both older persons and households. However, area differences in food assistance participation may confound the associations between the monetary transfer by PRAAPAM and food insecurity outcomes.

4.6. Ethical considerations

The London School of Hygiene and Tropical Medicine's Ethics Committee approved this study, as it involved interviews and anthropometric measurements to human subjects (Ethical Approval No. 866). Although none of the procedures or activities carried out in this study caused discomfort or distress to older adults or any other member of their households, it is worth noting that the duration of the interview (up to 1 hour and 30 minutes in some cases) was tedious for some subjects, particularly if households were composed of one or more adults aged 70 and over.

Fieldworkers stopped the interview when respondents requested it, and asked for a second or a third visit. For multi-generational households this did not represent a problem, as most of the interview could be answered by one or more individuals aged 18 and over. On the other hand, the measurement of height, weight, arm-span and knee-height was not distressful for older adults. Trained fieldworkers exclusively in charge of measuring the above-mentioned anthropometric indicators provided assistance for older persons at any time, particularly when subjects sat down, stood up, stepped on the scale and lifted up arms. No hazardous substances were used during the conduct of the survey. Written consent was obtained either from the older person under study or her/his primary caregiver (see Appendix 3: Information sheet and written consent).

There were some points taken into account concerning the degree of confidentiality maintained with respect to the data collected. Responding to questions on household expenditure patterns or others related to poverty and living conditions are usually embarrassing for interviewees. Interviews were hence conducted in privacy if requested by respondents. As regards use of the pension itself, some beneficiaries could have sold what they bought through the card in order to get cash. Others may have bought non-food items or basic products for their own households, or may have provided their relatives, either living in Mexico City or the ZMCM, with food or other goods obtained through the cash-transfer. It may also have happened that a member of a given household (e.g. the older person's caregiver) restricted or conditioned the use of the assistance to the beneficiary. For all these reasons, no names were given to

anyone involved in the use of the database, no questions concerning the programme misuse were included in the questionnaire, and no household-level information was provided to the GDF.

In the next chapter, an analysis of the socioeconomic differentials in selected indicators of malnutrition, food insecurity and poverty among older persons from Mexico City and its Metropolitan Zone will be presented.

Chapter 5. Older persons and their household environment in poor areas of Mexico City and its Metropolitan Zone

Previous sections of this study discussed the theoretical linkages between malnutrition, food insecurity and poverty during old age; how these relationships manifest themselves in contemporary urban societies of Latin America, and how governments of both developing and developed countries face their negative effects on older individuals and their households. Chapter 4 developed a quantitative approach for the study of these relationships in subjects aged 70 and over from Mexico City and its Metropolitan Zone of Mexico.

This chapter is linked to the previous ones in at least three major points. First, through an analysis of data on the older population under study it is possible to empirically demonstrate the existence of strong linkages between malnutrition, food insecurity and poverty during the latest stages of life, within a particular urban Latin American setting. Secondly, the following results show differences and similarities between older adults from Mexico City and its Metropolitan Zone, and those from other studies carried out in urban Latin America, including the area which this thesis focuses on. Thirdly, the findings of this thesis give evidence for the multiple ways in which local and national governments face food and nutrition issues in poor older citizens. This chapter first presents basic statistics on the main characteristics of the older population under study and their household context. Secondly, a general description of the socioeconomic status of sampled households with older persons is based on the median monthly *per capita* monthly household expenditure. This is followed by a descriptive analysis of data related

to each level of causality and component of the relationship between malnutrition, food insecurity and poverty in old age. Results are disaggregated by quintiles of monthly median *per capita* household expenditure, as a way to show how the theoretical framework fits reality, trying to understand the rationale of the *Programa de Apoyo Alimentario para Personas Adultas Mayores* (Food Assistance for Older Persons) (PRAAPAM, to use its Spanish acronym) for tackling malnutrition in older people and inadequate access to food by using money.

5.1. General characteristics of the older population under study

Table 5.1*a* and 5.1*b*. present the distribution of the older population under study by seven selected sociodemographic characteristics: sex and age, area of residence, household headship, educational level, availability of a living spouse or partner, household size and household composition. Individually interviewed older persons are differentiated from non-interviewed older persons for comparative purposes. It is worth emphasising that only one older member aged 70 and over was individually interviewed and measured in each household with older persons (see Chapter 4). Overall, out of 1,581 adults aged 70 and over living in households from selected poor neighbourhoods of Mexico City and its Metropolitan Zone (ZMCM, to use its Spanish acronym), 1,263 subjects were individually interviewed and measured, following the procedures described in Chapter 4.

According to Table 5.1*a* sex differences between individually interviewed and non-interviewed older people are statistically significant ($p < 0.01$, probit

regression adjusted for design effect). Older women participated in this study more than older men which, in turn, constitute more than half of non-interviewed older persons. Older men were much less interested in the interview than women or withdrew more frequently from it. However, the sex distribution of individually interviewed older persons is similar to that observed in other urban areas of Latin America (see Chapter 2).

Table 5.1a. Distribution of older population under study by selected sociodemographic characteristics, 2002.

Variables	Interviewed older persons		Non-interviewed older persons	
	%	No.	%	No.
Sex *				
Men	37.2	470	52.8	168
Women	62.8	793	47.2	150
Total				
Age group by sex				
Both sexes				
70-79	71.0	897	68.9	219
80-89	25.3	319	25.5	81
≥ 90	3.7	47	5.7	18
Total	100.0	1,263	100.0	318
Men				
70-79	69.6	327	61.9	104
80-89	26.6	125	33.3	56
≥ 90	3.8	18	4.8	8
Total	100.0	470	100.0	168
Women				
70-79	71.9	570	76.7	115
80-89	24.5	194	16.7	25
≥ 90	3.7	29	6.7	10
Total	100.0	793	100.0	150
Area of residence				
Mexico City	66.9	845	63.8	203
ZMCM	33.1	418	36.2	115
Total	100.0	1,263	100.0	318

* p < 0.01 for differences between interviewed and non-interviewed older persons (probit regression adjusted for design effect)

When both sexes are combined no big age differences between the two population groups are evident ($p > 0.05$, ordered probit regression adjusted for design effect)—around 70 percent were 70 to 79 years of age, a quarter were 80 to 89 years, and less than 6 percent were 90 years of age or older. Age differences by sex showed no statistically significant differences either ($p > 0.05$, ordered probit regression adjusted for design effect). In short, 70 percent of individually interviewed older men were 70 to 79 years of age; 27 percent were 80 to 89 years of age, and nearly 4 percent were 90 years of age and older. The distribution the female population by age group was 72, 24, and close to 4 percent, respectively. As expected by design, two thirds of both older populations lived in Mexico City, whereas only a third were resident in areas of the ZMCM (see Chapter 4).

Even though 60 percent of individually interviewed older adults were recognised as head of their respective households (Table 5.1*b*), more men were classified in this category than women (82 and 46 percent, respectively), suggesting that the female population may be less likely to take part in crucial decisions at the household level. Differences regarding household headship between the two older population groups proved to be highly statistically significant ($p < 0.01$, probit regression adjusted for design effect).

That most older persons from the study sample have very low educational levels can be confirmed by the fact that only around a third mentioned having studied complete primary school or more. Women are far less privileged than men when it comes to education. No significant differences between individually interviewed

and non-interviewed older persons were found ($p > 0.05$, probit regression adjusted for design effect).

Table 5.1b. Distribution of older population under study by selected sociodemographic characteristics, 2002.

Variables	Interviewed older persons		Non-interviewed older persons	
	%	No.	%	No.
Older person as household head *	59.9	757	37.7	120
Men	82.5	388	69.6	117
Women	46.5	369	2.0	3
Older person with primary school complete or more	31.1	393	34.0	108
Men	39.6	186	32.7	55
Women	26.1	207	35.3	53
Older person with a living spouse or partner *	35.3	446	84.3	268
Men	56.6	266	90.5	152
Women	22.7	180	77.3	116

	Total older population	
	%	No.
Households with		
1 member	12.6	199
2 members	27.1	428
3 members	17.8	282
4 members	12.1	192
5 members	12.3	194
6 members	7.4	117
7 members	4.2	67
8 members	2.7	42
9 members	1.3	21
≥ 10 members	2.5	39
Total	100.0	1,581
Household composition		
Multigenerational households	71.6	1,132
Single-member household (≥ 70)	12.6	199
Older persons only	15.8	250
Total	100.0	1,581

* $p < 0.01$ for differences between interviewed and non-interviewed older persons (probit regression adjusted for design effect)

Although the availability of a living spouse or partner is reported by 35 percent of older persons individually interviewed, men have practically double the rate of women, meaning that the female population counts less on this important source

of support than men during old age. Differences between both population groups were highly statistically significant ($p < 0.01$, probit regression adjusted for design effect).

With respect to the household size, 70 percent of the older population lived with 3 or fewer other persons, mostly from younger cohorts. For the Mexican National Institute of Statistics, Geography and Informatics (INEGI, to use its Spanish acronym), the Mexican average household is composed of 4.1 members (INEGI, 2001a). Whilst living in multi-generational households was reported by nearly three quarters of older subjects, 13 and 16 percent of older subjects lived in single-member households and households composed by older persons, respectively.

An indicator of the socioeconomic status of sampled households was obtained from the median *per capita* monthly expenditure. As seen in Chapter 4, total monthly household expenditure is composed of the sum of food expenditure, non-food expenditure and the estimated or actual value of rent. For each household, total household expenditure was divided by the number of members to obtain the *per capita* monthly expenditure, of which median value was estimated.

According to Table 5.2, the difference between the poorest and the wealthiest socioeconomic groups was MX\$ 2,657.3 (£ 132.80). The difference between quintiles I and II was MX\$ 433.5 (£ 21.70), that between quintiles II and III falls to MX\$ 394.7 (£ 19.80), and the difference between subjects from quintile III and those from quintile IV was MX\$ 534.0 (£ 26.70). Meanwhile, individuals from

quintile V have a higher median *per capita* monthly expenditure than those from quintile IV by a factor of 2.5. Between these two socioeconomic strata there is a difference of MX\$ 1,295.1 (£ 64.70).

Table 5.2. Median *per capita* monthly expenditure by quintiles of expenditure. Households with older persons from Mexico City and ZMCM, 2002.

Quintile of median <i>per capita</i> monthly expenditure	Median <i>per capita</i> expenditure		Minimum		Maximum	
	in MX\$	in GBP	in MX\$	in GBP	in MX\$	in GBP
I	788.8	39.4	206.9	10.3	1,026.8	51.3
II	1,222.3	61.1	1,027.0	51.3	1,404.1	70.2
III	1,617.0	80.9	1,404.5	70.2	1,855.5	92.8
IV	2,151.0	107.6	1,858.9	92.9	2,623.2	131.2
V	3,466.1	173.3	2,625.7	131.3	51,994.4	2599.7

Further analysis of Table 5.2 suggests that practically all the households under study (with the exception of those whose *per capita* expenditure patterns are closest to the lowest value in quintile I) have enough spending power to afford a normative food and basic product basket. The total value of this basket has been adjusted to MX\$ 2,236.53 (£ 118.83) at prices of December, 2005.²² However, when the total value is divided by a 4.1-member household (i.e. the average household size for México), the *per capita* value of the food and basic product basket is MX\$ 545.5 (£ 27.30). In other words, if the socioeconomic differentials derived from the analysis of the median *per capita* monthly expenditure occur among the poorest households of Mexico City and its Metropolitan Zone, these are not necessarily the poorest households of Mexico. It is nonetheless worth

²² Author's estimations including most of the items of the normative food and basic product basket proposed by the Bank of Mexico (<http://www.banxico.org.mx/>), and using the price list of food items and products proposed by the National Institute for Consumer Affairs (PROFECO, to use its Spanish acronym) (<http://www.profeco.gob.mx/>).

emphasising the existence of big differences in terms of median *per capita* monthly expenditure between the poorest and the wealthier groups.

When data on the median *per capita* monthly expenditure of households with older persons under study are compared to those of total urban households and urban households with older persons from Mexico and Mexico City and its Metropolitan Zone, reported by the Mexican Household Income and Expenditure Survey (ENIGH, to use its Spanish acronym) (see Table 5.3), it is possible to observe that households from this study have greater consumption levels.

Table 5.3. Median *per capita* monthly expenditure in total urban households and urban households with older persons from Mexico and Mexico City and its Metropolitan Zone by quintile of expenditure, 2000.

Urban households	Median		Minimum		Maximum	
	In \$MXN	In GBP	In \$MXN	In GBP	In \$MXN	In GBP
All						
Mexico						
I	305.7	15.3	0.0	0.0	412.8	20.6
II	551.1	27.6	414.3	20.7	671.2	33.6
III	847.8	42.4	671.6	33.6	1,028.7	51.4
IV	1,321.2	66.1	1,028.9	51.4	1,740.6	87.0
V	2,934.1	146.7	1,741.3	87.1	54,624.7	2,731.2
Mexico City & ZMCM						
I	295.8	14.8	65.4	3.3	412.8	20.6
II	550.6	27.5	414.3	20.7	669.4	33.5
III	878.1	43.9	671.7	33.6	1,021.5	51.1
IV	1,316.2	65.8	1,028.9	51.4	1,736.2	86.8
V	3,232.1	161.6	1,745.9	87.3	26,080.4	1,304.0
With older persons						
Mexico						
I	260.1	13.0	0.0	0.0	406.7	20.3
II	551.1	27.6	414.3	20.7	670.2	33.5
III	803.7	40.2	672.5	33.6	1,024.2	51.2
IV	1,299.7	65.0	1,035.4	51.8	1,725.5	86.3
V	2,644.4	132.2	1,741.3	87.1	11,602.3	580.1
Mexico City & ZMCM						
I	314.3	15.7	65.4	3.3	340.2	17.0
II	550.0	27.5	414.3	20.7	657.0	32.8
III	793.9	39.7	682.0	34.1	1,020.9	51.0
IV	1,328.9	66.4	1,061.5	53.1	1,674.7	83.7
V	2,674.9	133.7	1,768.6	88.4	7,833.1	391.7

Source: author's estimation using ENIGH databases (INEGI 2001a)

* Localities with 100 thousand or more inhabitants were considered as urban

In particular, differences between households from this study and urban households with older persons from both Mexico and Mexico City and its Metropolitan Zone are greater. The only similarity between both sources of information is that of total urban households from Mexico City and its Metropolitan zone and households from this study classified in quintile V. In both cases, the median *per capita* monthly income is higher than MX\$ 3,000 (£ 150).

5.2. Malnutrition and its immediate causes

5.2.1. Malnutrition-related indicators

Table 5.4 shows descriptive data on age, height, weight and body mass index (BMI). Mean age values for older adults of both sexes was 77 years, with no significant differences between men and women. Whilst mean estimated height based on knee height was 1.56 m \pm 8.0 cm in both sexes combined, men, with an average estimated height of 1.64 cm \pm 6.1 cm, were 12 cm taller than women ($p < 0.01$, probit regression adjusted for design effect). The male population is also heavier than its female counterpart by a 7-kilo difference ($p < 0.01$, probit regression adjusted for design effect).

According to the BMI cut-off points proposed by an expert panel of the World Health Organisation (WHO) in 1995 (WHO, 1995), both men and women from Mexico City and its Metropolitan Zone can be classified into the category Overweight grade I (25.0 to 29.9 kg/m²). However, women reported a greater mean BMI value than men. This difference proved to be highly statistically significant ($p < 0.01$, probit regression adjusted for design effect). Results also show that the older the person, the lower the mean BMI value ($p < 0.01$, ordered

probit regression adjusted for design effect). While subjects 70 to 89 years of age fall into the category Overweight grade I, persons aged 90 and over have a normal BMI. It is worth noting that due to the lack of anthropometric measurements, data on BMI were unavailable for 16 individuals.

Table 5.4. Mean values of age, height, weight and body mass index in the older population under study by sex, 2002.

	Mean	± s.d.	No.
Age			
Male	77.2	5.8	470
Female	76.9	5.9	793
Both	77.0	5.9	1,263
Estimated height based on knee height (m) *			
Male	1.64	6.1	462
Female	1.52	4.9	786
Both	1.56	8.0	1,248
Weight (kg) *			
Male	69.0	11.5	464
Female	62.0	12.5	785
Both	64.6	12.6	1,249
Body mass index (kg/m ²) *			
Male	25.6	3.8	462
Female	26.8	4.8	785
Both	26.4	4.5	1,247
Body mass index (kg/m ²) by age group †			
70-79 years	26.9	4.5	885
80-89 years	25.4	4.4	315
90 and over	23.7	4.4	47

* p < 0.01 for differences between men and women (probit regression adjusted for design effect)

† p < 0.01 for differences between age groups (ordered probit regression adjusted for design effect)

The distribution of older persons' BMI by quintile of median *per capita* monthly expenditure is shown in Table 5.5. Underweight is not a major health problem among this population, as only 2.2 percent reported a BMI value below 18.5 kg/m². The same prevalence was found in men and women. Conversely, overweight (≥ 25 kg/m²) affects nearly 59 percent of the total older population

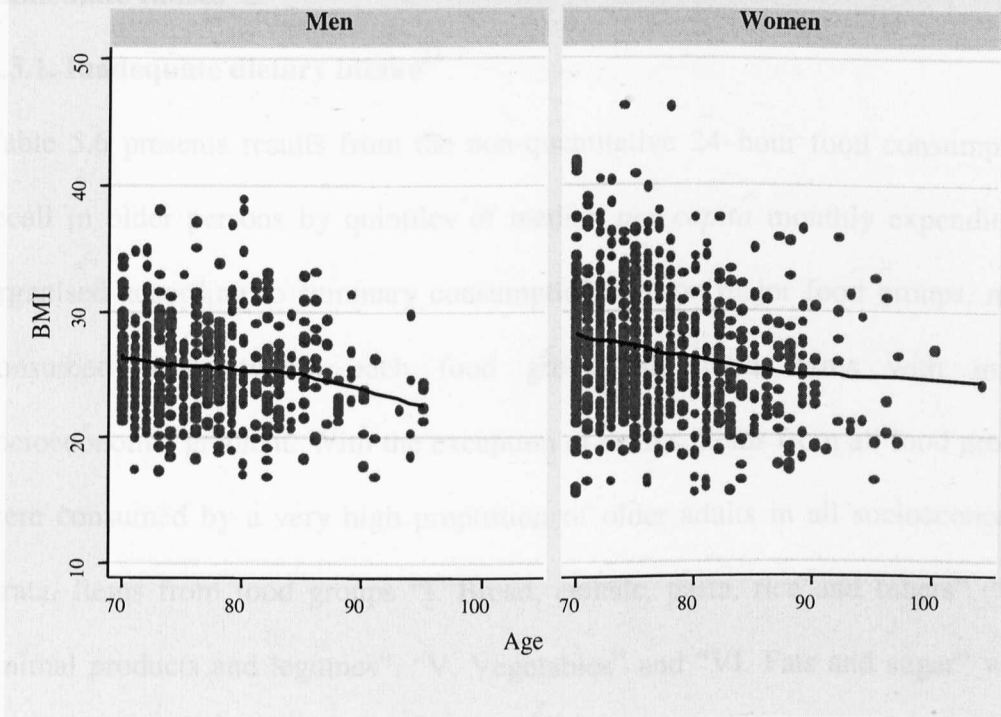
under study, 51 percent of older men and 63 percent of older women, without following a clear socioeconomic gradient. BMI differences between quintiles of median *per capita* monthly expenditure were not statistically significant ($p > 0.05$, probit regression adjusted for design effect). It is worth mentioning that regardless of its degree, prevalences of overweight are higher among women than among men in all socioeconomic strata. Men from quintile V and women from quintile IV reported the highest prevalences of overweight all degrees: 57.5 and 68.7 percent, respectively. Overweight grade III ($> 40 \text{ kg/m}^2$) affected no older men. Figure 5.1 is a graphic representation of BMI of the older population under study by age and sex and shows that individuals in the oldest age group had a lower BMI than those in younger age groups.

Table 5.5. Body mass index of the older population under study by quintile of median *per capita* monthly expenditure and sex, 2002 *

Sex and Body mass index	I		II		III		IV		V		Total	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Both sexes												
Underweight	2.0	5	2.8	7	1.2	3	2.4	6	2.4	6	2.2	27
Normal weight	40.3	102	43.3	107	37.5	93	34.4	86	41.0	102	39.3	490
Overweight I	39.5	100	34.0	84	40.7	101	43.2	108	37.3	93	39.0	486
Overweight II	17.4	44	19.4	48	19.8	49	18.8	47	18.9	47	18.8	235
Overweight III	0.8	2	0.4	1	0.8	2	1.2	3	0.4	1	0.7	9
Total	100.0	253	100.0	247	100.0	248	100.0	250	100.0	249	100.0	1,247
Men												
Underweight	2.5	2	2.2	2	2.0	2	1.9	2	2.3	2	2.2	10
Normal weight	53.1	43	50.6	45	48.5	48	42.5	45	40.2	35	46.8	216
Overweight I	37.0	30	32.6	29	38.4	38	39.6	42	46.0	40	38.7	179
Overweight II	7.4	6	14.6	13	11.1	11	16.0	17	11.5	10	12.3	57
Total	100.0	81	100.0	89	100.0	99	100.0	106	100.0	87	100.0	462
Women												
Underweight	1.7	3	3.2	5	0.7	1	2.8	4	2.5	4	2.2	17
Normal weight	34.3	59	39.2	62	30.2	45	28.5	41	41.4	67	34.9	274
Overweight I	40.7	70	34.8	55	42.3	63	45.8	66	32.7	53	39.1	307
Overweight II	22.1	38	22.2	35	25.5	38	20.8	30	22.8	37	22.7	178
Overweight III	1.2	2	0.6	1	1.3	2	2.1	3	0.6	1	1.1	9
Total	100.0	172	100.0	158	100.0	149	100.0	144	100.0	162	100.0	785

* $p > 0.05$ for differences between quintiles of median *per capita* monthly expenditure (ordered probit regression adjusted for design effect)

Figure 5.1. BMI of the older population under study by age and sex, 2002



However, whilst BMI continues to decrease between 85 years of age and above in men, in women aged 90 and over, BMI seems to plateau. It is also possible to observe less variable BMI values in men than in women, as well as higher BMI values in the latter population than in the former one.

Data on BMI found in this thesis are similar to those from studies carried out among older adults from Mexico City and other areas of Latin America, where researchers have also employed the BMI cut-off points suggested by the WHO expert committee (see Chapter 2).

5.3. Inadequate dietary intake and disease amongst older persons: the immediate causes

5.3.1. Inadequate dietary intake²³

Table 5.6 presents results from the non-quantitative 24-hour food consumption recall in older persons by quintiles of median *per capita* monthly expenditure, organised according to summary consumption data on major food groups, most consumed foods within each food group and food items with major socioeconomic gradient. With the exception of drinks, items from all food groups were consumed by a very high proportion of older adults in all socioeconomic strata. Items from food groups “I. Bread, cereals, pasta, rice and tubers”, “III. Animal products and legumes”, “V. Vegetables” and “VI. Fats and sugar” were included in the diet of 90 percent or more of older adults. However, statistically significant socioeconomic differences ($p < 0.01$) were only observed in the overall reported consumption of proteins (i.e. animal products and legumes) and vegetables, probably because most sources of animal protein are expensive, and the intake of vegetables is proved to be low in countries experiencing a process of nutrition transition. Between quintiles I and V there are nearly 5 and 7 percentage points difference, respectively for these food groups. Lower frequencies of consumption were observed in groups “II. Dairy products”, “IV. Fruits” and, particularly, in group “VII. Drinks”. Between the poorest and the wealthiest socioeconomic stratum there were nearly 10 percentage points difference in the reported consumption of dairy products ($p < 0.01$), 8 percentage points difference in the consumption of fruits ($p < 0.05$), and 22 percentage points difference in the

²³ In this section, probit regression adjusted for design effect was used to estimate trends between the dependent variables (consumption of food items or groups during the last 24 hours) and socioeconomic stratum.

consumption of drinks ($p < 0.01$). Yoghurt, some types of cheese, out-of-season fruit and soft drinks may, for instance, be unaffordable for poorer urban households. Low intakes of fruit have also been reported in countries facing a process of nutrition transition.

An overview of major items consumed from group “I. Bread, cereals, pasta, rice and tubers” reveals that maize tortillas were the main source of carbohydrates in older adults from the study sample, with nearly 9 out of 10 subjects consuming this traditional Mexican meal the day before the survey. The inclusion of maize tortillas in the diet was practically homogeneous in all socioeconomic groups (89 percent, on average). With an average percentage of 53, Mexican traditional bread rolls *bolillos* were the second most consumed item from this food group, followed by rice, included in the diet of close to 44 percent of older persons from the study sample. Fresh milk was the most consumed dairy product, with 79 older individuals out of every 100 reporting its consumption in the last 24 hours, followed by cheese, included in the diet of around 36 percent of the total older population. Beans constituted the most important source of proteins among older adults from the study sample, followed by chicken and eggs. However, these two latter food items, comparatively more affordable than beef or fish, were consumed by 62 percent or less of the subjects. Other items of this group, such as canned tuna fish, pork ham or sausages, were consumed by less than 10 percent of the sample, probably because these foods are not freshly made or because older persons may not be used to them. The low consumption of fresh fish can be attributed to its high prices in Mexico City and the MZMC. Lentils are not as

popular as beans in the Mexican cuisine, even though they could be sometimes cheaper.

Table 5.6. Food groups and items consumed by the older population under study during the last 24 hours, by quintile of median *per capita* monthly expenditure, 2002

Food group or item	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
I. Bread, cereals, pasta, rice and tubers	99.6	252	100.0	253	99.6	251	99.6	252	99.6	251	99.7	1,259
II. Dairy products *	78.3	198	86.2	218	86.1	217	88.9	225	88.1	222	85.5	1,080
III. Animal products and legumes *	93.3	236	96.4	244	93.3	235	97.2	246	98.8	249	95.8	1,210
IV. Fruits †	79.1	200	87.4	221	84.1	212	86.2	218	87.3	220	84.8	1,071
V. Vegetables *	90.5	229	93.3	236	96.8	244	96.4	244	97.2	245	94.9	1,198
VI. Fats and sugar	94.1	238	96.4	244	94.4	238	96.8	245	96.0	242	95.6	1,207
VII. Drinks *	56.5	143	65.2	165	74.2	187	74.3	188	78.6	198	69.8	881
I. Bread, cereals, pasta, rice and tubers												
Tortilla	89.3	226	92.9	235	88.5	223	88.5	224	86.1	217	89.1	1,125
Bread rolls	51.4	130	56.9	144	51.6	130	58.1	147	50.0	126	53.6	677
Rice †	39.9	101	42.3	107	39.7	100	47.0	119	49.6	125	43.7	552
Sweet bread rolls *	28.9	73	38.7	98	43.7	110	47.4	120	52.4	132	42.2	533
Pasta	38.3	97	40.7	103	41.7	105	43.5	110	45.6	115	42.0	530
Potatoes *	31.2	79	32.4	82	43.7	110	41.1	104	40.9	103	37.8	478
Bread loaf †	17.4	44	15.0	38	20.2	51	20.6	52	23.0	58	19.2	243
Other maize products	18.6	47	16.2	41	18.3	46	17.0	43	16.3	41	17.3	218
Breakfast cereals †	12.3	31	16.2	41	10.3	26	13.0	33	20.6	52	14.5	183
II. Dairy products												
Fresh milk *	68.8	174	74.7	189	76.2	192	83.0	210	81.3	205	76.8	970
Cheese *	25.7	65	32.4	82	41.7	105	42.3	107	39.7	100	36.3	459
Yoghurt *	14.2	36	20.9	53	20.2	51	20.9	53	29.4	74	21.1	267
Other dairy products *	4.7	12	7.5	19	6.0	15	9.1	23	14.3	36	8.3	105
III. Animal products and legumes												
Beans	60.5	153	60.9	154	61.1	154	61.7	156	58.3	147	60.5	764
Chicken *	41.5	105	50.2	127	50.0	126	56.1	142	52.8	133	50.1	633
Eggs	37.5	95	39.1	99	36.5	92	41.9	106	43.3	109	39.7	501
Beef *	18.6	47	24.9	63	25.8	65	31.2	79	33.7	85	26.8	339
Lentils	11.1	28	10.7	27	7.5	19	9.5	24	7.9	20	9.3	118
Canned tuna	8.3	21	9.9	25	10.3	26	8.3	21	8.7	22	9.1	115
Pork ham	6.3	16	9.1	23	8.7	22	9.5	24	10.3	26	8.8	111
Pork *†	4.3	11	5.1	13	5.2	13	8.3	21	10.3	26	6.7	84
Fresh fish	5.5	14	4.3	11	6.3	16	8.7	22	7.1	18	6.4	81
Other animal products	3.2	8	4.7	12	4.0	10	2.8	7	6.7	17	4.3	54
Sausages	2.4	6	1.6	4	2.4	6	2.8	7	4.4	11	2.7	34

Table 5.6. Food groups and items consumed by the older population under study during the last 24 hours, by quintile of median *per capita* monthly expenditure, 2002
(continued)

Food group or item	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
IV. Fruits												
Banana *	41.1	104	43.1	109	46.0	116	50.2	127	52.0	131	46.5	587
Lemon and lime*	35.2	89	44.7	113	44.4	112	49.8	126	45.6	115	43.9	555
Apple *	20.9	53	32.0	81	38.5	97	27.7	70	35.7	90	31.0	391
Other fruits *	17.4	44	22.1	56	24.2	61	28.1	71	25.8	65	23.5	297
Papaya *	15.4	39	19.8	50	25.8	65	19.4	49	28.2	71	21.7	274
Apricot or peach	12.6	32	18.6	47	17.9	45	21.3	54	15.9	40	17.3	218
Guava †	13.8	35	13.0	33	16.7	42	15.4	39	21.0	53	16.0	202
Orange *	7.5	19	11.9	30	15.9	40	12.6	32	17.1	43	13.0	164
V. Vegetables												
Onion *	68.0	172	74.7	189	82.5	208	82.6	209	84.1	212	78.4	990
Tomato (red) *	66.8	169	76.3	193	78.6	198	82.6	209	81.7	206	77.2	975
Chilli peppers †	47.8	121	46.6	118	54.4	137	55.3	140	55.2	139	51.9	655
Tomatillo (green variety) †	32.8	83	35.6	90	36.5	92	39.5	100	41.7	105	37.2	470
Carrot *	20.6	52	21.7	55	33.3	84	32.8	83	40.1	101	29.7	375
Courgette *	23.7	60	20.9	53	31.3	79	35.6	90	33.7	85	29.1	367
Nopales	24.5	62	28.9	73	27.4	69	28.9	73	25.8	65	27.1	342
Lettuce *	10.7	27	13.8	35	22.2	56	21.3	54	26.2	66	18.8	238
Chayote squash *	14.6	37	13.0	33	19.4	49	18.2	46	22.2	56	17.5	221
Green beans †	13.0	33	11.5	29	17.5	44	16.2	41	18.7	47	15.4	194
Other vegetables	13.8	35	9.9	25	9.9	25	13.0	33	13.9	35	12.1	153
Cucumber	6.3	16	10.3	26	11.1	28	8.3	21	8.7	22	8.9	113
Frozen mixed vegetables †	5.1	13	6.3	16	9.5	24	10.3	26	9.1	23	8.1	102
Artichoke and radish	2.4	6	2.0	5	2.4	6	2.8	7	4.8	12	2.9	36
VI. Fats and sugar												
Cooking oil †	80.2	203	87.4	221	87.7	221	88.1	223	88.1	222	86.3	1,090
Sugar	68.8	174	73.5	186	71.4	180	73.9	187	71.8	181	71.9	908
Soft drinks *	22.9	58	22.9	58	31.3	79	32.8	83	35.7	90	29.1	368
Avocado *	18.2	46	21.3	54	27.8	70	30.0	76	35.3	89	26.5	335
Sweets and desserts *	14.6	37	21.7	55	25.4	64	26.1	66	26.2	66	22.8	288
Sour or double cream *	15.8	40	15.4	39	22.2	56	24.1	61	26.2	66	20.7	262
Other fats	10.3	26	9.1	23	8.7	22	9.9	25	12.3	31	10.1	127
Fried pork skin and/or meat	9.9	25	7.9	20	6.7	17	5.9	15	13.9	35	8.9	112
Chorizo	2.8	7	3.2	8	2.8	7	4.0	10	4.0	10	3.3	42
VII. Drinks												
Mineral water (still) *	49.4	125	59.7	151	69.0	174	70.0	177	71.8	181	64.0	808
Other drinks †	7.5	19	7.5	19	7.5	19	10.3	26	12.3	31	9.0	114
Beer, wine and spirits †	1.2	3	2.8	7	3.2	8	2.4	6	5.6	14	3.0	38

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

† $p < 0.05$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

It seems to be a contradiction that in a country growing different types of fruits throughout the year, very low consumption levels were reported. According to the findings of this study, less than half of older persons included fruits in their diets. Bananas, by far the cheapest option while data were collected, were only consumed by 46 percent of subjects, on average. Both lemon and lime, mostly used to prepare the traditional soft drink *agua de limón* or to add a few drops to various dishes, were the second most important items of this group, with 44 percent of individuals mentioning to have included them in the last 24 hours. Other fruits like apples, papaya or oranges were consumed by a third or less of the older population. Apart from the possible nutrition transition being experienced in Mexico, the other main three reasons explaining the low consumption of fruits in this region are probably the high prices of out-of-season fruit and the limited information available on the nutritional benefits of consuming cheaper fruits, and the presence of physical problems in older persons, such as lack of teeth.

As is the case with fruit, the consumption of vegetables among older persons from Mexico City and its ZMCM is low. The high percentages observed for onion and tomatoes (more than 75 percent) are explained by the fact that these two items are used in small amounts to prepare sauce or purée for pasta or traditional dishes, rather than as raw ingredients for salads. Chili peppers, the third most important food component of the traditional Mexican diet, are consumed by around half of older persons. *Tomatillo* or green tomato (a Mexican variety of tomato) is another ingredient used for making sauce or purée, which may explain why less than 40 percent of individuals included in their diet. Whilst carrots, courgette and *nopales* (an edible cactus variety) were consumed by 30 percent or less of older persons,

lettuce, *chayote* squash (a traditional Mexican vegetable), green beans and other options were reported by 20 percent or less of subjects.

Cooking oil and sugar, the most important sources of fat and energy from group “VI. Fats and sugar”, were part of the diet of more than 80 percent and nearly three quarters of older persons, respectively. Soft drinks and avocado were the second most important items from this food group, given that, respectively, 29 and 26 percent of subjects consumed them. Group “VII. Drinks”, including alcoholic and non-alcoholic drinks, reveals that practically 64 percent of the interviewees drank still mineral water. Other drinks were consumed by less than 10 percent of the population. It is worth pointing out that the reported consumption of alcoholic drinks is not fully reliable. The very low percentage observed is likely to be due to the fact that older persons did not declare alcohol consumption accurately, given the social stigma surrounding alcoholism.

An analysis of food items with major socioeconomic gradient suggests that older persons from the poorest households eat cheaper sources of nutrients than older subjects from wealthier socioeconomic strata. A comparison between quintiles I and V shows that such is the case of rice, in theory, one of the cheapest sources of energy in Mexico (10 percentage points difference, $p < 0.05$); sweet bread rolls (23 percentage points difference, $p < 0.01$); potatoes, presumably another cheap source of energy (nearly 10 percentage points difference, $p < 0.01$); bread loaf (6 percentage points difference, $p < 0.05$); breakfast cereals (8 percent point difference, $p < 0.05$), and all dairy products (with differences ranging from 9 to 15 percentage points, $p < 0.01$). Despite the large political tradition of the Mexican

Government subsidising milk to make it more accessible for poor households with children and older persons, the lower the socioeconomic strata, the smaller the proportion of older people reporting its consumption. The low proportions of sampled households benefiting from the nationwide milk programme LICONSA are presented in later paragraphs. Cheese, presumably a cheap source of protein and calcium, is less consumed in the poorest quintile of *per capita* expenditure. Socioeconomic differences in the consumption of yoghurt and other dairy products can be attributed to their high prices. Meanwhile, within the group of animal products and legumes, beef showed the highest significant socioeconomic differences between extreme socioeconomic groups, with a 15 percentage point difference, followed by chicken, with an 11 percentage points difference, and pork, with a 6 percentage points difference. Socioeconomic differentials in the consumption of these food items proved to be highly statistically significant ($p < 0.01$).

The consumption of apples and papayas shows a clear socioeconomic gradient ($p < 0.01$). Both types of fruit were out of season — and, therefore, expensive — while data were being collected. Between socioeconomic stratum I and V, there were 15 and 13 percentage points difference for the reported consumption of these fruit, respectively. The socioeconomic differentials observed in lemon and lime (10 percentage points difference), as well as in oranges (10 percentage points difference) may also be attributed to the fact that these three fruits were out of season when data were collected. However, cheaper fruits were also less consumed by older subjects from the poorest strata in comparison with those from

the wealthiest. This is the case of banana (11 percent points difference) and guava (7 percent points difference).

As mentioned in previous paragraphs, even though tomato and onion are mostly used in small amounts to prepare seasoning sauce or purée, the poorer the expenditure strata, the lower their consumption. The difference between quintiles I and V are 15 and 16 percentage points ($p < 0.01$). More expensive vegetables like carrots, courgettes and *chayote* squash, along with lettuce and chili peppers, presumably two of the cheapest vegetables in Mexico, also showed statistically significant socioeconomic differences by strata. Socioeconomic differences in the consumption of green beans, *tomatillo*, as well as frozen mixed vegetables ranged from 4 to 15 percentage points between the poorest and the wealthiest stratum. These differences were statistically significant.

The consumption of the most expensive food items from group “VI. Fats and sugar” is less reported in the poorer socioeconomic stratum. Differences found in the consumption of soft drinks, avocado, sweets, desserts and soured or double cream go from 10 to 17 percentage points between older adults from the poorest strata and those from the wealthiest one ($p < 0.01$). An 8 percentage points difference is reported in the consumption of cooking oil ($p < 0.05$). The socioeconomic differences in the consumption of all types of drinks reported were statistically significant between quintiles I and V. The highest socioeconomic gradient is observed in still mineral water (22 percentage points, $p < 0.01$), followed by other drinks (5 percentage points, $p < 0.05$) and beer, wine and spirits (4 percentage points, $p < 0.05$).

Another approach to dietary diversity in older persons is presented in Table 5.7 (results limited to foods, excluding drinks). The diet of close to 70 percent of the older population was considered as diverse, since they mentioned consuming items from each of the six food groups listed in the previous table. But if dietary diversity is disaggregated by median *per capita* monthly expenditure, it is clear that the poorer the older person, the less diverse their diet ($p < 0.01$, ordered probit regression adjusted for design effect). If analysed by the number of food items from each food group, only 23 percent of respondents consumed at least two items from every group, the present definition of a diverse diet. 45 percent of older adults had a moderately diverse diet, given that they consumed at least one item of every food group. Meanwhile, the proportion of subjects with a non-diverse diet, that is, no food items from one or more groups, is 32 percent. Poorer older people had consistently the worst indicators of food diversity by this approach ($p < 0.01$, ordered probit regression adjusted for design effect).

Table 5.7. Selected indicators of diet diversity in the older population under study by quintiles of median *per capita* monthly expenditure, 2002.*

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Number of food groups included in the diet												
6 groups	55.7	141	69.6	176	67.5	170	72.7	184	74.2	187	67.9	858
5 groups	28.9	73	22.5	57	23.0	58	20.9	53	19.4	49	23.0	290
≤ 4 groups	15.4	39	7.9	20	9.5	24	6.3	16	6.3	16	9.1	115
Number of items per food group												
At least 2 in every group	11.9	30	14.6	37	25.0	63	32.0	81	31.7	80	23.0	291
At least 1 in every group	43.9	111	54.9	139	42.5	107	40.7	103	42.5	107	44.9	567
Non diverse	44.3	112	30.4	77	32.5	82	27.3	69	25.8	65	32.1	405

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (ordered probit regression adjusted for design effect)

Despite the methodological limitations of the measurement of food consumption using 24-hour dietary recall (see Chapter 4), and the relatively arbitrary cut-offs employed for diverse and non-diverse diets, clear differences in quality of diet are evident between groups. The food items reported to have been consumed by four older adults from the population under study are shown in Box 5.1.

Box 5.1. Examples of dietary diversity in the older people from the study sample, 2002.				
Food group	Non-diverse diets		Diverse diets	
	Individual 1	Individual 2	Individual 3	Individual 4
Cereal	Tortilla Bread rolls	Bred rolls	Bread rolls Sweet bread rolls Rice Pasta Potatoes	Tortilla Breakfast cereals Potatoes
Dairy	Milk	Milk	Milk Cheese	Milk Yoghurt
Protein	Eggs Beans Canned tuna fish	Chicken Pork sausages	Chicken Eggs Beans	Chicken Eggs Pork
Vegetables			Tomatos Onion <i>Tomatillo</i> Carrot Courgette Green beans	Onion Carrot Courgette <i>Chayote</i> squash Green beans
Fruit			Banana Lemon Apple Papaya	Banana Lemon Papaya Peach
Fats and sugars	Soft drinks Sugar Sour cream	Oil Sugar	Avocado Soft drinks Oil Sugar Cream	Sugar Sweets

The four diets were randomly selected from the non-diverse (examples 1 and 2) and the diverse (examples 3 and 4) diet categories. The diets illustrate the dietary patterns commonly found in these two diet categories. The diets of individuals 1 and 2 do not include food items from the six food groups analysed — none of

these individuals reported eating fruits and vegetables during the previous 24 hours. A poor intake of fruits and vegetables is, for instance, associated with increased risk of cardiovascular disease and stroke, hypertension, some types of cancer and diverticulitis, cataract and macular degeneration (REF? – WHO 916?). Meanwhile, the diets reported by individuals 3 and 4 are more diverse. Both individuals not only included food items from every group, but also reported to have eaten at least 2 items from each food group.

5.3.2. Food insecurity in older persons

As discussed in Chapter 4, two different time intervals and statement formulations were used to find out whether studied older people from Mexico City and the ZMCM were food insecure or not. During the last week, nearly 19 percent of older subjects could not afford to eat properly, 15 percent were hungry because they could not afford enough food to eat and 21 percent perceived to have eaten less than they thought they should eat because they did not have enough money for food. A summary measure of individual food insecurity, obtained by counting the number of experiences perceived by each older person in the last week reveals that, in total, a quarter of older adults suffered from uncertain access to food within this period (Table 5.8). There is strong evidence suggesting that the poorer the older person, the more food-insecure she or he was during this period ($p < 0.01$, probit regression adjusted for design): 40 percent of individuals from the poorest strata perceived at least one experience on individual food insecurity during the last week, in comparison with 14 percent of subjects in quintile V.

Table 5.8. Selected indicators of food insecurity in the older population under study by quintiles of median *per capita* monthly expenditure, 2002. *

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
During the last week, older person...												
a) couldn't afford to eat properly	32.4	82	22.1	56	12.7	32	15.0	38	11.1	28	18.7	236
b) was often hungry but didn't eat because she/he couldn't afford enough food	25.3	64	17.8	45	11.1	28	13.0	33	8.7	22	15.2	192
c) ate less than she/he thought she/he should because she/he didn't have enough money for food	34.8	88	25.3	64	16.3	41	15.0	38	11.9	30	20.7	261
At least one food insecurity experience during the last week	40.3	102	29.2	74	22.2	56	18.6	47	14.3	36	24.9	315
During the last year, older person...												
c) lose weight because there wasn't enough food	21.3	54	19.4	49	9.1	23	9.9	25	9.9	25	13.9	176
d) had hunger pangs but couldn't eat because she/he couldn't afford food	13.4	34	10.3	26	4.4	11	5.5	14	4.8	12	7.7	97
Food insecurity experience during the last year	24.5	62	22.1	56	10.7	27	11.9	30	11.5	29	16.2	204

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

With respect to experiences on individual food insecurity during the past year, on average, 14 percent of older adults reported having lost weight because there was not enough food, whereas nearly 8 percent mentioned to have felt hunger pangs and being unable to eat because they could not afford food. A summary measure of past experiences on food insecurity, obtained by counting the number of older adults with at least one experience on uncertain access to food during the previous year, shows a prevalence of 16 percent. Past experiences on food insecurity are more prevalent as poverty increases ($p < 0.01$, probit regression adjusted for design). Whereas prevalences of past experiences on food insecurity in older adults from the first and the second strata are similar (around 23 percent, on

average), and higher than those observed in quintiles III to V (around 11 percent, on average).

These results suggest that it is not only present, but also past experiences on food insecurity mainly affecting older adults whose households have a limited spending power. The strong associations between individual food insecurity and poverty are qualitatively similar to those reported by Olson *et al* (1996) and Lee & Frongillo (2001*a, b* and *c*).

Whilst current individual food insecurity was not associated with BMI values, the differences between past experiences and nutritional status were statistically significant ($p < 0.01$, probit regression adjusted for design effect). Uncertain access to food during the last year was perceived by 40 percent of underweighted older adults and practically 60 percent of individuals with overweight (Table 5.9).

Table 5.9. Body mass index by individual food insecurity experiences in the older population under study, 2002.

	Yes		No		Total
	%	No.	%	No.	
At least one experience on food insecurity in the last week					
Non-overweight	41.6	390	41.1	127	517
Overweight	58.4	548	58.9	182	730
	100.0	938	100.0	309	1,247
At least one experience on food insecurity in the last year *					
Non-overweight	40.0	418	49.0	99	517
Overweight	60.0	627	51.0	103	730
	100.0	1,045	100.0	202	1,247

* $p < 0.01$ for differences between degrees of BMI (probit regression adjusted for design effect)

In what may constitute basic information to stimulate further in depth gender approaches to dietary diversity in older persons from Mexico City and its

Metropolitan Zone (Table 5.10), no significant differences in neither the number of food groups, nor the number of foods included in each food group, were found between older men and older women. Around a third of women and men have non-diverse diets. The analysis of selected indicators of old-age food insecurity in older persons from the study sample revealed no significant differences by sex either (Table 5.11).

Table 5.10. Selected indicators of dietary diversity in the older population under study by sex, 2002

	Men		Women		Both sexes	
	%	No. 470	%	No. 793	%	No. 1,263
Number of food groups included in the diet						
6 groups	66.0	310	69.1	548	67.9	858
Up to 5 groups	23.2	109	22.8	181	23.0	290
≤ 4 groups	10.9	51	8.1	64	9.1	115
Number of items per food group						
At least 2 in every group	21.1	99	24.2	192	23.0	291
At least 1 in every group	44.9	211	44.9	356	44.9	567
Non diverse	34.0	160	30.9	245	32.1	405

* p > 0.05 for differences between men and women

Table 5.11. Selected indicators of food insecurity in the older population under study by sex, 2002

	Men		Women		Both sexes	
	%	No. 470	%	No. 793	%	No. 1,263
During the last week...older person...						
...couldn't afford to eat properly	17.7	83	19.3	153	18.7	236
...was often hungry but didn't eat because she/he couldn't afford enough food	14.3	67	15.8	125	15.2	192
...ate less than she/he thought she/he should because she/he didn't have enough money for food	19.1	90	21.6	171	20.7	261
At least one food insecurity experience during the last week	24.0	113	25.5	202	24.9	315
During the last year...older person						
...lose weight because there wasn't enough food	12.8	60	14.6	116	13.9	176
...had hunger pangs but couldn't eat because she/he couldn't afford	8.3	39	7.3	58	7.7	97
Food insecurity experience during the last year	15.3	72	16.6	132	16.2	204

* p > 0.05 for differences between men and women

The use of food insecurity scales adapted from younger adults or households with different arrangements to estimate uncertain access to food in older people has not yet been validated for Latin American. There is no consensus among researchers from North America about how to create suitable scores derived from these scales to classify older adults as food secure or food insecure. These limitations have to

some extent affected the results of this study. However, either analysed separately or summarised in broader indicators of past and present experiences, the selected statements on old-age food insecurity provided a preliminary view of the impact of limited economic resources on access to food during old stages of life in Mexico City and its Metropolitan Zone. It is worth mentioning that in this urban area, food insecurity (either affecting older persons or their household context) is not determined by a lack of food or food suppliers. Both Mexico City and the Metropolitan Zone of Mexico City are fully equipped with a number of traditional markets, local and foreign supermarket chains, as well as smaller shops of diverse kind.

5.3.3. Disease in older persons

Table 5.12 presents two indicators of health and quality of life during old age: self-perceived health status and functioning. Although nearly three quarters of older subjects perceived their health as at least as good as other persons of the same age, the wealthier the socioeconomic strata, the more the subjects perceiving better health conditions. Between quintiles I and V, a 14 percentage points difference is observed. Meanwhile, the socioeconomic difference of perceiving health status not as good as other persons of the same age was 14 percentage points between older adults from the poorest and the wealthiest strata. These socioeconomic differences proved to be highly statistically significant ($p < 0.01$, ordered probit regression adjusted for design effect).

84 out of every 100 older subjects were found to be independent in terms of functioning, as they were able to carry out the seven instrumental activities of

daily living (IADL) described in Chapter 4. The socioeconomic gradient observed in this variable is highly statistically significant ($p < 0.01$, ordered probit regression adjusted for design effect). These results suggest that many older persons from the study sample may still be physically able to prepare own meals, to go out for shopping or to be less dependant on others.

Table 5.12. Self-perceived health status and limitation of instrumental activities of daily living in the older population under study by quintiles of median *per capita* monthly expenditure, 2002.*

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Self-perceived health status												
Better	32.0	81	37.9	96	45.6	115	45.1	114	46.0	116	41.3	522
As good as others	37.9	96	32.0	81	27.8	70	36.8	93	29.8	75	32.9	415
Not as good	30.0	76	30.0	76	26.6	67	18.2	46	24.2	61	25.8	326
Functioning: IADL-OARS												
Independent functioning	88.5	224	86.2	218	84.1	212	81.4	206	81.0	204	84.2	1,064
Almost indep. funct.	10.7	27	11.1	28	13.5	34	14.2	36	17.1	43	13.3	168
Dependent functioning	0.8	2	2.8	7	2.4	6	4.3	11	2.0	5	2.5	31

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (ordered probit regression adjusted for design effect)

5.4. Household food insecurity, inadequate care, unhealthy household environment and lack of access to health services: the underlying causes

5.4.1. Household food insecurity

Recent or usual experiences on uncertain access to food at the household level are described in Table 5.13. For more than half of sampled households the usual amount of food eaten is enough, whereas 35 percent have not enough food to eat either sometimes or often. If analysed by socioeconomic status, households from poorer strata consistently report less amount of food to eat. A 24 percentage points difference is observed between the poorest and wealthiest households ($p < 0.01$, ordered probit regression adjusted for design effect). The following four

statements in the table also refer to food insecurity present or usual experiences at the household level.

Table 5.13. Selected indicators of recent or usual experiences of food insecurity in households with older members. Mexico City and the ZMCM, 2002.*

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Amount of food eaten in the household												
Enough	53.8	136	56.1	142	65.1	164	70.0	177	77.8	196	64.5	815
Sometimes not enough	32.4	82	32.8	83	27.0	68	23.7	60	18.3	46	26.8	339
Often not enough	13.8	35	11.1	28	7.9	20	6.3	16	4.0	10	8.6	109
We worry whether our food will run out before we get money to buy more												
Never	43.9	111	59.3	150	59.9	151	60.1	152	69.0	174	58.4	738
Sometimes true	45.5	115	35.6	90	33.7	85	34.8	88	26.6	67	35.2	445
Often true	10.7	27	5.1	13	6.3	16	5.1	13	4.4	11	6.3	80
We eat the same thing for several days in a row because we only have few different kinds of food on hand and don't have money to buy more												
Never	41.5	105	52.2	132	63.1	159	62.1	157	75.0	189	58.7	742
Sometimes true	43.9	111	39.1	99	29.8	75	31.2	79	22.6	57	33.3	421
Often true	14.6	37	8.7	22	7.1	18	6.7	17	2.4	6	7.9	100
The food that we bought didn't last and we didn't have money to buy more												
Never	49.8	126	62.1	157	63.1	159	66.4	168	75.0	189	63.3	799
Sometimes true	40.3	102	34.0	86	32.1	81	30.4	77	22.2	56	31.8	402
Often true	9.9	25	4.0	10	4.8	12	3.2	8	2.8	7	4.9	62
We ran out of the food that we needed to put together a meal and we didn't have money to get more												
Never	46.6	118	53.8	136	61.5	155	61.3	155	73.4	185	59.3	749
Sometimes true	44.7	113	40.3	102	33.3	84	35.2	89	24.6	62	35.6	450
Often true	8.7	22	5.9	15	5.2	13	3.6	9	2.0	5	5.1	64
At least 1 experience of present or usual food insecurity at the household level												
	76.7	194	64.8	164	57.5	145	55.3	140	43.3	109	59.5	752

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (ordered probit regression adjusted for design effect)

On average, none of these four situations affected more than 42 percent of sampled households; however, when data are disaggregated by socioeconomic status, 50 percent or more of households from quintile I experienced each one of these forms of current food insecurity, whereas they were prevalent in 30 percent or

less of wealthier households. The socioeconomic differences between households from quintile I and V were 25 percentage points for households reporting either sometimes or often being worried whether food would run out before they got money to buy food; 34 percentage points for households mentioning sometimes or often eating the same thing for several days in a row; 25 percentage points for households perceiving that the food they bought did not last and had no money to buy more, and 27 percentage points for those households reporting running out of the food they needed to prepare a meal. When data on the four food insecurity experiences are grouped in a summary indicator, it is nearly 77 percent of poorer households suffering from at least one form of current inadequate access to food, compared to 43 percent of wealthier households reporting at least one of those conditions. All these socioeconomic differences proved to be highly statistically significant ($p < 0.01$, ordered probit regression adjusted for design effect).

Households were also asked to remember four different types of food insecurity experiences occurring in the last year and in the last month, including how many times they occurred in the last 30 days (Table 5.14). The highest prevalence of food insecurity in the past year was that of households perceiving money to buy food running out (close to 32 percent, on average), followed by households where members ate less than they thought they should because there was not enough money for food (20 percent, on average), and households cutting the size of meals because there was not enough food (19 percent, on average). Less than 5 percent of households reported not eating for a whole day because there was no food or money to buy food.

Table 5.14 Selected indicators of past food insecurity at the household level. Households with older persons from Mexico City and the ZMCM, 2002 *

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
In the past year, did you and your household ever...												
a) run out of money to buy food?	39.5	100	34.8	88	30.2	76	30.8	78	22.6	57	31.6	399
b) cut the size of meals because there was not enough food in the house?	31.2	79	20.9	53	15.9	40	19.4	49	9.1	23	19.3	244
c) not eat for a whole day because there was no food or money to buy food?	7.5	19	5.9	15	2.0	5	3.6	9	1.6	4	4.1	52
d) ever eat less than you/someone thought you/someone should because there was not enough money for food	28.1	71	25.7	65	17.9	45	16.6	42	10.3	26	19.7	249
In the last month, did you and your household ever...												
a) run out of money to buy food?	31.6	80	24.5	62	24.2	61	22.1	56	17.9	45	24.1	304
how many times did this happen in the last 30 days?												
1 – 2 times	12.6	32	11.5	29	11.9	30	10.3	26	9.9	25	11.2	142
≥ 3 times	19.0	48	13.0	33	12.3	31	11.9	30	7.9	20	12.8	162
b) cut the size of meals because there was not enough food in the house?	28.1	71	17.4	44	13.5	34	15.4	39	7.1	18	16.3	206
how many times did this happen in the last 30 days?												
1 – 2 times	11.5	29	6.3	16	5.2	13	7.1	18	2.4	6	6.5	82
≥ 3 times	16.6	42	11.1	28	8.3	21	8.3	21	4.8	12	9.8	124
c) not eat for a whole day because there was no food or money to buy food?	5.5	14	3.6	9	1.6	4	3.2	8	0.8	2	2.9	37
how many times did this happen in the last 30 days?												
1 – 2 times	1.6	4	1.6	4	1.6	4	1.6	4	0.0	0	1.3	16
≥ 3 times	4.0	10	2.0	5	0.0	0	1.6	4	0.8	2	1.7	21
d) ever eat less than you/someone thought you/someone should because there was not enough money for food	24.1	61	20.6	52	14.7	37	14.2	36	9.1	23	16.5	209
how many times did this happen in the last 30 days?												
1 – 2 times	9.9	25	8.7	22	6.3	16	8.3	21	3.6	9	7.4	93
≥ 3 times	14.2	36	11.9	30	8.3	21	5.9	15	5.6	14	9.2	116

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (probit regressions adjusted for design effect)

As households have better consumption patterns, food insecurity experiences at this level are less prevalent. The differences between extreme quintiles of median *per capita* monthly expenditure were 17, 18, 22 and 6 percentage points, respectively ($p < 0.01$, ordered probit regression adjusted for design effect). The occurrence of all these experiences also showed significant socioeconomic differences when referred both to the last month ($p < 0.01$, probit regression adjusted for design effect), and the number of times they were perceived in the last 30 days ($p < 0.01$, probit regression adjusted for design effect). With the exception of the statement regarding the number of times during the last 30 days that households did not eat *for a whole day because there was no food or money to buy food*, clear socioeconomic differentials of uncertain access to food during the last month are appreciable, particularly among households reporting having experienced the other three food insecurity conditions 3 or more times during the last month.

Current and past experiences of household food insecurity were also disaggregated by sex of the household head. According to Table 5.15, in households headed by men, eating the *same thing for several days in a row due to a lack of food diversity and economic resources* was more prevalent than in households headed by women: on average, 39 and 45 percent, respectively ($p < 0.01$, ordered probit regression adjusted for design effect). The other three indicators of current experiences on household food insecurity showed no statistically significant differences. Past experiences on household food insecurity affected similarly both households headed by men and those headed by women. When these experiences were referred to the last month and to the number of

times occurred in the last 30 days, no significant sex differences were found either (Table 5.16).

	Male household head		Female household head		Both sexes	
	%	No. 763	%	No. 500	%	No. 1,263
Amount of food eaten in the household						
Enough	64.5	492	64.6	323	64.5	815
Sometimes not enough	27.4	209	26	130	26.8	339
Often not enough	8.1	62	9.4	47	8.6	109
We worry whether our food will run out before we get money to buy more						
Never	59.5	454	56.8	284	58.4	738
Sometimes true	35.1	268	35.4	177	35.2	445
Often true	5.4	41	7.8	39	6.3	80
We eat the same thing for several days in a row because we only have few different kinds of food on hand and don't have money to buy more *						
Never	61.3	468	54.8	274	58.7	742
Sometimes true	32.4	247	34.8	174	33.3	421
Often true	6.3	48	10.4	52	7.9	100
The food that we bought didn't last and we didn't have money to buy more						
Never	64.7	494	61	305	63.2	799
Sometimes true	31.3	239	32.6	163	31.8	402
Often true	3.9	30	6.4	32	4.9	62
We ran out of the food that we needed to put together a meal and we didn't have money to get more						
Never	60.6	462	57.4	287	59.3	749
Sometimes true	35.8	273	35.4	177	35.6	450
Often true	3.7	28	7.2	36	5.1	64
At least 1 experience of present or usual food insecurity at the household level	57.7	440	62.4	312	59.5	752

* p < 0.01 for differences between men and women (ordered probit adjusted for design effect)

	Male household head		Female household head		Both sexes	
	%	No. 763	%	No. 500	%	No. 1,263
In the past year, did you and your household ever...						
a) run out of money to buy food?	29.8	227	34.4	172	31.6	399
b) cut the size of meals because there was not enough food in the house?	18.6	142	20.4	102	19.3	244
c) not eat for a whole day because there was no food or money to buy food?	3.9	30	4.4	22	4.1	52
d) ever eat less than you/someone thought you/someone should because there was not enough money for food	18.7	143	21.2	106	19.7	249
In the last month, did you and your household ever...						
a) run out of money to buy food?	22.7	173	26.2	131	24.1	304
how many times did this happen in the last 30 days?						
1 - 2 times	10.7	82	12.0	60	11.2	142
≥ 3 times	11.9	91	14.2	71	12.8	162
b) cut the size of meals because there was not enough food in the house?	15.2	116	18.0	90	16.3	206
how many times did this happen in the last 30 days?						
1 - 2 times	6.2	47	7.0	35	6.5	82
≥ 3 times	9.0	69	11.0	55	9.8	124
c) not eat for a whole day because there was no food or money to buy food?	2.5	19	3.6	18	2.9	37
how many times did this happen in the last 30 days?						
1 - 2 times	1.0	8	1.6	8	1.3	16
≥ 3 times	1.4	11	2.0	10	1.7	21
d) ever eat less than you/someone thought you/someone should because there was not enough money for food	15.7	120	17.8	89	16.5	209
how many times did this happen in the last 30 days?						
1 - 2 times	8.3	63	6.0	30	7.4	93
≥ 3 times	7.5	57	11.8	59	9.2	116

* p > 0.05 for differences between men and women (probit and ordered probit regression adjusted for design effect)

5.4.2. Inadequate care for older persons

The lack of a companion in late stages of life can be assumed as a concrete expression of, and may lead to, inadequate care for older persons. Data from Table 5.17 show that practically 65 percent of the older population from Mexico City and the ZMCM under study had no living spouse or partner; around two fifths are visited by no person, and nearly the same proportion eats alone most of time. From this three indicators, eating alone most of time proved to have a very strong socioeconomic gradient — the poorer the older person, the less accompanied she or he is while eating ($p < 0.01$, probit regression adjusted for design effect).

A second group of indicators of inadequate care for older persons is given by five different situations suggesting lack of help or support from other people. Up to 23 percent of older adults from the study sample do not count on anyone when they need help. But as subjects get poorer, less support is provided when they feel unwell, need to take a medicine, need to see the doctor, need money or things ($p < 0.01$, probit regression adjusted for design effect). Overall, these conditions are prevalent in 17 to 27 percent of subjects from the poorest quintiles, whereas it is 9 to 22 percent of older adults from quintiles III to V reporting lack of support. In all cases, around a fifth of subjects are not taken into account or are not allowed to participate in major decisions concerning what to eat, what food or things to buy and how to prepare meals for themselves or for the household overall. These are important indicators of older persons' bargaining power *vis-à-vis* other members of the household that, eventually, account for food security at both the individual and at the household levels. Unlike other indicators of inadequate care to older

persons presented in Table 5.17, indicators of bargaining power show that the poorer the subject, the greater her or his participation in major decisions over food security.

Socioeconomic differences proved to be statistically significant. However, it is very likely that older adults from wealthier socioeconomic strata are less concerned about cooking, deciding what to eat or doing the food shopping, whereas subjects from the poorest strata may participate actively in, or may be completely responsible for, all these tasks, as other members of the household work, study or are being looked after an older person. Given that 16 percent of total households and 44 percent of households in quintile I are single-member, this analysis was repeated stratifying for household composition.

Table 5.17. Selected indicators of inadequate care in the older population under study by quintiles of median *per capita* monthly expenditure, 2002.

All households	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Single-member household (≥ 70)	44.3	112	15.8	40	9.9	25	4.7	12	4.0	10	15.8	199
No spouse or partner	69.2	175	66.4	168	58.7	148	60.5	153	68.7	173	64.7	817
Not visited by anyone	49.0	124	41.9	106	43.3	109	40.7	103	40.9	103	43.2	545
Eats alone most of time *	59.7	151	43.9	111	31.3	79	29.2	74	25.0	63	37.8	478
Does not count on someone if/when...												
... wants/needs to talk	26.9	68	23.7	60	21.0	53	24.9	63	18.3	46	23.0	290
... is unwell or needs to take a medicine *	26.9	68	20.9	53	17.1	43	16.2	41	12.7	32	18.8	237
... needs to see the doctor *	20.6	52	18.6	47	11.1	28	15.4	39	9.1	23	15.0	189
... needs money or things *	24.1	61	21.3	54	21.8	55	20.9	53	10.7	27	19.8	250
... needs something from the shop *	27.3	69	17.4	44	11.5	29	17.0	43	9.5	24	16.5	209
Does not decide or is not taken into account to decide...												
... what to eat †	15.8	40	19.8	50	19.4	49	25.3	64	25.4	64	21.1	267
... what foods or things to buy *	14.6	37	20.9	53	19.8	50	25.7	65	26.2	66	21.5	271
... how to prepare her/his own meals or the household meals *	17.0	43	20.6	52	20.6	52	27.3	69	29.0	73	22.9	289

In multigenerational households, or in those composed with two or more members, the wealthier the stratum, the more older persons with no living spouse or partner. The 18 percentage points difference between quintiles I and V proved to be highly statistically significant ($p < 0.01$, probit regression adjusted for design effect). Eating alone most of time is more prevalent as households get poorer. Between the extreme quintiles of median *per capita* monthly expenditure, a 12 percentage points difference was found ($p < 0.01$, probit regression adjusted for design effect).

As is the case with the total households from the study sample, in multigenerational households, or in those households with two or more members, older persons count on more sources of help and support, as socioeconomic status is better. The differences observed in the five indicators of help and support towards older persons range from 7 to 14 percentage points between the poorest and the wealthiest stratum. Meanwhile, the only indicator of older persons' bargaining power regarding food security issues for which statistical significance was found, corresponds to that of older subjects not being taken into account or not participating on how to prepare their own meals or those for the whole household. A 9 percentage point difference between extreme socioeconomic stratum proved to be statistically significant.

The only two indicators of inadequate care for older persons showing clear socioeconomic gradients in single-member households were that of older persons no visited by anyone and eating alone most of time. Between quintiles I and V, a 24 and a 84 percentage points differences were found for these indicators,

respectively. However, it is important to take into account that some strata have only a few observations.

Table 5.17. Selected indicators of inadequate care in the older population under study by quintiles of median *per capita* monthly expenditure, 2002.
(continued)

Multigenerational households or households with ≥ 2 members	I		II		III		IV		V		Total	
	%	No. 141	%	No. 213	%	No. 227	%	No. 241	%	No. 242	%	No. 1,064
No spouse or partner *	48.9	69	61.0	130	54.6	124	58.9	142	67.4	163	59.0	628
Not visited by anyone	53.2	75	45.1	96	45.4	103	42.3	102	41.7	101	44.8	477
Eats alone most of time *	36.9	52	36.2	77	26.4	60	26.1	63	24.4	59	29.2	311
Does not count on someone if/when...												
...wants/needs to talk †	27.7	39	26.3	56	21.1	48	24.1	58	18.2	44	23.0	245
...is unwell or needs to take a medicine †	19.9	28	22.1	47	15.9	36	15.4	37	12.4	30	16.7	178
...needs to see the doctor *	17.0	24	17.4	37	9.7	22	14.5	35	8.3	20	13.0	138
...needs money or things *	22.0	31	22.1	47	19.4	44	21.2	51	9.5	23	18.4	196
...needs something from the shop *	22.7	32	16.4	35	11.0	25	15.4	37	8.3	20	14.0	149
Does not decide or is not taken into account to decide...												
...what to eat	19.1	27	22.5	48	21.1	48	25.7	62	26.0	63	23.3	248
...what foods or things to buy	18.4	26	23.9	51	22.0	50	26.6	64	27.3	66	24.2	257
...how to prepare her/his own meals or the household meals †	20.6	29	23.0	49	22.9	52	27.4	66	29.8	72	25.2	268
Single-member households	%	No. 112	%	No. 40	%	No. 25	%	No. 12	%	No. 10	%	No. 199
No spouse or partner	94.6	106	95.0	38	96.0	24	91.7	11	100.0	10	95.0	189
Not visited by anyone *	43.8	49	25.0	10	24.0	6	8.3	1	20.0	2	34.2	68
Eats alone most of time *	88.4	99	85.0	34	76.0	19	91.7	11	40.0	4	83.9	167
Does not count on someone if/when...												
...wants/needs to talk	25.9	29	10.0	4	20.0	5	41.7	5	20.0	2	22.6	45
...is unwell or needs to take a medicine	35.7	40	15.0	6	28.0	7	33.3	4	20.0	2	29.6	59
...needs to see the doctor	25.0	28	25.0	10	24.0	6	33.3	4	30.0	3	25.6	51
...needs money or things	26.8	30	17.5	7	44.0	11	16.7	2	40.0	4	27.1	54
...needs something from the shop	33.0	37	22.5	9	16.0	4	50.0	6	40.0	4	30.2	60
Does not decide or is not taken into account to decide...												
...what to eat	11.6	13	5.0	2	4.0	1	16.7	2	10.0	1	9.5	19
...what foods or things to buy	9.8	11	5.0	2	0.0	0	8.3	1	0.0	0	7.0	14
...how to prepare her/his own meals or the household meals	12.5	14	7.5	3	0.0	0	25.0	3	10.0	1	10.6	21

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

† $p < 0.05$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

5.4.3. Unhealthy household environment and lack of access to health services

As discussed in Chapter 4, in this work, indicators of unhealthy household environment are mostly circumscribed to physical characteristics of the dwelling or the way they affect older persons' quality of life (Table 5.18). As is the case in most areas of Mexico City and the ZMCM, dwellings from this work have adequate conditions in terms of the materials used for walls, roofs and floors. Practically 96 percent of dwellings count on walls made of concrete, brick, cement, or stone; 85 percent of the roofs are predominantly made of concrete tiles or blocks, concrete panels, or bricks, and nearly all floors are made of concrete or covered with plastic or wood tiles. Households from quintiles I and II reported the worst conditions regarding the materials used for roofs, though. The socioeconomic gradient observed in this indicator of household environment is highly statistically significant ($p < 0.01$, probit regression adjusted for design effect).

Safe water provision has been qualified as not adequate in nearly half of households, given that one or more of the following conditions was registered: no connection to a piped supply, unavailable inside the dwelling, not coming from the public system and not available 24 hours a day during 7 days. Inadequate conditions concerning excreta disposal were present in 16 percent of households. Unsafe management of rubbish and use of pollutant fuel for cooking were present in less than 4 percent of sample households. Households from quintiles I and II are particularly affected by inadequate water supply and excreta disposal ($p < 0.01$, probit regression adjusted for design effect).

When the above-mentioned indicators of unhealthy environment for older persons are drawn together, it is once more households from the poorest strata reporting the worse conditions. Around three quarters of households from quintile I and 63 percent of households from quintile II can be considered as unhealthy. Meanwhile, half of household from strata III to IV had inadequate hygienic conditions ($p < 0.01$, probit regression adjusted for design effect). Nearly 40 percent of older adults reported no access to health services. However, if analysed by area of residence, it is more older adults from the ZMCM with lack of access to health care services. As suggested in Chapter 3, PRAAPAM beneficiaries are also entitled to use the health care services of the Government of Mexico City. However, no statistical differences by socioeconomic status were found.

Table 5.18. Unhealthy household environment and lack of access to health services in the older population under study by quintiles of median *per capita* monthly expenditure, 2002.

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Infrastructure												
Non proper materials for												
Walls	6.7	17	4.0	10	2.4	6	4.0	10	2.0	5	3.8	48
Roofs *	28.9	73	21.3	54	8.3	21	8.3	21	8.3	21	15.0	190
Floors	2.4	6	2.0	5	0.8	2	0.8	2	0.4	1	1.3	16
Water: inadequate conditions *	57.3	145	50.6	128	43.3	109	44.7	113	42.1	106	47.6	601
Toilet: inadequate conditions *	32.0	81	17.4	44	9.9	25	9.9	25	9.5	24	15.8	199
Unsafe management of rubbish	5.9	15	3.2	8	3.2	8	1.6	4	2.4	6	3.2	41
Use of pollutant fuel for cooking	2.4	6	3.2	8	2.8	7	0.4	1	1.2	3	2.0	25
Unhealthy household environment *	73.1	185	63.2	160	52.0	131	51.8	131	51.2	129	58.3	736
No health services available	42.7	108	33.6	85	37.3	94	39.1	99	41.7	105	38.9	491
Mexico City	19.2	30	15.7	28	18.6	32	17.7	31	24.4	40	19.0	161
ZMCM	80.4	78	76.0	57	77.5	62	87.2	68	73.9	65	78.9	330

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

5.5. An overview of income poverty in older persons and their households

Income poverty in older persons and their households was explored through three groups of indicators: I. Income from employment or self-employment, II. Assets and, III. Income from pensions and other transfer in cash or kind. Results are shown in Table 5.19.

Although, on average, 71 percent of sampled households have a source of economic resources from employment or self-employment, differences by socioeconomic strata are observed. While half of the poorest households count on this type of income, 88 percent of households from quintile V reported to have access to a source of wage income ($p < 0.01$, probit regression adjusted for design effect). Socioeconomic differences regarding the availability of income from employment or self-employment by older persons were not statistically significant, though. As socioeconomic status is better, more households have access to wage income from younger members only, whereas the poorer the household, the more the older members providing this source of income. Respectively, the 47 and 22 percentage points differences observed between extreme socioeconomic strata are highly statistically significant ($p < 0.01$, ordered probit regression adjusted for effect design).

According to the Economic Commission for Latin America and the Caribbean (ECLAC) (CEPAL, 2000), in 1997, close to 60 percent of households with older persons in urban areas of Mexico had at least one member aged 60 and over contributing with 50 percent or more of the overall household income (see Chapter 2).

Table 5.19. Selected indicators of income poverty in households with older persons by quintiles of median *per capita* monthly expenditure. Households from Mexico City and the MZMC, 2002.

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
I. Income from employment or self-employment												
At the household level *	49.4	125	62.1	157	71.0	179	85.8	217	88.5	223	71.3	901
Older persons	21.3	54	15.0	38	15.1	38	18.6	47	13.5	34	16.7	211
Providers of wage income from employment and self-employment at the household level *												
Younger members only	28.1	71	47.0	119	56.0	141	67.2	170	75.0	189	54.6	690
Both younger and older members	21.3	54	15.0	38	15.1	38	18.6	47	13.5	34	16.7	211
Older members only	15.8	40	4.7	12	7.9	20	2.8	7	1.6	4	6.6	83
II. Assets												
Owned dwellings *	71.5	181	81.8	207	86.5	218	87.7	222	90.1	227	83.5	1055
Households with												
Bicycle *	10.7	27	19.4	49	15.5	39	23.3	59	32.1	81	20.2	255
Car, truck or motorcycle *	3.2	8	9.5	24	20.2	51	35.2	89	46.0	116	22.8	288
Television *	84.2	213	95.3	241	96.4	243	97.2	246	96.4	243	93.9	1186
Radio	59.3	150	66.8	169	68.3	172	64.0	162	62.7	158	64.2	811
Sound system *	47.0	119	63.6	161	72.6	183	83.0	210	84.9	214	70.2	887
VCR *	11.9	30	23.7	60	32.1	81	44.3	112	60.3	152	34.4	435
Other entertainment assets (cable TV., video games, etc.) *	1.6	4	4.3	11	6.0	15	8.7	22	17.1	43	7.5	95
Computer *	0.4	1	3.2	8	7.1	18	15.0	38	30.6	77	11.2	142
Cooker *	93.3	236	98.0	248	97.6	246	97.2	246	98.8	249	97.0	1225
Blender *	83.8	212	94.9	240	96.8	244	97.2	246	98.8	249	94.3	1191
Iron *	75.5	191	91.7	232	92.5	233	94.1	238	95.6	241	89.9	1135
Fridge *	67.2	170	87.4	221	92.9	234	95.7	242	98.4	248	88.3	1115
Washing machine *	29.6	75	57.3	145	71.8	181	71.1	180	82.1	207	62.4	788
Sewing machine *	23.7	60	42.3	107	52.4	132	57.7	146	59.5	150	47.1	595
Microwave oven *	5.1	13	17.0	43	29.8	75	36.4	92	52.4	132	28.1	355
Water boiler *	41.1	104	58.1	147	77.4	195	77.5	196	83.3	210	67.5	852
Water pump *	14.2	36	24.1	61	29.8	75	39.5	100	40.5	102	29.6	374
Fan *	11.9	30	20.6	52	27.8	70	32.4	82	42.1	106	26.9	340
Vacuum cleaner *	0.4	1	4.3	11	7.1	18	11.9	30	19.0	48	8.6	108
III. Income from pensions and other transfers in cash or kind												
Pensions												
Households †	22.5	57	32.8	83	32.1	81	27.7	70	33.7	85	29.8	376
Older persons	20.2	51	25.3	64	23.4	59	20.6	52	24.6	62	22.8	288

The ownership of a dwelling and other common assets is considered as an important source of income in urban households. On average, 83 percent of dwellings were owned in sampled areas of Mexico City and the ZMCM. There is, nonetheless, clear differences by socioeconomic status ($p < 0.01$, probit regression adjusted for design effect). In the lowest *per capita* expenditure strata, 71 percent of dwellings were owned by tenants, compared to 90 percent in quintile V. According to the results, as households have less spending power, the ownership of 18 out of 19 selected common assets decreases.

Table 5.19. Selected indicators of income poverty in households with older persons by quintiles of median *per capita* monthly expenditure. Households from Mexico City and the MZMC, 2002.
(continued)

	I		II		III		IV		V		Total	
	%	No. 253	%	No. 253	%	No. 252	%	No. 253	%	No. 252	%	No. 1,263
Participation in food programmes												
PRAAPAM ‡	77.6	121	79.8	142	75.6	130	78.9	138	72.0	118	76.8	649
Milk	32.8	83	37.2	94	40.5	102	40.7	103	29.8	75	36.2	457
Free food baskets, meals, food items, food banks, etc.	9.5	24	7.1	18	9.1	23	8.3	21	4.4	11	7.7	97
Older person's discount card from INAPAM	5.5	14	2.0	5	3.2	8	3.2	8	4.4	11	3.6	46
Food vouchers as a benefit from job †	2.8	7	3.6	9	2.0	5	5.5	14	6.7	17	4.1	52
School breakfast	2.0	5	3.2	8	2.4	6	2.8	7	5.6	14	3.2	40
Community kitchens or prepared meals	1.6	4	0.4	1	0.8	2	0.8	2	0.4	1	0.8	10
Subsidised foods	0.4	1	2.0	5	2.4	6	0.8	2	1.6	4	1.4	18
Other cash transfers	0.4	1	0.0	0	0.0	0	0.4	1	0.4	1	0.2	3
Households with some kind of food assistance other than PRAAPAM	44.3	112	47.8	121	48.4	122	48.2	122	40.9	103	45.9	580

* $p < 0.01$ for differences between quintiles of median *per capita* monthly expenditure (ordered or non-ordered probit regression adjusted for design effect)

† $p < 0.05$ for differences between quintiles of median *per capita* monthly expenditure (probit regression adjusted for design effect)

‡ Include older persons from Mexico City only

Poorer households were not only less likely to own less expensive assets (such as a car), but also cheaper ones (such as a blender). Socioeconomic gradients are also observed in most popular assets such as television or sound system. All differences in terms of common household assets ownership were highly statistically significant ($p < 0.01$, probit regression adjusted for design effect).

The lack of pension benefits either at the household or at the older person level is high in all strata. On average, less than 30 percent of all households counted on a member with pension benefits, whereas in the poorest strata, only 22 percent of households had this source of income available ($p < 0.01$, probit regression adjusted for design effect). Findings on older persons under study with no social security, are similar to those reported by the ECLAC (CEPAL, 2000) for older persons from urban areas of Mexico (see Figure 2.9 from Chapter 2). Broadly speaking, 77 percent of older subjects from the sample did not have a pension. Socioeconomic differences were not statistically significant.

Most transfers in cash or in kind listed in this table are practically non-existent in households from the study sample. With the exception of PRAAPAM, which is only benefiting older persons from Mexico City (see Chapter 3), and the national subsidised milk programme LICONSA, other interventions assist 10 percent or less of sampled households. No statistically significant differences were found by quintile of median *per capita* monthly expenditure. However, because of the scale of the milk programme, the proportion of households using at least one food-related programme is high: 72 out of every 100 households, on average. Households from quintiles II, III and IV, are better covered than those from

quintiles I and V. This may be due to the fact that social interventions are not completely efficient in targeting the poorest sectors of Mexico City and the MZMC, or potential beneficiaries are not fully aware about the existence of these programmes. That fewer households from the wealthiest stratum report use of food-related assistance, demonstrates that interventions are somewhat focused on poorer populations groups.

5.6. Concluding remarks

This chapter suggests the existence of similarities and divergences between the older population under study and older population groups from other urban areas of Latin America analysed in Chapter 2. One of the most important findings is the high prevalences of old-age overweight and obesity, particularly among women. Data from this thesis and other research give evidence for the magnitude of this epidemic in contemporary societies from the developing world. Findings from this thesis also show that being overweight or obese are not exclusive to the wealthiest layers of the society. That nearly 60 percent of older subjects from the overall study sample suffer from being overweight or obese suggests, for instance, the urgent need for more decisive actions by both the local and the federal government against unhealthy eating habits, physical inactivity and other health-threatening conditions in urban older populations from middle-income countries.

The lack of detailed data on health makes it impossible to establish comparisons between the population under study in this thesis and that of the SABE project. However, a second characteristic shared by both groups of older people is the

relatively low prevalences of impaired physical functioning, measured through the limitation of selected instrumental activities of daily living.

That most older persons from this study live in multi-generational households is also a characteristic of urban societies from countries experiencing similar stages of demographic transition, like Brazil or Bolivia. Living with others may diversify sources of help and support for older persons and, at the same time, may account for the provision of care to younger members — particularly children — by an older person. It is nonetheless worth noting the apparent differences regarding the provision of help and support between the older population from this study and that participating in the SABE project. For instance, while up to 57 percent of older adults from the SABE project received money from members of their households, and 43 percent did it from people not living in the household (which is the case of Mexico City), it is only a fifth of the subjects from this study receiving money from another member of the household, a relative or a friend. This may respond to the fact that older persons from the study sample belonged to poor households, while those participating in the SABE project were rather representative of their corresponding urban contexts. Poor households may rely, in this sense, on limited sources of help and support.

In this study, that more older people from poorer socioeconomic strata live on their own does not necessarily mean that they are able to meet their needs adequately. On the contrary, most single-older person households in urban areas of Mexico may be rather poor, not visited and unhealthy. Under these living conditions, it is very likely that single-member households from similar urban

areas of Latin America be food-insecure. Data from this study reveal that food insecurity exists not only among older persons from Mexico City and the ZMCM, but also in their households. The socioeconomic gradient is evident: as spending power decreases, past and current experiences on uncertain access to food are more prevalent. The magnitude of food insecurity in poor households with older persons from other Latin American urban areas may be expected to be similar.

According to the non-quantitative 24-hour recall, the diet of most older persons from the study sample is based on a few cheap sources of nutrients, regardless of the strata of spending power. However, socioeconomic differences suggest that the poorer the subject, the less reported the consumption of more expensive foods and the less diverse the diet. Despite the limitations of this method to quantify dietary intake, it could be presupposed that eating habits of the older population under study are as unhealthy as those among urban older populations from Brazil, Mexico and Chile reported in works by Najas *et al* (1994), INNZS (1995), Monteiro *et al* (1995), De Oliveira (1997), Atalah *et al* (1998) and Aguilar-Salinas *et al* (2001).

Whilst inadequate care for older persons from the sample of study is evident, especially as poverty increases, no socioeconomic gradient could be observed in other sources of information referred in to urban Latin American older populations. Nonetheless, data for Mexico City from the SABE project reveal that more older adults in selected participating cities have a living spouse or partner and receive more money, things, services or help from others than subjects studied in this research. The availability of a an unhealthy household environment, along

with a lack of access to health care services seem to be more prevalent in this study than in the SABE project.

The hypothesis that older persons overall have very low opportunities to generate their own economic resources does not seem to be confirmed in the SABE project, as wage income is available in high proportions of older adults from Buenos Aires, Sao Paulo, Santiago, Montevideo and even Mexico City. However, the fact that only up to 21 percent of the older population studied in this thesis count on a source of income from employment or self-employment suggest that poverty, low educational levels, lack of social security and other variables related to precarious living conditions are crucial in understanding the limitations of generating own income during old age.

Overall, the ownership of a dwelling and other common household assets seem to be similar among older persons from both studies. The socioeconomic differences observed in this thesis confirm that poorer people has less access to these sources of income, though. On the other hand, the proportion of households benefiting from transfers in cash or in kind were very low among households with older persons participating in the SABE project, whereas in this research, around 72 households with older persons out of every 100 were assisted by at least one food-related intervention, although mostly it is milk.

In short, this chapter provides evidence supporting the argument that socio-geographically targeted poor sectors of the urban older population do not constitute a homogeneous group. Socioeconomic gradients are seen (and can be

measured) in key indicators of nutrition, health and quality of life during old age. Despite its particular expressions at the individual level, poverty does not affect older persons in isolation. Their households also suffer from a lack of resources, uncertain access to food and limited participation in social safety nets, among other factors. For all these reasons, local or regional governments interested in contributing to a successful ageing based on food security measures should take into account how heterogeneous poor urban older populations can be. Therefore, means-tested and universally-delivered interventions should start by first evaluating needs, problems or interests of potential beneficiaries, identifying which other sectors or members of the household are also benefiting from old-age programmes, and how this affect older subjects.

In the next chapter, a more complex analysis of the relationships between malnutrition, food insecurity and poverty in old age will take place. It is, in essence, the isolation of the impact of PRAAPAM as a way to find out how a secure source of income modifies the above-mentioned relationship in beneficiaries and non-beneficiaries.

Chapter 6. Potential impacts of the *Programa de Apoyo Alimentario para Personas Adultas Mayores* (Food Assistance for Older Persons) on selected indicators of malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone

The previous chapter presented empirical evidence on how various hierarchically ordered indicators of the relationship between malnutrition, food insecurity and poverty during old age varied among the overall urban older population under study (and its household context), when analysed by *per capita* household expenditure as a proxy for socioeconomic status. Results were consistent with the fact that the lower the strata of consumption (i.e. expenditure), the worse the living conditions and quality of life of both older people and their households. The disaggregation of data by *per capita* household expenditure showed that limited access to food and poverty do not affect all older individuals in the same way, confirming that older residents of *poor* neighbourhoods are not a homogeneous group. This latter finding may be used as strong evidence by local and regional policy makers to target old-age food-related interventions, especially if interested in best allocating scarce resources to the most deprived sectors of the older population. Such targeting is missing in universal schemes benefiting all subjects of a given community, just as happens with the *Programa de Apoyo Alimentario para Personas Adultas Mayores* (Food Assistance for Older Persons) (PRAAPAM, to use its Spanish acronym), run by the local government of Mexico City (hereafter GDF).

In this chapter, data are disaggregated by area of residence as a proxy for receiving PRAAPAM, consisting of a monthly monetary transfer worth £33. According to the hypothesis of this study, a secure source of cash income during old age improves older persons' nutritional status and food security, contributing strongly to lessen poverty. Therefore, this analysis focuses on the differences given by the fact of counting on a secure source of economic resources or not without distinguishing the degree of poverty between individuals or their households, as presented in Chapter 5. It is important to bear in mind that during the first stage of PRAAPAM, the Secretariat of Health of Mexico City (SSDF, to use its Spanish acronym), presumably benefited all older individuals aged 70 and over living in *socio-geographically*-defined poor, moderately poor and extremely poor neighbourhoods of Mexico City. For this reason, the comparison group was constituted by older persons of the same age group living in neighbourhoods of the Metropolitan Zone of Mexico City (ZMCM, to use its Spanish acronym) with similar characteristics to those of their counterparts, and not receiving assistance from the GDF (see Chapter 4).

A description of sociodemographic characteristics of the older population under study by area of residence is first introduced. But unlike previous chapters, this chapter does not strictly follow the same structure of the theoretical framework (see Chapter 1) —the analysis of differentials in income poverty, presented in the second section, brings to the foreground diverse socioeconomic contrasts between the two areas of residence. All income poverty-related variables used in this thesis that clearly pre-date the introduction of the PRAAPAM benefit have been assumed as potential confounders of the relationship between malnutrition, food

insecurity and poverty during old age, because they are thought to have a strong influence on the outcomes under study (see Chapter 4). Thirdly, a group of variables associated with an unhealthy household environment for the older person is presented, pointing out differences between Mexico City and the ZMCM. This group of variables are also potential confounders.

The impact analysis starts off with a description of selected anthropometric indicators of the nutritional status and body mass index (BMI) in older persons from the two zones of study. This is followed by a comparison of selected indicators of dietary diversity, food insecurity, self-perceived health status, limitation of activities of daily living and access to health services in older persons by PRAAPAM eligibility status (area of residence). Thirdly, a comparison of selected indicators of current and past experiences on food insecurity at the household level by area of residence is carried out. The analysis continues with a description of selected indicators of inadequate care in older persons by type of household and area of residence. Finally, data on median monthly per capita income by area of residence are presented, as described in Chapter 4. Multivariate analysis is used to adjust for sex, age, old-age household headship, maximum educational level in the household, availability of a living spouse or partner, household size and composition, number of hours worked at the household level, participation in the labour force at the household level; participation of the older person in the labour force; dwelling ownership, availability of telephone, vehicle, motorcycle, van or pick-up truck and water pump; participation in the *Liconsa* milk programme, and availability of the INAPAM's older persons' card (see Table 4.6). These variables are thought to

influence the relationship between receiving the PRAAPAM benefit, nutrition, access to food and poverty in older persons.

6.1. Sociodemographic and socioeconomic characteristics of the older populations under study

Table 6.1 presents the distribution of the two older populations of study by selected sociodemographic characteristics. Both in Mexico City and in the ZMCM, the proportion of older women is greater than the proportion of older men, by nearly a 2:1 ratio. These results are similar to those reported by other sources referred to Latin American urban areas like the SABE project (see Chapter 2). Sex differences between areas of residence were not statistically significant, as the p value was greater than 0.05.

The distribution by age group shows that around 70 percent of the older populations is aged 70 to 79 years of age; a quarter is 80 to 89, and only up to 5 percent has 90 years of age and more. When disaggregated by sex, there seems to be a greater proportion of male subjects from older cohorts in Mexico City than in the ZMCM, whereas more older women aged 80 and over are reported in this latter area than in the former one. However, it is only age differences between older women from the two zones of study proving to be highly statistically significant ($p < 0.01$, ordered probit adjusted for clustering).

Table 6.1. Distribution of older population under study by selected sociodemographic characteristics and area of residence, 2002.

	Mexico City		ZMCM		Total		P value
	%	No. = 835	%	No. = 418	%	No. = 1,253	
Sex							
Men	35.9	300	39.2	164	37.0	464	
Women	64.1	535	60.8	254	63.0	789	
Age group by sex							
Both sexes							
70-79	72.2	603	68.7	287	71.0	890	
80-89	24.7	206	26.3	110	25.2	316	
≥ 90	3.1	26	5.0	21	3.8	47	
Men							
70-79	67.7	203	73.2	120	69.6	323	
80-89	28.0	84	23.8	39	26.5	123	
≥ 90	4.3	13	3.0	5	3.9	18	
Total	100.0	300	100.0	164	100.0	464	
Women							*
70-79	74.8	400	65.7	167	71.9	567	
80-89	22.8	122	28.0	71	24.5	193	
≥ 90	2.4	13	6.3	16	3.7	29	
Total	100.0	535	100.0	254	100.0	789	
Older person as household head	64.0	534	51.9	217	59.9	751	*
Men	85.7	257	76.8	126	82.5	383	
Women	51.8	277	35.8	91	46.6	368	
Primary school complete and more	35.0	292	22.5	94	30.8	386	*
Men	45.0	135	28.7	47	39.2	182	
Women	29.3	157	18.5	47	25.9	204	
Has a living spouse or partner	33.1	276	39.7	166	35.3	442	†
Men	54.0	162	61.6	101	56.7	263	
Women	21.3	114	25.6	65	22.7	179	
Households with							
1 member	16.6	139	13.9	58	15.7	197	
2 members	26.0	217	22.2	93	24.7	310	
3 members	17.1	143	17.0	71	17.1	214	
4 members	12.0	100	12.7	53	12.2	153	
5 members	12.1	101	13.4	56	12.5	157	
6 members	6.9	58	7.7	32	7.2	90	
7 members	3.7	31	5.3	22	4.2	53	
8 members	2.3	19	3.6	15	2.7	34	
9 members	1.4	12	1.2	5	1.4	17	
≥ 10 members	1.8	15	3.1	13	2.2	28	
Total	100.0	835	100.0	418	100.0	1,253	
Household composition							
Multigenerational households	73.2	611	77.3	323	74.5	934	
Single-member household (≥ 70)	10.2	85	8.9	37	9.7	122	
Older persons only	16.6	139	13.9	58	15.7	197	

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (probit or ordered probit regression adjusted for clustering)

† p < 0.05 for differences between older populations from Mexico City and the ZMCM (probit or ordered probit regression adjusted for clustering)

More older persons in Mexico City were considered as heads of their households than in the ZMCM. This difference proved to be highly statistically significant, as *p* value was lower than 0.01 (probit regression adjusted for clustering). According to the results, there is a 12 percentage points differences between the two areas of

residence. Overall, in both urban areas, fewer women reported to be head of their households in comparison with men. However, the household headship of an older person was more common in Mexico City. Regional differences for men and women were 9 and 16 percentage points, respectively.

A second important difference between the two older populations is given by the level of education. As discussed in the previous chapter, most older subjects from the study sample, particularly women, did not complete primary school. When analysed by urban area, lower educational levels are observed in the ZMCM, with a 12 percentage points difference in relation to Mexico City. Sex differences show that both older men and women from Mexico City achieved higher educational levels than their counterparts in the ZMCM. Between men, a difference of 16 percentage points was reported, whereas between women, it was 11 percentage points. All these differences ($p < 0.01$, probit regression adjusted for clustering) could be linked to the immigration flows from highly illiterate and poor rural villages to the ZMCM registered in the 1960's. Even though Mexico City could have been the goal of immigration, the living costs of capital of the Mexican Republic were a serious economic and cultural obstacle for families. For this reason, many decided to settle in cheaper areas close to Mexico City, thereby assuming the social costs of no sanitation, no transport, as well as a lack of schools and health services. This is the case of municipalities like Atizapán de Zaragoza, Chalco, Chimalhuacán, Ecatepec and Nezahualcóyotl (see Figure 4.1, Chapter 4), just to mention a few examples.

The availability of a living spouse or partner has been suggested as an important source of help and support during late stages of life. Differences found between zones and sexes ($p < 0.1$, probit regression adjusted for clustering) evidence a greater availability of this source of help and support in the ZMCM, particularly when both sexes and men only from the two areas are compared: 7 and 8 percentage points, respectively. Meanwhile, the difference between older women is half of what it was reported as being in men. Even though the indicators of household size and household composition showed no statistically significant differences, it is worth mentioning that most households in both areas of study are composed of 4 or fewer members. According to the Mexican National Institute of Statistics, Geography and Informatics (INEGI, to use its Spanish acronym), the average Mexican household has 4.1 members (see Chapter 4). It is also important to point out that around three quarters of the households in both areas of residence are multigenerational.

As a comparative approach to socioeconomic status between older persons and households from Mexico City and the ZMCM, Table 6.2 presents a number of selected indicators of income poverty. Although the availability of income from employment or self-employment at the household level was reported by more than 65 percent of households, in the ZMCM more households counted on this source of income. The 8 percentage points difference showed strong statistical significance ($p < 0.01$, probit regression adjusted for clustering). No significant regional differences were observed in the proportions of members aged 12 to 69 and those aged 70 and over with a source of income from employment or self-employment available. Neither were those distinguishing from which members of

the household this source of income comes from. The availability of income from employment or self-employment has been considered as a proxy for participation in the labour force.

Table 6.2. Selected indicators of income poverty in households with older persons by area of residence, 2002

	Mexico City		ZMCM		Total		Difference	
	%	No. = 835	%	No. = 418	%	1,253		
I. Income from employment or self-employment								
At the household level	68.6	573	76.6	320	71.3	893	-7.9	*
Members aged 12-and-over ‡	56.1	894	54.8	492	55.6	1,386	1.2	
Older persons	16.8	140	16.3	68	16.6	208	0.5	
Source of income from employment and self-employment in the household								
Younger members only	51.9	433	60.3	252	54.7	685	-8.4	
Both younger and older members	10.4	87	9.3	39	10.1	126	1.1	
Older members only	6.3	53	6.9	29	6.5	82	-0.6	
II. Assets								
Owned dwellings	81.1	677	88.5	370	83.6	1,047	-7.4	*
Households with								
Bicycle	16.3	136	28.5	119	20.4	255	-12.2	*
Car, truck or motorcycle	20.0	167	28.5	119	22.8	286	-8.5	*
Other entertainment assets (cable t.v., video games, etc.)								
Computer	11.9	99	10.3	43	11.3	142	1.6	
VCR	33.8	282	34.9	146	34.2	428	-1.2	
Radio	61.3	512	69.6	291	64.1	803	-8.3	*
Sound system	69.5	580	71.1	297	70.0	877	-1.6	
Television	93.7	782	94.3	394	93.9	1,176	-0.6	
Microwave oven	28.9	241	26.3	110	28.0	351	2.5	
Sewing machine	46.8	391	47.6	199	47.1	590	-0.8	
Washing machine	63.2	528	60.3	252	62.3	780	2.9	
Fridge	89.0	743	86.6	362	88.2	1,105	2.4	
Iron	90.8	758	87.8	367	89.8	1,125	3.0	
Blender	94.4	788	94.0	393	94.3	1,181	0.4	
Cooker	97.2	812	96.7	404	97.0	1,216	0.6	
Vacuum cleaner								
Fan	25.3	211	29.2	122	26.6	333	-3.9	
Water pump	32.2	269	24.4	102	29.6	371	7.8	†
Water boiler	67.2	561	67.2	281	67.2	842	0.0	
III. Income from pensions and other transfers in cash or kind								
Pensions (disability and contributory)								
Households	30.7	256	27.8	116	29.7	372	2.9	
Older persons	23.5	196	21.1	88	22.7	284	2.4	
Participation in food programmes								
PRAAPAM §	76.9	642	0.0	0	51.2	642	n.a	
Milk	40.7	340	27.5	115	36.3	455	13.2	*
Free food baskets, meals, food items, food banks, etc.	7.8	65	7.4	31	7.7	96	0.4	
Food vouchers as a benefit from job	4.4	37	3.6	15	4.2	52	0.8	
Older person's discount card from INAPAM	1.3	11	8.1	34	3.6	45	-6.8	*
School breakfast	3.8	32	1.9	8	3.2	40	1.9	
Subsidised foods	1.1	9	2.2	9	1.4	18	-1.1	
Community kitchens, prepared meals	1.0	8	0.5	2	0.8	10	0.5	
Other cash transfers	0.4	3	0.0	0	0.2	3	0.4	
Households with food assistance other than PRAAPAM	48.0	401	41.9	175	46.0	576	6.2	

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

† p < 0.05 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

‡ total number of persons aged 12 - 69 years: DF = 1,594, ZMCM = 897

§ Only benefitting older persons from Mexico City

The second source of income at the household level is given by the number and type of assets. More than 80 percent of the dwellings in both zones are privately owned; nonetheless, the ZMCM registers a 7 percent points difference in comparison with Mexico City ($p < 0.01$, probit regression adjusted for clustering). The ownership of other common household assets is compared. For example, more than 85 percent of households in both areas of residence have television, gas cooker, blender, iron and fridge; and between 60 and 65 percent reported owning a sound system (CD player, recorder, Hi-Fi system, etc.) and water boiler. In the ZMCM, more households reported the ownership of a car, truck or motorcycle (8 percentage points difference), which are three of the most expensive assets. This area has more households with a bicycle (12 percentage points difference) and radio (8 percentage points difference) than its counterpart. Meanwhile, in Mexico City more households have a water pump (8 percentage points difference). Differences showed statistical significance: $p < 0.01$ for bicycle, car, truck or motorcycle, and radio, and $p < 0.05$ for water pump.

The third source of income in both older persons and households comes from contributory, non-contributory and disability pensions and other transfers in cash or in kind. No significant regional differences are shown regarding pensions at these two levels. In this table, both disability and contributory pensions are included. In terms of participation in social programmes, the subsidised milk programme *Liconsa* benefits more households in Mexico City than in the ZMCM (13 percentage points difference), but in this latter area there are more older persons using the discount card by the National Institute for Older People (INAPAM, to use its Spanish acronym) (7 percentage points difference). These

differences were highly statistically significant. It is worth noting that 77 percent of older persons from Mexico City were being benefited by PRAAPAM when data were collected. This contradicts the authorities of the GDF who suggested that 100 percent of older persons from the zones where this study was carried out were receiving the programme. Participation in other programmes showed no statistical differences between older populations.

Households in the ZMCM differ from those in Mexico City by most indicators of an unhealthy environment for the older person (Table 6.3). In the latter urban area, more households have better materials for walls (5 percentage points) and roofs (12 percentage points), as well as more hygienic or adequate conditions regarding water (14 percentage points), excreta disposal (7 percentage points) and management of rubbish (6 percentage points). Similarly, when the selected indicators of infrastructure and sanitation are summarised, more households in Mexico City seem to be healthier for the older person (16 percentage points). These differences showed highly statistical significance ($p < 0.01$, probit regression adjusted for clustering). Better equipped and hygienic dwellings may also be a proxy for consumption poverty, as households often spend considerable amounts of money for this purposes. Hence, households in the ZMCM would also be wealthier given that they have managed to invest in better physical conditions. It is nonetheless important to point out that receiving PRAAPAM probably did not directly impact on how households improve physically their dwellings. Most of these characteristics are likely to have been already present before the intervention was set out.

Table 6.3. Unhealthy household environment for older persons by area of residence, 2002

	Mexico City		ZMCM		Total		Difference	
	%	No. = 835	%	No. = 418	%	1,253		
Infrastructure								
Non proper materials for								
Walls	2.3	19	6.9	29	3.8	48	-4.7	*
Roofs	11.1	93	23.2	97	15.2	190	-12.1	*
Floors	1.1	9	1.7	7	1.3	16	-0.6	
Water: inadequate conditions	42.9	358	56.5	236	47.4	594	-13.6	*
Toilet: inadequate conditions	13.4	112	20.3	85	15.7	197	-6.9	*
Unsafe management of rubbish	1.2	10	7.4	31	3.3	41	-6.2	*
Use of pollutant fuel for cooking	1.6	13	2.9	12	2.0	25	-1.3	
Unhealthy household environment	52.7	440	69.1	289	58.2	729	-16.4	*

* $p < 0.01$ for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

The main similarities between the samples of Mexico City and the ZMCM on pre-programme variables are the sex distribution of their respective older populations under study; the age distribution of older adults of both sexes and older men only; the composition and size of households; the proportion of members of the household aged 12 to 69 years and 70 and over counting on a source of income from employment and self-employment, and the age of members from which wage income mainly comes from. Both samples are also similar in terms of their participation in food-related assistance at the individual and at the household level.

Meanwhile, the two samples differ in the age distribution of older women, particularly in the younger age group (70 to 79 years); the proportion of older persons considered as head of their households; the educational level of subjects aged 70 and over, and the availability of a living spouse or partner during old age. Higher proportions of older subjects as head of their households, and educational levels of older persons from Mexico City suggest, respectively, a higher degree of participation in the household and better access to information that may

eventually be crucial to face malnutrition, food insecurity and poverty during old age in this urban area. That more older persons from the ZMCM have a living spouse or partner suggests greater access to an important source of help and support during late life.

Whilst more households count on a source of wage income and own water pumps in Mexico City, the ownership of a dwelling, bicycle, car (or other vehicle for the use of the household) and radio favours more households in the ZMCM. It is nonetheless worth mentioning that the slightly greater proportion of dwellings owned in the ZMCM would not necessarily suggest better income or expenditure levels in these households. Over the last decades, many people have moved from Mexico City, or migrated from other parts of Mexico, to the neighbouring ZMCM because both land and mortgage plans were (and sometimes still are) more accessible. The smaller proportion of households with bicycles in Mexico City can be due to the fact that its use represents high risks of traffic accidents and death in this urban area where bikers are not respected. On the other hand, that more households in the ZMCM own cars (or other means of transport like motorcycle) should be assumed as a need, rather than as a luxury. Many people living in the ZMCM have to commute everyday to get to their jobs in Mexico City, travelling 2 or more hours in many cases.

That more households in Mexico City participate in the subsidised milk programme can probably be attributed to the greater number, less scattered, and therefore more accessible, *Liconsa* shops available in this area than in the ZMCM. Meanwhile, the higher use of INAPAM's card by older persons from the ZMCM

may be due to there being fewer opportunities to be benefited from other interventions than in Mexico City, such as PRAAPAM.

6.2. Comparing nutritional status

The older populations under study are not only similar demographically speaking, but also in physical terms. According to data from Table 6.4, there are small differences between older adults from Mexico City and the ZMCM; however, neither unadjusted nor adjusted differences were statistically significant, as *p* values were greater than 0.05 in both cases.

	Mexico City			ZMCM			Total			P value	
	Mean	± sd	No.	Mean	± sd	No.	Mean	± sd	No.	Unadjusted	Adjusted
Age										n.s	n.s *
Male	77.5	5.9	300	76.8	5.7	164	77.2	5.8	464		
Female	76.4	5.6	535	77.8	6.5	254	76.9	6.0	789		
Both	76.8	5.7	835	77.4	6.2	418	77.0	5.9	1,253		
Estimated height based on knee height (m)										n.s	n.s *
Male	1.64	5.7	293	1.64	6.9	164	1.6	6.1	457		
Female	1.52	4.9	531	1.52	4.9	253	1.5	4.9	784		
Both	1.56	7.8	824	1.57	8.4	417	1.6	8.0	1,241		
Weight (kg)										n.s	n.s *
Male	68.9	11.1	295	69.2	12.3	164	69.0	11.5	459		
Female	62.4	12.5	530	61.0	12.3	253	62.0	12.5	783		
Both	64.8	12.4	825	64.2	13.0	417	64.6	12.6	1,242		
Body mass index (kg/m ²)										n.s	n.s *
Male	25.6	3.8	293	25.7	3.9	164	25.6	3.8	457		
Female	27.0	4.8	530	26.4	4.7	253	26.8	4.8	783		
Both	26.5	4.5	823	26.1	4.4	417	26.4	4.5	1,240		
Body mass index (kg/m ²) by age group										n.s	n.s †
70-79 years	27.0	4.5	593	26.6	4.3	287	26.9	4.5	880		
80-89 years	25.4	4.3	204	25.5	4.5	109	25.4	4.4	313		
90 and over	24.4	4.5	26	22.9	4.3	21	23.7	4.4	47		

* probit regression adjusted for clustering
† ordered probit regression adjusted for clustering
n.s. No significance

On average, both older men and women from the two zones of study are 77 years of age. In both areas of residence, men had a mean estimated height (based in knee height) of 1.64 m and a weight of 69 k, whereas women had a mean

estimated height of 1.52 m and a weight of 64 k. Both older men and women from Mexico City and the ZMCM can be classified into the category Overweight I, since they registered a BMI value greater than 25 kg/m². Data confirm a decrease in BMI with age in the two older populations. When disaggregated into the two major categories “Non-overweight” and “Overweight”, BMI values showed no statistical significant differences by area of residence and sex, even after adjusting for possible confounding (Table 6.5). However, it is worth noting that half of older men and around 60 percent of older women from Mexico City and the ZMCM were classified as overweighted or obese.

Table 6.5. Body mass index of the older population under study by sex and area of residence, 2002

Sex and Body mass index	Mexico City		ZMCM		Total		Differences*			
	%	No. = 823	%	No. = 417	%	No. = 1,240	Unadjusted		Adjusted	
Both sexes										
Non-overweight	41.2	339	41.7	174	41.4	513	-0.54		—	
Overweight	58.8	484	58.3	243	58.6	727	0.54	n.s.	3.0	n.s.
Men										
Non-overweight	48.8	143	48.8	80	48.8	223	0.02		—	
Overweight	51.2	150	51.2	84	51.2	234	-0.02	n.s.	-0.1	n.s.
Women										
Non-overweight	37.0	196	37.2	94	37.0	290	-0.17		—	
Overweight	63.0	334	62.8	159	63.0	493	0.17	n.s.	5.1	n.s.

* probit regression adjusted for clustering

n.s. No significant

6.3. Comparative analysis of the immediate causes of malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone

6.3.1. Dietary diversity

Appreciable differences in the analysis of indicators of diet diversity in older populations by area of residence were found. Dietary diversity was measured by counting the number of food groups and items consumed in the last 24 hours.

When analysed by major food groups, only dairy products showed highly statistical differences after controlling for confounding ($p < 0.01$, probit regression adjusted for clustering). More older persons from Mexico City reported having eaten dairy products than their counterparts in the ZMCM (7 percentage points difference). Differences in the consumption of vegetables proved to be statistically significant only before adjusting for potential confounders (Table 6.6). When disaggregated by food item, older persons from Mexico City reported higher percentages of consumption. Furthermore, after controlling for confounding, most food items showing statistically significant regional differences are expensive and are usually bought in supermarkets, suggesting that most of the components of older persons' diet in Mexico City are accessed through PRAAPAM's benefit. The highest differences are those of cheese and yogurt (13 and 12 percentage points difference, respectively); followed by rice (9 percentage points), soft drinks and sliced bread (on average, 8 percentage points difference in each case); breakfast cereals, other dairy products, chicken, sweets and desserts, and soured or double cream (around 6 percentage points differences, on average); beef, canned tuna fish, pork ham and other fats (5 percentage points difference, on average), and fresh fish (3 percentage points difference).

Area differences in the consumption of some fruits and vegetables also proved to be statistically significant; however, these food items are not exclusively bought in supermarkets. Some households buy them in *mercados de barrio* or *tianguis* (respectively, local or itinerant markets, in Spanish), presumably because they can be cheaper.

Table 6.6. Food groups and items consumed by the older person in the last 24 hours by area of residence, 2002

	Mexico City		ZMCM		Total		Differences		
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted	
I. Bread, cereals , pasta, rice and tubers	99.6	832	99.8	417	99.7	1,249	-0.1		‡
II. Dairy products	89.1	744	78.0	326	85.4	1,070	11.1	*	6.7 *
III. Animal products and legumes	95.7	799	95.9	401	95.8	1,200	-0.2		-0.4
IV. Fruits	85.9	717	82.5	345	84.8	1,062	3.3		1.4
V. Vegetables	93.9	784	96.7	404	94.8	1,188	-2.8	†	-2.6 n.s
VI. Fats and sugar	96.2	803	94.3	394	95.5	1,197	1.9		1.0
VII. Drinks	68.6	573	71.8	300	69.7	873	-3.1		-4.2
I. Bread, cereals , pasta, rice and tubers									
Tortilla	87.2	728	92.8	388	89.1	1,116	-5.6	*	-4.6 †
Bread rolls	53.7	448	53.1	222	53.5	670	0.5		0.8
Rice	46.3	387	37.8	158	43.5	545	8.5	*	8.9 *
Sweet bread rolls	44.1	368	37.6	157	41.9	525	6.5	†	6.4 †
Pasta	41.9	350	41.6	174	41.8	524	0.3		0.5
Potatoes	40.6	339	31.6	132	37.6	471	9.0	*	7.0 †
Bread loaf	22.8	190	12.0	50	19.2	240	10.8	*	7.8 *
Other maize products	20.7	173	10.8	45	17.4	218	10.0	*	9.2 *
Breakfast cereals	17.0	142	9.6	40	14.5	182	7.4	*	7.3 *
II. Dairy products									
Fresh milk	78.7	657	72.7	304	76.7	961	6.0	†	1.3 n.s
Cheese	40.8	341	26.6	111	36.1	452	14.3	*	12.9 *
Yoghurt	25.4	212	12.9	54	21.2	266	12.5	*	12.0 *
Other dairy products	10.4	87	4.1	17	8.3	104	6.4	*	6.0 *
III. Animal products and legumes									
Beans	60.0	501	61.0	255	60.3	756	-1.0		-0.8
Chicken	52.6	439	44.7	187	50.0	626	7.8	*	5.9 †
Eggs	40.7	340	37.3	156	39.6	496	3.4		0.6
Beef	28.1	235	24.2	101	26.8	336	4.0		5.0 †
Lentils	9.7	81	8.4	35	9.3	116	1.3		1.2
Canned tuna	10.5	88	5.7	24	8.9	112	4.8	*	4.0 *
Pork ham	10.5	88	5.3	22	8.8	110	5.3	*	4.7 *
Pork	6.6	55	6.5	27	6.5	82	0.1		0.2
Fresh fish	7.7	64	3.8	16	6.4	80	3.8	*	3.4 †
Other animal products	4.8	40	3.3	14	4.3	54	1.4		0.7
Sausages	3.0	25	2.2	9	2.7	34	0.8		0.8
IV. Fruits									
Banana	48.0	401	43.1	180	46.4	581	5.0		3.6
Lemon and lime	45.3	378	40.7	170	43.7	548	4.6		4.1
Apple	32.8	274	27.3	114	31.0	388	5.5		4.1
Other fruits	24.4	204	22.0	92	23.6	296	2.4		1.5
Papaya	23.1	193	18.9	79	21.7	272	4.2		0.5
Apricot or peach	17.5	146	16.7	70	17.2	216	0.7		0.9
Guava	18.9	158	10.3	43	16.0	201	8.6	*	8.2 *
Orange	15.1	126	8.6	36	12.9	162	6.5	*	4.8 †
V. Vegetables									
Onion	77.1	644	80.4	336	78.2	980	-3.3		-4.0
Tomato (red)	78.1	652	74.9	313	77.0	965	3.2		4.9
Chilli peppers	52.2	436	50.7	212	51.7	648	1.5		3.3
Tomato (green variety)	36.4	304	38.5	161	37.1	465	-2.1		-0.6
Carrot	32.2	269	23.7	99	29.4	368	8.5	*	7.2 †
Courgette	29.9	250	27.0	113	29.0	363	2.9		2.2
Nopales	29.2	244	22.7	95	27.1	339	6.5	*	6.4 †
Lettuce	19.2	160	17.5	73	18.6	233	1.7		1.4
Chayote squash	20.2	169	12.2	51	17.6	220	8.0	*	7.8 *
Green beans	16.3	136	12.4	52	15.0	188	3.8		3.2
Other vegetables	12.1	101	12.4	52	12.2	153	-0.3		-1.7
Cucumber	10.7	89	5.5	23	8.9	112	5.2	*	3.1 n.s
Frozen mixed vegetables	9.5	79	5.5	23	8.1	102	4.0	†	2.4 n.s
Artichoke and radish	3.2	27	1.9	8	2.8	35	1.3		0.7
VI. Fats and sugar									
Cooking oil	87.5	731	83.7	350	86.3	1,081	3.8		4.2
Sugar	71.6	598	71.8	300	71.7	898	-0.2		-1.8
Soft drinks	32.2	269	22.5	94	29.0	363	9.7	*	8.3 *
Avocado	27.5	230	23.2	97	26.1	327	4.3		3.7
Sweets and desserts	25.4	212	17.7	74	22.8	286	7.7	*	6.0 †
Sour or double cream	22.6	189	15.8	66	20.4	255	6.8	*	6.0 †
Other fats	11.9	99	6.5	27	10.1	126	5.4	*	4.9 *
Fried pork skin and/or meat	9.3	78	7.7	32	8.8	110	1.7		3.5 †
Chorizo	3.1	26	3.6	15	3.3	41	-0.5		-0.2
VII. Drinks									
Mineral water (still)	65.6	548	60.3	252	63.8	800	5.3		2.8
Other drinks	4.0	33	19.4	81	9.1	114	-15.4	*	-11.8 *
Beer, wine and spirits	2.5	21	4.1	17	3.0	38	-1.6		-1.0

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

† p < 0.05 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

n.s. No significant differences found

‡ No adjusted difference could be obtained since nearly 100 percent of both populations reported consumption of items from this group in the last 24 hours

6.3.2. Food insecurity among the older populations under study

These results may also suggest that it is not only important sources of protein, fibre, calcium, phosphorus or complex carbohydrates presumably being purchased as expected by the GDF, but also food items containing high amounts of saturated fats and highly industrialized carbohydrates.

A second approach to dietary diversity in older persons from Mexico City and the ZMCM is presented in Table 6.7. Important regional differences are observed when the number of food groups that older persons included in their diet during the last 24 hours are summarised. Diets including 5 or more food groups were considered as diverse. According to this criterion, the adjusted difference between older persons from Mexico City and the ZMCM is 7 percentage points ($p < 0.05$, probit regression adjusted for clustering). Higher significant adjusted differences were found when estimating the proportion of older persons including at least 2 food items in every group during the last 24 hours ($p < 0.01$, probit regression adjusted for clustering). Older persons from Mexico City reported a more diverse diet according to this criterion (9 percentage points difference). In sum, these results may also suggest that PRAAPAM allows older persons from Mexico City to access a more diverse diet.

Table 6.7. Selected indicators of diet diversity in the older person by area of residence, 2002

	Mexico City		ZMCM		Total		Differences			
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted		
≥ 5 major food groups included in the diet	71.3	595	60.8	254	67.8	849	10.5	*	6.7	†
At least 2 food items in every group	26.6	222	15.5	65	22.9	287	11.1	*	9.2	*

* $p < 0.01$ for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

† $p < 0.05$ for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

6.3.2. Food insecurity among the older populations under study

Table 6.8 shows that three out of the four selected indicators of present experiences on old-age food insecurity were higher among older persons from the ZMCM and adjusted differences proved to be statistically significant: *couldn't afford to eat properly* (5 percentage points difference); *being often hungry* (6 percentage points difference) and *eating less than thought they should* (5 percentage points difference). Differences, though small, proved to be statistically significant ($p < 0.05$, 0.01 and 0.05, respectively), suggesting that PRAAPAM has a slightly better role in current than in past experiences on uncertain access to food, which showed no statistical significance between the two older populations under study.

Table 6.8. Selected indicators of food insecurity in older persons by area of residence, 2002

	Mexico City		ZMCM		Total		Differences			
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted		
During the last week, older person...										
a) couldn't afford to eat properly	16.3	136	23.4	98	18.7	234	-7.2	*	-5.2	†
b) was often hungry but didn't eat because she/he couldn't afford enough food	12.3	103	20.8	87	15.2	190	-8.5	*	-5.9	*
c) ate less than she/he thought she/he should because she/he didn't have enough money for food	18.4	154	25.1	105	20.7	259	-6.7	*	-4.9	†
At least one food insecurity experience during the last week	23.4	195	28.2	118	25.0	313	-4.9		-3.3	
During the last year, older person...										
a) lose weight because there wasn't enough food	13.4	112	15.1	63	14.0	175	-1.7		-0.5	
b) had hunger pangs but couldn't eat because she/he couldn't afford food	7.8	65	7.7	32	7.7	97	0.1		0.9	
Food insecurity experience during the last year	15.2	127	18.2	76	16.2	203	-3.0		-1.2	

* $p < 0.01$ for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

† $p < 0.05$ for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

6.3.3. Indicators of health, functioning and access to health services

The analysis of self-perceived health status and limitation of instrumental activities of daily living showed no significant statistical differences between

urban areas. Nearly three quarters of both populations perceived their health better or as good as other people of their same age, and around 84 percent in the two zones of residence are able to function independently. However, after adjusting for confounding, a 68 percentage points difference was found in the availability of health care services. It is important to remember that older persons from Mexico City receiving PRAAPAM are also entitled to use the local health services network, including free prescriptions and other benefits.

Table 6.9. Self-perceived health status, limitation of instrumental activities of daily living and lack of access to health services in older persons by area of residence, 2002

	Mexico City		ZMCM		Total		Differences	
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted
Self-perceived health status								
Better or as good as others	75.1	627	72.7	304	74.3	931	2.4	1.8
Functioning: IADL-OARS								
Independent functioning	84.7	707	83.0	347	84.1	1,054	1.7	1.4
No health services available	18.9	158	78.9	330	38.9	488	-60.0 *	-67.6 *

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

6.4. Household food insecurity and inadequate care for older persons

This section presents an analysis of selected indicators of current and past experiences on food insecurity at the household level and inadequate care for older persons. As mentioned in previous paragraphs, the component on unhealthy household environment for the older person has been excluded from this analysis because its variables were not expected to change as a result of receiving PRAAPAM or not. Moreover, its indicators are rather a proxy for long-term consumption poverty.

6.4.1. Current and past experiences of food insecurity at the household level

Unlike the disaggregation of current and past experiences on household food insecurity by quintiles of total household expenditure (Chapter 5), the analysis of

uncertain access to food at the household level by area of residence shows no statistically significant differences. In both areas prevalences are similar. For example, in Table 6.10, it is possible to observe that nearly a third of households in Mexico City and the ZMCM reported *not having enough food*; around 40 percent were *worried whether their food run out before they get money to buy more, ate the same thing for several days in a row or ran out of the food needed to put together a meal*. In 36 percent of households from both urban areas *the food they bought didn't last*. Overall, 60 percent of households from both zones had at least one current experience on food insecurity.

Table 6.10. Selected indicators of recent or usual experiences of food insecurity at the household level by area of residence, 2002

	Mexico City		ZMCM		Total		Differences *	
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted
Amount of food eaten in the household								
Sometimes or often not enough	34.7	290	36.8	154	35.4	444	-2.1	-0.9
We worry whether our food will run out before we get money to buy more								
Sometimes or often true	41.4	346	41.4	173	41.4	519	0.0	2.3
We eat the same thing for several days in a row because we only have few different kinds of food on hand and don't have money to buy more								
Sometimes or often true	41.6	347	40.7	170	41.3	517	0.9	0.3
The food that we bought didn't last and we didn't have money to buy more								
Sometimes or often true	37.0	309	35.9	150	36.6	459	1.1	2.3
We ran out of the food that we needed to put together a meal and we didn't have money to get more								
Sometimes or often true	40.8	341	40.2	168	40.6	509	0.6	2.0
At least 1 experience of present or usual food insecurity at the household level	60.2	503	57.9	242	59.5	745	2.3	4.0

* No significant differences found

The second approach to food insecurity at the household level reports no statistically significant differences between areas of residence either (Table 6.11). However, it is worth noting that around 30 percent of households in both urban areas *ran out of money* during the last year; nearly 20 percent cut the size of meals because *there was not enough food in the house*; in 4 percent of cases members *did not eat for a whole day because there was no money or food*, and around 20 percent *ate less than they thought they should eat* for economic reasons. When

households were asked whether these experiences occurred in the last month, as well as whether they occurred two or more times during the last month, results seem similar between the two areas of residence. Between 20 and 25 percent of households in both urban areas *ran out of money* during the last month; around 15 percent cut the size of meals because *there was not enough food in the house*; less than 4 percent reported that their members *did not eat for a whole day because there was no money or food*, and between 14 and 17 percent *ate less than they thought they should eat* for economic reasons. One possible explanation for these similarities on household food insecurity can be that PRAAPAM is not necessarily having impacts at this level, suggesting that older persons are the principal beneficiaries of this intervention, as expected by the GDF.

Table 6.11 Selected indicators of past and present food insecurity at the household level by area of residence, 2002

	Mexico City		ZMCM		Total		Differences *	
	%	No. = 835	%	No. = 418	%	No. = 1,253	Unadjusted	Adjusted
In the past year, did you and your household ever...								
...run out of money to buy food?	33.1	276	28.9	121	31.7	397	4.1	4.4
...cut the size of meals because there was not enough food in the house?	19.6	164	18.7	78	19.3	242	1.0	2.0
...not eat for a whole day because there was no food or money to buy food?	4.0	33	4.5	19	4.2	52	-0.6	-0.5
...ever eat less than you/someone thought you/someone should because there was not enough money for food	20.5	171	18.4	77	19.8	248	2.1	2.5
In the last month, did you and your household ever...								
...run out of money to buy food?	24.9	208	22.7	95	24.2	303	2.2	3.2
≥ 2 times in the last month	20.1	168	20.6	86	20.3	254	-0.5	-0.6
...cut the size of meals because there was not enough food in the house?	16.3	136	16.3	68	16.3	204	0.0	1.3
≥ 2 times in the last month	14.1	118	14.1	59	14.1	177	0.0	0.8
...not eat for a whole day because there was no food or money to buy food?	2.6	22	3.6	15	3.0	37	-1.0	-0.4
≥ 2 times in the last month	1.9	16	2.9	12	2.3	28	-1.0	-0.2
...ever eat less than you/someone thought you/someone should because there was not enough money for food	17.0	142	15.8	66	16.6	208	1.2	1.8
≥ 2 times in the last month	13.6	114	13.6	57	13.6	171	0.0	0.6

* No significant differences found

6.4.2. Inadequate care for the older person

Even though the comparative analysis of indicators of inadequate care for the older person evidences not many contrasts between Mexico City and the ZMCM (Table 6.12), three sets of data are crucial to understand the impact of PRAAPAM on an older person's well-being.

Table 6.12. Selected indicators of inadequate care in older persons by area of residence, 2002

	Mexico City		ZMCM		Total		Differences	
	%	No. = 835	%	No. = 418	%	1,253	Unadjusted	Adjusted
All households								
Not visited by anyone	43.8	366	41.9	175	43.2	541	2.0	4.8
Eats alone most of time	40.6	339	32.5	136	37.9	475	8.1 *	7.1 †
Does not count on someone if/when...								
...wants/needs to talk	22.9	191	23.7	99	23.1	290	-0.8	-1.1
...is unwell or needs to take a medicine	19.8	165	16.5	69	18.7	234	3.3	1.7
...needs to see the doctor	16.2	135	12.2	51	14.8	186	4.0	3.0
...needs money or things	19.9	166	19.4	81	19.7	247	0.5	0.8
...needs something from the shop	16.4	137	16.0	67	16.3	204	0.4	0.8
Does not decide or is not taken into account to decide...								
...what to eat	19.6	164	23.9	100	21.1	264	-4.3	-0.7
...what foods or things to buy	18.4	154	27.5	115	21.5	269	-9.1 *	-6.0 †
...how to prepare her/his own meals or the household meals	21.3	178	25.8	108	22.8	286	-4.5	-0.3
Households with ≥ 2 members								
No spouse or partner	61.2	426	55.0	198	59.1	624	6.2	5.8
Not visited by anyone	45.8	319	42.8	154	44.8	473	3.1	4.2
Eats alone most of time	31.9	222	24.4	88	29.4	310	7.5 †	6.0 n.s
Does not count on someone if/when...								
...wants/needs to talk	23.3	162	23.1	83	23.2	245	0.2	0.6
...is unwell or needs to take a medicine	17.5	122	14.7	53	16.6	175	2.8	2.3
...needs to see the doctor	13.6	95	11.4	41	12.9	136	2.3	1.1
...needs money or things	18.2	127	18.3	66	18.3	193	-0.1	-1.6
...needs something from the shop	13.4	93	14.4	52	13.7	145	-1.1	-2.5
Does not decide or is not taken into account to decide...								
...what to eat	21.8	152	25.8	93	23.2	245	-4.0	-0.9
...what foods or things to buy	21.0	146	30.3	109	24.1	255	-9.3 *	-5.1 n.s
...how to prepare her/his own meals or the household meals	23.6	164	28.1	101	25.1	265	-4.5	-0.9
Single-member households								
No spouse or partner	95.7	133	93.1	54	94.9	187	2.6	2.5
Not visited by anyone	33.8	47	36.2	21	34.5	68	-2.4	-0.6
Eats alone most of time	84.2	117	82.8	48	83.8	165	1.4	0.6
Does not count on someone if/when...								
...wants/needs to talk	20.9	29	27.6	16	22.8	45	-6.7	-6.9
...is unwell or needs to take a medicine	30.9	43	27.6	16	29.9	59	3.3	3.1
...needs to see the doctor	28.8	40	17.2	10	25.4	50	11.5	14.1 †
...needs money or things	28.1	39	25.9	15	27.4	54	2.2	3.5
...needs something from the shop	31.7	44	25.9	15	29.9	59	5.8	5.2
Does not decide or is not taken into account to decide...								
...what to eat	8.6	12	12.1	7	9.6	19	-3.4	-8.0
...what foods or things to buy	5.8	8	10.3	6	7.1	14	-4.6	-9.6 †
...how to prepare her/his own meals or the household meals	10.1	14	12.1	7	10.7	21	-2.0	-4.0

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

† p < 0.05 for differences between older populations from Mexico City and the ZMCM (probit regression adjusted for clustering)

n.s. No significant differences found

When all types of households are analysed, around 75 percent or more of older persons in both areas of study decide or are taken into account to decide what foods or things to buy. However, even after adjusting for confounding, the presence of this expression of bargaining power *vis-à-vis* other members of the

household is higher in Mexico City: 7 percentage points difference ($p < 0.05$, probit regression adjusted for clustering).

After adjusting for confounding, the difference is not clear in households with two or more members. Nonetheless, unadjusted differences were statistically significant ($p < 0.05$, probit regression adjusted for clustering). In single-member households, adjusted differences are clear again: 10 percentage points difference between Mexico City and the ZMCM ($p < 0.05$, probit regression adjusted for clustering).

These results may not only support the idea that older persons from Mexico City are the principal beneficiaries of PRAAPAM, but also that other members of the household respect the ways in which beneficiaries use the assistance by the GDF. In sum, these findings can be considered as expressions of care, support and help to the older person.

6.5. PRAAPAM: impact on expenditure patterns

After adjusting for potential confounders, Table 6.13 shows that differences in median monthly *per capita* expenditure between households from Mexico City and the ZMCM were not statistically significant (p value > 0.05 , quintile regression) and, therefore, cannot easily be attributed to receiving PRAAPAM benefits or not.

Table 6.13. Median monthly *per capita* expenditure by area of residence. Households with older persons from Mexico City and ZMCM, 2002

In MX\$	Urban area		Differences			
	DF	ZMCM	Unadjusted		Adjusted	
All households (n = 1,253)						
25th Percentile	1,201.3	978.3	223.0	*	9.3	n.s.
Median	1,677.8	1,465.6	212.2	*	29.4	n.s.
75th Percentile	2,480.0	2,144.8	335.2	*	26.2	n.s.
Multigenerational households (n = 934)						
25th Percentile	1,069.9	918.9	151.0	*	2.0	n.s.
Median	1,464.1	1,313.6	150.5	†	82.1	n.s.
75th Percentile	2,097.0	1,798.9	298.2	*	-1.0	n.s.
Older persons only (n = 197)						
25th Percentile	2,007.9	1,931.6	76.3	n.s.	235.7	n.s.
Median	2,952.3	2,722.9	229.4	n.s.	259.7	n.s.
75th Percentile	4,066.2	4,707.1	-640.9	n.s.	109.3	n.s.
Single-member households (n = 122)						
25th Percentile	1,593.5	1,080.0	513.5	*	311.8	n.s.
Median	2,012.1	1,741.0	271.1	n.s.	141.6	n.s.
75th Percentile	2,506.8	2,422.3	84.4	n.s.	154.3	n.s.
In GBP						
All households						
25th Percentile	60.1	48.9	11.1	*	0.5	n.s.
Median	83.9	73.3	10.6	*	1.5	n.s.
75th Percentile	124.0	107.2	16.8	*	1.3	n.s.
Multigenerational households						
25th Percentile	53.5	45.9	7.5	*	0.1	n.s.
Median	73.2	65.7	7.5	†	4.1	n.s.
75th Percentile	104.9	89.9	14.9	*	-0.1	n.s.
Older persons only						
25th Percentile	100.4	96.6	3.8	n.s.	11.8	n.s.
Median	147.6	136.1	11.5	n.s.	13.0	n.s.
75th Percentile	203.3	235.4	-32.0	n.s.	5.5	n.s.
Single-member households						
25th Percentile	79.7	54.0	25.7	*	15.6	n.s.
Median	100.6	87.0	13.6	n.s.	7.1	n.s.
75th Percentile	125.3	121.1	4.2	n.s.	7.7	n.s.

* p < 0.01 for differences between older populations from Mexico City and the ZMCM (quantile regression)

However, data suggest that, overall, households with two or more older persons, and those composed of one older person only, may have better consumption levels

in comparison with all households and multigenerational households. Results also suggest that, in Mexico City, households with older persons only and single-member households are likely to have better expenditure patterns in comparison with their counterparts in the ZMCM. It is worth noting that these differences, in favour of households from Mexico City, corresponded respectively to 40 and 20 percent of the monetary transfer by PRAAPAM.

6.6. Concluding remarks

This chapter shows that, when analysed by PRAAPAM eligibility status, the two populations under study differ in some core demographic and socioeconomic characteristics. Mexico City has better indicators in terms of old-age household headship, education, the availability of water pump and participation of households in the *Liconsa* milk programme. In the ZMCM, more older persons count on a living spouse or partner, the availability of income from employment and self-employment is higher; more dwelling, bicycles, cars and radios are owned and more older persons count on INAPAM's older people's card.

Theoretically speaking, the matching design employed was thought to be robust enough to detect two comparable population groups. It may have happened that the matching models excluded important variables for the selection of beneficiary and non-beneficiary neighbourhoods, or that the sample size was small. It is worth mentioning that whilst the matching processes were carried out using data for all households in Mexico City and its Metropolitan Zone, households under study were selected only if they had an older member aged 70-and-over, with at least three years of residence in the area and willing to participate in the survey.

Imbalances in measured variables were compensated by adjusting the regression models by the potential confounders described in Chapter 4. However, there is still the possibility that residual confounders would not have been included in the analysis.

Even though food acquisition may be affected by a lack of non-wage income, and unavailability of social safety nets, among other factors, the concept of food security used throughout this study describes situations in which limited or uncertain access to food due to a lack of financial resources is perceived. Most indicators of food insecurity at both the individual and the household level are, thus, built upon people's uncertainty or anxiety about economic resources to buy food. Although this is exactly the way in which old-age food insecurity has mainly been explored to date, most knowledge derive from research on younger adults, children and households with other arrangements. Therefore, the magnitude of food insecurity among older persons from Mexico City and its Metropolitan Zone might have been underestimated, because unresolved theoretical gaps in the study of malnutrition, food insecurity and poverty during old age may result in both methodological and measurement limitations. The study of old-age food insecurity should, for instance, include appetite, expectations during late life, and other indicators exploring actual needs of older persons.

PRAAPAM has clearly proved to impact dietary diversity in older persons. Despite the limitations of a one-day 24-hour recall, the beneficiaries of this

intervention systematically reported higher consumption of most selected food items, particularly those traditionally expensive (such as, breakfast cereals, sliced bread, dairy products and animal proteins) that, furthermore, are mainly bought in supermarkets. But on the other hand, the monetary transfer seems to be also spent in soft drinks. Even though differences in old-age food insecurity are not as high as those found in dietary diversity, there is evidence suggesting that PRAAPAM has a small impact on access to food among its beneficiaries. Unfortunately, no clear impacts on BMI were found, probably because data were collected in a stage of the programme in which no tangible effects on the nutritional status could have been yet observed. Neither a positive effect of PRAAPAM on BMI suggesting less undernutrition, nor a negative effect of this intervention suggesting increased prevalences of overweight and obesity among their beneficiaries were observed. However, counting on a secure source of economic resources by the GDF seems to have positive impacts on beneficiaries' bargaining power regarding food choices and decisions.

Results of PRAAPAM's impact are not consistent with the approach based on consumption poverty presented in Chapter 5, except for dietary diversity. In the former analysis of malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone, those receiving MX\$ 668 (£ 33) were expected to be better off than non-beneficiaries. Through the latter approach, it was found what *a priori* was expected: the poorer the households, the lower the outcomes of interest.

As seen in Chapter 3, PRAAPAM is not an intervention based on a poverty alleviation approach, but rather designed upon a universalisation of available resources basis. Therefore, it would not be rare that the few impacts of this large-scale non-contributory pension are assumed as a success by the GDF. Local authorities are paying attention to a group traditionally excluded from the social agenda, are increasing their political capital, presumably, are making older persons economically independent, and could be absolutely sure that it is older persons mainly using and benefiting from the intervention, given that no significant improvements at the household level were found. It is worth emphasising that, in this particular case, an intervention addressed to improve access to food in older persons does not seem to have any impact on food security at the household level.

But from an independent point of view, PRAAPAM does not have any significant difference on beneficiaries and non-beneficiaries in terms of their expenditure patterns. Data suggest, nonetheless, that households composed by older persons only and single-member households in Mexico City are spending more than their counterparts in the Metropolitan Zone, which could also be interpreted as a success of the programme by the GDF. But the weak associations found, suggest that beneficiaries may not be spending the transfer, probably because it is being saved for times of hardship, and other sources of income are used instead, with which the net effect of PRAAPAM is null. Beneficiaries may also be allowing the resources to accumulate on the card to buy more expensive non-food products (such as microwave ovens, iron, television sets, etc.) in the supermarkets where the programme's card is accepted. Another possible explanation to these findings

is that recipients may be giving away what they buy to others considered as poorer (or more needy), just as happens with the Chilean *Programa de Alimentación Complementaria para el Adulto Mayor* (Programme of Supplementary Nutrition for Older Persons, in Spanish). The other possibility is simply that beneficiaries are not using the assistance.

It is very likely that the presence of PRAAPAM may have crowded out other private transfers by adult children or other relatives. Furthermore, it is also possible that beneficiaries themselves and younger members of the household may have dropped out of the labour market once PRAAPAM became a secure source of income in the household. In this sense, beneficiaries may have decided to retire, and younger members of the household may have decided to return to school. Any of these possibilities would dilute the effect of PRAAPAM in the expenditure patterns of beneficiary households.

In one way or another, PRAAPAM seems to be an enormously expensive intervention to improve dietary diversity in older persons. However, this study brings up to the discussion the need to evaluate other indicators exploring, for instance, how satisfied beneficiaries are, what do they think about their local authorities investing in them, and what other changes occur once they count on a secure source of income, among others. It is not the purpose of this study to suggest structural changes to PRAAPAM, the interruption of the pension, or the allocation of part of its resources to other population groups at nutritional and social risk. But the provision of economic resources to older persons would probably have better impacts on older persons' nutritional status and food security

if complementary actions were implemented. Local authorities of Mexico City should, for example, carry out systematic nutritional surveillance among beneficiaries, given the high prevalences of overweight and obesity reported. In addition, educational and physical activity-related interventions to face this public health problem, and to prevent younger cohorts from becoming obese should be set out. By doing this, the GDF's health services network would lower the costs that overweight and obesity-related causes imply.

The final conclusions of the whole study on malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone are presented in the next chapter.

Chapter 7. The study of malnutrition, food insecurity and poverty in older persons from Mexico City and its Metropolitan Zone: findings, contributions, gaps, lessons and recommendations

This chapter summarises the main findings from the analysis of the relationships between malnutrition, food insecurity and poverty in older persons living in geographically-targeted poor neighbourhoods of Mexico City and its Metropolitan Zone, identifying the contribution of the present study to this insufficiently explored field of knowledge, and how it complements or contradicts previous research by other authors. In doing so, it also discusses strengths and weaknesses of this study, which is the first research of its kind ever conducted in older populations from a major urban area of Latin America. Thirdly, it considers how the findings from this study contribute to the overall study of the relationships between malnutrition, food insecurity and poverty in older populations from other Latin American urban contexts (and probably from other regions of the developing world) with similar sociodemographic and socioeconomic characteristics.

The discussion then moves to the formulation of a number of recommendations addressed at policy-makers, planners and programme implementers from Mexico and other areas of Latin America, at both the local and regional level. This is followed by a summary of lessons learned during the development phases of the study. Finally, a number of recommendations and needs for further research in malnutrition, food insecurity and poverty in older persons from urban Latin America are formulated.

Building on a review of previous research focused on children and households of other demographic structures, this study demonstrates that the relationships between malnutrition, food insecurity and poverty in older persons constitute a number of hierarchically organised interactions between conceptual components of diverse nature and degrees of complexity. These relationships manifest themselves at both the individual (i.e. older person) and at the collective levels (i.e. household, group, community, region, etc.), and its organisation into immediate, underlying and basic levels of causality permits a better understanding of how to cope with these old-age issues both theoretically and empirically. The relationships between malnutrition, food insecurity and poverty have concrete biological expressions, but are essentially determined by socioeconomic processes.

The theoretical frameworks proposed to explain old-age malnutrition, food insecurity and poverty in works by Olson *et al* (1996), Spark and Frongillo (2000), Lee and Frongillo (2001*a, b and c*), and Wolfe *et al* (2003) in the United States of America (USA), have also been inspired by approaches on food insecurity in younger populations and households with other arrangements. The concept of food security used in all these works refers mainly to inadequate access to food due to a lack of economic resources, without ignoring that other circumstances may affect food acquisition in older persons (such as, social isolation, lack of help and support, unavailability of social safety nets, etc.), and in their households (such as, lack of wage income, restricted availability of assets,

etc.). In fact, this study proves that *money* is not the only means through which poor older persons may achieve better access to food.

There is nonetheless limited research on public health nutrition issues in older populations from Latin America, particularly aiming at understanding the socioeconomic nature and differentials of biological outcomes. With a few exceptions, older populations from the region have traditionally been ignored by research and academic groups, local and regional governments, and society as a whole. Available data confirm that over the last decades the ageing of Latin American populations, particularly in urban areas, has become one of the most remarkable demographic transformations taking place in the region. However, most urban societies of Latin American countries experiencing medium and less advanced stages of demographic transition, are not yet fully prepared to face a rapid and sustained ageing process under deeply heterogeneous socioeconomic conditions.

A comparison of available data on nutrition and health conditions of Latin American urban older populations, in addition to a comparative analysis of selected socioeconomic indicators of major urban areas of Latin America, systematically ranked Mexico City and its Metropolitan Zone as one of the worst urban environments not only for current older cohorts, but also for those to become old. In this context, malnutrition, food insecurity and poverty are expected to become serious threats to the quality of life of important sectors of the urban older population in this metropolis.

By rethinking old-age food insecurity mainly as a social problem, it has been assumed that older persons living in poor neighbourhoods of the same urban area do not constitute a homogeneous group. Food insecurity exists among the older population from Mexico City and its Metropolitan Zone, but this *expression* and *determinant* of people's quality of life affects differentially individuals and households depending on their socioeconomic status. The poorer the households in the sample, the higher the food insecurity and the worse other indicators of quality of life in older members. Poverty also affected the household as a whole. Results were consistent with the fact that the more restricted the access to resources and assets, the more limited the spending power, and the higher the food insecurity at the household level. These findings coincide with points of view suggesting that income and consumption poverty is invariably associated with poverty in terms of human capital (Coady, 2004). Relationships between low income during old age and uncertain access to food has been also found in works carried out among older populations from the United States of America (USA) (Olson *et al*, 1996; Lee and Frongillo, 2001*a, b* and *c*; Wolfe *et al*, 2003).

Another important contribution of this study to the field is that old-age food insecurity in poor neighbourhoods of Mexico City and its Metropolitan Zone is essentially associated with being overweight and obese. Being overweight or obese, both expressions of malnutrition and associated with food insecurity and poverty, are highly prevalent, are closely related to chronic disease, lead to disability, and bear high costs for individuals, households and health systems.

Strong linkages between uncertain access to food and the risk of being overweight or obese have for instance been found among North American women aged 18 and over (Townsend *et al*, 2001; Adams *et al*, 2003). Mean body mass index (BMI) values of 25.6 and 26.8 kg/m², respectively for older men and older women from the study sample are, in turn, similar to those reported by works carried out among older populations from the United States of America (USA) (Lee & Frongillo, 2001*a*, *b* and *c*) and major urban areas of Latin America, including Mexico City (WHO, 1995; Velázquez-Alva *et al*, 1996; Ortiz-Hernández *et al*, 2002; see Chapter 2). However, the prevalences of overweight and obesity in older persons from the study sample did not vary according to socioeconomic stratum or PRAAPAM eligibility status.

It is nonetheless worth noting that the main difference between works carried out among older persons from the USA and this study is the type of older populations and households interviewed and measured, in cultural, demographic and socioeconomic terms, even though Hispanic subjects were included in their samples. Contrary to Olson *et al* (1996) suggestion, the socioeconomic limitations and sociodemographic characteristics found in this study may not constitute a small proportion of older persons from Mexico City and its Metropolitan Zone, as it does in the USA. They may actually be representative of older populations not only living in poor neighbourhoods of this metropolis, but also in those from urban areas of Mexico and, probably, other regions of Latin America with similar characteristics. Unfortunately, there are no other sources of information on malnutrition, food insecurity and poverty focused on urban older populations from the subcontinent to compare this study with.

Large amounts of public funds have been and are still being spent in alleviating old-age malnutrition, food insecurity and poverty in some areas of Latin America and other parts of the developing world. As has been observed, schemes vary from one country to another, and even from one region to another within countries, depending on the availability of resources, goals, ideological views and concrete needs of older populations. Results may also vary from one programme to another. Unfortunately, not all interventions are rigorously evaluated.

The fact that the PRAAPAM stipend worth MX\$ 668 (£33) did not appear to impact positively on indicators of malnutrition, food insecurity and poverty among its beneficiaries or their households, could possibly be due to several reasons that have direct policy implications. There continues a debate regarding how best to allocate scarce resources and whether they should be provided universally, or only to the poorest sectors of society. This debate revolves, among other things, around the frontiers of *the public* and *the private*, the role of the state in meeting people's basic needs, the definition of both human rights and citizenship, and the project of nation and society that individuals pursue.

Far from a poverty alleviation perspective, the ideology behind PRAAPAM is one of universalisation of benefits, where older persons should have access to economic resources. However, regardless of the political orientation or the type of intervention, it appears essential that authorities should be more efficient in detecting the principal problems affecting the target populations, focusing first on the most needy. The fact that PRAAPAM had no impact on nutritional indicators

was probably because the programme was not based on an analysis of nutritional needs of the older population from Mexico City, as it is for example in the Chilean *Programa de Alimentación Complementaria para el Adulto Mayor* (Programme of Supplementary Nutrition for Older Persons, or PACAM, to use its Spanish acronym). According to the results of the current study, overweight and obesity seem to be the most important nutritional problems among beneficiaries (and non-beneficiaries) and therefore, more appropriate actions should be implemented to ensure that the mismatch between the real problems and the interventions is resolved.

There is some evidence that PRAAPAM impacted positively on older people's food security. Though small, differences between beneficiaries and non-beneficiaries in old-age current experiences on food insecurity, along with a lack of evidence for positive impacts on household food security, suggest that PRAAPAM is mainly used by, and essentially benefits, older people (rather than other household members), as expected by the Government of Mexico's Federal District (i.e. Mexico City) (GDF, to use its Spanish acronym). Evidence also suggests that this monetary transfer impacts positively on dietary diversity of direct beneficiaries. As discussed in Chapter 1, dietary diversity is a core component of food security. PRAAPAM beneficiaries appear to be using the transfer to buy traditionally expensive food items, such as animal and dairy products, breakfast cereals and other sources of carbohydrates, that otherwise would not have been included in their diets. However, the assistance by the GDF is also being used to buy less healthy items, such as soft drinks. Some indicators of support to older people and older people's bargaining power *vis-à-vis* other

members of the household regarding food security issues, are consistently higher in those receiving PRAAPAM. However, when analysed from a consumption poverty perspective, the highest percentages of uncertain access to food and a lack of dietary diversity are concentrated in the poorest socioeconomic strata, suggesting that the unconditioned cash transfer is not necessarily benefitting the most food insecure.

Unfortunately, there are no real possibilities to compare the impacts of PRAAPAM on food security in comparison with other programmes like PACAM or the Argentinean *Beneficio de Complemento Alimentario* (Supplementary Food Benefit, in Spanish), as no questions regarding uncertain access to food have been addressed to the beneficiaries of the two latter interventions to date. However, old-age food insecurity is not only dependent upon the availability of a secure source of economic resources, and it would therefore be recommended that programmes determine among other things, whether beneficiaries can prepare their own meals, go shopping or if they require dentures.

The third group of policy implications resulting from PRAAPAM are related to its capacity to improve socioeconomic indicators among beneficiaries. Even though this intervention is not based on a poverty alleviation scheme, it is worth emphasising that the poorest beneficiaries may not necessarily find MX\$ 668 (£33) useful to improve food security and meet other basic needs. This is to some extent confirmed when data are disaggregated by quintiles of median *per capita* monthly expenditure. Of course, the success of social and food programmes in

tackling poverty-related problems depend importantly on the household composition, on cultural preferences and individual taste.

The non-contributory South African Old Age Pension (SOAP) has, for instance, proved to impact positively not only on beneficiaries' nutritional status, but also on the food budgets of households with beneficiaries (Case & Deaton, 1996; Case, 2001; Duflo, 2003; Maitra & Ray, 2003). Overall, SOAP seems to have a significant impact on income poverty (Barrientos, 2003). Household budgets have also improved and poverty has significantly decreased in households with older persons benefiting from the non-contributory Brazilian Social Assistance Pension (SAP) (Barrientos, 2003; Legido-Quigley, 2003).

The GDF would find it politically difficult to withdraw PRAAPAM, and in fact, the provision of a social pension for older people is a great step in improving quality of life during ageing. However, it is strongly recommended that authorities bear in mind that in old-age, nutritional, health and socioeconomic problems result in complex challenges for society, and that merely giving *money* away to the older population is not the only means to face these challenges adequately. But it is also worth mentioning that in this study, PRAAPAM was evaluated in a very early stage — around its first year of operation. In 2002, recipients may still have been getting used to the new scheme, not using all the amount transferred in one single purchase, saving the money for times of hardship, and being careful not to misuse the pension. Further evaluations of PRAAPAM would therefore be recommended to observe the evolution of its potential impacts.

Conceptual gaps in understanding the nature of malnutrition, food insecurity and poverty during old age in particular urban contexts lead almost necessarily to methodological gaps and, therefore, to measurement limitations. The fact that questions and statements on old-age food insecurity derive from those designed for younger adults and households with children may have been the cause of underestimated prevalences of food insecurity among subjects aged 70 and over from Mexico City and its Metropolitan Zone. The underestimation of food insecurity has been a matter of concern in different research studies (Olson *et al*, 1996; Lee and Frongillo, 2001*a, b* and *c*; Nord, 2003).

Another group of weaknesses detected in this study were, for example, not having asked older people about receipt of remittances, which have proved to be the second largest source of economic resources in the country; not having found non-intrusive and respectful ways to explore whether PRAAPAM beneficiaries used the card or not and, probably, not having asked older persons from both urban areas what type of nutrition and food needs should be met in the first place. Moreover, the length of the questionnaire may have been stressful for many older subjects, and the assessment of aspects such as dietary diversity may have been affected by limited recall due to fading memory or disabilities in attention, as suggested by Klipstein-Grobusch *et al* (1998). The evaluation of household expenditure may have also been affected by limited recall of older persons.

However, an important strength of this study is that older persons were conceived not only as individuals in biological terms, but also as members of a household and a community, through a holistic approach that combined a theoretical

development, a methodological proposal and an empirical approximation to three problems expected to become major challenges for many Latin American urban societies in the short term.

The critical review of current social safety nets for older populations in Latin America and other parts of the world provided a portfolio of useful information for policy-makers, planners and programme implementers to decide what strategies could be carried out depending on the level of causality or specific component of the relationships between malnutrition, food insecurity and poverty that they pretend to focus on. Thirdly, despite criticism over the use of standard measures of income and consumption to evaluate old-age poverty (Barrientos, 2002), the assessment of socioeconomic differentials in households of the sample through an approach based on median monthly *per capita* expenditure, proved to be useful in detecting associations between poverty and most outcomes of interest. Findings from this study bring up for discussion the need to eradicate old-age poverty while reducing vulnerability and social exclusion in older persons.

That malnutrition, food insecurity and poverty affect important sectors of the older population in Mexico City and its Metropolitan Zone, that overweight and obesity are highly prevalent among adults aged 70 and over, and that a secure source of economic resources is strongly associated with dietary diversity in older persons are, *per se*, important findings from this study. These findings, and results from the study overall, could be a reference point for further research in older persons living in geographically-targeted poor neighbourhoods of other Mexican and Latin American urban areas with similar characteristics than Mexico City and

its Metropolitan Zone. Furthermore, these findings could orientate (and reorientate) the design, implementation and evaluation of both old-age monetary transfers and actions based on different schemes in cities and metropolises of the region facing similar challenges regarding the ageing of their populations.

Interventions aiming at reducing malnutrition, food insecurity and poverty during old age should nonetheless be realistic according to the availability of resources, goals and achievements. In this sense, large-scale programmes such as the BCA, PACAM and PRAAPAM could probably be more cost-effective if evaluated and adjusted on a regular basis. The analysis of these three interventions suggests, on the other hand, that food assistance is more than just the provision of food items, meals or resources to access to a healthy diet. Policy planners should therefore focus on health promotion, nutritional education, physical activity and other actions pursuing better ageing conditions in both current older cohorts and younger sectors of the population. But at the same time, there should be full awareness that food assistance cannot guarantee improvements in every single indicator of older persons' quality of life.

Although food programmes cannot be expected to be perfect, a few adjustments could make them not only more cost-effective, but also more appreciated by recipients and communities overall. For instance, the inclusion of milk in the PACAM will be positively reflected in the programme's response rate and compliance, improving the nutritional outcomes in the short term. Enormous amounts of public funds would therefore not be spent in producing two kilos of meal per beneficiary, of which some amount is not consumed, is given as a gift or

is used for other purposes. In Argentina, for example, the government would eradicate corruption, duplicities and unnecessary expenses reported over the last years, by stimulating the creation of one single list of beneficiaries of BCA.

With PRAAPAM, local authorities of Mexico City could probably design accurate, non-intrusive strategies to find out whether beneficiaries are using the card or not, and what they use the benefit for, identifying how important is for older persons the acquisition of food and basic products through this programme. By responding to these questions, the GDF would be able to decide if it is necessary to implement awareness campaigns addressed at increasing the use of the benefit to buy and consume healthy foods. Persuasive communication in nutritional information via radio has, for instance, proved to positively modify knowledge and attitudes towards nutrition in poor neighbourhoods of Guadalajara, Mexico (Cabrera-Pivaral et al, 2002).

The GDF could also stimulate the creation of support groups at the neighbourhood level to assist PRAAPAM beneficiaries with the food shopping, paying special attention to housebound beneficiaries. Co-operation agreements between local universities and the GDF could be signed to train groups of nutrition advisors (out of undergraduate students starting their compulsory community work), to provide PRAAPAM beneficiaries and their households with practical nutritional information. By doing so, the GDF would guarantee that the monetary transfer is used to meet old-age food needs in an adequate way. More co-ordination between GDF health system and PRAAPAM is required to carry out regular health checks and nutritional surveillance in its beneficiaries, just as the PACAM does. As

mentioned in previous sections of this work, PRAAPAM has a second component, which is the provision of free health care and medication to its beneficiaries.

For other local or regional governments planning to set out interventions aimed at improving food security in older persons, it would be strongly advisable to make baseline measures, regardless of the type of benefit to give away. Baseline observations are crucial for the evaluation of interventions. Meanwhile, for policy makers rather willing to universally distribute benefits, findings from this study suggest that an approach based on consumption poverty could be used to first target the most needy.

There have been important lessons learnt during the undertaking of this study. Interviewing older persons and being in touch with their household environments and communities not only in Mexico City and its Metropolitan Zone, but also in Santiago, Concepción and other areas of Chile, have highlighted the need to analyse malnutrition, food insecurity and poverty through more anthropological and qualitative approaches. Interacting with policy-makers, planners and programme implementers in Argentina, Chile and Mexico City has shown the strong commitment and political will of governments towards this population group, in times where the responsibilities of the State over the distribution of social expenditure are limited and anti-poverty programmes rather target younger sectors of the society. But this study, derived from an impartial perspective committed to older persons' well-being, has also found that needs, interests and concerns are not necessarily the same in older persons and governments. Policy-

makers, planners and programme implementers should be more open to criticism. Food assistance for older populations in Latin America does not necessarily accomplish nutritional goals, and much of the success of large-scale interventions focused on alleviating old-age malnutrition, food insecurity and poverty seem to rely on how valuable is for recipients that governments look after them.

The existence of conceptual and methodological gaps in the construction of the relationships between malnutrition, food insecurity and poverty in older populations should stimulate academic and research groups to find out, for example, to which extent the operationalisation of old-age food insecurity should rely on exploration of uncertainty or anxiety about food resources; how older people understand and interpret food insecurity questions and statements, and what are the main differences between older and younger adults in experiencing and responding to food insecurity. Research on these issues and the evaluation of programmes like PACAM, BCA and PRAAPAM should be conducted by multidisciplinary teams.

It would be recommended that study of old-age malnutrition, food insecurity and poverty in Mexico City and its Metropolitan Zone be, for example, carried out through gender perspective making, on the other hand, in depth approaches to single-member and older persons-only households. Research on these topics would also improve if a detailed analysis of categories of expenditure was performed. This suggestions, and other mentioned in previous sections of this chapter, would probably give continuity to this starting point.

In short, important sectors of the older population aged 70 and over living in poor neighbourhoods of Mexico City and its Metropolitan Zone are food insecure and overweight, and the availability of a regular source of economic resources is an important initial step to achieving better access to food and quality of life during old age. The truth is that there is still a long way to go but at least, so far, there is more than political will to create better ageing conditions for all in one of the largest urban areas of the world.

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List of acronyms

AGEB	Area Geoestadística Básica
AR\$	Argentinean Pesos
ASOMA	Apoyo Solidario a los Mayores
BCA	Beneficio de Complemento Alimentario
BMI	Body mass index
CD	Communicable diseases
CD	Compact disc
CEPAL/ECLAC	Comisión Económica para América Latina y el Caribe/Economic Commission for Latin America and the Caribbean
CONACYT	Consejo Nacional de Ciencia y Tecnología
COPD	Chronic obstructive pulmonary disease
COPUSI	Cocinas Populares y Unidades de Servicios Integrales
CVD	Cardiovascular disease
DF	Distrito Federal or Mexico City
DFID	Department for International Development
DIF	Sistema Integral para el Desarrollo de la Familia
DM	Type 2 Diabetes Mellitus
EFAM	Encuesta de Funcionalidad del Adulto Mayor
ENIGH	Encuesta Nacional de Ingreso y Gasto de los Hogares
ENURBAL	Encuesta de Alimentación y Nutrición en la Zona Metropolitana de la Ciudad de México
EXC	External causes
FNAS	Brazilian National Assistance Fund
GBP	Great Britain Pounds
GDF	Gobierno del Distrito Federal
HC	Hepatic cirrhosis
Hi-Fi	High Fidelity
IADL	Instrumental activities of daily living
IHD	Ischemic heart disease
INAPAM	Instituto Nacional de las Personas Adultas Mayores
INEGI	Instituto Nacional de Estadística, Geografía e Informática
INSSJP	Instituto Nacional de Servicios Sociales para Jubilados y Pensionados
INTA	Instituto de Nutrición y Tecnología de Alimentos
ISSSTE	Instituto de Servicios y Seguridad Social para los Trabajadores del Estado
LSHTM	London School of Hygiene and Tropical Medicine
MSD	Ministerio de Desarrollo Social
MX\$	Mexican Pesos
OR	Odds ratio
PACAM	Programa de Alimentación Complementaria del Adulto Mayor
PAHO	Pan-American Health Organization
PAMI	Programa de Atención Médica Integral
PAN	Partido Acción Nacional
PASAF	Programa de Asistencia Social Alimentaria a Familias
PEA	Programa de Emergencia Alimentaria
PEM	Protein energy malnutrition
PEMEX	Petróleos Mexicanos
PRAAPAM	Programa Alimentario para Personas Adultas Mayores de 70 y más años de la Ciudad de México
PRANI	Programa de Alimentación y Nutrición Infantil
PRD	Partido de la Revolución Democrática
PRI	Partido Revolucionario Institucional
Pro-Bienestar	Programa de Promoción del Bienestar de los Mayores
PROFECO	Procuraduría Federal del Consumidor
PROGRESA	Programa de Educación, Salud y Alimentación
PRONASOL	Programa Nacional de Solidaridad
PSAM	Programa de Salud del Adulto Mayor
R\$	Brazilian Reais
SABE	Project "Salud, Bienestar y Envejecimiento en América Latina y el Caribe"

SAGE	Singapore Action Group of Elders
SAP	Brazilian Social Assistance Pension
SOAP	South African State Old-Age Pension
SSDF	Secretaría de Salud del Distrito Federal
Tb	Tuberculosis
TU	Territorial Units
UAM	Universidad Autónoma Metropolitana
UN	United Nations
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USA	United States of America
VCR	Video cassette recorder
WB	World Bank
WHO	World Health Organization
ZMCM	Metropolitan Zone of Mexico City

Appendix 1: Questionnaire



The World Bank Group

MALNUTRITION, FOOD INSECURITY AND POVERTY IN OLDER PERSONS FROM MEXICO CITY

VISIT CONTROL

Visit	Visit date (dd/mm)	Time of visit (hh/mm)	Result of interview	Date of next visit (dd/mm)	Time of next visit (hh/mm)	Interviewer:	
1			1) complete 2) incomplete 3) nobody at home 4) inadequate informant 5) older per. lives alone 6) refused			Supervisor:	
2						Checked by:	
3						Data entry (1):	
						Data entry (2):	

SECTION 1. IDENTIFICATION OF THE LOCALITY, DWELLING AND HOUSEHOLD.

ITEMS 1.1 TO 1.4. SHOULD BE EXCLUSIVELY COMPLETED BY THE SUPERVISOR

1.1. State:	09) DF	15) EDOMEX (ZMCM)			
1.2. Borough					
1.3. Town or village					
1.4. Basic geo-statistic area (AGEB, to use its Spanish acronym)					-

THIS SECTION SHOULD BE COMPLETED BY THE INTERVIEWER ASSISTED BY ANY MEMBER OF THE HOUSEHOLD AGED 18 AND OVER, IF NECESSARY

		No. of Member
Name of respondent:		
1.5. Street		
1.6. External number	1.7. Internal number	
1.8. Section		
1.9. Neighbourhood		
1.10. This address is located between the following streets		
1.11. Other references		

QUESTIONS 1.13 TO 1.21 MAY BE RESPONDED BY ANY MEMBER OF THE HOUSEHOLD AGED 18 AND OVER

1.12. Do all persons living in this household eat from the same pot?	1) Yes, 2) No	
1.13. How many households in this dwelling eat from different pots?	Write the number of households	
1.14. Is there any guest sleeping in this household on a regular basis?	1) Yes 2) No (Go to question 1.17)	
1.15. How many? (Conclude the interview if there are more than 6 guests in this household)	Write the number of guests or 88) Not applicable	
1.16. How many of this guests eat in this household on a regular basis?	Write the number of guests or 88) Not applicable	
1.17. Is there any visitor, friend, neighbour or relative sleeping in this household on a regular basis?	1) Yes 2) No (Go to question 1.20)	
1.18. How many?	Write the number of persons or 88) Not applicable	
1.19. How many of these visitors, friends, neighbours or relatives eat in this household on a regular basis?	Write the number of persons or 88) Not applicable	
1.20. Is there any cleaning person, gardener, etc., sleeping in this household on a regular basis?	1) Yes 2) No (Go to question 1.22)	
1.21. How many of these cleaning persons, gardeners, etc., eat in this household on a regular basis?	Write the number of persons or 88) Not applicable	

TO BE COMPLETED BY THE INTERVIEWER

1.22. Did you detect additional households composed of guests or cleaning persons, gardeners, etc.,?	1) Yes, 2) No	How many?	
1.23. Did you detect additional dwellings composed of guests or cleaning persons, gardeners, etc.,?	1) Yes, 2) No	How many?	

SECTION 2. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE HOUSEHOLD (THIS SECTION MAY BE RESPONDED BY ANY MEMBER OF THE HOUSEHOLD AGED 18 AND OVER)

Name of respondent:	OCCUPATION OF MEMBERS AGED 6 AND OVER IN THE LAST MONTH								No. Member		Only for members aged 60 in column P270 number all members of the household aged 70 and over, living in Mexico City or its Metropolitan Zone for 3 years and more. Do this by ordering their first names in an ascending way		
	2.1.	2.2.	2.3.	2.4.	2.5. and 2.6.	2.7.	2.8.	2.9.	2.10.	2.11. y 2.12.		2.13.	2.14.
	Sex 1) M 2) F	Age in years If less than 1 year old write 00	Relationship with the household head	Marital status of members aged 15 and over	Last level and year of studies approved of members aged 5 and over	Did [NAME] work for a company, institution, farm or land, being paid or expecting to be paid in cash or kind? or Did [NAME] work for her or his own business, farm or land making or expecting to make any profit in cash or kind? 1) Yes 2) No 8) NA 9) DK	Did [NAME] work as a trainee or assistant for a company, institution, farm or land not owned by the household, without receiving any payment? or Did [NAME] work for the household's business, farm or land without receiving any payment? 1) Yes 2) No 8) NA 9) DK	Did [NAME] have any sporadic job or activity to obtain more economic resources for the household? 1) Yes 2) No 8) NA 9) DK	How many hours per week did [NAME] work in her or his principal activity? Write 888 if this member did not work during the last month 999) DK	How many hours and minutes does it usually take [NAME] to get to her or his principal job? Write the number of hours (H) and minutes (M), or 0000 if the activity takes place in the household or the member does not travel to her or his job 88) NA 99) DK	How many jobs or activities (including the principal) did [NAME] have during the last month? 88) NA 99) DK	Only for members of the household reporting no occupation during the last month Why did [NAME] not work during the last month? See codes at the end of this section	R
					Level	Year	H	M					
No													
1			1										
2													
3													

<p>2.3. Relationship with the household head</p> <ul style="list-style-type: none"> 01) Head 02) Head not currently living in the household 03) Spouse or partner 04) Own son or daughter 05) Adopted child 06) Parent 07) Sibling 08) Grand child 09) Great grand child 10) Grand parent 11) Great grand parent 12) Uncle, aunt, cousin, nephew, niece (blood relation) 13) Son or daughter-in-law 14) Father or mother-in-law 15) Brother or sister-in-law 16) Spouse or partner of brothers or sisters-in-law 17) Uncle, aunt, cousin, nephew, niece (no blood relation) 18) Friend, god-son, god-daughter and other persons with no blood relation to the household head 19) Co-resident 20) Cleaning persons, gardeners, etc., and their relatives 21) Guest 	<p>2.4. Marital status of members aged 15 and over</p> <ul style="list-style-type: none"> 01) Living in common law 02) Married 03) Separate 04) Divorced 05) Widower or widow 06) Single 08) NA (<15 years) 	<p>2.5. Last level of studies</p> <ul style="list-style-type: none"> 00) Did not attend school 01) Kindergarten 02) Primary school 03) Technical studies not requiring previous education 04) Secondary school or technical studies requiring primary school 05) High school or technical studies requiring secondary school 06) University or technical studies requiring high school 08) NA (<5 years) <p>2.6. Write the last year of studies approved</p> <ul style="list-style-type: none"> 8) NA 	<p>2.14. Causes of economic inactivity for members aged 6 and over</p> <ul style="list-style-type: none"> 01) Temporary discapacity 02) On holidays 03) Unemployed (but was not fired) 04) Lack of materials for production or sales 05) Equipment at work is being repaired or in maintenance 06) Waiting for the agricultural season to begin 07) On strike 08) Bad weather 09) Already hired but has not started yet 10) Other different reasons than the above-mentioned, but without being fired 11) Found a job in Mexico and ready to take it immediately 12) Found a job abroad and ready to take it immediately 13) Has a house, flat or a room to let but no tenants at the moment 14) Pensioner, retired 15) Student 16) House-work 17) Permanent discapacity 18) Unemployed and has not look for a job 19) Other causes of unemployment 88) NA 99) DK
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SECTION 3. CHARACTERISTICS OF THE DWELLING AND THE HOUSEHOLD

QUESTIONS 3.1 TO 3.3 WILL BE RESPONDING BY THE INTERVIEWER AFTER DIRECT OBSERVATION

3.1. What materials are mostly used for walls?	01) Cardboard, rubber, fabrics, worn out tires 02) Cardboard panels 03) Bamboo, rattan, straw, etc. 04) Mud (raw) 05) Asbestos panels 06) Metallic, fibreglass, plastic, or mica panels 07) Particleboard 08) Wood 09) Glass 10) Concrete panels 11) Monolithic concrete panels 12) Baked mud 13) Bricks 14) Cement or stone 15) Other materials (specify):		
3.2. What materials are mostly used for roofs?	01) Cardboard, rubber, fabrics, worn out tires 02) Cardboard panels 03) Wood or palm tree leaves 04) Metallic, fibreglass, plastic, or mica panels 05) Bamboo, rattan, straw, etc. 06) Asbestos panels 07) Tiles 08) Concrete panels 09) Monolithic concrete panels 10) Bricks 11) Concrete blocks 13) Other materials (specify):		
3.3. What materials are mostly used for floors?	1) Earth 2) Cement 3) Wood, tiles, concrete, plastic or other synthetic covers		

THIS SECTION MAY BE RESPONDED BY ANY MEMBER OF THE HOUSEHOLD AGED 18 AND OVER

Name of respondent:	No. Member
3.4. How many years has this family or group of persons lived in this house for?	
3.5. Why this family or group of persons live in this house?	
This question can have two answers	
1) The dwelling was inherited 2) Workplace is close 3) The family lives nearby 4) Friends live nearby 5) Cheap place to live 6) Good / available transport 7) Other reason (specify): 8) NA 9) DK	
3.6. This dwelling is...	
1) Lent (paying no rent or compensation) 2) Given as a benefit from a member's work 3) Rented 4) Owner-occupied (still being paid) 5) Own: built over an irregular land 6) Own: built over a community land 7) Owner-occupied (fully paid) 8) Other (specify): 88) DK	

3.7. If you let your house for rent how much would you ask per calendar month? (DK = 99999)		MX\$					
3.8. Without taking into account bathroom, kitchen and hallways, how many rooms does this dwelling have?							
3.9. How many of these rooms are used to sleep?							
3.10. How many bedrooms are there in this house?							
3.11. Is there a specific room used for cooking (a kitchen) in this house?						1) Yes 2) No	
3.12. Does anyone sleep in the room used for cooking?						1) Yes 2) No	
3.13. Does this dwelling have connections to piped water supply?						1) Yes 2) No (go to question 3.17)	
3.14. Is the water supply...				1) Inside the dwelling (bathroom, kitchen, other room) 2) Outside the dwelling but within the property 8) NA 9) DK			
3.15. Does the water come from the public water system?						1) Yes 2) No 8) NA 9) DK	
3.16. How often does this house have water? 1) 1 – 2 days per week 2) 4 – 6 days per week 3) Every day but just a few hours a day 4) Everyday, 24 hr 5) Other periods (specify): 8) NA 9) DK							
3.17. Does this dwelling have a bathroom?						1) Yes 2) No	
3.18. This house has... 1) Pit-latrine (go to question 3.20) 2) Hygienic latrine (go to question 3.20) 3) Toilet (go to question 3.19) 4) No excreta disposal system (go to question 3.22) 9) DK							
3.19. Is the toilet connected to a water piping system?						1) Yes 2) No 8) NA 9) DK	
3.20. Is the pit-latrine, hygienic latrine or toilet for the exclusive use of the members of this household?						1) Yes 2) No 8) NA 9) DK	
3.21. The toilet is connected to...				1) Septic tank 2) Public sewage system 3) Other type of sewage (specify): 4) Excreta goes to earth, river or lake 8) NA 9) DK			
3.22. Is there any sewage system for black waters from sink, shower, washing machine or washing board?						1) Yes 2) No (go to question 3.24) 8) NA 9) DK	
3.23. Where do black waters from sink, shower, washing machine or washing board go?				1) Septic tank 2) Public sewage system 3) Other type of sewage (specify): 4) Excreta goes to earth, river or lake 8) NA 9) DK			
3.24. What do you or other members of the household usually do with refuse?				1) Throw it into the river 2) Burn it down 3) Throw it in the street or in a piece of land 4) Dig it 5) Throw it in a city dump 6) Collected by the city service 7) Collected by a private company 8) Recycle it 9) DK			

3.25. Does this neighbourhood have rubbish collecting service from the council?	1) Yes 2) No (go to question 3.27) 9) DK	
3.26. How many days a week does refuse is collected by the public service? 01) Daily; 2) Every 2 days; 3) Every 3 days; 4) Every 4 days; 5) Every 5 days....15) Every 15 days...etc. 8) NA 9) DK		
3.27. What fuel is it used for cooking?	1) Wood 2) Charcoal 3) Oil 4) Electricity 5) Gas 6) Other (specify): 7) None 9) DK	
3.28. Does this house have telephone?	1) Yes 2) No 8) NA 9) DK	

ASSETS FOR THE USE OF THE HOUSEHOLD (THIS SECTION MAY BE RESPONDED BY ANY MEMBER OF THE HOUSEHOLD AGED 18 AND OVER)		No. Member
Name of respondent:		
Does this house have...	1) Yes 2) No 9) DK	How many?
3.29. Car		
3.30. Pick-up truck		
3.31. Motorcycle		
3.32. Bicycle		
3.33. Animal powered vehicles		
3.34. Boat, canoe, etc		
3.35. Other means of transport (specify):		
3.36. Radio		
3.37. Tape recorder		
3.38. Hi-Fi system		
3.39. Television		
3.40. VCR		
3.41. Video games		
3.42. Computer		
3.43. Parabolic aerial		
3.44. Fan		
3.45. Sewing machine		
3.46. Gas cooker		
3.47. Other fuel-powered cooker		
3.48. Fridge		
3.49. Blender		
3.50. Water pump		
3.51. Iron		
3.52. Hand mill		
3.53. Washing machine		
3.54. Vacuum cleaner		

ASSETS FOR THE USE OF THE HOUSEHOLD. CONTINUED...		No. Member
Name of respondent:		
Does this house have...	1) Yes 2) No	¿How many?
3.55. Gas water boiler		
3.56. Other fuel-powered water boiler		
3.57. Microwave oven		
3.58. CD player		
3.59. Air conditioning		
3.60. Heater		
3.62. Other appliances (specify):		
3.63. Other appliances (specify):		
3.64. Other appliances (specify):		

SECTION 4. PARTICIPATION IN FOOD ASSISTANCE (TO BE RESPONDED PREFERABLY BY THE HOUSEHOLD HEAD, HER OR HIS PARTNER, OR BY THE ADULT MEMBER OR MEMBERS IN CHARGE OF DOING THE FOOD SHOPPING).				No. Member
Name of respondent:				
Is this household or any member benefiting from one or more of the following programmes?	1) Yes 2) No 8) NA 9) DK	Write the number of beneficiaries or 88) NA 99) DK	Since when? Write the year or the month in case that the benefit was first delivered from January 1 st 2000 onwards, or 8888) NA 9999) DK	How many times have you received the assistance in the last month? Write the number of times or 88) NA 99) DK
4.1. <i>Liconsa</i> milk programme				
4.2. Free food baskets or pantries				
4.3. Food banks				
4.4. Low price foods and basic products				
4.5. Prepared meals				
4.6. Community kitchens				
4.7. Food vouchers				
4.8. PRAAPAM				Do not write here
4.9. Other (specify):				
4.10. Other (specify):				
Only for households with members 12 years of age or less				
4.11. Is any child benefiting from the DIF's school breakfast programme?				

SECTION 5. SELECTED INDICATORS OF HOUSEHOLD EXPENDITURES

A. FOOD EXPENDITURES (TO BE RESPONDED PREFERABLY BY THE ADULT MEMBER OR MEMBERS IN CHARGE OF COOKING AND/OR DOING THE FOOD SHOPPING)

Name of respondent:		No. Member	
Could you please tell me which of the following foods were consumed by this household during the last fortnight or how much did you pay for them, or how much would you pay in case you had been given them as a payment or as a gift?			
Food group and items	1) Yes 2) No	Total expenditure in the last fortnight	Notes and calculations
I. Bread, cereals, pasta, rice and tubers			
5.1. Maize tortillas			
5.2. Other maize products			
5.3. Bread rolls			
5.4. Sliced bread			
5.5. Rice			
5.6. Pasta			
5.7. Breakfast cereals			
II. Dairy products			
5.8. Milk			
5.9. Cheese			
5.10. Yoghurt			
5.11. Other dairy products			
III. Animal products and legumes			
5.12. Beef			
5.13. Chicken			
5.14. Eggs			
5.15. Dried beans			
5.16. Pork ham			
5.17. Pork			
5.18. Pork sausages			
5.19. Canned tuna fish			
5.20. Fish			
5.21. Lentils			
5.22. Other items from this group			
IV. Vegetables			
5.23. Red tomato			
5.24. Potatoes			
5.25. Onion			
5.26. <i>Tomatillo</i> (green tomato)			
5.27. Carrots			
5.28. Courgette			
5.29. Serrano and jalapeño chili peppers			
5.30. Other type of chili peppers			

Food group and items	1) Yes 2) No	Total expenditure in the last fortnight	Notes and calculations
IV. Vegetables			
5.31. Lettuce			
5.32. Chayote squash			
5.33. Green beans			
5.34. Nopales			
5.35. Artichoke, radish and other vegetables			
5.36. Cucumber			
5.37. Mixed vegetables (packed)			
5.38. Other vegetables			
V. Fruits			
5.39. Banana			
5.40. Lemon			
5.41. Apple			
5.42. Avocado			
5.43. Orange			
5.44. Papaya			
5.45. Guava			
5.46. Peach and apricot			
5.47. Other fruits			
VI. Fats and sugar			
5.48. Soft drinks			
5.49. Sweet bread rolls			
5.50. Cooking oil			
5.51. Sugar			
5.52. Double cream			
5.53. Pork scratches or fried chopped meat			
5.54. Chorizo			
5.55. Sweets and deserts			
5.56. Other fats			
VII. Drinks			
5.57. Mineral still water			
5.58. Beer, wine and spirits			
5.59. Other drinks			

B. NON-FOOD EXPENDITURES (TO BE RESPONDED PREFERABLY BY THE HOUSEHOLD HEAD, HER OR HIS PARTNER, OR BY THE ADULT MEMBER OR MEMBERS IN CHARGE COOKING AND/OR DOING THE FOOD SHOPPING).

Name of respondent:		No. Member	
Could you please tell me how much did you pay for each of the following products or services during the last fortnight and how much did you pay for them, or how much would you pay in case you had been given them as a payment or as a gift?			
Products or services	1) Yes 2) No	Total expenditure in the last fortnight	Notes and calculations
5.59. Food and meals consumed away			
5.60. Tobacco, cigarettes, cigars			
5.61. Soap, shampoo, hair conditioner, etc			
5.62. Detergents, house cleaning liquids, washing powder, etc			
5.63. Public transport			
5.64. Newspapers and magazines			
5.65. Mail, phone cards (public telephone), mobile top-up vouchers			
5.66. Petrol, oil, etc (household vehicles only)			
5.67. Other product (specify):			
5.68. Other product (specify):			

Could you please tell me how much did you pay for each of the following products or services during the last three months and how much did you pay for them, or how much would you pay in case you had been given them as a payment or as a gift?			
Products or services	1) Yes 2) No	Total expenditure in the last fortnight	Notes and calculations
5.69. Fabrics and clothes for the adult members of the household			
5.70. Fabrics and clothes for the children of the household			
5.71. Shoes and shoe repair for the adult members of the household			
5.72. Shoes and shoe repair for the children of the household			
5.73. Vehicle maintenance and repair			
5.74. House maintenance and repair			
5.75. Furniture, electric appliances, etc. (including maintenance and repairs)			
5.76. Linen, towels, curtains, etc			
5.77. Ceramics, glassware, cutlery, cookware, etc			
5.78. Medication (prescribed, over-the-counter, traditional medicine)			
5.79. Contraceptive methods			
5.80. Health care (doctor, dentist, laboratories, x-rays, etc)			
5.81. Books and subscriptions to magazines			
5.82. Housekeeping (cleaners, gardeners, etc.)			
5.83. Haircut, hairdresser, beauty parlours, etc.			
5.84. Leisure (film theatre, theatre, CD, DVD, video games, sports, etc)			
5.85. Lottery and gambling			
5.86. Travel (within Mexico and abroad)			
5.88. Food for pets			
5.89. Veterinary and care for pets			
5.90. Education			
5.91. Other products or services			

SECTION 7. THE OLDER PERSON	
<p>This section is addressed to the older persons previously selected in Section 2. However, it may be partially or totally responded by the older person's main caregiver. As long as possible, make sure that it is the older person who decides whether to respond or not.</p>	
<p>Please address to the older person or to her or his main caregiver by her or his name</p>	No. Member
7.0a. Name of the older person:	
7.0b. Name of respondent:	
7.1. If you have to make a phone call today, could you do it without any help?	<p>1) Yes (go to question 7.3) 2) No</p>
7.2. IF NOT, could you do it if helped?	<p>1) Yes 2) No 8) NA</p>
7.3. If you have to prepare your own or the household meals today, could you do it without any help?	<p>1) Yes (go to question 7.5) 2) No</p>
7.4. IF NOT, could you do it if helped?	<p>1) Yes 2) No 8) NA</p>
7.5. If you have to make light household or some repair, could you do it without any help?	<p>1) Yes (go to question 7.7) 2) No</p>
7.6. IF NOT, could you do it if helped?	<p>1) Yes 2) No 8) NA</p>
7.6. IF NOT, could you do it if helped?	<p>1) Yes 2) No 8) NA</p>

Section 8. Older person's self-perception	
<p>THIS SECTION SHOULD ONLY BE RESPONDED BY THE OLDER PERSON SELECTED IN SECTION 2</p>	
8.1. [NAME] In comparison with other people of the same age, how do you consider your health status?	<p>1) Not as good 2) As good 3) Better 4) DK</p>
<p>Question 8.2. will ONLY be made if answer to question 7.3. is "2" (NO) and/or the answer to question 7.4 is "2" (NO)</p>	<p>1) Someone else would cook for me 2) Meals would be prepared elsewhere and brought home 3) Someone would come to prepare your meals 4) You would skip meals while somebody comes to help you 5) You would not eat today 8) NA</p>
8.2. [NAME] How would you feed yourself today, if you were unable to prepare your own meals or the household meals?	<p>1) Yes 2) No</p>
[NAME] During the last week did you decide or were taken into account to decide...	<p>1) Yes 2) No</p>
8.3. What did you want to eat?	<p>1) Yes 2) No</p>
8.4. What food items and basic products should have been bought for the household	<p>1) Yes 2) No</p>

7.7. If you had to do the laundry today, could you do it without any help?	1) Yes (go to question 7.9) 2) No	
7.8. If NOT, could you do it if helped?	1) Yes 2) No 8) NA	
7.9. If you had to take any medication today, could you do it without any help?	1) Yes (go to question 7.11) 2) No	
7.10. If NOT, could you do it if helped?	1) Yes 2) No 8) NA	
7.11. If you had to manage money today, could you do it without any help?	1) Yes (go to question 7.13) 2) No	
7.12. If NOT, could you do it if helped?	1) Yes 2) No 8) NA	
7.13. Do you have any difficulty feeding yourself?	1) Yes 2) No (go to question 7.16)	
7.14. Do you feed yourself in spite of such difficulty?	1) Yes 2) No (go to question 7.16) 8) NA	
7.15. Always?	1) Yes 2) No 8) NA	

8.5. How your meals should be have been prepared	1) Yes 2) No	
8.6. [NAME] Were you visited by any friend, relative or neighbour in the last week?	1) Yes 2) No	
8.7. [NAME] Do you eat alone most of the time?	1) Yes 2) No	
[NAME] Do you count on a friend, relative or neighbour when/if you...		
8.8. Need someone to talk to?	1) Yes 2) No	
8.9. Do not feel well or need to take a medication?	1) Yes 2) No	
8.10. Go to see the doctor?	1) Yes 2) No	
8.11. Need money or things?	1) Yes 2) No	
8.12. Need something from the shop or the drugstore?	1) Yes 2) No	

<p>7.16. If you had to go out today, could you do it without any help?</p> <p>1) Yes (go to question 7.18) 2) No</p>	<p>1) Health problems and/or impairments; not feel well enough 2) You do not feel like going out 3) Nobody helps you or you are ignored 8) NA</p>	<p>8.13. [NAME] If you were unable to go out today or if you just did not go out today, what would the main reason be?</p>	<p>1) Yes (go to question 7.18) 2) No</p>
<p>7.17. IF NOT, could you do it if helped?</p>	<p>1) Yes 2) No 8) NA</p>	<p>8.14. [NAME] If you were unable to do the food shopping today, how would you be provided with food items and basic products?</p>	<p>1) Yes 2) No 8) NA</p>
<p>7.18. If you had to do the food shopping today, could you do it without any help?</p>	<p>1) Yes (go to question 7.20) 2) No</p>	<p>8.15. In the last week, I couldn't afford to eat properly</p>	<p>1) Yes 2) No 8) NA</p>
<p>7.19. IF NOT, could you do it if helped?</p>	<p>1) Yes 2) No 8) NA</p>	<p>8.16. In the last week, I was often hungry, but I didn't eat because I couldn't afford enough food</p>	<p>1) Yes 2) No 8) NA</p>
<p>7.20. [NAME] where did you (or the person in charge of the food shopping in this household) do most of the food shopping the last time that you bought food?</p>	<p>1) Community market 2) Open market 3) Street vendors 4) Grocery stores 5) Supermarket</p>	<p>[NAME], I am going to read 3 statements. Could you answer each one by saying TRUE or NOT TRUE?</p>	<p>1) True 2) Not true</p>
<p>7.21. [NAME] how long did it take you (or the person in charge of the food shopping in this household) to get to the place where you did the most of the food shopping by any of the following means or a combination? 88:88 NA</p>	<p>Walking Tube, cab, bus, train, etc., Car (own or other person's)</p>	<p>8.17. In the last week, I ate less than I think I should have because I didn't have enough money for food?</p>	<p>1) True 2) Not true</p>
<p>7.22. [NAME] during the last week, did you visit any friends, relatives and/or neighbours?</p>	<p>1) Yes 2) No</p>	<p>And now, thinking about the past year...</p>	<p>1) Yes 2) No</p>
<p>ONCE CONCLUDED QUESTION 7.22, GO TO PAGE 15 AND START "SECTION 8. OLDER PERSON'S SELF-PERCEPTION".</p>			

ONCE CONCLUDED QUESTION 7.22, GO TO PAGE 15 AND START "SECTION 8. OLDER PERSON'S SELF-PERCEPTION".

<p>8.19. Did you have hunger pangs but couldn't eat because you couldn't afford food?</p> <p>1) Yes 2) No</p>	
<p>(NAME) could you please tell me for each one of the following statements whether you AGREE or DISAGREE?</p>	
<p>8.20. On the whole, I am satisfied with myself</p>	<p>1) Agree 2) Disagree</p>
<p>8.21. At times I think I am no good at all</p>	<p>1) Agree 2) Disagree</p>
<p>8.22. I feel that I have a number of good qualities</p>	<p>1) Agree 2) Disagree</p>
<p>8.23. I am able to do things as well as most other people</p>	<p>1) Agree 2) Disagree</p>
<p>8.24. I feel I do not have much to be proud of</p>	<p>1) Agree 2) Disagree</p>
<p>8.25. I certainly feel useless at times</p>	<p>1) Agree 2) Disagree</p>
<p>8.26. I feel that I'm a person of worth, at least on an equal plane with others</p>	<p>1) Agree 2) Disagree</p>
<p>8.27. I wish I could have more respect for myself</p>	<p>1) Agree 2) Disagree</p>
<p>8.28. All in all, I am inclined to feel that I am a failure</p>	<p>1) Agree 2) Disagree</p>
<p>8.29. I take a positive attitude toward myself</p>	<p>1) Agree 2) Disagree</p>

Section 9. Foods consumed by the older person in the last 24 hours (this section should be responded by the older person selected in Section 2, but may be assisted by her or his main caregiver if needed or required)

[NAME] from the following list, could you please tell me what foods did you eat yesterday?					
Food group and items	1) Yes 2) No	Food group and items	1) Yes 2) No	Food group and items	1) Yes 2) No
I. Bread, cereals, pasta, rice and tubers		9.20. Fish		9.40. Lemon	
9.1. Maize tortillas		9.21. Lentils		9.41. Apple	
9.2. Other maize products		9.22. Other items from this group		9.42. Avocado	
9.3. Bread rolls		IV. Vegetables		9.43. Orange	
9.4. Sliced bread		9.23. Red tomato		9.44. Papaya	
9.5. Rice		9.24. Potatoes		9.45. Guava	
9.6. Pasta		9.25. Onion		9.46. Peach and apricot	
9.7. Breakfast cereals		9.26. <i>Tomatillo</i> (green tomato)		9.47. Other fruits	
II. Dairy products		9.27. Carrots		VI. Fats and sugar	
9.8. Milk		9.28. Courgette		9.48. Soft drinks	
9.9. Cheese		9.29. Serrano and jalapeño chili peppers		9.49. Sweet bread rolls	
9.10. Yoghurt		9.30. Other type of chili peppers		9.50. Cooking oil	
9.11. Other dairy products		9.31. Lettuce		9.51. Sugar	
III. Animal products and legumes		9.32. Chayote squash		9.52. Double cream	
9.12. Beef		9.33. Green beans		9.53. Pork scratches or fried chopped meat	
9.13. Chicken		9.34. Nopales		9.54. Chorizo	
9.14. Eggs		9.35. Artichoke, radish and other vegetables		9.55. Sweets and deserts	
9.15. Dried beans		9.36. Cucumber		9.56. Other fats	
9.16. Pork ham		9.37. Mixed vegetables (packed)		VII. Drinks	
9.17. Pork		9.38. Other vegetables		9.57. Mineral still water	
9.18. Pork sausages		V. Fruits		9.58. Beer, wine and spirits	
9.19. Canned tuna fish		9.39. Banana		9.59. Other drinks	

Section 10. Anthropometric indicators in the older person

10.1 Height 1 (cm): Ignore it if the older person cannot stand, has back problems or her/his legs are bent				
10.2 Height 2 (cm): Ignore it if the older person cannot stand, has back problems or her/his legs are bent				
10.3 Arm span 1 (cm): for older persons who can extend both arms				
10.4 Arm span 2 (cm): for older persons who can extend both arms				
10.5 Demi-span 1 (cm): only for older persons who cannot extend both arms				
10.6 Demi-span 2 (cm): only for older persons who cannot extend both arms				
10.7 Knee height 1 (cm): for all older persons				
10.8 Knee height 2 (cm): for all older persons				
10.9 Weight 1 (kg): for all older persons				
10.10 Weight 1 (kg): for all older persons				

Appendix 2: Research logistics and fieldwork

1. Funding

Once the author of this thesis was formally upgraded to PhD Student, and ethical approval was cleared, he himself and Dr. Saul S. Morris from the United Kingdom's Department for International Development (DFID), Honorary Senior Lecturer of the London School of Hygiene and Tropical Medicine, former supervisor of this thesis between March 2001 and May 2004, and current co-supervisor of this thesis, started looking for possible funding. Application forms were sent to the European Union (Belgium), DFID (UK), the Borchard Foundation, Ford Foundation, Kellogg Foundation and The World Bank (USA). A total of £ 25,000 were obtained from the World Bank's Research Grant, and were partially administered by the Mexican Health Foundation (FUNSALUD, to use its Spanish acronym).

The Social Medicine Unit and the Health Care Department of the Metropolitan Autonomous University (Campus Xochimilco) (UAM-X, to use its Spanish acronym), in Mexico City, supported this research by providing the author of this thesis with computers and software, rooms for fieldwork training sessions and photocopies. Authorities of Mexico City's Secretariat of Health (SSDF, to use its Spanish acronym) provided the author of this thesis with updated versions of the beneficiaries database of the *Programa de Apoyo Alimentario para Personas Adultas Mayores* (PRAAPAM, to use its Spanish acronym), and regular information on PRAAPAM's functioning.

The Wellcome Trust, through the Health Consequences of Population Change Project (Grant Number 069496), sponsored the interviews to the authorities involved in the conduction of the Chilean *Programa de Salud del Adulto Mayor* (PSAM) (Health Programme for Older Persons), including those to operative staff and beneficiaries of the Chilean *Programa de Alimentación Complementaria para el Adulto Mayor* (PACAM, to use its Spanish acronym), as well as a number of interviews to authorities and operative staff involved in the conduction of the Argentinian *Beneficio de Complemento Alimentario* (Supplementary Food Benefit, hereafter BCA) and other social programmes addressed to older persons run by both the Ministry of Social Development and the Ministry of Health. It is worth mentioning that the author of this thesis participated in the design PACAM's evaluation proposal.

2. Fieldworkers recruitment

Between May and June 2002, potential fieldworkers were recruited. The author of this thesis contacted four main sources of recruitment: 1) undergraduate students of Human Nutrition and other *ad hoc* Health or Social disciplines from the UAM-X, the National Autonomous University of Mexico (UNAM, to use its Spanish acronym) and the National Polytechnic Institute (IPN, to use its Spanish acronym), during their last year of studies, 2) alumni of the National College of Professional Technical Education, Campus Coyoacán (CONALEP, to use its Spanish acronym) and the Centre of Technical and Industrial Studies, Campus No. 5 (CETIS, to use its Spanish acronym) with diploma in Nutrition and other *ad hoc* Health or Social disciplines, 3) the job bureaus of various councils in Mexico City and municipalities of the Metropolitan Zone of Mexico City and, 4) the

SSDF job applications database for community worker positions. Potential candidates were called to the UAM-X to attend information meetings. A research assistant was continuously helping with this tasks.

3. Training and standardization

a) fieldwork supervisors

Both the research assistant and 5 fieldwork supervisors were selected by the author of this thesis. The research assistant and two supervisors were alumni of the Human Nutrition programme of the UAM-X, whereas three supervisors were in their last year of studies at the same programme. Two 10-hour training workshops were carried out to train the research assistant and the fieldwork supervisors. Both the project and the questionnaire were presented and discussed in detail. A practice session in which participants interviewed themselves was also carried out. Attendants were informed on: a) their duties during fieldwork, b) how to assist interviewers and, c) how to cope with potential problems *in situ*. In a third 5-hour session, the research assistant and the fieldwork supervisors were trained and standardized on anthropometric measurements by the author of this thesis, so that they could help anthropometry staff with any problem during fieldwork. Fieldwork supervisors were trained in May 2002.

b) fieldworkers

A total of 10, 6-hour training sessions were carried out until 20 interviewers were finally recruited. Candidates were welcome to attend more than one session if they wanted. Although a broad outline of the project were discussed in each session, the purposes of each training session was mainly to prepare fieldworkers

to: a) carry out the entire interview satisfactorily, b) treat respondents respectfully, c) not to cause discomfort in any member of the household and, d) make respondents feel as relaxed as possible. Special attention was paid to train fieldwork staff in the way they should approach to older persons. Each session consisted of a 4-hour theoretical and a 2-hour practical sessions. Written examination was mandatory for all candidates. Fieldworkers were trained in June 2002.

c) anthropometry staff

Candidates were trained to have control on measuring height, arm-span, half-span, knee height and weight in older persons. A standardization process was carried out as suggested by Habicht (1973). During the standardization, 10 older persons aged 70 and over working as cleaning staff for the UAM-X were called to participate. The training session for the anthropometry staff took around five hours, on average. Anthropometry staff was trained in early July 2002.

The author of this thesis and his research assistant co-ordinated and conducted all the training sessions for supervisors, fieldworkers and anthropometry staff. Dr. Saul S. Morris participated in the supervisors' training session. Fieldwork supervisors participated actively in the fieldworkers and anthropometry staff training sessions.

4. Questionnaire pre-test and pilot test

The research assistant, the fieldwork supervisors and the author of this thesis pre-tested the questionnaire in 14 households with older persons from poor

neighbourhoods of Mexico City and its Metropolitan Zone, not participating in the study, before the fieldwork started. The purpose of this pre-test was to improve the form itself by making any amendment to questions, statements or entire sections. A pilot test was set up to identify potential methodological errors—30 households with older persons aged 70 and over from poor neighbourhoods of Mexico City and its Metropolitan Zone, not participating in the study, were interviewed. Selected older members from these households were measured. Questionnaire pre-test and pilot test took place in May 2002.

5. Mapping the areas under study

Dr Saul. S. Morris and the author of this thesis analysed:

- a) census and geographical data from the System for the Analysis of Census Information database (SINCE, to use its Spanish acronym) (INEGI, 2001*b*) to design the sampling strategy, estimate the sample size, and mapping the areas under study in Mexico City and its Metropolitan Zone
- b) the PRAAPAM beneficiaries database to detect the Territorial Units targeted by the Government of Mexico City (GDF, to use its Spanish acronym)

6. Older persons selection and the interviewing process

The fieldwork was carried out between August and October 2002. Fieldwork supervisors found out in every selected household if there was any person aged 70 and over who had lived in the visited urban area for three or more years. Then they asked if the household wanted to participate in the study and if any of the

available older members were able and agreed to answer some questions, and accepted to be measured. If so, they asked whether any of these older adults were physically able to be measured. When all the above questions were affirmatively answered, supervisors then proceeded to either verbally administer an information sheet or hand it in to be read. A member aged 18 and over — preferably the older person or his or her main caregiver — were asked to sign a consent form in case that the visited household and the older adult wanted to participate in the study.

When possible, interviews were carried out inside the dwelling in order to prevent uncomfortable situations for household members, such as being observed by others, being stood the entire interviewing process or being distracted by outside noises. Supervisors and fieldworkers were encouraged to treat respondents kindly and patiently. It was particularly important to speak clearly and loud to older persons alongside to those seemed not to understand directions, statements or questions. Older adults under study willing to respond the whole questionnaire were welcome, although they were always reminded that other members could answer most of it in case they wanted so or felt tired.

Sections 4 to 6 of the questionnaire (“Participation in food assistance”, “Selected indicators of household expenditures” and “Household food security”, respectively) were asked to be responded by the household head, her or his partner, or by the adult member or members in charge of doing the food shopping or preparing the meals. It was reminded to all potential respondents that sections 8 to 10 of the questionnaire (“Older person’s self-perception”, “Foods consumed by the older person in the last 24 hours” and “Anthropometric indicators in the older

person”, respectively) were exclusively addressed to the older person and, therefore, no one else should answered them. Older persons’ main caregivers were expected to have limited participation in these sections.

Originally, the anthropometrics evaluation was planned to occur at the end of the interview, once the older person had concluded to respond the corresponding sections. However, anthropometrics measures were occasionally carried out in other moments of the process if requested by the older adult or the principal caregiver.

Fieldwork teams — composed of 1 supervisor, 5 interviewers and 1 anthropometrics staff — were, as much as possible, allocated to neighborhoods under study in such a way that staff did not travel long distances from home to visited areas, or get there as straight as possible.

The author of this thesis supervised fieldwork on a regular basis, interviewed some households with older persons and helped measuring older subjects. Dr. Saul. S. Morris also supervised the fieldwork and interviewed household with older persons

7. Equipment used for the anthropometric measurements in older persons

- a) Arm span, demi-span and knee height: Perimet™ model Futaba R-280 fibreglass anthropometric tape (1 mm)
- b) Weight: SECA™ model 841scale (0.1 kg)

8. Data-entry

Data were doubled-entered and then validated using Epi Info 6.04d. The data-entry programme was designed by Saul. S. Morris. Two enters and single validation processes were carried out for each borough and municipality. Once discrepancies between each pair of files were detected, data-entry staff got back to the questionnaires to make any amendments on the chosen file from each pair to be the final one. After the completion of both data-entry and validation, final files were merged into a single database. This was done using SPSS 10.0. The database was split into five different files, depending on the type of data and the unit of analysis to be explored: a) household characteristics, b) assets in the household, c) household expenditures, d) information on the members of the household and, e) food consumption in older persons. These files were all set using STATA™ version 8.1 (Stata Corp, 1984-2005). The data-entry process was carried out between September and November 2002, and was entirely supervised by the author of this thesis who, furthermore, did the data entry of a number of questionnaires himself.

Appendix 3. Information sheet and consent forms



Project: "Malnutrition, food insecurity and poverty in older persons from Mexico City"
Main investigator: José Alberto Rivera-Márquez

Information sheet

Date: _____ 2002

Dear Madam or Sir:

We are going to conduct a study aiming at analysing the relationships between food assistance, food security, nutritional status and self-esteem in a sample of elderly persons aged 70 and over living in the Metropolitan Zone of Mexico City. For this reason, we are kindly requesting your co-operation. We would also appreciate your primary caregiver and/or some members of your household aged 16 and over to co-operate with this study by answering some questions.

A survey including various aspects of both the elderly person aged 70 and over and her/his household will be conducted. This aspects are: a) socioeconomic characteristics of the members of the household, b) characteristics of the dwelling and the household, c) use of food assistance-related programmes at the household level, d) selected household expenses, e) food security at the household level, and f) health, self-esteem, nutrition and food in the elderly person. We will also be measuring height, weight and arm-span in elderly persons aged 70 and over only. None of these measures will cause discomfort or imply distressful physical efforts.

Both the interview and the measures altogether will not take more than one hour and thirty minutes. However, if you feel tired and want to stop, we could come any other time during this week. We could also meet you up in a place of your preference in case that you do not want to be interviewed at home. In addition, you can withdraw from the study at any time without giving us a reason and you have our promise that none of the food-related assistance that you or your household is currently being benefited from will change by any reason regarding your participation in this study.

Should the elderly person have a problem related to his/her nutritional status, she/he will be advised to seek treatment at local surgeries from the Secretary of Health of Mexico City, the Health Institute of the State of Mexico, the local premises of the National Institute for Old Age and/or the local office of the System for the Integral Development of Family. This service will also be given even though the elderly person decides to withdraw from the study.

It is important to note that all the information you give us will be handled confidentially. No names, addresses or other data will be given to any health or other governmental authority. Data will be coded, computerised and stored and no one but the project staffs will have access to them.

The results of this study will be communicated to you and to the local health authorities. We hope that the findings of this study will help to improve food programmes for the elderly in your community, as well as to re-define food assistance for the household.



The World Bank Group

**Project: "Malnutrition, food insecurity and poverty in older persons from Mexico City"
Main investigator: José Alberto Rivera-Márquez**

Consent form

I have read the information sheet concerning this study and I understand what will be required of me if I take part in the study.

My questions concerning this study have been answered by _____

I understand that any time I may withdraw from this study without giving a reason and without affecting my normal care and management

I agree to take part in this study

Signed _____

Date _____