MEXICO

Study on global AGEing and adult health (SAGE), Wave 1

WHO SAGE WAVE 1

Study on global AGEing and adult health (SAGE) Wave 1

Mexico National Report

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1. Introduction

Mexico is ageing. The first phase of the ongoing demographic transition took place in the 1930s, when mortality began to decline in conjunction with persistent high birth rates, leading to a sustained period of high population growth. However, policy and cultural changes have led to steady and rapid declines in birth rates from 46 births per thousand population in 1960 to 21 per thousand in 2000. Over the same period, average fertility fell from 7.0 to 2.4 children per woman. The birth rate is expected to continue its downward trend to reach 11 births per thousand population by 2050 (CONAPO).

Meanwhile, the average life expectancy of Mexicans doubled during the second half of the twentieth century; it rose from 36 years in 1950 to 74 years in 2000. This trend is expected to continue over the next few decades allowing average life expectancy at birth to reach 80 years in 2050. As is the case in almost every country in the world, women in Mexico tend to live longer than men. In 2012, female life expectancy at birth was 79.4 years and male 74.5 years (Atun, 2014). Trends in the proportion of the total population aged 60-plus are provided by state in Table 1.1.

1.1 Health and socio-demographic situation

In recent decades, there has been an improvement in the living conditions of Mexico's population, together with a decline in overall mortality and a transformation in the profile of causes of death, all of which have had a profound impact on society. The transition is at an advanced stage among the better-off strata of the population, while less well-off groups are at an earlier stage in the process (CONAPO, 2010).

Nevertheless, life expectancy in Mexico is the lowest amongst OECD countries (OECD, 2014), impacted by

harmful health-related behaviors, road traffic accidents and homicides. Ischemic heart disease, diabetes, chronic kidney disease and interpersonal violence were the top contributors to premature mortality in Mexico in 2010 (IHME, 2013). The leading causes of disability in the country were lower back pain, depression, diabetes and neck pain. Compared to 1990, a higher proportion of the burden of disease in 2010 was from non-communicable disease and injuries, and a lower proportion of the disease burden was contributed by infectious diseases. High body mass index (BMI), high blood sugar, dietary risks, alcohol use and high blood pressure were the leading health risks contributing to disease burden in 2010.

1.2 Ageing issues and policy goals

Socio-economic aspects of health among older adults

Prevalence of disability gradually increases among both men and women after the age of 45 years and becomes considerable after the age of 79, when there is a greater likelihood of experiencing functional impairment in association with the inability to independently perform everyday tasks. As people grow older, the proportion of individuals in high-risk age groups will increase, making it likely that prevalence of disability will also increase (CONAPO).

One of the policy challenges presented by an ageing population is to adopt and introduce preventive measures and programmes to make it possible to reduce rates of morbidity and disability so as to increase disability-free life expectancy and enable more people to live longer in a satisfactory state of physical and mental health (CONAPO). In 2010, a man who reached the age of 60 years was expected to live an average of 2.5 of his

Table 1.1 Population ageing trends for states in México, 1950-2030 (secondary source)

Sub-national (state)	Percent of population aged 60-plus				
	1950	1975	2000	2025	2030
Aguascalientes	6.67	6.11	6.23	12.45	14.97
Baja California	4.09	4.11	5.24	10.87	12.94
Baja California Sur	6.15	5.32	5.84	11.93	14.52
Campeche	5.25	5.53	4.04	12.73	15.20
Coahuila de Zaragoza	5.75	6.65	7.01	13.59	16.55
Chiapas	4.56	4.71	5.42	11.22	13.52
Chihuahua	4.87	5.21	6.88	14.63	17.93
Federal District	5.17	4.39	8.49	19.49	22.61
Durango	5.41	5.71	7.77	14.70	17.60
Guanajuato	6.21	6.11	7.09	14.20	17.17
Guerrero	4.85	5.53	7.49	14.66	17.38
Hidalgo	5.74	6.0	7.06	15.69	18.82
Jalisco	6.26	6.0	7.52	14.42	17.03
México	5.95	4.66	5.44	13.50	16.29
Michoacán	5.39	6.19	8.17	16.77	20.16
Morelos	5.63	8.22	7.72	16.58	19.53
Nayarit	5.35	5.73	8.47	16.45	19.46
Nuevo León	5.56	5.47	7.16	13.92	16.60
Oaxaca	5.25	6.14	8.44	15.85	18.55
Puebla	5.97	6.54	7.36	13.47	15.79
Querétaro Arteaga	6.04	9.65	5.95	12.51	15.17
Quintana Roo	3.64	7.0	3.70	8.47	10.32
San Luis Potosí	5.84	12.70	8.12	14.96	17.70
Sinaloa	5.21	10.26	7.27	15.99	19.04
Sonora	5.17	4.91	7.12	14.76	17.49
Tabasco	4.81	9.52	5.83	13.72	16.76
Tamaulipas	4.95	5.69	7.47	13.94	16.66
Tlaxcala	6.43	6.98	7.23	12.77	15.22
Veracruz de Ignacio	5.26	5.42	7.98	16.31	19.15
Yucatán	6.26	7.1	5.9	13.80	15.82
Zacatecas	7.38	6.18	8.68	16.44	19.84
Total	**24,524,156**	**48,225,238**	**97,483,412**	**150,484,602**	**120,928,075**

General population censuses for 1950, 1970 and 2000. Available at: www.inegi.org.mx/sistemas/TabuladosBasicos/default.aspx?c=16763&s=est

Forecasts, Mexico 2005 - 2050 National Population Census, CONAPO. Available at: www.conapo.gob.mx/index.php?option=com_content&view=article&id=36&Itemid=234

remaining life-years (20.2 on average) with some form of disability. This figure was 3.1 years among women, whose life expectancy at 60 was 22.1 years. In other words, after the age of 60 years, the average person will spend more than 10% of his or her remaining life years with some form of disability. The age-standardized prevalence of disability was estimated by the 2003 World Health Survey in Mexico to be 7.5% (http://who.int/disabilities/world_report/2011/technical_appendices.pdf). The predominant form of disability among older adults was with mobility, which affected 56% of men and 62% of women, followed by visual impairment (33% and 32%, respectively) and hearing impairment (27% and 19%, respectively). One social factor affecting the older population that has to be considered is migration by Mexicans to the United States in search of economic support. This has affected both older adults and their families. For this reason, migration plays a very important role in any study of health and ageing (Wong, 2007).

It is noteworthy that in the data produced by the 2001 National Survey of Health and Ageing in Mexico (ENASEM), self-evaluation of health for the population aged over 50 years was closely associated with self-reporting of chronic diseases (of the heart, lungs, cancer or stroke) and with functional disability. This would seem to indicate that self-reporting may be a valuable global indicator of health in studies among the community. The exception is for obesity, which is not closely associated with self-reporting of health (INSP/SEDESOL).

Public policy and programmes for older adults

Activities that have been proposed to improve our understanding of the health needs of older adults and to improve health programmes for this population include the following (Ham-Chande, 2007):

- Setting up a health surveillance system for older adults, based on morbidity and disability indicators;

- Bolstering the programme of research into ageing and health;

- Including older adults in health promotion and preventive health strategies with precise and verifiable targets that emphasize functional independence;

- Establishing a policy to train human resources to care for older adults;

- Improving governance of the health system as regards regulation of establishments providing long-term care; and,

- Expanding health-care services for older adults to cover community and home care.

The provision of services for older adults in Mexico is regulated by NOM-167-SSA1-1997, "On provision of social welfare services for minors and older adults". A patchwork of different programmes have been implemented at the federal and state levels to provide financial support to older adults; these generally suffer from the lack of an overall framework and government policy to define basic strategies for meeting older adults' considerable needs. Some programmes have focused on ensuring the participation of the population living in extreme poverty, while others have emphasized a universal approach within a specific geographical area.

The three main programmes addressing this population group are the Over 70s Allowance in the Federal District; the component of Oportunidades (now Prospera) providing support for older adults; and the 70+ Programme (Rubio 2010). Prospera is a selective intervention targeting the population living in extreme poverty, while the Over 70s Allowance in the Federal District and the 70+ Programme are designed to provide universal coverage within specific geographical areas (Secretaría de Salud). Since 2006, families benefiting from Prospera and with family members aged over 70 years have received additional financial support for each older family member. The level of support is adjusted every six months on the basis of variations in the National Basic Basket Price indicator, and since 2007 the component's geographical coverage has gradually been limited so as to gradually transfer beneficiaries to the new 70+ Programme (Secretaría de Salud). In 2009, the support for the older adult component of Prospera had an authorized budget of 47.8 billion pesos – approximately 0.4% of GDP – and benefited more than 5 million families, almost two-thirds of whom were in the three lowest income deciles of the population. Prospera also provides members of the families concerned with a basic package of free health services determined by their age, sex and life history. Persons of over 60 years of age benefit from health promotion measures and early diagnosis of diseases such as diabetes, high blood pressure, visual and hearing deficiencies, cognitive impairment.

At the Federal level, the 70+ Programme is a universal non-contributory allowance for older persons, initially intended for those living in rural localities of up to 2,500

inhabitants. Each year, the Chamber of Deputies has increased the programme's budget and its catchment area. In 2009, the allowance benefited older persons living in localities of up to 30,000 inhabitants and operated with a budget of slightly more than 13 billion pesos (approximately 0.1% of GDP); it was the social development programme with the second largest budget after Prospera. This programme involves a monthly cash payment of $500 (US$38.5), with two-monthly payments to older persons of more than 70 years of age. In 2009, there were 1.8 million active participants in more than 75,000 towns and villages throughout Mexico (Secretaría de Salud).

In 2001, the Over 70s Allowance in the Federal District Programme began to provide food support, medical care and free medicine for persons living in the Federal District. Initially, it focused on older persons living in areas that were highly or very highly marginal, but later became universal. In 2003, a law was established that provided the right of Mexico City residents to a daily allowance of no less than half the current minimum wage in the Federal District, provided they meet the age requirement and obliged the executive and legislative authorities to make available the necessary budget (Secretaría de Salud). In 2009, it was estimated to include at least 470,000 older persons with an annual Budget of at least 4.34 billion pesos. The allowance amounted to 822 pesos (US$63) per month.

The National Health System

The national health system comprises the social security institutions (IMSS, ISSSTE, PEMEX and others), which provide benefits for their beneficiaries (workers in the formal sector of the economy and their families); the Ministry of Health; the state health services (SESA); and the IMSS-Opportunities Programme, which provides services to people without social security coverage. It also includes the private sector, which provides services to those able to pay for them. The services provided by the social security institutions to their beneficiaries are funded by government revenue, revenue from employers (which in the case of the ISSSTE is also government revenue) and employee contributions. The Ministry of Health and the SESA are funded by revenue from the Federal and State Governments, and to a small extent by payments by patients receiving treatment. The private sector is funded by direct payments by individuals when they receive treatment and by the premiums paid to private medical insurance companies. The social security institutions provide treatment via their own staff and establishments. The Ministry of Health and the SESA also provide care to their beneficiaries via their own staff, clinics and hospitals. Finally, in the private sector, private providers operate through private clinics and hospitals which provide treatment to patients who pay directly for their services or who pay via their insurance companies. The Seguro Popular de Salud (People's Social

Figure 1.1. Structure of the National Health System
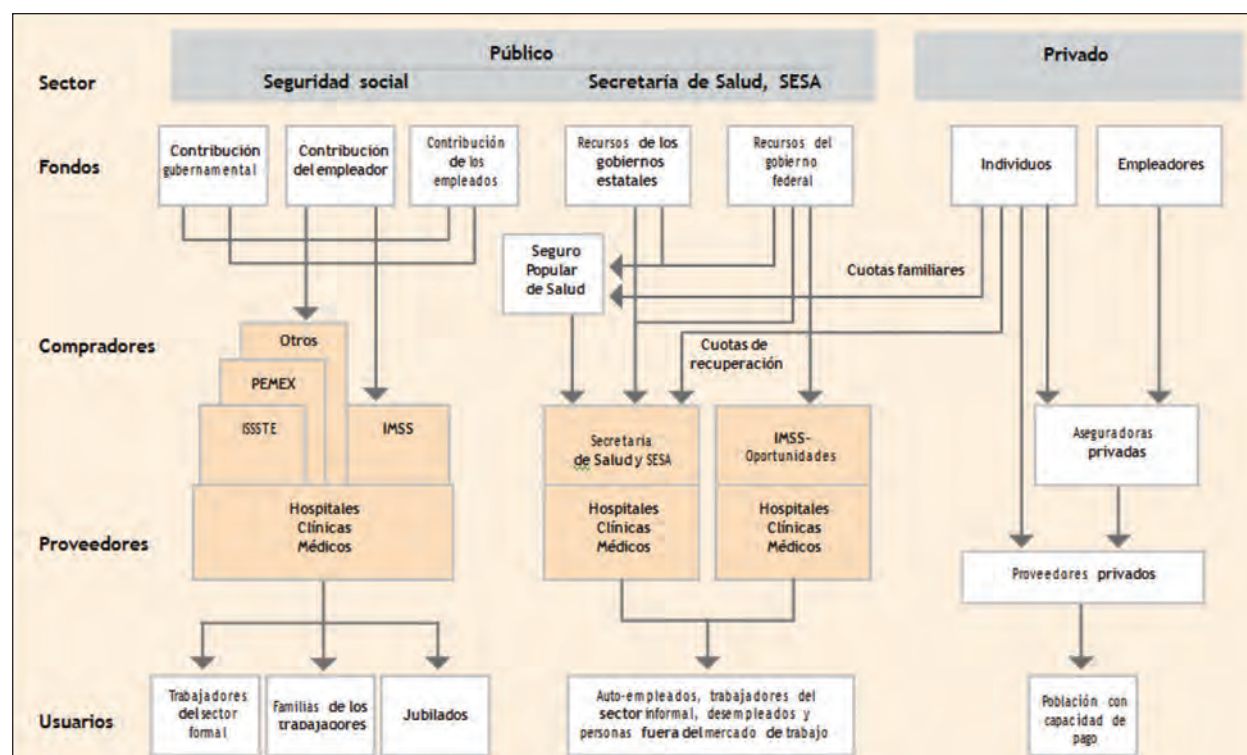
Security) receives funds from the Federal Government, the State Governments and family contributions, and purchases services from the Ministry of Health and the SESA for its members (Ham-Chande, 2007).

Financial resources

In 2012, Mexico invested 6.2% of its gross domestic product (GDP) on health (Atun, 2014), up from 5.6% of GDP in 2000 but below the, 6.5% spent in 2005 (OECD 2014). This percentage is lower than the average figure for Latin America (6.9%) and far below the percentage of GDP spent on health by other medium-income countries in Latin America, such as Argentina (8.9%), Brazil (7.6%), Colombia (7.6%) and Uruguay (9.8%).

This proportion may be insufficient to meet the demands arising from the epidemiological transition described above. Forty-nine percent of total health expenditure is from public sources; the remaining expenditure is private and for the most part out-of-pocket expenditure. If it is to meet the new health and social challenges it faces, Mexico will need to expand expenditure, and in particular public expenditure, on health and to strengthen social protection in this sphere (INSP/SEDESOL).

At the time of Wave 1 interviews, approximately one-third of the population, mainly the lowest income groups, had no health insurance. The Government reached universal health coverage in 2012 through Seguro Popular (Knaul, 2012), although continued work is needed on reform and reorganization of systems to create effective, equitable and responsive health services.

Public expenditure on health

Public resources are used to fund the activities of the two basic types of public health institutions; the social security institutions (the Mexican Social Security Institute (IMSS), the State Employees Social Security and Social Service Institute (ISSSTE), the Mexican Petroleum Company (PEMEX), the Ministry of Defence (SEDENA) and the Merchant Navy Ministry (SEMAR)); and the institutions that cater for people without social security (the Ministry of Health and IMSS-Opportunities (IMSS-O)). Private resources fund the activities of numerous service providers operating in surgeries, clinics and hospitals (Ham-Chande, 2007).

Private expenditure on health

Private expenditure on health includes all direct and indirect expenditure by families on health care for their members: out-of-pocket expenditure on care, payment for service or to purchase an item of health care, and payment of insurance premiums. Private expenditure has generally been increasing since the 1990s; however, in recent years the rate of growth has been lower than that of public expenditure. The effects of the attainment of universal health coverage in 2012 remain to be seen.

Infrastructure

The infrastructure of the Mexican health sector (treatment facilities, beds, operating theatres and equipment) is still inadequate; moreover, infrastructure is unequally distributed among the States, institutions and the population. Drug supplies have improved considerably throughout the sector, especially in outpatient facilities, although availability of drugs in hospitals is a challenge that still has to be taken up (Ham-Chande, 2007).

Human resources

In order to satisfy the demands arising from the epidemiological profile of the population for which they are responsible, health systems need sufficient and properly trained human resources. However, many of the world's health systems are beset by two problems where human resources are concerned: a shortage of properly trained health workers and their unequal geographical distribution. Mexico is no exception and faces a relative shortage of physicians and nurses, and above all a problem with distribution across the country.

1.3 Ageing related studies, data and policy gap

Mexico is unique in many ways, including the production of a number of high quality population studies on ageing and health. The multi-country Study on global AGEing and adult health (SAGE) in Mexico focuses on health and well-being in older adulthood, and also provides an opportunity for insights into the ageing process domestically and in comparison to five other middle-income countries.

The need for a more thorough study of processes of ageing and of the state of health of the over-60 age group in Mexico has been apparent for several decades. A number of surveys have been carried out to provide a clearer picture of the situation. This includes the Survey of the Older Adult Population in the metropolitan area

of Monterrey, which was carried out in 1988 by the Nuevo Leon State Population Council, and the National Survey on Ageing in Mexico, carried out in 1994 by the National Population Council. Subsequently, a wider Latin American project was coordinated by the Pan-American Health Organization, which in 2000 and 2001 carried out a survey of health, well-being and ageing (SABE) in seven urban areas in Latin America. In Mexico, the sample came from the metropolitan area of Mexico City (PAHO, 2001; Albala, 2005). In connection with this work, considerable progress was achieved by the survey included in the National Survey of Health and Ageing in Mexico (ENASEM; Albala, 2005). In 2001, the Mexican Health and Aging Study (MHAS) started as a prospective panel study of health and ageing in Mexico, and has completed three waves of data collection (http://www.mhasweb.org/). The Mexican Family Life Survey was launched in 2002, and has completed two additional waves of data collection (http://www.ennvih-mxfls.org/english/introduccion. html). In 2003, the National Performance Evaluation Survey (ENED) was carried out by the National Public Health Institute (INSP) in collaboration with the World Health Organization (WHO) as part of the technical cooperation undertaken between the Ministry of Health and WHO. This was also known as the World Health Survey, and in Mexico as SAGE Wave 0, with this report detailing the follow-up SAGE Wave 1 from 2009/10.

1.4 World Health Survey (SAGE Wave 0 in Mexico) and SAGE Wave 1

Between 2002 and 2004, WHO conducted the World Health Survey (WHS) in 70 countries, including Mexico (Ustun, 2003). In each country, health and health systems information was gathered on the adult population aged 18 years and older, including persons aged 50-plus. This one study is known by three names in Mexico: ENED, WHS and SAGE Wave 0. Representative state indicators for the rural and urban areas of each State were generated from this study. Questionnaires were applied in 38,746 of the 40,000 households selected for the sample, with an average of 1250 households in each State. The response rate was 96.9%, with 3.1% failure to reply, in comparison with an expected 15%.

The next wave of this study, WHO's Study on global AGEing and adult health (SAGE) Wave 1, was implemented in 2009/10 in Mexico (Kowal, 2012). Wave 1 focused more on older adults and included six geographically distributed countries with and wide variations in demographic

and economic development: Mexico, China, Ghana, India, Russia and South Africa. Once again, INSP implemented the study in Mexico, which was carried out in 31 of Mexico's 32 States. The tools used in SAGE Wave 1 built on SAGE Wave 0, with revisions and other topics added as a result of reviews of other major surveys of ageing.

1.5 SAGE goals and objectives

The SAGE study has the following objectives: to improve our empirical understanding of the effects of ageing on well-being, to examine changes in the health state of adults and to determine trends and patterns over time. It is also intended to improve investigators' ability to analyse the impact of social and economic changes, and of health policy, on the population's present and future state of health. The study was implemented in six developing countries and will yield reliable and valid data to allow an assessment of differences in health between individuals, countries and regions. Another major objective of SAGE is to supplement the information routinely provided by Health Information Systems (HIS).

The goal of SAGE is to generate high quality health data on older adults in order to inform responses to population health needs (policy, planning and research) with the following specific objectives, to:

- Obtain reliable, valid and comparable data on levels of health in a range of key domains for adult populations;
- Examine the patterns and dynamics of age-related changes in health using a longitudinal design;
- Include measured performance tests for selected health domains as a means to better understand self-reported health measures;
- Collect data on health examinations and biomarkers in order to improve the reliability morbidity and risk factor estimates, and monitor the effects of policy interventions;
- Follow intermediate outcomes, monitor trends, examine transitions and life events, and address relationships between health determinants and health-related outcomes;
- Build linkages with other national and cross-national ageing studies; and,
- Provide a public-access information base for evidence-based policy debate among all stakeholders.

The SAGE national report will be structured to present data on the main dimensions of the health, social and economic conditions of the older population in Mexico, and will highlight the salient features of differences between the poor and the rich; differences in access to health care services; and particular social and economic issues confronting older adults. All results were broken down by standard socio-demographic characteristics (age, sex, education, rural/urban location, marital status and income quintiles).

Reports and publications from SAGE Wave 1 and WHS/ SAGE Wave 0 will be available on the WHO website, www.who.int/healthinfo/sage/. These are provided as one aspect of ongoing dissemination activities.

2. Methodology

2.1 Sampling design, implementation and size

SAGE Wave 1 is a follow-up survey of the 2003 WHS/SAGE Wave 0 sample with two target populations: individuals aged 18-49 and those age 50-plus (in 2003). The target sample size for individuals aged 18-49 was 1,000, whereas the sample size for individuals aged 50-plus was 3,100; these sample sizes were defined under the assumption that the response rate would be 60%. Since SAGE is a follow-up survey, we start by describing the Wave 0 sampling design (see also Naidoo, 2012).

WHS/SAGE Wave 0 sampling design

The sampling design of SAGE Mexico Wave 0 had three elements: stratification, sample allocation and sample selection.

Stratification. The primary sampling units (PSU) were the Basic Geo-Statistical Areas defined by the Census Office of México (INEGI). PSU were classified according to two criteria: state and urbanicity. In Mexico, there are 32 states, and uerbanicity was defined as in Table 2.1. Therefore, PSU were classified into 32 (State) x 3 (urbanicity) = 96 strata.

Sample allocation. A sample size of 1,250 households was allocated to each State. The sample was distributed proportionally among strata according to the census population of year 2000. Forty-nine households were

Table 2.1 Strata definition

Stratum	Definition
Rural	Less than 2,500 inhabitants
Urban	Less than 100,000 inhabitants and more than 2,499 inhabitants
Metropolitan	More than 99,999 inhabitants and State capitals

allocated to each PSU, and PSUs were allocated proportionally among the strata.

Sample selection. PSUs were selected with probability proportional to census size for every stratum. Seven blocks were selected in each urban PSU or metropolitan PSU, and seven households were selected in each selected block. Blocks of urban or metropolitan PSU were selected with probability proportional to the PSU's size, and households were selected using systematic sampling.

In contrast, rural PSUs were divided into secondary sampling units (SSM) of approximately 10 households; next, five SSM were selected from each rural PSU by means of systematic sampling. Finally, one individual was selected among the inhabitants aged 18-plus of each household; therefore, the probability of selection of individuals was intended to be:

State Sample Size 1

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Population of State Persons aged 18-49 in the household

Whereas the probability of selection of households was intended to be:

State Sample Size

Population of State

SAGE Wave 1 sampling design

SAGE Mexico Wave 1 used a stratified multi-stage cluster sample design. Strata were defined by locality (metropolitan, urban, rural). The Basic Geo-Statistical Areas (AGEB) defined by the National Institute of Statistics, Geography and data processing (INEGI) was used as the sampling frame. An AGEB constitutes a PSU.

The sample size of SAGE Wave 1 is considerably smaller than that of SAGE Wave 0; therefore, in order to obtain a sample for SAGE Wave 1 with less geographical dispersion than that of the Wave 0 sample, a sub-sample of 211 PSUs were selected from the 797 Wave 0 PSUs.

PSUs were selected using probability proportional to three factors:

a) (SAGE Wave 0 50-plus): number of SAGE Wave 0 participants aged 50-plus interviewed in the PSU

b) (State Population): population of the state to which the PSU belongs

c) (SAGE Wave 0 PSU at county): number of PSUs selected from the county to which the PSU belongs for SAGE Wave 0.

For instance, if two PSUs in Aguascalientes State were selected for SAGE Wave 0, then, for such a PSU, the factor (SAGE Wave 0 PSU at county) would be equal to two. The first and third factors were included to reduce geographic dispersion. Factor two affords states with larger populations a greater chance of selection.

All SAGE Wave 0 individuals aged 50-plus in the selected rural or urban PSUs and a random sample 90% of individuals aged 50-plus in metropolitan PSUs who had been interviewed in SAGE Wave 0 were included in the SAGE Wave 1 primary sample. The remaining 10% of SAGE Wave 0 individuals aged 50-plus in metropolitan areas were then allocated as a replacement sample to replace individuals who could not be contacted or did not consent to participate in SAGE Wave 1. A systematic sample of 1000 SAGE Wave 0 individuals aged 18-49 across all selected PSUs was selected as the primary sample and 500 as a replacement sample. Further sampling details and weighting strategies can be found in Naidoo, 2012.

2.2 Questionnaires

The survey was carried out electronically using a CAPI programme exclusively developed by SAGE Mexico. Each interviewer had a laptop computer for conducting face-to-face interviews. SAGE Wave 1 used five main questionnaires in electronic format; these are described in Table 2.1. GPS coordinates were collected from each household using Garmin eTrex devices, with a minimum of three satellite signals.

2.3 Data collection procedures

A total of 4326 households were targeted to achieve stated sample size goals. Households were included from 31 of Mexico's 32 States, the exception being Colima. Details about the sample distribution by State, municipality and number of households is available online (http://apps.who.int/healthinfo/systems/survey data/index.php/catalog/67/study-description#page= sampling&tab=study-desc).

The survey began in November 2009 and ended in the third week of January 2010. On account of the geographical hurdles and the scattered habitat in some municipalities, visits to each State were conducted in three stages:

● First stage

This involved administration of the household questionnaire, the individual questionnaire and/or the proxy questionnaire by direct interview in the selected households.

● Second stage

This stage was used for anthropometry, function (walking, grasping, spirometry and visual acuity) and cognitive tests (verbal fluency, immediate and recent verbal memory and repetition of numbers) and to measure biomarkers (blood pressure and blood samples to determine sugar and cholesterol levels).

● Third stage

This comprised the retest by the supervisor. It involved administration of some of the tests and questions from the household, individual or proxy questionnaires to persons who had already been interviewed.

Each coordinator was supported by one computer support person who was responsible for back-up of the information obtained during interviews and for maintenance of the laptop computers assigned to each interviewer. The total staff involved in the survey consisted of five coordinators, five computer support staff, 10 supervisors, 36 interviewers and 20 staff responsible for anthropometric data (weight, height, waist and hip circumference), blood sample and spirometry, most of whom were specially trained nurses.

Strategy for transferring and backing up data

The information obtained from the interviews was stored directly on each interviewer's laptop computer. At the

Table 2.2 Questionnaire types and description of contents

Questionnaire type	Domain	Wave 1 measures
Household	Household identification, contact and sampling details	Identification and contact details; structure of household; dwelling characteristics; improved water, sanitation and cooking facilities
	Transfers and support networks	Family, community and government assistance into and out of the household; informal personal care provision/receipt
	Assets, income and expenditure	List of household assets; sources and amount of household income; improved household expenditure on food, goods and services, health care
	Household care and health insurance	Persons in household needing care; mandatory and voluntary health insurance coverage
Individual	Sociodemographic characteristics	Sex; age; marital status; education; ethnicity/background; religion; language spoken; area of residence; employment and education of parents; childhood residence, migration
	Work history and benefits	Length of time worked; reasons for not working; type of employment; mode of payment; hours worked; retirement
	Health states and descriptions	Overall self-rated health; eight self-rated health domains (affect, mobility, sleep/energy, cognition, interpersonal activities, vision, self-care and pain); 12-item WHO Disability Assessment Schedule, Version 2 (WHODAS-II); activities of daily living (ADLs); instrumental activities of daily living (IADLs); vignettes on health state descriptions
	Anthropometrics, performance tests and biomarkers	Measured blood pressure; self-report and measured height and weight; measured waist and hip circumference; timed walk; near- and distant vision tests; grip strength, executive functioning (verbal recall, digit span forwards and backwards, verbal fluency); spirometry; non-fasting fingerprick blood sample (stored at -20C) as dried blood spots
	Risk factors and preventive health behaviours	Smoking; alcohol consumption; fruit and vegetable intake; physical activity (GPAQ)
	Chronic conditions and health services coverage	Self-reported and symptomatic reporting of arthritis; stroke; angina (Rose Questionnaire); asthma; and, depression (ICD-10, DSM-IV). Self-reporting of diabetes; chronic lung disease; hypertension; cataracts; oral health (edentulism); injuries; cervical and breast cancer screening
	Health care utilization	Past need for health care; reasons for health care or for not receiving health care; inpatient and outpatient health care: number of admissions / visits within the past 3 years (inpatient) or 1 year (outpatient); reasons for admission / visit; details of hospital or provider; costs of hospitalization or health care visit; satisfaction with treatment; health system responsiveness; vignettes for responsiveness of health services
	Social cohesion	Community involvement and social networks; perceptions of other people and institutions; safety in local area; stress; interest in politics and perceptions of government
	Subjective well-being and quality of life	Perceptions about quality of life and well-being; 8-item WHO Quality of Life measure (WHOQoL); Day Reconstruction Method (DRM)
	Impact of caregiving	Household members needing care; type of care required; length of time spent on care; costs of care; impact of providing care on career well-being
Proxy	IQ Code	IQ Code;
	Health state descriptions	All measures described above for individual data
	Chronic conditions	All measures described above for individual data
	Health care utilization	All measures described above for individual data
Retest	Quality control measure	Selected key variables for household and individual questionnaires repeated up to one week after initial interview.
Mortality (verbal autopsy)	Deaths and cause of death	Verbal Autopsy for all deaths within past 24 months in households

Note: Section 9000 of the individual questionnaire allowed the interviewer to document observations during the interviews.

end of each day, the data was backed up in coded form and compressed onto a ZIP archive protected by an encrypted 128-bit password.

The computer support person extracted the information from the interviewers' computers and was transferred in encrypted form to a central server specifically used for storage. The server ensured that the files were un-damaged (uncorrupted). The files were then decrypted, decompressed and loaded into the project's data base. A record of successful data upload was then sent via e-mail to the computer support person. The email contained receipts of the interview forms and result code for each interview. This information enabled the field coordinators and their supervisors to check the interview forms sent to the central office and to record productivity of each interviewer. Each computer support person was issued with a mobile wide-band device (MWB) to enable them to access the Web portal from anywhere and whenever necessary, thus averting the risk of introducing viruses into the files sent to the central server or into the computers used by the interviewers.

Follow-up system

In order to obtain information on the progress of the survey in real time, a system was developed to permit advance reports to be produced routinely, together with ad hoc reports to check the quality of the survey. As soon as information was sent to the central server, these reports were generated automatically and in real time. Only staff authorized by the INSP's Department of Surveys could assign keys for access to these systems. The main tables and graphs produced by the system were:

- An overall report on interviews by results code, State, municipality and type of questionnaire

- A graph showing the non-response rate per type of questionnaire.

Training strategy

Standardized training materials were provided by WHO and were translated to Spanish and adapted for field work in Mexico.

The survey teams were trained during the last week of October and the first week of November 2009. The training programme consisted of three modules taught in parallel:

1. Questionnaire (for supervisors and interviewers);

2. Anthropometry, function and cognitive tests and biomarkers (for supervisors and staff responsible for carrying out the function tests); and,

3. Use of the data entry programme on the laptop computers (for all survey staff working in the field, including supervisors, interviewers and staff recording anthropometric data).

The staff responsible for training were all experienced in carrying out surveys and in particular had experience with SAGE Mexico Wave 0. INSP staff specialized in particular areas, such as verbal autopsies or IQ code, were also asked to participate in the training. The trainers who taught anthropometrics came from various hospitals and institutes specialized in the topic to be taught. Details are given below:

- Anthropometrics: Training and standardization was provided by staff from INSP specialized in anthropometrics. The training covered the techniques for weighing, measuring height and waist and thigh circumference.

- Timed walk: Staff with experience of evaluation of programmes for older adults (PAAM 70+) provided training.

- Grip strength: Training was provided by a geriatric physician from the Salvador Zubirán National Institute of Medical Science and Nutrition (INNSZ).

- Cognition tests: Training was provided by staff specialized in psychology and in performing this type of test to assess the cognitive skills of adults aged 60-plus.

- Spirometry: Training was provided by staff from the National Institute of Respiratory Diseases who are specialized in the use of spirometers in field settings.

- Training in the remaining tests (capillary and venous blood sample and evaluation of distant and near vision) was provided by a colleague from the WHO SAGE team.

2.4 Survey metrics and data quality

A total of 2629 individual interviews were completed, with 113 proxy interviews. Table 2.3 shows the number of household, individual and proxy interviews in each State, along with male/female ratios for household informants and individual respondents.

Table 2.3 Number of interviews completed, by type and M/F ratios for each area

Sub-national (region/province/state)	Household interviews	M/F	Individual*	Proxy*	M/F
Aguascalientes	120	0.93	116	2	0.76
Baja California	127	1.10	75	0	0.49
Baja California Sur	26	1.00	18	1	0.47
Campeche	39	1.16	25	1	3.83
Coahuila de Zaragoza	51	1.10	47	3	1.22
Chiapas	28	1.06	24	1	1.31
Chihuahua	81	0.92	45	1	1.20
Federal District	191	0.94	166	5	1.21
Durango	129	0.95	138	6	1.39
Guanajuato	88	0.98	81	6	1.10
Guerrero	202	0.92	224	10	0.77
Hidalgo	86	0.95	79	5	1.74
Jalisco	184	0.90	161	8	1.07
México	164	0.84	142	8	1.28
Michoacán	98	0.81	123	4	0.08
Morelos	75	0.81	59	5	0.70
Nayarit	70	0.95	59	1	1.68
Nuevo León	187	1.02	149	7	0.97
Oaxaca	100	0.83	90	5	0.62
Puebla	57	0.81	50	2	0.96
Querétaro Arteaga	105	0.94	121	2	2.68
Quintana Roo	35	1.20	35	1	0.65
San Luis Potosí	94	0.87	83	2	0.53
Sinaloa	159	0.91	142	4	2.94
Sonora	120	1.09	96	2	0.24
Tabasco	54	1.14	50	3	0.28
Tamaulipas	68	0.69	55	6	0.34
Tlaxcala	14	0.88	12	1	1.32
Veracruz de Ignacio de	50	0.78	42	3	1.16
Yucatán	76	0.94	58	5	0.93
Zacatecas	57	0.93	64	3	1.08
Total (pooled)	**2935**	**0.94**	**2629**	**113**	**0.92**

Note: Number of individual and proxy interviews completed and M/F ratios (fit to UN standard population)

Table 2.4 Number of retest interviews, proxy retest, proxy validation and verbal autopsy interviews completed

Characteristics	HH retest	Individual retest	Proxy retest	Proxy validation	Verbal Autopsy (VA)
Age group in years					
18-49	7	6	0	11	4
50-59	9	7	0	5	8
60-69	11	8	1	10	20
70-79	10	10	0	8	34
80+	6	6	1	4	53
Total	**43**	**37**	**2**	**38**	**119**

Retest interviews were conducted as one component of the quality assurance procedures, and verbal autopsies (VA) were used as a means to ascertain cause of death for deaths of household members. The numbers of completed retests (household, individual and proxy), proxy validation and verbal autopsy interviews are shown in Table 2.4. A total of 43 household retest interviews were completed across the five age groups. A total of 37 individual retest questionnaires were completed, and only two proxy retest interviews. A total of 38 interviews were carried out to validate the use of a proxy test for a selected individual.

The largest number of verbal autopsies was obtained in the 80-plus age group, from whom 53 were obtained, in comparison with only four in the 18-49 year age group. The total number of verbal autopsies was 119.

Table 2.5 Household and individual response rates by selected background characteristics

Characteristics	Household response rate	Households contacted	Individual* response rate	Individuals contacted
Age group in years				
18-49	–	–	28.0	429
50-59	–	–	19.7	434
60-69	–	–	57.1	937
70-79	–	–	57.9	619
80+	–	–	83.2	336
Residence				
Urban	73.9	550	66.6	747
Rural	75.5	658	67.1	893
Metropolitan	57.3	2,036	49.0	2158
Wealth quintile*				
Q1 (lowest)	90.6	498	83.0	617
Q2	60.1	507	56.8	627
Q3	44.8	469	42.6	585
Q4	41.7	552	36.8	658
Q5 (highest)	31.6	427	29.0	520
Total		**2,453**		**2742**

* Refers to completion of the full interview.

2.5 Response rate

The household response rate was higher in rural areas than in urban and metropolitan areas; the rates were 75.5%, 73.9% and 57.3%, respectively (Table 2.5).

For individual interviews, the response rate for the 18-49 years age group was 28.0%, for the 50-59 year age group was 19.7%, for the 60-69 age group was 57.1%, for the 70-79 years age group was 57.9%, and for those aged 80-plus was 83.2%. Final sample sizes for each age group are included in Table 2.5. The response rate was higher among women than among men, and higher in rural and urban areas than metropolitan areas. Response rates were generally higher in lower income quintiles than in higher income quintiles.

The total number of households in which an interview was completed was 2453 and the number of individuals interviewed was 2742.

3. Characteristics of Households and Individuals

3.1 Household characteristics

This chapter presents a profile of the selected households and household members. The information on household members and housing characteristics was collected from household informants, usually the head of the household. The information collected from each of the households included a roster of household members; member composition and demographic characteristics, including marital status and education; insurance coverage and care needs of all residents staying in the household for at least four months per year; housing characteristics; and the income/economic situation of the household. These basic household data play an important role in gaining an understanding of the issues related to adult health at the micro level, particularly of older persons.

Socio-demographics of household population

A total of 13,378 persons of all ages were listed in the 2919 sampled households. Table 3.1 presents the results

Table 3.1 Household population by age, residence, marital status, educational attainment and care issues (percent distribution), by sex (unweighted).

	Male		Female		Total		Number
	Percent	SE*	Percent	SE	Percent	SE	
Age group							
0-4	4.1	0.52	7.1	1.11	5.6	0.50	755
5-9	9.2	0.96	6.1	0.59	7.6	0.50	1,019
10-14	9.5	0.71	8.4	0.74	9.0	0.50	1,199
15-19	12.4	1.06	10.5	0.98	11.4	0.83	1,529
20-24	11.5	1.03	10.2	0.81	10.8	0.57	1,446
25-29	7.5	0.66	7.7	0.54	7.6	0.45	1,011
30-34	5.6	0.54	6.7	0.56	6.2	0.44	830
35-39	7.5	0.91	7.4	0.73	7.4	0.74	993
40-44	5.9	0.59	5.9	0.53	5.9	0.43	787
45-49	5.1	0.56	4.8	0.46	4.9	0.41	662
50-54	4.0	0.53	5.6	0.63	4.8	0.46	648
55-59	4.3	0.47	4.6	0.44	4.4	0.33	594
60-64	3.4	0.34	3.8	0.33	3.6	0.28	486
65-69	3.5	0.43	3.1	0.34	3.3	0.33	439
70-74	2.4	0.33	2.4	0.25	2.4	0.22	320
75-79	1.9	0.24	2.6	0.32	2.3	0.24	305
80+	2.2	0.25	3.0	0.3	2.6	0.25	351
Total	**100**		**100**		**100**		**13,374**

Table 3.1 Continued

	Male		Female		Total		Number
	Percent	SE*	Percent	SE	Percent	SE	
Residence							
Urban/metropolitan	77.7	3.10	78.2	2.77	78.0	2.89	10,430
Rural	22.3	3.10	21.8	2.77	22.0	2.89	2,948
Total	**100**		**100**		**100**		**13,378**
Marital status							
Never married	54.0	1.50	47.5	1.09	50.6	1.11	5,251
Currently married	38.0	1.63	34.9	1.43	36.3	1.42	3,772
Cohabitating	4.2	0.67	4.8	0.61	4.5	0.61	470
Separated/divorced	1.3	0.22	4.4	0.61	2.9	0.35	304
Widowed	2.1	0.28	8.2	0.71	5.3	0.44	551
Don't know	0.4	0.23	0.2	0.09	0.3	0.12	34
Total	**100**		**100**		**100**		**10,383**
Education							
No formal education	7.0	0.74	11.0	1.36	9.1	0.72	969
Less than primary school	28.7	2.13	29.2	1.52	28.9	1.65	3,069
Primary school completed	21.9	1.25	21.6	1.20	21.7	1.00	2,303
Secondary school completed	22.3	1.29	18.9	1.19	20.5	0.97	2,172
High school (or equivalent) completed	11.1	1.00	10.0	0.81	10.5	0.75	1,117
College/university completed	8.0	0.97	8.2	0.87	8.1	0.76	861
Post-graduate degree completed	1.0	0.29	1.1	0.52	1.0	0.37	111
Total	**100**		**100**		**100**		**10,603**
Insurance coverage							
Mandatory	33.8	2.86	35.0	2.5	34.5	2.55	3,597
Voluntary	23.0	2.71	24.4	2.75	23.8	2.66	2,479
Both	0.2	0.08	0.2	0.06	0.2	0.06	18
None	43.0	2.81	40.4	2.72	41.6	2.65	4,343
Total	**100**		**100**		**100**		**10,436**
Household member needs care							
Yes	3.1	0.57	5.3	0.83	4.2	0.56	443
No	96.9	0.57	94.7	0.83	95.8	0.56	9,993
Total	**100**		**100**		**100**		**10,436**
Household member institutionalized at time of interview							
Yes	0	0.02	0.6	0.28	0.3	0.15	42
No	2.3	0.44	3.6	0.51	3.0	0.37	400
Not applicable	97.7	0.44	95.8	0.66	96.7	0.43	12,935
Total	**100**		**100**		**100**		**13,378**
Number	**6,470**		**6,908**		**13,378**		

* SE = standard error

Table 3.2 Percent distribution of household sizes, household head types and main income earner types, by income quintile*

| | Income quintile | | | | | | | | | | Total | Number |
| | Lowest | | Second | | Middle | | Fourth | | Highest | | | |
	Percent	SE*	Percent	SE	Percent	SE	Percent	SE	Percent	SE	Percent	Number
Household size (number of household members)												
1	48.6	5.79	27.4	4.28	12.7	4.65	8.0	2.64	3.3	1.80	100	79
2–5	19.6	2.25	22.3	2.88	18.9	1.83	17.7	1.55	21.4	2.02	100	1,797
6–10	19.7	3.58	21.1	3.23	19.2	2.71	18.3	3.17	21.8	2.41	100	980
11+	18.3	6.17	16.1	6.18	7.9	4.01	22.9	7.66	34.8	9.74	100	58
Total	**20.4**	**2.30**	**21.9**	**2.25**	**18.6**	**1.39**	**17.8**	**1.62**	**21.3**	**1.64**	**100**	**2,913**
Number	**594**		**638**		**542**		**518**		**621**		**2,913**	
Mean household size	**4.7**	**0.18**	**5.1**	**0.27**	**5.2**	**0.22**	**5.2**	**0.17**	**5.3**	**0.15**	**5.1**	**0.12**
Household head												
Younger woman (aged 18-49)	16.8	6.44	16.7	6.24	31.8	11.47	15.9	5.13	18.8	5.71	100	167
Older woman (50+)	27.6	3.71	19.3	1.80	22.6	2.97	13.1	1.68	17.4	3.70	100	464
Younger man (18-49)	20.3	4.07	23.5	4.76	16.7	2.86	20.4	3.71	19.1	2.91	100	1,002
Older man (50+)	18.4	2.16	22.4	2.77	16.8	1.68	17.6	1.55	24.8	2.35	100	1,276
Total	**20.4**	**2.30**	**21.9**	**2.25**	**18.6**	**1.39**	**17.8**	**1.63**	**21.3**	**1.64**	**100**	**2,910**
Number	**594**		**638**		**540**		**517**		**621**		**2,910**	
Mean age of household head	**56.8**	**1.2**	**55.5**	**1.92**	**54.7**	**1.38**	**54.4**	**1.26**	**54.8**	**0.99**	**55.3**	**0.75**
Main income earner												
Younger woman (aged 18-49)	25.6	5.81	20.1	5.92	15.9	3.49	19.1	4.76	19.3	4.66	100	338
Older woman (50+)	24.8	4.11	25.6	6.27	19.2	2.76	10.9	1.75	19.4	4.51	100	492
Younger man (18-49)	16.9	3.87	21.1	3.43	21.4	2.99	20.6	3.06	20.0	2.66	100	1,014
Older man (50+)	17.4	2.52	21.5	2.32	16.2	1.71	19.1	1.78	25.8	2.54	100	951
Total	**19.5**	**2.31**	**21.9**	**2.36**	**18.6**	**1.41**	**18.2**	**1.68**	**21.8**	**1.68**	**100**	**2,795**
Number	**546**		**612**		**519**		**509**		**609**		**2,795**	
Mean age of main earner	**52.5**	**1.12**	**51.1**	**1.97**	**50.7**	**1.17**	**50.6**	**0.98**	**51.4**	**0.93**	**51.3**	**0.71**

* SE = standard error. Income quintile Q1 is the lowest (poorest) and Q5 the highest (wealthiest).

for the main socio-demographic variables for house-hold members: sex, age, place of residence, marital status, level of education, and insurance cover and care needs.

Overall, 48% of the household members in the study were male and 52% were female. The age of house-hold members ranged from less than one year to over 100 years; 22% of respondents were under the age of 15, while 14% were aged 60-plus. The sample was mostly urban and metropolitan (78%) with a smaller percentage living in rural areas (22%). Distribution of household members by sex was similar in all areas.

The largest proportion of the household members had never married, followed by those who were currently married. Distribution by marital status was similar in both sexes, although more women were separated or divorced and widowed compared to men. Educational levels were generally similar between the sexes.

A bit less than 60% of respondents had insurance cover, whether mandatory or voluntary. The majority (around 96%) households lacked any member in need of care; similarly, only around 3% of households had a member in any form of health institution at the time of the survey.

Household size, household head and main income earner

Table 3.2 presents information on household size, house-hold head type, and main income earner type of the sample households by income quintile. The mean household size was 5.1 persons, with only the lowest income quintile households falling below the mean at 4.7. Households with only one member accounted for less than 5% of the total number; households with between six and ten members, meanwhile, made up more than a third of the total.

More heads of household were men than were women. A higher proportion of households with a female head of household, whether younger or older, were low-income households (first or second income quintile), while a higher proportion of households whose head was a younger man were in the highest income quintile.

Household head characteristics

Table 3.3 presents selected characteristics of household heads. Around 42% of household heads in the study were aged between 40 and 59 years; families whose head was aged 80-plus made up around 8% of the total, while those whose head was younger than 30 years accounted for a little over 2%. Households headed by women were considerably less likely to be in the top two income quintiles. Meanwhile, 64% of household heads had no more than a primary education. Only 2% of household heads had attended university.

3.2 Individual respondent characteristics

A total of 2313 older adults were interviewed, with adults younger than 50 years not included in the remainder of the report. Table 3.4 presents selected characteristics of these individual respondents.

Age, sex distribution and place of residence

A total of 74% of individual respondents were women and 26% were men. Nearly 50% of older respondents were aged between 50 and 59; with around 9% of respondents aged 80-plus. Nearly 80% of older respondents lived in urban areas. Of urban residents, 77% of respondents were women, a proportion similar to that in rural areas, while in metropolitan areas the proportion was 72%.

Education, marital status and income distribution

Nearly 80% of older respondents had no more than a primary education; men were more likely than women to have completed primary school, while women were more likely to have left school during the primary years. 32% of respondents had no education and 45% had no more than a primary education. Only 2.5% of respondents had completed tertiary education.

Seventy percent of older respondents were currently married; around 15% had lost their spouses. Interestingly, the largest proportion (27%) of older respondents were in the highest (fifth) income quintile, and the smallest proportion (15%) were in the lowest.

In terms of income distribution, 21% of respondents were in the highest (wealthiest) income quintile, and 20% in the lowest (poorest) quintile, with more women in the poorer quintiles and more men in the wealthier quintiles.

Religion, ethnicity and language of older respondents

A huge majority (over 90%) of older respondents self-identified as Catholic; an even higher number (94%) described Spanish as their mother tongue; and almost all (97%) said that they were of no particular ethnicity. Slightly more respondents described Zapoteco as their mother tongue than identified themselves with Zapoteco ethnicity.

Table 3.3 Percent distribution of selected socio-demographic characteristics of household heads, by sex

	Male		Female		Total		Number
	Percent	SE*	Percent	SE	Percent	SE	
Age group (HH head)							
18-29	2.1	0.59	3.7	1.30	2.4	0.55	63
30-39	17.3	2.04	11.7	3.61	16.1	1.95	422
40-49	24.6	2.23	11.2	2.45	21.7	1.89	569
50-59	20.7	1.91	21.5	2.60	20.9	1.50	548
60-69	18.2	1.52	17.2	2.03	18.0	1.25	471
70-79	11.4	1.29	20.0	2.10	13.2	1.13	347
80+	5.8	0.60	14.8	2.13	7.8	0.71	204
Total	**100**		**100**		**100**		**2,624**
Education (HH head)							
No formal education	3.0	0.62	7.3	1.61	4.0	0.69	83
Less than primary	33.7	2.56	42.3	3.29	35.5	2.20	748
Primary school completed	25.3	2.26	21.1	2.80	24.4	1.90	514
Secondary school completed	21.2	2.09	15.2	2.78	19.9	1.79	419
High school completed	6.4	1.27	6.6	3.41	6.5	1.25	137
College completed	8.7	1.57	6.8	1.25	8.3	1.30	174
Post graduate degree completed	1.6	0.72	0.7	0.44	1.4	0.57	30
Total	**100**		**100**		**100**		**2,105**
Income quintile							
Lowest	19.2	2.70	24.7	3.47	20.4	2.30	535
Second	22.8	2.93	18.6	2.04	21.9	2.25	574
Middle	16.8	1.56	25.1	3.17	18.6	1.39	486
Fourth	18.8	1.95	13.9	2.00	17.8	1.63	465
Highest	22.3	2.02	17.8	2.57	21.3	1.64	559
Total	**100**		**100**		**100**		**2,619**
Residence							
Urban/metropolitan	75.9	3.17	83.9	2.60	77.7	2.68	2,038
Rural	24.1	3.17	16.1	2.60	22.3	2.68	586
Total	**100**		**100**		**100**		**2,624**
Number	**2,054**		**570**		**2,624**		

* SE = standard error

Table 3.4 Percent distribution of selected socio-demographic characteristics of older individual respondents, by sex

	Men		Women		Total		Number
	Percent	SE*	Percent	SE	Percent	SE	
Age group							
50-59	49.3	5.66	46.9	4.67	48.1	4.16	1,111
60-69	26.3	3.57	25.0	3.26	25.6	2.7	592
70-79	15.7	2.09	19.6	2.51	17.8	1.88	412
80+	8.7	1.31	8.4	1.39	8.6	1.02	198
Total	**100**		**100**		**100**		**2,313**
Marital status							
Never married	2.8	0.73	10.7	2.85	7.0	1.65	157
Currently married	85.2	2.20	57.2	5.20	70.3	3.31	1,577
Cohabiting	3.8	0.89	1.9	0.66	2.7	0.60	62
Separated/divorced	2.4	0.73	6.3	1.40	4.5	0.86	101
Widowed	5.8	1.16	24	2.94	15.5	1.80	348
Total	**100**		**100**		**100**		**2,244**
Education							
No formal education	12.0	2.26	21.8	4.68	17.2	3.13	387
Less than primary	36.9	4.93	39.6	5.41	38.4	3.09	861
Primary school completed	29.8	5.84	19.0	2.72	24.0	2.83	539
Secondary school completed	8.6	2.27	11.0	2.70	9.9	1.81	223
High school completed	2.3	0.90	2.5	1.11	2.4	0.70	54
College completed	5.5	1.33	5.6	1.38	5.5	1.04	124
Post graduate degree completed	4.9	2.85	0.5	0.24	2.6	1.40	57
Total	**100**		**100**		**100**		**2,244**
Income quintile							
Lowest	13.3	2.24	17.1	2.80	15.3	2.01	353
Second	24.8	6.53	24.6	5.44	24.7	3.84	571
Middle	12.6	2.29	20.5	5.33	16.8	2.85	388
Fourth	19.7	3.30	13.9	2.20	16.6	2.16	384
Highest	29.6	5.56	24.0	4.09	26.6	3.57	615
Total	**100**		**100**		**100**		**2,311**
Religion							
None	3.5	1.05	0.9	0.29	2.1	0.52	48
Catholic	92.8	1.61	90.3	4.12	91.5	2.67	2,051
Evangelical	3.0	1.01	8.1	4.11	5.7	2.62	128
Other	0.7	0.35	0.7	0.20	0.7	0.23	16
Total	**100**		**100**		**100**		**2,242**

Table 3.4 Continued

	Men		Women		Total		Number
	Percent	SE*	Percent	SE	Percent	SE	
Mother tongue							
Maya	0.6	0.36	0.6	0.32	0.6	0.34	13
Nahuatl	1.3	1.06	0.8	0.70	1.0	0.66	23
Spanish	93.9	2.72	94.8	2.05	94.3	2.09	2,117
Zapoteco	3.5	2.63	2.7	1.84	3.0	1.99	68
Other	0.8	0.55	1.2	0.60	1.0	0.54	23
Total	**100**		**100**		**100**		**2,244**
Ethnic background							
None	95.7	2.22	98.3	0.82	97.1	1.18	2,157
Nahuatl	1.5	1.08	0.6	0.57	1.0	0.62	22
Zapoteco	2.3	2.08	0.6	0.57	1.4	1.06	31
Other	0.5	0.23	0.5	0.19	0.5	0.16	11
Total	**100**		**100**		**100**		**2,221**
Residence							
Urban/metropolitan	73.5	5.78	83.4	2.82	78.8	3.58	1,822
Rural	26.5	5.78	16.6	2.82	21.2	3.58	491
Total	**100**		**100**		**100**		**2,313**
Number	**1,083**		**1,230**		**2,313**		

* SE = standard error

4. Income, Consumption, Transfers and Retirement

Economic status is an important factor influencing health. In general, the older population is a vulnerable socio-demographic group as work force participation declines, especially in countries with limited coverage of older-age social protection systems. Therefore, the economic situation of the older population and the population who are about to become older is an important element of the SAGE survey.

This section presents results on household and individual respondents' economic conditions, including employment status and income, work history, and consumption. It also describes results related to retirement issues and to social and economic transfers. Social protection measures introduced in 2003 have resulted in significant advances towards achieving universal health coverage in Mexico, thereby ensuring a level of social protection for older adults not seen in many countries (Knaul, 2012). Nevertheless, since universal coverage has yet to see full implementation, catastrophic health spending and its impacts are documented here, as well as types of care given.

4.1 Work history

Information on the past and present work status of older respondents is presented in Table 4.1. Thirty-seven percent of older respondents were working at the time of the survey; 39% had never worked and 24% had stopped work. Among women, 18% were currently working. Among respondents aged 50 to 59, most (54%) were working; however, a considerable portion of respondents aged 80-plus (7.5%) continued to work. More urban dwellers were still working than those living in rural areas. For the most part, work participation increased with educational levels; only 20% of those with no formal education were currently working, compared with over 90% of those with post-graduate qualifications.

Table 4.2 presents information on age of stopping work and reasons for stopping. The mean age of stopping work was 48.3 years. However, the total time that older respondents had worked increased with age. Among respondents aged 50-59 years, the average age for stopping work was 39 years; this figure rose steadily, to 56 years among respondents aged 80-plus. While among respondents under 60, the most common reason for stopping work was failure to find work or dismissal, among older respondents, age, health and retirement gained prominence.

Both place of residence and marital status affected the age and reasons for stopping work. The average age at which older urban inhabitants stopped work or retired was 47, compared to 56 for older rural inhabitants. Meanwhile, those who had separated or divorced worked the longest, followed by those who had lost spouses and single persons.

Affluence bore a clear relation to the reason that respondents left work. Health and age-related issues were the most common reason for respondents in the lowest income quintiles stopping work; among persons in the highest income quintiles, most left work due to family responsibilities.

4.2 Income and transfers (household level)

Table 4.3 presents information on types of employment. The largest proportion of older respondents (35%) had been self-employed, with the private sector following at 27%. Older women were substantially more likely to have been employed in the informal sector than older men. Self-employment was the most common form of employment among both urban and rural inhabitants; however, in urban areas the second most common

Table 4.1 Percent distribution of past and current work status, by selected background characteristics

	Currently working		Currently not working		Never worked		Percent	Number
	%	SE*	%	SE	%	SE		
Sex								
Male	59.5	4.2	28.3	3.2	12.2	1.9	100	1028
Female	18.1	3.3	20.5	3.8	61.5	4.7	100	1176
Total	**37.4**	**3.0**	**24.1**	**2.5**	**38.5**	**3.2**	**100**	**2204**
Age group								
50-59	54.1	5.3	11.8	3.4	34.1	5.8	100	1082
60-69	31.1	3.1	29.1	3.8	39.8	3.5	100	568
70-79	12.7	2.3	39.3	4.0	47.9	4.7	100	393
80+	7.5	2.4	52.2	5.2	40.3	4.8	100	161
Total	**37.4**	**3.0**	**24.1**	**2.5**	**38.5**	**3.2**	**100**	**2204**
Education								
No formal education	20.2	4.2	28.0	4.9	51.8	6.9	100	380
Less than primary	34.7	6.9	23.3	4.0	42.0	6.9	100	845
Primary school completed	48.6	8.1	20.7	3.8	30.8	6.1	100	529
Secondary school completed	41.2	9.6	25.0	9.0	33.8	9.0	100	219
High school completed	31.4	11.7	39.1	14.6	29.5	17.0	100	53
College completed	32.5	7.2	32.2	7.4	35.3	8.5	100	122
Post graduate degree completed	91.8	5.5	7.0	4.7	1.2	1.0	100	56
Total	**37.4**	**3.0**	**24.1**	**2.5**	**38.5**	**3.2**	**100**	**2204**
Marital status								
Never married	26.8	3.8	24.9	3.2	48.3	4.2	100	334
Currently married	38.4	9.1	21.8	4.2	39.9	8.6	100	549
Cohabiting	28.8	7.3	21.8	5.9	49.3	11.0	100	364
Separated/divorced	39.4	5.4	22.4	3.7	38.2	4.9	100	367
Widowed	46.8	7.5	28.0	6.4	25.2	6.0	100	586
Total	**37.4**	**3.0**	**24.0**	**2.5**	**38.5**	**3.2**	**100**	**2200**
Residence								
Urban	37.5	3.2	25.2	3.1	37.3	3.6	100	1729
Rural	37.0	7.6	20.3	3.9	42.8	7.0	100	475
Total	**37.4**	**3.0**	**24.1**	**2.5**	**38.5**	**3.2**	**100**	**2204**
Number	**824**		**531**		**848**			**2204**

* SE = standard error.

Table 4.2 Mean age of retirement/work stoppage and reasons for discontinuation of work, by age, sex, location and income quintile

	Mean retirement age (yrs)	SE*	Reasons for work discontinuation (%)									
			Homemaker	SE	Health/age	SE	Redundancy	SE	Other	SE	Total (%)	Number
Sex												
Male	57.0	1.3	6.8	3.1	59.8	6.6	26.0	6.5	7.5	2.1	100	309
Female	39.4	2.7	63.8	4.7	28.4	6.8	6.2	4.2	1.6	0.9	100	276
Total	48.3	2.3	33.6	4.7	45.0	5.4	16.6	4.0	4.8	1.3	100	585
Age group												
50–59	38.5	2.8	58.0	8.2	9.7	4.3	27.7	8.6	4.5	2.7	100	146
60–69	47.9	1.7	21.2	5.5	50.8	8.2	22.4	9.6	5.7	2.4	100	181
70–79	51.5	3.4	36.3	7.4	50.6	7.3	9.4	5.4	3.7	1.9	100	164
80+	55.6	4.0	15.1	8.0	78.7	7.9	1.2	0.9	5.1	2.6	100	94
Total	48.3	2.3	33.6	4.7	45.0	5.4	16.6	4.0	4.8	1.3	100	585
Marital status												
Never married	48.1	3.9	54.4	17.5	31.0	12.0	2.2	1.7	12.4	7.1	100	33
Currently married	47.6	2.3	29.0	5.4	43.4	6.6	23.0	5.5	4.6	1.5	100	391
Cohabiting	47.9	2.1	64.1	17.6	32.9	16.7	3.0	2.8	0.0	0.0	100	18
Separated/divorced	53.9	5.5	28.7	11.3	49.8	13.2	12.8	8.4	8.7	7.9	100	33
Widowed	48.8	4.5	40.4	8.3	55.3	8.1	1.8	1.0	2.5	1.5	100	110
Total	48.3	2.3	33.6	4.7	45.0	5.4	16.6	4.0	4.8	1.3	100	585
Income quintile												
Lowest	57.0	2.2	17.3	4.0	64.5	6.1	10.4	4.1	7.8	3.6	100	93
Second	46.2	3.7	30.7	9.5	45.3	8.9	20.3	9.6	3.7	2.4	100	132
Middle	53.0	2.0	31.1	8.1	57.1	7.9	4.7	2.3	7.2	3.9	100	86
Fourth	47.8	3.5	39.0	9.8	48.8	9.5	8.5	5.6	3.7	1.9	100	93
Highest	43.2	3.9	42.7	8.9	26.4	8.6	27.6	9.5	3.3	1.8	100	176
Total	48.3	2.3	33.6	4.7	44.9	5.4	16.7	4.0	4.8	1.3	100	581
Residence												
Urban	47.1	2.5	38.4	4.9	45.2	6.2	12.3	2.9	4.2	1.4	100	481
Rural	55.6	1.7	11.5	4.1	44.2	9.4	36.8	14.4	7.5	3.0	100	104
Total	48.3	2.3	33.6	4.7	45.0	5.4	16.6	4.0	4.8	1.3	100	585
Number			197		263		97		28			585

* SE = standard error.

Table 4.3 Percentage distribution of selected background characteristics, by employment type (public or private sector, self-employed, informal employment)

	Public sector		Private sector		Self-employed		Informal sector		Total (%)	Number
	%	SE*	%	SE	%	SE	%	SE		
Sex										
Male	16.1	3.7	29.4	6.0	35.0	5.7	19.5	5.4	100	809
Female	8.9	2.2	23.4	4.8	36.8	5.2	31.0	5.8	100	406
Total	**13.7**	**2.6**	**27.4**	**4.4**	**35.6**	**4.4**	**23.4**	**4.0**	**100**	**1215**
Age group										
50-59	11.1	4.1	27.4	7.4	35.9	7.4	25.6	7.5	100	639
60-69	18.6	3.9	26.1	4.9	35.6	5.0	19.8	3.0	100	306
70-79	16.7	4.5	29.3	6.1	34.2	5.4	19.9	3.7	100	184
80+	8.6	2.6	28.0	6.1	36.5	7.1	26.9	7.7	100	86
Total	**13.7**	**2.6**	**27.4**	**4.4**	**35.6**	**4.4**	**23.4**	**4.0**	**100**	**1215**
Marital status										
Never married	8.0	3.2	26.0	10.7	26.2	10.3	39.8	18.0	100	99
Currently married	15.0	3.4	26.2	5.4	35.8	5.4	23.0	5.2	100	878
Cohabiting	14.2	12.0	19.2	7.9	42.4	11.5	24.1	9.3	100	39
Separated/divorced	12.1	6.8	28.8	7.4	43.4	9.9	15.6	6.1	100	51
Widowed	10.3	3.0	36.7	8.4	36.0	7.2	16.9	3.8	100	148
Total	**13.7**	**2.6**	**27.4**	**4.4**	**35.6**	**4.4**	**23.4**	**4.0**	**100**	**1215**
Income quintile										
Lowest	7.2	2.6	18.7	3.8	39.6	4.1	34.6	5.4	100	155
Second	4.2	1.7	17.9	6.0	36.0	11.1	42.0	12.2	100	296
Middle	13.4	4.1	16.9	3.9	50.6	6.8	19.0	4.7	100	165
Fourth	26.4	7.3	32.4	8.1	28.0	6.1	13.2	4.2	100	203
Highest	17.0	5.8	39.6	9.5	31.5	7.2	11.9	4.7	100	392
Total	**13.7**	**2.6**	**27.3**	**4.4**	**35.7**	**4.4**	**23.3**	**4.0**	**100**	**1211**
Residence										
Urban	16.0	3.1	32.4	5.1	32.9	5.0	18.7	3.1	100	972
Rural	4.4	1.7	7.3	2.4	46.4	9.9	41.9	12.3	100	243
Total	13.7	2.6	27.4	4.4	35.6	4.4	23.4	4.0	100	1215
Number	166		332		433		284			1215

* SE=standard error.

form was private sector employment, while in rural areas the informal sector came in second. Older respondents from lower-income households were more frequently self-employed or worked in the informal sector, while most of those from high-income households worked in the private sector or were self-employed.

Tables 4.4 and 4.5 outline income sources, amounts and perceived sufficiency. Wages and salaries made up the bulk of most respondents' incomes for both sexes and urban and rural place of residence alike. Urban residents had the highest median incomes. Overall, only 16% of respondents considered their incomes to be sufficient

Table 4.4 Percentage distribution of background characteristics for older adults, by type of income source

	Wage/salary			Trading			Rental income			Pension			Other		
	%	SE*	N	%	SE	N	%	SE	N	%	SE	N	%	SE	N
Sex															
Male	69.5	2.1	2243	18.5	1.6	2248	2.7	0.7	2255	17.9	1.4	2261	11.5	1.5	2252
Female	65.2	3.2	623	20.8	2.7	625	3.1	0.6	627	14.1	1.8	629	8.4	1.5	627
Total	**68.6**	**1.8**	**2866**	**19.0**	**1.4**	**2873**	**2.8**	**0.5**	**2882**	**17.1**	**1.2**	**2890**	**10.8**	**1.3**	**2879**
Residence															
Urban	71.4	1.8	2227	18.8	1.8	2231	2.8	0.6	2240	16.5	1.4	2245	11.3	1.6	2233
Rural	58.7	5.8	639	20.0	1.6	642	2.6	1.3	642	19.1	2.5	645	9.2	0.4	646
Total	**68.6**	**1.8**	**2866**	**19.0**	**1.4**	**2873**	**2.8**	**0.5**	**2882**	**17.1**	**1.2**	**2890**	**10.8**	**1.3**	**2879**
Marital status															
Never married	67.7	5.0	160	25.6	6.0	160	2.9	1.3	160	14.4	3.6	162	5.1	1.6	162
Currently married	70.9	2.4	1594	18.4	1.6	1599	2.8	0.9	1603	16.7	1.2	1608	9.2	1.3	1599
Cohabiting	82.8	4.4	122	25.4	10.5	123	0.1	0.1	123	16.4	6.3	123	9.4	3.6	123
Separated/divorced	60.7	7.4	98	20.6	7.7	99	3.3	1.9	98	18.3	5.5	99	8.0	3.6	99
Widowed	56.2	4.2	302	19.8	3.1	306	3.9	1.2	307	24.8	2.8	306	8.6	2.3	308
Total	**68.6**	**1.8**	**2277**	**19.0**	**1.4**	**2285**	**2.8**	**0.5**	**2291**	**17.1**	**1.2**	**2298**	**10.8**	**1.3**	**2290**
Income quintile															
Lowest	57.3	4.0	585	16.4	2.5	589	1.1	0.8	588	16.8	1.8	591	10.3	1.2	591
Second	65.4	4.2	632	16.7	3.9	634	1.3	0.4	636	17.7	3.5	636	12.8	4.3	636
Middle	68.1	3.9	531	18.9	2.5	535	2.6	0.7	537	16.0	2.0	539	11.6	2.1	539
Fourth	76.1	3.5	512	22.5	3.6	509	3.4	1.2	510	15.9	2.0	511	10.3	3.2	505
Highest	76.7	2.8	605	21.2	3.1	606	5.5	1.8	611	18.6	2.7	613	8.8	2.4	608
Total	**68.6**	**1.8**	**2866**	**19.0**	**1.4**	**2873**	**2.8**	**0.5**	**2882**	**17.1**	**1.2**	**2890**	**10.8**	**1.3**	**2879**

* SE = standard error.

Table 4.5 Self-reported mean monthly income (in pesos) and perceived income sufficiency (%)

	Mean monthly income (local currency)			Sufficient to cover needs*		
	Pesos	SE**	N	%	SE	N
Sex						
Male	5029.79	446.0	2523	15.4	1.6	2248
Female	4129.75	328.2	701	16.6	2.6	623
Total	**4833.99**	**370.3**	**3224**	**15.7**	**1.3**	**2871**
Residence						
Urban	5359.01	349.7	2505	16.56	1.54	2228
Rural	3005.21	256.5	719	12.64	1.14	643
Total	**4833.99**	**370.3**	**3224**	**15.68**	**1.34**	**2871**
Marital status						
Never married/cohabiting	3689.91	586.5	176	9.9	3.0	158
Currently married	5045.17	621.8	1766	15.3	2.0	1605
Cohabiting	5916.98	2237.5	134	27.7	10.9	122
Separated/divorced	3439.96	534.7	108	15.0	4.0	98
Widowed	3489.02	397.83	338	20.0	4.6	302
Total	**4833.99**	**370.3**	**2521**	**15.7**	**1.3**	**2286**
Income quintile						
Lowest	1834.51	177.1	593	6.1	0.9	585
Second	3691.48	560.3	637	11.6	2.6	630
Middle	4149.13	258.9	541	15.1	2.5	532
Fourth	6239.59	1106.6	517	15.3	3.3	508
Highest	8348.15	602.6	620	29.8	4.4	616
Total	**4833.99**	**370.3**	**2907**	**15.7**	**1.3**	**2871**

* "Sufficient" reflects a response of "completely" or "mostly" in response to the question "Do you have enough money to meet your needs?"
** SE = standard error.

to meet their needs. Men earned on average a slightly higher wage than women, but were slightly less likely to consider their incomes to be sufficient. Single respondents were particularly vulnerable, with less than 10% reporting adequate income. The mean monthly income of the highest income quintile was 4.6 times that of the lowest quintile. Nevertheless, only 30% of the highest earners considered their incomes to be sufficient— a figure still higher than the 6% of the lowest earners.

Transfers were considered to be financial or non-financial support either coming into the household, or being provided by a household member to someone outside the household. The three main types of support were monetary (for example, cash, loans, tuition, or paying for bills, fees or taxes); non-monetary (for example, food or other goods); and assistance (doing household chores or activities, meal preparation, shopping, cleaning,

laundry), providing care or transportation (help getting around outside the home). Table 4.6 describes types of monetary and non-monetary transfers into and out of households. Monetary support came mainly from other family members (81%), followed by government payments (75%), while non-monetary support came primarily from the community. Non-monetary assistance, meanwhile, was most likely to come from the family and the community. Households in the highest income quintile received the lowest levels of support (monetary or non-monetary) or assistance; households in the second and third income quintiles, meanwhile, had the highest levels.

In terms of support provided to others outside of the household, households were most likely to provide monetary support to family not living in the household, although the community also received striking levels of

Table 4.6 Percentage distribution of transfers into and out of households, by source (family and kin, community and government) and income quintile

| | Household transfers (%) | | | | | | Number of respondents |
| | Into household | | | Out of household | | | |
	Monetary	Non-monetary*	Assistance**	Monetary	Non-monetary	Assistance	
Sources							
Family and kin	81.3	38.4	17.7	61.3	55.4	24.0	2,927
Community	35.7	64.3	12.5	43.7	63.7	21.5	2,927
Government	75.0	34.2	.	4.5	.	.	2,927
Income quintile							
Lowest	20.3	19.4	19.2	17.9	15.5	27.5	498
Second	23.5	29.1	28.2	23.5	22.5	23.5	507
Middle	24.3	27.4	21.8	11.0	23.3	19.6	469
Fourth	21.4	15.4	18.0	24.1	20.9	15.7	552
Highest	10.6	8.6	12.8	23.5	17.8	13.7	427
Total							**2,453**

* Refers to the food or other goods.
** Refers to physical help in the year prior to interview, including involvement in household chores or activities (meal preparation, shopping, cleaning and laundry), physical care, or transportation/help getting around outside the home.

non-monetary support and assistance. High- and very high-income households most frequently provided monetary support; while low- and very low-income households most frequently provided non-monetary assistance.

Table 4.7 presents the mean hours of assistance provided to and by the household members. The mean number of hours of assistance provided to households by other family members and relatives was 15 hours per week, and by the community and neighbours

13 hours per week. Meanwhile, households provided a mean of 12 hours a week of assistance to other family members and relatives, and 13 hours to neighbours and other members of the community. Very high-income households received the most time in support of one of their members, while medium-income households (third quintile) received the least. In terms of support for others, households with the highest income provided most time and low-income households the least.

Table 4.7 Mean time transfers into and out of households, by source and income quintile

| | Mean time transfers (hours/week) | | Number of respondents |
	Into HH	Out of HH	
Sources			
Family and kin	15.0	11.6	98
Community/neighbours	12.8	13.1	90
Income quintile			
Lowest	11.1	6.2	14
Second	15.5	9.2	19
Middle	10.7	11.5	18
Fourth	14.1	12.3	21
Highest	18.4	23.1	11
Total			**98**

5. Health Risks and Behaviours

This section describes risks to health and measures how these risks are distributed in the population. The rationale behind the inclusion of risk factors in SAGE is that they have significant impact on mortality and morbidity from non-communicable diseases, and risk modification is possible through effective primary prevention and health promotion efforts. The SAGE questions are based on recommendations from the WHO NCD STEPS guidelines (WHO 2009).

Data were collected on four major behavioural risk factors (tobacco use, alcohol consumption, intake of fruit and vegetables, and physical activity levels), and on three environmental risk factors (water, sanitation and indoor air pollution). Interventions towards healthy behaviours and environments offer a large potential for disease prevention and can help to reduce health inequalities.

SAGE Wave 1 has added questions on food security, a particularly important issue for economically or socially vulnerable groups whose relevance will only increase with growing inequalities, environmental damage and rolling financial crises.

5.1 Tobacco and alcohol consumption

Tobacco and alcohol have well-documented and considerable impacts on health, namely heart disease and a range of cancers. The study asked about current use of any tobacco products, including inhaling, sniffing, and chewing tobacco, as well as duration and quantity of daily smoking or use. Users were categorized into current daily users, non-daily users, former users and never-users.

Table 5.1 presents information on the prevalence of tobacco use and daily consumption. Over 60% of the study's older respondents had never used tobacco; some 13% were daily users, while nearly 20% had given up tobacco. Interestingly, a sharp difference was observed between the numbers of respondents aged 60-69 (53%) and those aged 70-79 (67%) who had never smoked, raising questions about economic circumstances or social norms affecting the two demographics. In keeping with global patterns, men were more likely to be daily, occasional, or former smokers than women, while women were significantly more likely to have never smoked (78%, compared to around 41% for men). Respondents who had never married were more likely than the average to be current daily smokers (28%); those who were separated/divorced (who were highly disproportionally women) were both less likely than average to currently use tobacco and to have ever used tobacco.

The prevalence of tobacco use increased with increasing income level but also decreased with increasing education over the high school level. Respondents with no formal education, who were also the least likely to have much disposable income, were the most likely to have never smoked (71%), while those with post-graduate degrees were by far the most likely to have given up smoking (nearly 82%). Current smoking was highest among respondents who had finished high school but who had not attended college and among those in the highest income quintile (17%), and lowest among both those with no formal education and those with a post-graduate degree (under 6% in both cases) as well as in the lowest income quintile (9.3%). Urban residents were more likely to be current smokers; rural residents were more likely to have quit or to never have smoked at all.

Table 5.2 presents information on mean daily tobacco consumption by daily smokers. The mean tobacco consumption by those respondents who did smoke

Table 5.1 Prevalence of tobacco use for different consumption patterns, by selected background characteristics

	Tobacco use								Total Percent	Number
	Current daily user		User, not daily		Not current user		Never used			
	Percent	SE*	Percent	SE	Percent	SE	Percent	SE		
Age group										
50-59	14.5	5.34	6.9	2.37	16.3	3.92	62.2	6.36	100	1,101
60-69	14.0	2.07	9.2	2.35	23.7	3.64	53.1	3.84	100	578
70-79	10.7	2.03	4.6	1.28	17.7	3.41	67.0	3.64	100	401
80+	8.9	2.68	4.5	1.86	24.8	4.18	61.8	4.93	100	164
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,243**
Sex										
Men	18.8	4.27	11.1	2.53	29.5	3.90	40.6	4.81	100	1,046
Women	8.5	3.08	3.2	1.20	10.0	2.36	78.3	3.35	100	1,197
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,243**
Education										
No formal education	5.9	1.91	3.0	1.13	19.3	4.94	71.7	5.51	100	387
Less than primary	13.2	4.02	5.3	1.38	18.8	3.76	62.6	5.60	100	859
Primary school completed	17.9	7.24	9.0	3.15	16.2	3.73	56.9	7.04	100	539
Secondary school completed	10.8	4.22	13.2	8.16	14.3	5.13	61.8	9.34	100	223
High school completed	32.0	14.04	9.6	5.95	8.5	4.50	49.9	15.09	100	54
College completed	16.6	5.86	12.1	7.48	17.1	5.12	54.2	8.35	100	124
Post graduate degree completed	5.3	5.58	0.7	0.8	81.8	12.92	12.2	8.00	100	57
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,243**
Marital status										
Never married	28.2	15.28	5.7	2.56	14.3	6.65	51.8	12.36	100	157
Currently married	13.1	3.09	7.5	1.84	20.6	3.15	58.8	4.31	100	1,576
Cohabiting	11.4	5.17	17.6	8.73	25.7	6.90	45.2	9.24	100	62
Separated/divorced	7.8	3.17	7.6	4.33	7.3	2.35	77.3	5.72	100	100
Widowed	9.4	1.82	2.7	0.94	16.7	4.50	71.1	4.41	100	348
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,243**
Income quintile										
Lowest	9.3	2.40	4.1	1.34	17.5	3.58	69.1	4.35	100	340
Second	12.9	5.04	2.7	1.00	16.1	3.33	68.3	5.14	100	559
Middle	11.1	3.90	3.8	1.32	15.2	3.52	69.9	6.89	100	371
Fourth	13.5	3.29	10.7	3.09	21.4	4.02	54.4	5.42	100	374
Highest	17.2	7.00	12.1	4.20	23.8	6.04	46.9	6.49	100	597
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,240**
Residence										
Urban	15.2	3.49	7.8	1.73	17.7	2.74	59.2	3.71	100	1,760
Rural	6.3	1.56	3.7	0.96	24.0	4.46	65.9	5.05	100	483
Total	**13.3**	**2.83**	**6.9**	**1.37**	**19.1**	**2.40**	**60.7**	**3.12**	**100**	**2,243**
Number	**298**		**155**		**428**		**1,361**		**2,243**	

* SE = standard error.

Table 5.2 Mean daily tobacco consumption by daily smokers

	Mean daily tobacco consumption*		
	Mean	SE**	Number
Age group			
50-59	9.9	1.73	160
60-69	12.2	1.76	81
70-79	21.7	7.35	43
80+	12.1	1.24	15
Total	**12.3**	**1.26**	**298**
Sex			
Men	13.2	2.37	197
Women	10.7	1.79	101
Total	**12.3**	**1.26**	**298**

* Average number of daily cigarettes/cigarette equivalents.

** SE = standard error.

daily was 12.3 cigarettes—higher than one other country in the SAGE study (Ghana, where the highest use was 5.7 cigarettes/day) but lower than several others (China, Russia, or India, whose highest users of all tobacco products topped the global survey at 35.3 cigarette equivalents/day). Daily use by men was higher than that of women by a little under a third.

Table 5.3 presents information on alcohol consumption. The figures on alcohol consumption are consistent with a steady increase in alcohol consumption among Mexican women across the last fifty-plus years. Over 90% of respondents aged 80-plus described themselves as lifetime abstainers; by contrast, only a bit over 50% of respondents aged 50-59 were abstainers. Nevertheless, over 83% of the study's total older women still said that they had never drunk alcohol, a figure that was closely replicated in the two marital status groups dominated by women (separated/divorced and widowed). As age decreased, the percentage reporting moderate drinking increased by a factor of five (from around 8% among those aged 80-plus to around 40% among those aged 50-59), while those reporting infrequent heavy drinking rose more than 18-fold (0.5% to 9.1%). Very few (less than 1%) of older respondents said that they were frequent heavy drinkers. Interestingly, those with a post-graduate degree were by far the least likely to have been life-long abstainers at only 7.6%, while those with no formal education were by far the most likely at over 93%—a fact that may reflect the disproportionate number of women in the latter

group. Percentages of drinkers were roughly equal across areas of residence and across the three middle income quintiles, although significantly lower in the lowest income quintile (where women were disproportionately represented) and higher in the highest income quintile (dominated by men).

5.2 Diet and physical activity

SAGE collected data on the number of servings of fruit and vegetables eaten by respondents on a typical day (WHO, 2009). WHO considers consumption of fewer than five servings of fruit and vegetables per day (80g per serving for a total of 400g daily) to be insufficient to reduce the risk of diet contributing to cardiovascular disease and other health conditions (WHO, 2003). The 2010 Global Burden of Disease estimates showed that dietary risk and physical inactivity ranked third and seventh, respectively, among leading risk factors in Mexico (IHME 2012. www.healthmetricsandevaluation. org/sites/default/files/country-profiles/GBD%20Country %20Report%20-%20Mexico.pdf).

Table 5.4 presents information on fruit and vegetable consumption. The large majority of respondents—three quarters of men, and over 85% of women, for a total of over 80% overall—did not consume a healthy amount of fruit and vegetables. These proportions were roughly consistent across age groups, although respondents aged 60-69 were slightly more likely to

Table 5.3 Alcohol consumption, by selected background characteristics*

	Alcohol consumption (%)								Total Percent	Number
	Lifetime abstainer		Non-heavy drinker		Infrequent heavy drinker		Frequent heavy drinker			
	Percent	SE**	Percent	SE	Percent	SE	Percent	SE		
Age group										
50-59	51.2	8.76	39.7	9.52	9.1	3.86	0	0	100	827
60-69	72.4	3.58	23.1	3.47	4.1	1.36	0.3	0.30	100	344
70-79	82.5	4.59	14.9	4.28	2.6	1.11	0	0	100	285
80+	91.1	2.22	7.7	2.14	0.5	0.52	0.6	0.59	100	107
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,563**
Sex										
Men	36	6.40	49.1	7.96	14.7	4.98	0.3	0.20	100	629
Women	83.4	7.42	16.0	7.46	0.6	0.31	0	0	100	934
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,563**
Education										
No formal education	93.3	2.20	5.5	2.06	1.0	0.53	0.2	0.24	100	277
Less than primary	57.6	9.81	38.9	10.34	3.5	1.09	0	0	100	632
Primary school completed	62.4	10.06	29.5	10.62	7.8	3.58	0.3	0.30	100	356
Secondary school completed	64	13.11	19.1	8.07	16.9	12.79	0	0	100	134
High school completed	82.9	9.05	17.1	9.05	0	0	0	0	100	42
College completed	51.9	10.56	47.8	10.57	0.3	0.32	0	0	100	72
Post graduate degree completed	7.6	6.41	49.1	31.49	43.3	31.37	0	0	100	51
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,563**
Marital status										
Never married	62.2	16.91	31.6	18.07	6.2	3.54	0	0	100	125
Currently married	57.8	7.09	34.1	7.54	7.9	2.93	0.2	0.11	100	1,091
Cohabiting	63.2	10.94	33.9	10.81	3	2.21	0	0	100	37
Separated/divorced	89.1	3.92	10.9	3.92	0	0	0	0	100	58
Widowed	88.1	4.25	10.9	4.22	1	0.59	0	0	100	252
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,563**
Income quintile										
Lowest	88.6	2.58	7.5	2.07	3.8	1.67	0	0	100	230
Second	64.6	11.56	32.7	11.87	2.4	1.52	0.3	0.28	100	388
Middle	59.7	18.38	37.3	19.19	3	1.47	0	0	100	261
Fourth	60.8	7.03	30.7	7.53	8.2	4.30	0.3	0.27	100	247
Highest	55.9	9.93	32.4	10.22	11.8	6.34	0	0	100	435
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,561**
Residence										
Urban	63.3	5.93	30.2	6.18	6.4	2.59	0.1	0.09	100	1,223
Rural	68.1	12.60	26.0	13.51	5.7	2.14	0.2	0.20	100	340
Total	**64.3**	**5.38**	**29.3**	**5.65**	**6.2**	**2.08**	**0.1**	**0.08**	**100**	**1,563**
Number	**1,006**		**458**		**97**		**2**		**1,563**	

* Life-time abstainer: never consumed alcoholic beverages; non-heavy drinker : <2 days per week with 5 or more standard drinks in last 7 days; infrequent heavy drinker: 2-3 days per week with 5+ standard drinks in last 7 days; frequent heavy drinker: 4 or more days per week with 5+ standard drinks in last 7 days.

* SE = standard error.

Table 5.4 Sufficiency of intake of fruit/vegetables, by selected background characteristics*

	Diet				Total Percent	Number
	Insufficient intake of fruit and vegetables		Sufficient intake of fruit and vegetables			
	Percent	SE**	Percent	SE		
Age group						
50-59	82.7	6.21	17.3	6.21	100	1,111
60-69	76.2	3.56	23.8	3.56	100	592
70-79	82.2	3.03	17.8	3.03	100	412
80+	88.2	2.40	11.8	2.40	100	198
Total	**81.4**	**3.29**	**18.6**	**3.29**	**100**	**2,313**
Sex						
Men	75.6	5.85	24.4	5.85	100	1,083
Women	86.5	2.11	13.5	2.11	100	1,230
Total	**81.4**	**3.29**	**18.6**	**3.29**	**100**	**2,313**
Education						
No formal education	88.6	3.66	11.4	3.66	100	387
Less than primary	77.7	6.41	22.3	6.41	100	861
Primary school completed	85.1	3.12	14.9	3.12	100	539
Secondary school completed	83.5	5.77	16.5	5.77	100	223
High school completed	78.8	10.31	21.2	10.31	100	54
College completed	69	7.61	31	7.61	100	124
Post graduate degree completed	52.6	28.14	47.4	28.14	100	57
Total	**80.8**	**3.39**	**19.2**	**3.39**	**100**	**2,244**
Marital status						
Never married	84.0	6.47	16.0	6.47	100	157
Currently married	79.2	4.65	20.8	4.65	100	1,577
Cohabiting	89.9	3.51	10.1	3.51	100	62
Separated/divorced	88.4	3.58	11.6	3.58	100	101
Widowed	83.1	2.73	16.9	2.73	100	348
Total	**80.8**	**3.39**	**19.2**	**3.39**	**100**	**2,244**
Income quintile						
Lowest	89.1	2.41	10.9	2.41	100	353
Second	79.8	10.50	20.2	10.50	100	571
Middle	82.2	5.13	17.8	5.13	100	388
Fourth	76.7	3.51	23.3	3.51	100	384
Highest	80.7	5.06	19.3	5.06	100	615
Total	**81.4**	**3.29**	**18.6**	**3.29**	**100**	**2,311**
Residence						
Urban	84.2	2.31	15.8	2.31	100	1,822
Rural	70.9	11.31	29.1	11.31	100	491
Total	**81.4**	**3.29**	**18.6**	**3.29**	**100**	**2,313**
Number	**1,883**		**430**		**2,313**	

* Insufficient intake of fruit or vegetables: less than five servings (400g) in a typical day on average in the last seven days.

** SE = standard error.

Table 5.5 Percent distribution of low, moderate and high physical activity levels, by selected background characteristics

	Physical activity levels*						Total Percent	Number
	Low		Moderate		High			
	Percent	SE**	Percent	SE	Percent	SE		
Age group								
50-59	28.1	6.16	20.0	4.7	51.9	7.9	100	1,073
60-69	39.6	3.59	26.6	3.19	33.8	3.97	100	562
70-79	50.8	5.94	24.2	7.56	25.0	3.94	100	392
80+	63.8	4.96	21.1	4.29	15.1	4.65	100	160
Total	**37.7**	**3.95**	**22.5**	**3.37**	**39.7**	**4.85**	**100**	**2,186**
Sex								
Men	31.0	3.75	19.5	2.81	49.5	5.32	100	1,023
Women	43.7	5.56	25.3	5.30	31.1	6.08	100	1,163
Total	**37.7**	**3.95**	**22.5**	**3.37**	**39.7**	**4.85**	**100**	**2,186**
Marital status								
Never married	46.1	11.52	31.0	14.77	22.8	6.22	100	154
Currently married	32.6	4.55	20.2	2.95	47.2	5.94	100	1,534
Cohabiting	41.0	8.92	27.1	7.89	31.9	7.78	100	60
Separated/divorced	51.0	9.13	27.2	8.70	21.8	5.88	100	98
Widowed	52.5	6.83	27.2	7.71	20.2	4.07	100	339
Total	**37.7**	**3.95**	**22.5**	**3.37**	**39.7**	**4.85**	**100**	**2,186**
Education								
No formal education	54.2	6.66	20.9	4.14	25.0	5.35	100	378
Less than primary	34.8	5.02	24.0	5.05	41.2	7.33	100	841
Primary school completed	32.3	6.59	19.1	5.55	48.7	8.35	100	520
Secondary school completed	33.0	8.12	19.2	6.11	47.9	10.12	100	217
High school completed	38.0	12.99	44.5	16.27	17.5	8.67	100	52
College completed	51.3	7.74	18.6	3.91	30.1	7.96	100	121
Post graduate degree completed	10.5	8.49	45.0	28.43	44.4	28.22	100	56
Total	**37.7**	**3.95**	**22.5**	**3.37**	**39.7**	**4.85**	**100**	**2,186**
Income quintile								
Lowest	45.9	3.77	21.6	3.16	32.6	4.15	100	333
Second	38.1	9.43	27.9	8.96	34.0	10.21	100	547
Middle	27.5	6.95	21.3	6.16	51.2	11.99	100	356
Fourth	46.9	5.57	15.4	2.66	37.7	6.08	100	364
Highest	33.2	5.65	23.2	5.44	43.6	8.10	100	584
Total	**37.7**	**3.95**	**22.5**	**3.38**	**39.8**	**4.86**	**100**	**2,184**
Residence								
Urban	39.0	4.79	22.5	4.18	38.5	5.91	100	1,713
Rural	33.0	5.92	22.9	3.75	44.2	6.89	100	473
Total	**37.7**	**3.95**	**22.5**	**3.37**	**39.7**	**4.85**	**100**	**2,186**
Number	**825**		**493**		**868**		**2,186**	

* High physical activity: vigorous-intensity activity achieving a minimum of at least 1500 MET (metabolic equivalent)-minutes on at least 3 days per week or 7 or more episodes of any combination of walking, moderate or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes per week. Moderate physical activity: 3 or more days of vigorous-intensity activity of at least 20 minutes per day or 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day or 5 or more days of any combination of walking, moderate or vigorous intensity activities achieving a minimum of at least 600 MET-minutes per week.Low physical activity: activity not meeting any of the above criteria.

** SE = standard error.

Source: (WHO 2009).

consume sufficient fruit and vegetables and those aged 80-plus who were highly unlikely to do so. Respondents with college and particularly post-graduate educations were the most likely to eat well; those in the lowest income quintile (as well as female cohabiting/separated/divorced/widowed respondents) were the least likely. Meanwhile, rural residents, while still not scoring well, were significantly more likely to eat healthily than urban residents (71% insufficient, as opposed to 84%).

Physical activity refers to activity undertaken at work, around the home and garden, to get to and from places, and for recreation, fitness and sport. Regular physical activity has a significant positive effect in preventing ischemic heart diseases, ischemic stroke, diabetes mellitus, and breast and colon cancers. Questions on physical activity were based on the Global Physical Activity Questionnaire (GPAQ) (Bull, 2007; Hoos, 2012) and assessed the frequency and intensity of physical activity over the preceding seven days.

Table 5.5 presents information on activity levels. Less than half of the respondents had engaged in high-level physical activity in the previous week, and an almost equal number had only engaged in low-level activity. Levels of activity decreased with increasing age. Men

were more likely than women to engage in either high or moderate activity (69% across the two categories for men, as opposed to 56% for women). Across other demographic characteristics, activity levels varied without clear patterns, suggesting a role for structural factors such as employment type, access to public transport, or public safety as well as personal factors such as health status or leisure time activities.

5.3 Access to improved water sources and sanitation

Access to improved water and sanitation are crucial to health outcomes. Epidemiological evidence suggests that improved sanitation is at least as effective in preventing disease as improved water supply. SAGE's questions on water and sanitation were based on 2006 WHO/UNICEF international survey standards and therefore should be comparable to other recently collected and future data.

Table 5.6 presents information on access to improved water and sanitation. The large majority (97%) of the study's respondents had access to improved drinking

Table 5.6 **Access to improved drinking water and sanitation, by income quintile and residence**

	Drinking water source				Sanitation				Total Percent	Number of HHs
	Improved		Unimproved		Improved		Unimproved			
	Percent	SE**	Percent	SE	Percent	SE	Percent	SE		
Income quintile										
Lowest	91.7	2.95	2.95	8.3	77.1	4.01	22.9	4.01	100	594
Second	97.9	0.80	0.80	2.1	73.9	4.67	26.1	4.67	100	638
Middle	97.9	0.68	0.68	2.1	87.8	2.24	12.2	2.24	100	542
Fourth	98.3	0.83	0.83	1.7	77.5	6.32	22.5	6.32	100	518
Highest	99.1	0.35	0.35	0.9	84.4	3.65	15.6	3.65	100	621
Total	**97.0**	**0.69**	**0.69**	**3.0**	**80.0**	**2.71**	**20.0**	**2.71**	**100**	**2,913**
Residence										
Urban	97.8	0.61	0.61	2.2	80.7	3.32	19.3	3.32	100	2,264
Rural	93.9	2.14	2.14	6.1	77.6	3.86	22.4	3.86	100	649
Total	**97.0**	**0.69**	**0.69**	**3.0**	**80.0**	**2.71**	**20.0**	**2.71**	**100**	**2,913**
Number of HHs	**2,824**			**89**	**2,331**		**582**		**2,913**	

* Improved water means piped into household or yard/plot. Other improved sources: public standpipe, tube well/borehole, protected dug well, protected spring, rainwater collection, bottled water. Unimproved sources: unprotected dug well, unprotected spring, surface water, tanker truck. Other improved sanitation: connection to septic system, pour-flush latrine, covered dry latrine (with privacy) [provided facilities not shared]. Unimproved facility: uncovered dry latrine (without privacy), bucket latrine, no facilities (open defecation).
** SE = standard error.

Table 5.7 Cooking fuel type, by income quintile and residence

| | Cooking fuel used | | | | Total Percent | Number of HHs |
| | Clean fuel | | Solid fuel* | | | |
	Percent	SE**	Percent	SE		
Income quintile						
Lowest	58.0	7.85	41.9	7.85	100	594
Second	92.9	2.89	7.1	2.89	100	638
Middle	97.2	1.22	2.8	1.22	100	542
Fourth	98.0	0.89	1.8	0.81	100	518
Highest	99.9	0.14	0.1	0.14	100	621
Total	**89.0**	**2.70**	**11.0**	**2.69**	**100**	**2,913**
Residence						
Urban	97.7	0.66	2.3	0.66	100	2,264
Rural	58.5	9.08	41.3	9.05	100	649
Total	**89.0**	**2.70**	**11.0**	**2.69**	**100**	**2,913**
Number of HHs	**2,592**		**320**		**2,912**	

* Coal, charcoal, wood, agriculture/crop, animal dung, shrubs/grass and other.

** SE = standard error.

water, with the lowest level of access (that of lowest-income households) still at 91%. By contrast, only 80% of respondents had improved sanitation, with the lowest levels found in the two lowest income quintiles (as low as 73% for the second quintile) and rural residents (around 77%).

5.4 Solid fuel use and indoor air pollution

The use of solid fuels such as wood, coal, agricultural and crop residues can have a serious effect on respiratory health. Traditional low-efficiency stoves produce heavy smoke with fine particles, carbon monoxide and carcinogenic compounds. Women are at high risk of chronic respiratory disease and eye conditions, as they have traditionally spent more time in the home, particularly during cooking.

Table 5.7 shows fuel sources used by the study's households. While almost 90% of households overall used clean fuel for cooking, lowest-income households and rural residents were significantly more likely to be using solid fuel (58% and nearly 59%, respectively). The 2010 GBD estimates indeed show that household air pollution is in the top 15 leading health risks in Mexico (IHME, 2012).

6. Health State

The World Health Organization defines health as a multi-dimensional construct:

> ". . . health is a state of complete physical, mental and social well-being, not just the absence of disease or infirmity." (WHO Constitution, 1948)

This definition has been operationalised more recently as the measurement of health across a parsimonious set of health domains. SAGE included eight different health domains, as well as a single overall general health question, as a means to measure health state. Responses to the different domains were combined into a composite health score that is useful for approximating someone's true health. This improves our understanding of the determinants of health and the comparability of data at the individual and population levels.

6.1 Self-reported overall general health and day-to-day activity

Self-reported general health status in epidemiological surveys has been well studied and applied, and has been shown to be an important and easily collected health indicator. Often it is included as a single question, and has been a good predictor for numerous health and health-related outcomes. SAGE included a common version of this overall general health question—"In general, how would you rate your health today?"—using a 5-point response scale ranging from "very good" to "very bad".

Table 6.1 presents information on overall self-rated health. The large majority (81%) of respondents described their health as falling in the moderate to good range. Only a small percentage (2.3%) described their health as 'very good;' however, an even smaller percentage described

their health as 'very bad' (0.3%). In common with other SAGE countries, women had similar results for very bad or very good health, but differed sharply from men in the middle range, with far more (nearly 22%) describing their health as 'bad' than men (around 11%), and with rates of self-reported health as 'moderate' or 'good' around 5% lower than those of men in both categories. Interestingly, older respondents did not consider themselves significantly less healthy than those in younger age groups, with 50-59 year olds actually topping the 'bad' characterisation at 20.5%. Distribution by income quintile followed a slightly more predictable pattern, with members of the highest quintile much more likely to enjoy very good health and disinclined to admit to very bad health at all; nevertheless, it was the third quintile that reported the worst health overall, and not the poorest. Intriguingly, over 85% of those who had never married enjoyed moderate to good health, compared to 80-81% among the currently married, the separated/divorced and the widowed. By contrast, only nearly 77% of those cohabiting fell in that range, with a much higher proportion (32% more) reporting 'moderate' health than 'good'. Urban residents enjoyed a clear health advantage, topping the 'very good' and 'good' characterisations and coming in lower on all the other three characterisations than rural residents.

6.2 Composite health state score and disability score

A summary score for health state was generated from responses to 16 questions covering the following eight domains: mobility, self-care, pain and discomfort, cognition, interpersonal activities, vision, sleep and energy, and affect. Results are discussed in terms of mean scores, with a higher score representing better health.

Table 6.1 Percent distribution of overall general health, by selected background characteristics

	Very good		Good		Moderate		Bad		Very bad		Total Percent	Number
	%	SE*	%	SE	%	SE	%	SE	%	SE		
Sex												
Men	2.0	0.53	41.1	5.42	45.5	4.82	11.1	5.08	0.3	0.14	100	1028
Women	2.4	1.30	36.7	4.51	38.9	4.05	21.7	5.69	0.3	0.12	100	1176
Total	**2.3**	**0.74**	**38.8**	**2.91**	**42.0**	**3.43**	**16.7**	**3.59**	**0.3**	**0.09**	**100**	**2204**
Age group												
50-59	0.8	0.43	41.2	5.70	37.5	6.15	20.5	6.67	0.0	0.03	100	1082
60-69	5.3	2.51	36.6	3.09	44.9	4.01	12.6	1.95	0.6	0.30	100	568
70-79	1.6	0.60	34.3	4.95	49.6	5.96	14.2	3.44	0.3	0.19	100	393
80+	2.5	0.95	41.0	5.12	43.6	4.91	12.4	2.54	0.5	0.40	100	161
Total	**2.3**	**0.74**	**38.8**	**2.91**	**42.0**	**3.43**	**16.7**	**3.59**	**0.3**	**0.09**	**100**	**2204**
Marital status												
Never married	1.3	0.76	58.3	10.69	27.1	8.01	13.3	7.04	0	0	100	155
Currently married	1.3	0.36	39.2	3.96	41.4	4.66	18.0	4.86	0.1	0.06	100	1548
Cohabiting	2.5	1.70	22.4	6.37	54.4	9.52	20.5	7.39	0.3	0.28	100	61
Separated/divorced	3.0	2.24	33.0	8.07	47.4	8.48	16.7	7.23	0.1	0.05	100	99
Widowed	6.7	4.17	32.6	5.21	47.8	6.54	11.9	2.81	1.1	0.52	100	341
Total	**2.3**	**0.74**	**38.8**	**2.91**	**42.0**	**3.43**	**16.7**	**3.59**	**0.3**	**0.09**	**100**	**2204**
Income quintile												
Lowest	1.9	0.71	32.5	4.60	49.0	4.50	15.8	3.08	0.8	0.45	100	334
Second	0.8	0.39	45.8	9.42	32.3	5.32	20.9	9.06	0.3	0.17	100	549
Middle	1.3	0.72	26.8	7.13	42.0	9.25	29.6	14.80	0.3	0.29	100	364
Fourth	1.1	0.39	37.3	4.89	52.5	5.44	9.2	2.44	0	0	100	367
Highest	5.2	2.61	43.9	6.42	40.8	6.89	10.2	3.70	0	0.02	100	586
Total	**2.2**	**0.74**	**38.7**	**2.91**	**42.1**	**3.43**	**16.7**	**3.60**	**0.3**	**0.09**	**100**	**2200**
Residence												
Urban	2.4	0.93	41.5	3.19	39.9	4.00	16.0	3.65	0.2	0.10	100	1729
Rural	1.6	0.48	28.9	5.61	49.7	5.96	19.4	9.96	0.4	0.18	100	475
Total	**2.3**	**0.74**	**38.8**	**2.91**	**42.0**	**3.43**	**16.7**	**3.59**	**0.3**	**0.09**	**100**	**2204**
Number	**49**		**855**		**926**		**368**		**6**			**2204**

* SE = standard error.

Decrements in health, specifically disability or functioning, were also measured using the 12-item version of WHO Disability Assessment Scale 2.0 (WHODAS). The WHODAS is a measure of functioning or disability that evaluates six domains of day-to-day functioning – understanding and communicating, getting around, self-care, getting along with people, household activities and participation in society –over the last 30 days. Details on the selected items and how individual scores were computed are given in Appendix 1. The final score was rescaled to 0 to 100, with a higher score implying higher levels of disability.

Table 6.2 presents mean health state and WHODAS scores. Compared to the single self-reported health question, respondents' health state scores followed different patterns. Women showed lower (i.e. worse) health state scores than men; scores dropped with increasing age and rose with increasing education levels and (for the most part) income quintiles. Widow/widower status showed more noticeable impacts on health state, and urban residents showed better scores. However, the middle income quintile continued to show the lowest scores, and the never-married continued to solidly outperform the mean.

Table 6.2 Percent distribution of mean composite health state score (not adjusted for vignettes) and mean WHODAS score, by selected background characteristics

	Health state score			WHODAS score		
	Mean	SE*	Number	Mean	SE	Number
Sex						
Men	64.7	1.69	1028	14.1	1.41	1,083
Women	60.5	1.68	1176	16.3	1.28	1,230
Age group						
50-59	65.3	1.75	1082	11.9	1.65	1,111
60-69	61.6	0.90	568	15.5	0.86	592
70-79	60.2	2.31	393	18.8	2.13	412
80+	52.3	1.27	161	25.5	1.93	198
Marital status						
Never married	69.3	6.40	155	11.8	1.58	157
Currently married	62.7	1.07	1548	14.8	1.21	1,577
Cohabiting	61.9	2.97	61	20.9	3.55	62
Separated/divorced	60.6	2.25	99	20.2	3.16	101
Widowed	59.0	1.92	341	19.1	2.18	348
Education						
No formal education	58.3	1.23	380	21.2	2.45	387
Primary incomplete	60.1	2.10	845	18.9	1.55	861
Primary school completed	65.5	2.17	529	10.9	1.50	539
Secondary school completed	64.6	2.27	219	9.6	1.52	223
High school	67.4	5.11	53	11.1	2.56	54
College	68.3	1.34	122	10.4	1.41	124
Post-graduate	70.9	7.39	56	14.8	5.51	57
Income quintile						
Lowest	56.9	1.05	334	24.0	1.31	353
Second	64.9	4.01	549	14.9	2.88	571
Middle	57.8	1.33	364	15.9	1.40	388
Fourth	65.0	1.68	367	13.0	1.46	384
Highest	64.6	1.35	586	11.5	1.09	615
Residence						
Urban	63.6	1.29	1729	13.7	0.97	1,822
Rural	58.4	1.93	475	20.8	1.89	491
Total	**62.5**	**1.18**	**2204**	**15.2**	**1.01**	**2,313**

* SE = standard error.

Some similar patterns were seen in the WHODAS results. Women showed higher disability than men; scores rose with age and roughly dropped with increasing income. The never-married continued to score well and urban residents had lower disability levels. However, respondents with post-graduate education actually scored worse than most other educational levels, and cohabiting, separated/divorced and widowed respondents scored noticeably worse than those currently married.

6.3 Functioning and health: ADLs and IADLs

Measures of functioning are common in surveys of older adults, and often include an assessment of the Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADL). ADLs are considered basic tasks of everyday life, such as bathing, eating, dressing and toileting. IADLs include activities that are more complex than ADLs, such as meal preparation, doing housework, and travelling. Deficiencies or limitations in ADLs or IADLs suggest cognitive and/or physical decline signalling a need for assistance. WHODAS contains many of the most commonly asked ADL and IADL questions, as well as assessing severity of disability. SAGE included a fuller set of ADLs and IADLs widely used in surveys and studies of older populations to assess disability. A list of ADL and IADL items included in the study is given in Appendix 2. SAGE also compared deficiencies in ADLs and IADLs to WHODAS scores (Tables 6.3 and 6.4).

The overall level of disability in the community was low, which was to be expected from a community-based sample of older adults (Table 6.2). The level of disability was higher among women than among men on average (16.3 in comparison to 14.1, respectively), and clearly increased with increasing age.

Table 6.3 presents information on ADL deficiencies. Overall, nearly 37% of respondents had one or more ADL limitations, and over one-fifth had two or more limitations. Women were noticeably more likely to suffer some limitation than men (40%, as opposed to 32.5%) as well as to suffer more severe levels of impairment than men (around one-quarter with two or more limitations, as opposed to around 17%). Levels of impairment rose steadily with age. The level of severe (2-plus) impairment was highest among the two oldest age groups (nearly 54% respondents aged 80-plus) and those in the lowest income quintile (around 40%); however, respondents who lacked a partner, either due

to separation/divorce or widowhood, were not far behind. The gap between the lowest and highest income quintiles was around 25%. Rural residents were noticeably more likely to suffer from one ADL limitation, but only slightly more likely to suffer from two or more.

Because the IADLs measure a more complex level of activities, deficiencies in these would suggest less severe impairment or disability than deficiencies in ADLs. Using them together may allow for general assessment of severity of disability.

Table 6.4 presents information on IADL deficiencies. A smaller percentage of respondents reported difficulties with IADLs than reported ADL limitations. Over 90% of respondents said that they had no difficulties with any IADL, and only 5.6% reported limitations in two or more IADLs. At greatest risk of severe impairment (deficiency in relation to two or more IADLs) were the oldest respondents (25% among those aged 80-plus), those in the lowest income quintile (nearly 15%), widows/widowers (over 12%), and those with no formal education (nearly 12%).

6.4 Measured cognitive function

Lower WHODAS scores and/or deficiencies in ADLs or IADLs often signal cognitive decline or dementia; the challenge is to differentiate normal age-related changes in cognition from cognitive impairment. In addition to ADL-type measures in SAGE, self-reported cognition and cognition tests were used.

Three cognition tests were used: verbal fluency (VF), verbal recall (VR), and digit span (DS). These tested learning ability, concentration and memory. The test used for verbal fluency challenged the respondent to produce as many words (animals) as possible in a one-minute time span. Immediate verbal and delayed verbal recall were used as tests of memory, wherein 10 words were successively presented after which the respondent was given the opportunity to recall as many of the words as possible. This was repeated three times to saturate the learning curve. After about 10 minutes of interview time, recall and recognition of the same 10 words were again tested. Digit span forward and backward were the last tests used for testing working memory and executive function.

A single composite cognition score was compiled using an exploratory and confirmatory factor analysis of correct and erroneous replies to each of the immediate

Table 6.3 Persons with ADL deficiencies (0, 1, 2+), by selected background characteristics and mean WHODAS scores

| | ADL | | | | | | Total | |
| | 0 | | 1 | | 2+ | | | |
	Percent	SE*	Percent	SE	Percent	SE	Percent	Number
Sex								
Men	67.5	6.06	15.9	5.52	16.6	1.63	100	1,047
Women	59.8	4.37	14.9	2.31	25.2	3.32	100	1,197
Age group								
50-59	78.4	6.54	14.3	5.73	7.3	1.66	100	1,102
60-69	58.1	3.75	15.4	2.79	26.5	3.39	100	578
70-79	43.2	6.45	18.2	3.75	38.6	5.43	100	401
80+	30.4	4.65	15.8	4.16	53.8	5.26	100	164
Total	**63.4**	**3.78**	**15.4**	**2.99**	**21.2**	**1.89**	**100**	**2,244**
Education								
No formal education	54.2	6.78	14.2	3.28	31.6	5.62	100	387
Less than primary	58.9	6.50	16.8	6.33	24.4	3.73	100	861
Primary school completed	75.3	4.90	11.1	3.47	13.6	2.38	100	539
Secondary school completed	64.9	9.82	14.8	6.48	20.3	8.95	100	223
High school completed	75.8	9.79	14.1	6.76	10.1	6.55	100	54
College completed	69.3	7.48	15.9	6.54	14.7	3.66	100	124
Post graduate degree completed	51.0	28.17	45.6	28.61	3.4	2.71	100	57
Marital status								
Never married	63.5	10.84	17.9	8.34	18.6	7.41	100	157
Currently married	68.9	4.70	13.4	4.06	17.7	2.01	100	1,577
Cohabiting	58.4	8.84	16.3	5.33	25.3	7.25	100	62
Separated/divorced	37.9	7.17	29.8	8.82	32.3	9.25	100	101
Widowed	46.5	6.72	18.9	4.98	34.6	4.76	100	348
Income quintile								
Lowest	44.7	4.67	15.2	2.72	40.1	4.17	100	341
Second	58.5	10.55	20.4	9.02	21.1	4.38	100	560
Middle	72.5	6.04	9.6	2.86	17.8	3.96	100	371
Fourth	68.3	4.58	12.2	3.06	19.5	3.17	100	374
Highest	69.8	6.86	16.3	5.50	13.8	3.50	100	597
Residence								
Urban	65.5	3.81	13.9	2.48	20.6	2.26	100	1,761
Rural	55.9	9.49	20.7	9.87	23.4	2.68	100	483
Total	**63.4**	**3.78**	**15.4**	**2.99**	**21.2**	**1.89**	**100**	**2,244**
Number	**1,423**		**345**		**476**			**2,244**

| | 0 | | 1 | | 2+ | | Total | |
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Mean WHODAS score	**8.3**	**0.73**	**19.9**	**2.44**	**34.7**	**1.58**	**15.2**	**1.01**

* SE = standard error.

Table 6.4 Persons with IADL deficiencies (0, 1, 2+), by selected background characteristics and mean WHODAS scores

| | IADL | | | | | | Total | |
| | 0 | | 1 | | 2+ | | | |
	Percent	SE*	Percent	SE	Percent	SE	Percent	Number
Sex								
Men	93.4	1.01	1.9	0.49	4.8	0.86	100	1,047
Women	87.6	2.29	6.1	1.94	6.3	1.04	100	1,197
Age group								
50-59	98.2	0.73	1.2	0.65	0.6	0.27	100	1,102
60-69	87.4	3.43	6.6	3.40	6.0	1.29	100	578
70-79	84.1	2.56	5.4	1.15	10.6	2.16	100	401
80+	62.8	5.57	11.9	4.68	25.3	4.04	100	163
Education								
No formal education	84.4	3.13	4.0	0.87	11.6	3.14	100	387
Less than primary	89.3	1.83	4.6	1.31	6.1	1.02	100	861
Primary school completed	95.6	0.96	1.5	0.44	2.9	0.76	100	539
Secondary school completed	88.8	8.55	10.0	8.59	1.2	0.63	100	223
High school completed	90.1	6.56	7.8	6.27	2.1	1.51	100	54
College completed	92.4	2.73	1.7	0.98	5.9	2.16	100	124
Post graduate degree completed	97.0	2.54	2.0	2.09	0.9	1.08	100	57
Marital status								
Never married	95.1	1.65	2.3	1.04	2.6	0.98	100	157
Currently married	92.2	1.63	3.7	1.43	4.0	0.77	100	1,577
Cohabiting	83.2	6.41	6.1	3.00	10.7	5.67	100	62
Separated/divorced	81.3	7.52	10.8	6.39	8.0	4.86	100	101
Widowed	83.4	2.65	4.5	1.04	12.2	2.23	100	347
Income quintile								
Lowest	76.5	3.38	8.8	2.16	14.7	2.86	100	341
Second	93.9	1.50	1.4	0.50	4.8	1.24	100	559
Middle	91.1	2.69	3.0	1.36	5.9	1.85	100	371
Fourth	91.0	2.41	4.5	2.09	4.5	1.28	100	374
Highest	93.9	3.32	4.6	3.32	1.5	0.42	100	597
Residence								
Urban	90.7	1.51	4.1	1.33	5.2	0.70	100	1,761
Rural	88.8	2.81	4.4	1.10	6.8	2.04	100	483
Total	**90.3**	**1.33**	**4.1**	**1.07**	**5.6**	**0.70**	**100**	**2,244**
Number	**2,026**		**93**		**125**		**2,244**	

| | 0 | | 1 | | 2+ | | Total | |
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Mean WHODAS score	**8.3**	**0.73**	**19.9**	**2.44**	**34.7**	**1.58**	**15.2**	**1.01**

* SE = standard error.

and delayed recall tests, longest forward digit span, longest backward digit span, and total number of correctly named animals in one minute and number of errors. The factor solution was incorporated into the final method to generate the overall score, summing the correct answers and transforming these results to a 0 to 100 scale, where lower scores indicated lower cognitive function.

Table 6.5 Mean scores for verbal fluency (VF), verbal recall (VR) and digit span (DS) and composite cognition score, by selected socio-background characteristics

	Verbal recall		Verbal fluency		Forward digit span		Backward digit span		Composite cognition score		Number
	Mean	SE*	Mean	SE	Mean	SE	Mean	SE	Mean	SE	
Sex											
Men	5.3	0.15	15.7	0.55	4.5	0.10	2.9	0.09	58.9	1.23	1,083
Women	5.4	0.08	14.4	0.30	4.4	0.13	2.6	0.13	58.2	0.88	1,230
Age group											
50-59	5.8	0.14	16.2	0.55	4.6	0.12	2.8	0.16	62.9	1.21	1,111
60-69	5.4	0.12	15.2	0.30	4.4	0.08	2.9	0.08	59.5	0.94	592
70-79	4.6	0.09	13.3	0.42	4.2	0.07	2.5	0.09	52.6	0.87	412
80+	3.5	0.14	10.7	0.46	3.6	0.14	2.2	0.11	41.7	1.54	198
Education											
No formal education	4.5	0.14	12.5	0.64	3.7	0.23	1.7	0.26	48.4	1.25	387
Less than primary	5.2	0.14	14.5	0.51	4.4	0.16	2.8	0.06	57.7	1.02	861
Primary school completed	5.6	0.22	15.9	0.47	4.6	0.10	2.9	0.11	61.4	1.74	539
Secondary school completed	6.1	0.21	17.5	1.16	5.1	0.17	3.4	0.18	66.9	1.56	223
High school completed	6.1	0.25	16.7	1.17	4.6	0.25	3.4	0.29	65.8	2.69	54
College completed	6.2	0.22	18.1	0.72	5.1	0.17	3.4	0.14	68.8	2.05	124
Post graduate degree completed	7.0	0.09	20.3	1.21	5.5	0.29	3.9	0.10	75.0	1.00	57
Marital status											
Never married	5.3	0.24	14.4	0.73	4.2	0.25	2.6	0.20	57.7	2.18	157
Currently married	5.6	0.10	15.8	0.39	4.6	0.09	2.8	0.11	60.7	0.85	1,577
Cohabiting	5.0	0.28	14.0	0.80	4.6	0.31	3.0	0.34	57.1	3.12	62
Separated/divorced	5.4	0.21	15.4	0.84	4.4	0.21	2.8	0.20	60.2	2.14	101
Widowed	4.7	0.12	12.9	0.34	4.1	0.07	2.5	0.08	52.7	1.00	348
Income quintile											
Lowest	4.6	0.10	12.3	0.42	3.8	0.10	2.2	0.12	50.4	1.12	353
Second	5.0	0.10	13.7	0.55	4.1	0.12	2.4	0.22	54.3	0.65	571
Middle	5.4	0.23	15.4	0.48	4.6	0.32	2.8	0.08	58.8	1.86	388
Fourth	5.4	0.14	16.1	0.39	4.6	0.12	3.1	0.09	60.3	1.19	384
Highest	6.1	0.13	16.8	0.67	4.9	0.10	3.1	0.13	65.9	1.09	615
Residence											
Urban	5.5	0.08	15.5	0.29	4.5	0.08	2.8	0.10	59.9	0.74	1,822
Rural	4.8	0.21	13.1	0.56	4.0	0.12	2.5	0.10	53.2	1.48	491
Total	**5.3**	**0.08**	**15.0**	**0.29**	**4.4**	**0.07**	**2.7**	**0.08**	**58.5**	**0.67**	**2,313**

* SE = standard error.

Table 6.5 presents information on the results of the three individual cognition tests and composite cognition scores. Composite cognition scores decreased with increasing age and increased with increasing educational level and income quintile. Men and women scored roughly equally, although with a very slight advantage towards men throughout. Urban residents topped rural ones, and the currently married came first among the different marital status groups. The lowest scores were found among respondents aged 80-plus, those from the lowest income quintile, and the widowed.

Globally, the burden of disease is shifting from infectious diseases to non-communicable diseases. In most countries, the contribution of chronic conditions to the overall burden of disease is increasing, with chronic conditions such as heart disease and stroke now the chief causes of death. This pattern is also seen in Mexico (see the 2010 Global Burden of Disease Mexico profile at: www.healthmetricsandevaluation.org/sites/default/files/country-profiles/GBD%20Country%20Report%20-%20Mexico.pdf), with increasing burden from ischemic heart disease, diabetes and chronic kidney disease, and decreasing burden from diarrheal diseases and lower respiratory infections.

SAGE gathered evidence on a range of chronic diseases that contribute to a large portion of the disease burden for non-communicable conditions and are typically more widely prevalent among older adults. In this section, results are presented for arthritis, stroke, angina, diabetes mellitus, chronic lung disease, asthma, depression, and hypertension. Prevalence rates were based on self-reported diagnosis. In addition, alternate prevalence rates were generated for four of the conditions (angina, asthma, depression and arthritis) based on a set of questions about common disease-related symptoms. This section also covers injuries and aspects of health-care coverage and preventive measures, including screening for cervical and breast cancer.

7.1 Chronic conditions

Prevalence for each of the chronic conditions was based on self-reporting by respondents to the question "Has a health care professional/doctor ever told you that you have . . . ?". Respondents were asked about chronic ongoing treatment (in the last 12 months prior to interview) and current treatment (last two weeks prior to interview) in order to capture both ongoing treatment and current adherence to prescribed therapies.

Single chronic conditions and treatment rates

Arthritis

Table 7.1 presents information on the prevalence of arthritis. Less than 10% of respondents reported a diagnosis of arthritis. Of these, a bit over 40% were receiving current therapy, and around 45% had received treatment over the past year—a rather lower rate than in some of the other SAGE countries (Russia and China, for example). Around three times as many women as men had received a diagnosis. The widowed and respondents in the 70-79 age group were the most likely to have received a diagnosis; both of these groups were also the most likely to have received current or chronic treatment. Urban residents also had higher treatment rates than rural residents by a few percentage points. Otherwise, however, prevalence rates did not follow clear patterns.

Symptom-based prevalence to some extent replicated these patterns at slightly (5-10%) higher levels, although the difference between men and women dropped to a bit over double. Symptom-based prevalence fell below diagnosed levels among the never-married. The gap between self-reported diagnosis and symptom-based prevalence was the greatest among respondents in the lowest income quintile and among widowed and particularly separated/divorced respondents (the latter a gap of nearly 16%), possibly indicating issues with accessing health care for these sub-groups of respondents.

Stroke

The prevalence of self-reported stroke was low overall, in the 4% range for both men and women (Table 7.2). Prevalence was noticeably higher—8.4%— in the 70-79 year old age group than for other age groups, with prevalence among those aged 80-plus (the next highest

Table 7.1 Prevalence of arthritis (self-reported and symptom-reporting) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported			Symptom-based			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N	%	SE	N
Sex												
Men	4.8	0.98	1028	8.4	1.69	960	42.0	8.77	93	47.9	9.44	93
Women	12.6	2.90	1176	19.8	3.21	1061	42.4	11.49	242	44.4	11.23	242
Age group												
50-59	3.9	1.86	1082	9.1	2.74	974	16.9	7.74	102	20.0	7.89	102
60-69	10.6	1.71	568	17.9	2.62	521	43.3	8.33	107	44.6	8.29	107
70-79	18.4	6.09	393	22.1	6.44	371	67.6	13.3	95	71.1	12.16	95
80+	14.3	3.33	161	17.8	3.49	155	44.1	11.99	32	52.8	11.79	32
Marital status												
Never married	8.2	2.70	155	7.9	2.64	156	60.2	12.17	14	62.6	11.88	14
Currently married	6.4	1.40	1548	12.1	1.94	1387	31.6	6.36	194	35.4	6.55	194
Cohabiting	10.9	5.55	61	10.7	5.84	61	69.6	24.29	8	69.6	24.29	8
Separated/divorced	16.6	4.51	99	32.7	9.21	93	20.5	11.19	35	22.5	11.61	35
Widowed	18.6	7.23	341	22.7	7.61	323	70.1	13.47	85	72.8	12.38	85
Income quintile												
Lowest	8.5	1.87	334	19.2	3.66	334	27.5	8.00	74	27.8	8.13	74
Second	12.9	4.66	549	15.6	4.84	544	69.8	12.63	98	74.3	11.13	98
Middle	6.9	2.44	364	10.0	2.22	277	45.5	12.68	32	50.2	12.29	32
Fourth	5.8	1.09	367	11.6	2.66	330	32.7	9.00	44	35.0	9.32	44
Highest	8.8	3.11	586	14.3	4.26	531	27.5	10.63	87	31.5	10.92	87
Residence												
Urban	9.5	2.13	1729	15.1	2.37	1544	42.5	10.92	268	45.2	10.65	268
Rural	7.0	2.04	475	12.2	2.94	477	41.2	9.43	67	46.3	10.26	67
Total	**9.0**	**1.74**	**2204**	**14.4**	**1.97**	**2021**	**42.2**	**8.97**	**335**	**45.4**	**8.76**	**335**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.
** SE = standard error.

group) a full two percentage points lower. Interestingly, respondents who had never married and who were widowed reported significantly higher prevalence rates than other marital status cohort. The three middle income quintiles were also much more likely to report having had a stroke than those in the lowest or highest quintiles, as to a lesser degree were urban residents compared to rural residents.

Among respondents who reported having had a stroke, just over half were currently receiving therapy, and just under half had received therapy in the last twelve

months. Those groups who were the most likely to have received either current or chronic therapy were the never-married (nearly 95%), those in the highest income quintile (over 90% of whom were receiving current therapy), and, for no clear reason, those in the second income quintile. By far the least likely to have received therapy were those in the lowest income quintile, whose treatment rates ranged between 20% (chronic) and 30% (current). Interestingly, urban residents were less likely to have received either current or chronic therapy than rural residents.

Table 7.2 Prevalence of stroke (self-reported) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported stroke			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N
Sex									
Men	4.5	1.10	1028	66.3	9.49	52	42.3	10.57	52
Women	4.1	1.29	1176	45.1	14.07	54	48.1	13.70	54
Age group									
50-59	2.2	1.04	1082	61.6	17.18	27	21.1	11.28	27
60-69	4.9	1.14	568	36.1	7.55	31	36.8	7.74	31
70-79	8.4	3.29	393	63.9	16.81	37	63.8	16.71	37
80+	6.4	2.08	161	67.3	14.66	11	64.3	15.40	11
Marital status									
Never married	8.4	6.76	155	94.1	6.46	14	94.1	6.46	14
Currently married	3.5	0.82	1548	51.9	10.42	60	33.4	8.01	60
Cohabiting	2.7	1.54	61	54.6	30.02	2	54.6	30.02	2
Separated/divorced	1.8	0.81	99	56.4	21.00	2	63.2	20.73	2
Widowed	7.3	2.33	341	43.4	13.64	28	43.5	13.82	28
Income quintile									
Lowest	2.7	0.95	334	30.2	15.45	10	20.1	14.14	10
Second	4.4	2.26	549	78.1	11.91	27	80.3	11.17	27
Middle	6.7	2.46	364	32.5	13.94	27	32.7	13.95	27
Fourth	5.0	1.75	367	32.8	8.45	21	35.0	8.97	21
Highest	3.2	1.46	586	91.5	6.46	21	39.3	20.49	21
Residence									
Urban	4.8	1.08	1729	54.8	9.45	92	43.7	10.02	92
Rural	2.7	0.88	475	60.2	9.77	14	55.4	9.55	14
Total	**4.3**	**0.87**	**2204**	**55.6**	**8.24**	**106**	**45.2**	**8.75**	**106**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.
** SE = standard error.

Angina pectoris

The self-reported prevalence rate of angina was low—under 3% overall, under 4% for women (who were slightly more likely to report a diagnosis than men), the highest income quintile (the most likely of the income groups), and urban residents (with over three times the prevalence of rural residents), and still only 5% in the age cohort with the highest prevalence (70-79%) (Table 7.3). By far the highest self-reported prevalence was among respondents who were separated or divorced, at 8.4%.

By sharp contrast, the symptom-based prevalence was nearly 14% overall, with nearly 30% of the middle income quintile, over 20% of the separated/divorced, and nearly 20% of women and the lowest income quintile being diagnosed based on symptom reporting and diagnostic algorithm. The gaps between self-reported diagnosis and symptom-based prevalence were most dramatic in the middle income quintile (an over twelve-fold increase) and the cohabiting (an eleven-fold increase).

Discouragingly, current and chronic therapy rates for those who had been diagnosed with angina were also

Table 7.3 Prevalence of angina (self-reported and symptom-reporting plus diagnostic algorithm) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported angina			Symptom+algorithm angina			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N	%	SE	N
Sex												
Men	1.7	0.63	1028	7.6	1.64	977	13.9	6.38	59	15.1	6.45	59
Women	3.6	1.51	1176	19.5	5.92	1103	2.2	1.00	172	7.6	5.83	172
Total	**2.7**	**0.85**	**2204**	**13.9**	**3.26**	**2080**	**5.1**	**2.30**	**231**	**9.5**	**4.89**	**231**
Age group												
50-59	2.4	1.38	1082	17.9	6.05	1041	2.6	2.54	149	8.9	7.32	149
60-69	1.8	0.67	568	9.1	1.44	537	6.9	2.43	39	8.1	2.65	39
70-79	5.0	2.81	393	8.7	1.90	364	12.2	6.39	25	10.6	6.38	25
80+	2.3	1.10	161	16.1	5.38	137	12.7	7.40	18	16.2	8.53	18
Total	**2.7**	**0.85**	**2204**	**13.9**	**3.26**	**2080**	**5.1**	**2.30**	**231**	**9.5**	**4.89**	**231**
Marital status												
Never married	7.5	6.75	155	5.2	2.73	139	3.7	4.14	6	3.7	4.14	6
Currently married	1.9	0.85	1548	15.4	4.41	1478	4.5	2.63	181	9.9	6.24	181
Cohabiting	1.0	0.74	61	11.0	4.57	58	5.8	6.15	5	5.8	6.15	5
Separated/divorced	8.4	7.59	99	21.4	9.13	91	1.6	1.82	16	1.6	1.82	16
Widowed	2.9	1.10	341	9.2	2.04	314	12.8	6.64	23	14.2	6.70	23
Total	**2.7**	**0.85**	**2204**	**13.9**	**3.26**	**2080**	**5.1**	**2.30**	**231**	**9.5**	**4.89**	**231**
Income quintile												
Lowest	2.9	2.36	334	19.8	5.08	315	1.1	0.93	50	0.3	0.34	50
Second	2.6	2.02	549	5.6	1.63	524	5.6	3.20	24	8.2	4.14	24
Middle	2.4	1.15	364	29.7	16.4	337	4.1	3.86	80	4.1	3.86	80
Fourth	1.9	0.99	367	11.1	2.82	346	8.0	3.62	31	8.0	3.62	31
Highest	3.4	2.09	586	10.5	3.7	554	9.1	7.60	47	30.3	17.82	47
Total	**2.7**	**0.85**	**2200**	**13.9**	**3.26**	**2076**	**5.1**	**2.30**	**231**	**9.5**	**4.89**	**231**
Residence												
Urban	3.2	1.08	1729	13.8	4.00	1634	4.9	2.75	181	10.6	6.35	181
Rural	1.0	0.43	475	14.1	4.04	446	6.1	3.19	50	5.6	2.77	50
Total	**2.7**	**0.85**	**2204**	**13.9**	**3.26**	**2080**	**5.1**	**2.30**	**231**	**9.5**	**4.89**	**231**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.
** SE = standard error.

very low—under 6.5% overall, with a top rate of only 30% for chronic therapy among respondents in the highest income quintile. These low figures, coupled with the gaps between diagnosis- and symptom-based prevalence, could suggest low frequency of symptoms or alternately, the need for public information campaigns highlighting the importance of seeking out diagnosis and treatment for chest pain.

Diabetes

Self-reported rates of diabetes among respondents were in the 10-20% range overall, as well as for almost all demographic groups (Table 7.4). The exceptions were respondents from the highest income quintile, who also had the highest prevalence (25%), as well as respondents who were separated/divorced, widowed or who were aged 60-69, all at 23-24.5%. Encouragingly,

Table 7.4 Prevalence of diabetes mellitus (self-reported) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported diabetes			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N
Sex									
Men	16.7	3.62	1028	88.9	6.40	197	76.1	10.29	197
Women	18.4	2.67	1176	86.5	3.74	249	80.7	5.27	249
Total	**17.6**	**2.32**	**2204**	**87.6**	**3.58**	**446**	**78.7**	**5.23**	**446**
Age group									
50-59	14.1	3.90	1082	87.6	7.48	175	81.0	8.21	175
60-69	24.5	3.97	568	89.6	3.35	159	73.0	10.63	159
70-79	17.9	3.37	393	89.4	4.71	81	88.6	3.36	81
80+	16.7	3.64	161	71.8	13.80	31	68.4	13.28	31
Total	**17.6**	**2.32**	**2204**	**87.6**	**3.58**	**446**	**78.7**	**5.23**	**446**
Marital status									
Never married	10.4	6.86	155	90.3	7.92	18	90.5	7.82	18
Currently married	17.1	3.05	1548	88.4	4.57	303	81.7	7.13	303
Cohabiting	9.9	3.28	61	95.4	3.55	7	84.9	10.83	7
Separated/divorced	23.7	7.71	99	76.0	13.34	27	43.2	17.97	27
Widowed	23.0	3.74	341	87.0	5.74	90	76.1	7.80	90
Total	**17.6**	**2.32**	**2204**	**87.6**	**3.58**	**446**	**78.7**	**5.23**	**446**
Income quintile									
Lowest	15.6	3.23	334	84.3	6.50	60	74.6	12.36	60
Second	10.6	3.15	549	86.5	4.94	67	86.7	4.23	67
Middle	18.6	4.98	364	86.2	6.93	78	83.5	7.03	78
Fourth	17.0	4.00	367	73.0	14.57	72	69.2	14.33	72
Highest	25.0	5.94	586	95.9	1.67	168	78.5	11.47	168
Total	**17.6**	**2.32**	**2200**	**87.6**	**3.58**	**444**	**78.7**	**5.23**	**444**
Residence									
Urban	19.3	2.78	1729	87.5	4.06	384	82.8	4.44	384
Rural	11.4	3.98	475	88.0	5.47	62	53.4	17.08	62
Total	**17.6**	**2.32**	**2204**	**87.6**	**3.58**	**446**	**78.7**	**5.23**	**446**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

treatment rates were high, with around 88% receiving current therapy and around 79% having received therapy in the last 12 months. The highest rates of treatment were among those in the highest income quintile (nearly 96% on current therapy) and those who had never married (90%). The lowest were those aged 80-plus (around 72% current therapy). Rural residents showed a sharp difference between current (88%) and chronic (around 53%) therapies.

Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) typically refers to debilitating lung diseases such as chronic bronchitis or emphysema. The prevalence of COPD was low at under 4% overall, ranging across most of the various demographic groups from 1.6% (among those who were separated/divorced) to 5.4% (among the fourth income quintile). The highest rates were found

Table 7.5 Prevalence chronic obstructive pulmonary disease (COPD) (self-reported) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported COPD			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N
Sex									
Men	3.0	0.69	1028	28.8	8.35	50	23.6	7.78	50
Women	4.1	1.05	1176	27.6	7.40	79	18.5	4.41	79
Total	**3.6**	**0.66**	**2204**	**28.0**	**5.87**	**129**	**20.5**	**4.17**	**129**
Age group									
50-59	2.1	0.94	1082	18.3	12.85	37	8.1	5.02	37
60-69	4.5	0.89	568	27.5	7.03	41	24.8	6.97	41
70-79	4.4	1.39	393	39.2	12.92	28	24.5	9.26	28
80+	8.7	2.39	161	30.9	11.71	23	27.8	11.32	23
Total	**3.6**	**0.66**	**2204**	**28.0**	**5.87**	**129**	**20.5**	**4.17**	**129**
Marital status									
Never married	2.3	1.05	155	21.9	14.71	6	10.6	10.34	6
Currently married	3.2	0.77	1548	27.0	8.27	81	18.2	5.32	81
Cohabiting	2.4	1.41	61	75.0	22.47	2	41.7	17.16	2
Separated/divorced	1.6	1.09	99	2.9	3.43	3	2.9	3.43	3
Widowed	6.8	1.71	341	30.0	8.61	38	26.8	8.16	38
Total	**3.6**	**0.66**	**2204**	**28.0**	**5.87**	**129**	**20.5**	**4.17**	**129**
Income quintile									
Lowest	3.3	1.08	334	31.8	14.67	18	21.3	9.06	18
Second	3.3	1.05	549	39.8	10.78	29	30.9	9.19	29
Middle	4.4	1.92	364	32.6	14.42	26	28.3	12.64	26
Fourth	5.4	1.82	367	28.5	13.35	32	14.3	7.27	32
Highest	2.5	1.26	586	5.0	3.93	24	6.9	5.47	24
Total	**3.6**	**0.66**	**2200**	**28.0**	**5.87**	**129**	**20.5**	**4.17**	**129**
Residence									
Urban	4.0	0.82	1729	24.7	6.28	112	18.0	4.40	112
Rural	2.2	0.68	475	50.6	10.20	17	37.1	8.59	17
Total	**3.6**	**0.66**	**2204**	**28.0**	**5.87**	**129**	**20.5**	**4.17**	**129**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

among those aged 80-plus (nearly 9%), as well as the widowed (nearly 7%). Curiously, given the strong link between COPD and smoking (which was more prevalent among men), rates were higher among women (4.1%) than among men (3.1%) —a fact that may related to the impact of solid fuel use for cooking discussed below.

Treatment rates were also low, averaging 28% for current therapy and about 21% for chronic therapy, and topping out at only just under 40% for current therapy (among those aged 70-79 and the second income quintile) and just over 40% for chronic therapy (among those who were cohabiting). Again somewhat puzzlingly, respondents who were in the highest income quintile (as well as those who were separated/divorced) had low prevalence rates, but also notably low treatment rates (only 5-7% for the different therapies among the high income earners).

Asthma

The self-reported prevalence of an asthma diagnosis was low, at under 2% overall and with a maximum rate of 4.9% among those who were separated/divorced. Women's diagnosed rates were over twice those of men, although still low overall (2.5%, compared to 1%); however, when prevalence based on symptom reporting was taken into account, male rates were higher than those among women (4.2%, compared to 3.6%)—a finding that may reflect gendered smoking patterns. Overall, symptom-based prevalence was over twice that of self-

reported diagnosis prevalence, although still low (just under 4%). Although respondents who were separated/divorced showed the highest symptom-based prevalence (over 13%, compared to a diagnosed rate of just under 5%), the difference between diagnosed and symptom-based prevalence was biggest between the lowest and highest income quintiles (a nearly eight-fold increase, from 1.2% to 8.2%).

Treatment rates were low overall at around 16% for current therapy and around 17% for chronic therapy. Rates varied widely across the study's different demographic

Table 7.6 Prevalence of asthma (self-reported and symptom-based reporting plus diagnostic algorithm) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported asthma			Symptom+algorithm asthma			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N	%	SE	N
Sex												
Men	1.0	0.35	1028	4.2	1.37	1028	12.1	6.89	52	12.5	6.96	52
Women	2.5	0.55	1176	3.6	0.99	1176	20.3	7.18	51	22.0	7.39	51
Age group												
50-59	0.6	0.31	1082	3.9	1.48	1082	0.2	0.26	51	1.1	0.99	51
60-69	2.9	0.76	568	3.8	0.76	568	42.8	11.46	26	44.9	11.23	26
70-79	3.0	0.94	393	2.9	0.71	393	34.5	11.23	14	35.3	11.21	14
80+	3.0	1.64	161	6.7	2.94	161	6.1	4.71	13	6.1	4.71	13
Marital status												
Never married	1.6	0.78	155	4.0	2.45	155	17.9	15.70	7	17.9	15.70	7
Currently married	1.3	0.36	1548	3.8	0.96	1548	16.3	6.00	71	17.2	6.12	71
Cohabiting	2.1	1.44	61	0.9	0.71	61	0	0	1	0	0	1
Separated/divorced	4.9	2.86	99	13.2	7.86	99	18.7	19.22	16	21.5	20.10	16
Widowed	3.2	1.24	341	2.0	0.62	341	9.7	6.29	8	9.7	6.29	8
Income quintile												
Lowest	1.2	0.56	334	8.2	3.89	334	4.9	3.68	33	4.9	3.68	33
Second	1.4	0.48	549	1.9	0.62	549	21.9	9.10	12	23.8	9.02	12
Middle	3.2	1.43	364	6.6	1.94	364	14.2	9.83	29	15.8	9.93	29
Fourth	2.8	1.01	367	4.7	1.89	367	16.6	8.40	21	18.6	8.57	21
Highest	1.1	0.46	586	1.2	0.45	586	55.0	17.21	9	55.0	17.21	9
Residence												
Urban	1.9	0.40	1729	3.7	0.71	1729	19.7	6.53	77	20.1	6.58	77
Rural	1.6	0.59	475	4.6	2.46	475	5.8	4.27	26	8.7	5.62	26
Total	**1.8**	**0.34**	**2204**	**3.9**	**0.77**	**2204**	**16.1**	**5.19**	**103**	**17.2**	**5.32**	**103**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

groups, with a high of 55% for both therapies among the wealthiest respondents and a low of 0.2% for current therapy among those aged 50-59 (and no therapy at all for the one cohabiting respondent with the condition). Women, however, were almost twice as likely to have received treatment as men, and urban residents were between two and three times more likely to have received treatment than rural residents. The gap in treatment rates between the lowest and highest income earners was particularly stark (4.9% for the former, compared to the 55% for the latter noted above).

Depression

The prevalence rates of both self-reported diagnosis and symptom-reporting based depression for respondents as a whole were roughly equivalent, with the latter only slightly higher than the former (14.4% versus 13.8%) (Table 7.7). However, women were between five and six times more likely to have experienced depression than men, with female symptom-based prevalence rates of nearly 23% compared to 4.7% for men. Urban residents were 3.8 times more likely than rural residents to have been diagnosed with depression, although only 2.1 times

Table 7.7 Prevalence of depression (self-reported and symptom-reporting plus diagnostic algorithm) and percentage receiving current and chronic therapy, by selected background characteristics

	Self-reported depression			Symptom+algorithm depression			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N	%	SE	N
Sex												
Men	3.9	1.02	1028	4.7	0.97	1028	18.7	8.08	45	12.9	5.50	45
Women	22.4	5.58	1176	22.9	5.67	1176	25.0	8.77	250	19.9	6.93	250
Age group												
50-59	17.2	5.93	1082	18.4	6.09	1082	18.1	9.94	185	10.3	5.83	185
60-69	11.2	2.74	568	10.4	1.43	568	36.6	7.04	55	34.8	6.65	55
70-79	9.8	2.03	393	10.4	2.06	393	26.1	6.74	38	25.8	6.69	38
80+	9.4	3.63	161	11.5	3.97	161	42.6	19.73	17	44.1	19.56	17
Marital status												
Never married	9.3	3.25	155	7.7	2.94	155	48.0	19.66	11	54.5	18.17	11
Currently married	13.1	4.36	1548	14.2	4.57	1548	22.8	10.59	204	14.9	6.89	204
Cohabiting	7.1	3.69	61	13.1	6.73	61	26.1	11.79	7	26.1	11.79	7
Separated/divorced	28.0	9.27	99	29.2	9.11	99	14.7	6.75	27	15.1	6.87	27
Widowed	16.0	4.71	341	14.2	2.82	341	29.0	9.86	45	29.0	9.82	45
Income quintile												
Lowest	11.6	3.44	334	17.5	4.02	334	10.6	3.98	54	11.6	4.14	54
Second	5.4	1.51	549	5.4	1.59	549	33.0	7.95	28	37.6	9.00	28
Middle	38.2	14.24	364	36.5	14.56	364	11.4	8.40	124	10.4	7.91	124
Fourth	10.0	2.06	367	13.3	2.63	367	39.4	10.15	45	28.8	8.40	45
Highest	10.1	3.46	586	8.0	2.59	586	54.6	16.23	44	29.4	13.28	44
Residence												
Urban	16.4	3.73	1729	16.3	3.99	1729	23.8	8.84	261	18.0	6.70	261
Rural	4.3	1.34	475	7.6	2.25	475	26.0	6.56	34	25.5	6.50	34
Total	**13.8**	**3.11**	**2204**	**14.4**	**3.28**	**2204**	**24.0**	**7.92**	**295**	**18.8**	**6.18**	**295**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

more likely to show symptoms. The groups at greatest risk were respondents who were separated/divorced and those in the middle income quintile, whose diagnosed rate was over 38%. Interestingly, the prevalence rates among those who had lost a spouse and those who were still married fell both within a comparatively narrow (three percentage point) range.

Treatment rates varied widely across demographic groups, coming in at an average for current therapy of about 25% for the group overall as well as for women. Men, respondents in the 50-59 age range, and (despite the high prevalence rates noted above) the separate/divorced and the middle income quintile were less likely to have received current or chronic treatment than other groups,

with rates falling in the 10-20% range. Higher incomes clearly contributed to the ability to seek treatment: nearly 55% of those suffering from depression in the highest income quintile, and nearly 40% in the second-highest, were currently receiving treatment. The oldest (80-plus) respondents and those who had never married also had higher than average rates of treatment. Rural residents, despite their lower prevalence rates, were more likely to have received treatment than urban ones.

Hypertension (high blood pressure)

A self-reported diagnosis of hypertension was reported by 30% of respondents with higher prevalence in

Table 7.8 **Prevalence of hypertension (self-reported) and percentage receiving current and chronic therapy, by selected background characteristics**

	Self-reported hypertension			Current therapy*			Chronic therapy*		
	%	SE**	N	%	SE	N	%	SE	N
Sex									
Men	25.0	3.03	1028	72.5	6.16	320	66.0	5.83	320
Women	35.0	4.46	1176	81.7	5.35	511	70.6	5.57	511
Age group									
50-59	18.9	3.86	1082	74.6	7.49	255	73.8	7.79	255
60-69	42.1	4.38	568	74.2	7.83	297	59.1	7.50	297
70-79	38.1	5.09	393	85.7	3.69	187	77.1	4.78	187
80+	46.5	5.12	161	85.1	5.36	93	69.8	6.90	93
Marital status									
Never married	28.9	9.13	155	74.3	15.08	56	67.4	15.82	56
Currently married	27.3	3.68	1548	74.8	5.55	525	69.1	5.57	525
Cohabiting	28.7	7.58	61	88.3	5.47	22	63.2	15.65	22
Separated/divorced	35.3	7.83	99	54.1	14.92	44	47.4	13.58	44
Widowed	43.6	6.17	341	93.3	1.88	185	74.3	8.24	185
Income quintile									
Lowest	37.4	4.41	334	76.4	7.73	155	65.9	7.95	155
Second	22.3	4.84	549	82.9	5.25	153	74.9	6.27	153
Middle	26.2	5.89	364	76.3	6.20	119	73.6	5.73	119
Fourth	30.9	4.36	367	83.0	6.29	141	72.1	6.65	141
Highest	35.8	6.26	586	74.5	10.17	261	63.0	10.43	261
Residence									
Urban	29.8	3.68	1729	74.6	5.22	641	64.6	5.16	641
Rural	32.2	4.47	475	90.1	3.76	190	83.1	5.18	190
Total	**30.3**	**3.06**	**2204**	**78.1**	**4.23**	**831**	**68.9**	**4.40**	**831**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

women than men, and slightly higher in rural than urban areas (Table 7.8). Hypertension rates were highest in the 80+ year group followed by the 60-69 year old group. Women and rural dwellers had higher rates of current and chronic therapy than men and urban dwellers. Prevalence rates and treatment patterns by other characteristics were not as clear.

7.2 Injuries

Road-traffic injuries are among the ten leading causes of death in Mexico. However, the prevalence of injuries from road traffic accidents in the previous 12 months in SAGE was low, at only 1.7% overall (Table 7.9). Nevertheless, over 14% of these accidents had led to disability. The

Table 7.9 Prevalence of road traffic and other injuries and percentage resulting in disability, by selected background characteristics

	Road traffic injuries (RTI)			RTI resulting in disability			Injuries from other causes			Other injuries resulting in disability		
	%	SE**	N	%	SE	N	%	SE	N	%	SE	N
Sex												
Men	2.7	0.93	1028	14.4	7.37	39	4.5	2.00	1028	18.8	9.68	57
Women	0.9	0.28	1176	14.4	8.11	15	4.2	1.05	1176	17.0	5.98	61
Total	**1.7**	**0.47**	**2204**	**14.4**	**5.51**	**54**	**4.3**	**1.09**	**2204**	**17.8**	**5.43**	**118**
Age group												
50-59	1.4	0.80	1082	4.9	5.48	21	4.0	2.01	1082	8.0	6.22	53
60-69	2.3	0.61	568	17.4	9.07	19	4.0	1.08	568	34.6	9.68	28
70-79	1.5	0.65	393	29.1	19.26	8	5.2	1.34	393	15.4	6.42	25
80+	2.6	0.92	161	18.2	14.44	6	6.0	2.00	161	26.8	11.08	12
Total	**1.7**	**0.47**	**2204**	**14.4**	**5.51**	**54**	**4.3**	**1.09**	**2204**	**17.8**	**5.43**	**118**
Marital status												
Never married	1.0	0.59	155	15.9	15.86	2	1.5	0.74	155	43.8	23.18	3
Currently married	1.6	0.62	1548	11.8	6.16	35	4.5	1.48	1548	15.5	6.37	85
Cohabiting	4.5	2.56	61	38.4	28.52	4	4.1	2.59	61	29.8	25.56	3
Separated/divorced	0.6	0.44	99	0	0	1	3.6	2.40	99	15.3	16.67	4
Widowed	2.4	0.68	341	14.9	8.94	12	5.3	1.42	341	22.1	8.28	23
Total	**1.7**	**0.47**	**2204**	**14.4**	**5.51**	**54**	**4.3**	**1.09**	**2204**	**17.8**	**5.43**	**118**
Income quintile												
Lowest	1.0	0.48	334	32.8	19.76	5	5.8	1.62	334	31.1	13.95	24
Second	1.1	0.47	549	34.0	18.86	9	2.3	0.85	549	20.2	10.16	16
Middle	1.2	0.49	364	12.8	8.81	6	3.6	1.45	364	23.9	10.76	16
Fourth	2.7	0.96	367	13.2	10.56	14	8.6	5.11	367	10.3	7.59	39
Highest	2.4	1.38	586	2.9	2.73	20	3.2	1.53	586	11.3	6.87	23
Total	**1.7**	**0.47**	**2200**	**14.4**	**5.51**	**54**	**4.3**	**1.09**	**2200**	**17.8**	**5.43**	**118**
Residence												
Urban	1.9	0.58	1729	14.2	6.03	46	4.4	1.35	1729	15.9	5.96	93
Rural	1.2	0.50	475	15.7	13.07	8	4.2	1.24	475	25.0	10.73	25
Total	**1.7**	**0.47**	**2204**	**14.4**	**5.51**	**54**	**4.3**	**1.09**	**2204**	**17.8**	**5.43**	**118**

* Current therapy = over previous two weeks; chronic therapy = over previous 12 months.

** SE = standard error.

groups among whom road-related injury was most likely to have led to disability included men, respondents aged 70-plus and the lowest two income quintiles.

Accidents other than road-traffic accidents—such as falls, household accidents, or interpersonal violence—were more common, affecting a bit over 4% of respondents overall; the rate of disability resulting from such accidents was also higher, at nearly 18%. Respondents aged 80-plus and the widowed (and, interestingly, those in the lowest and fourth income quintiles) were more accident-prone than most other demographic groups. However, those in the 60-69 age group who had suffered accidents were more likely than others to have experienced disability as a consequence, as well

as those cohabiting, those aged 80-plus and those in the lowest income quintile.

7.3 Cervical and breast cancer

The uptake of preventative health measures or behaviours is one measure of public health system effectiveness and health systems coverage. We can use indicator conditions or services to estimate how well health promotion programmes are functioning in a country. Two of the leading causes of death in women are cervical and breast cancer, with established evidence about highly effective screening and early identification programmes.

Table 7.10 Prevalence of uptake of breast and cervical cancer screening, by selected background characteristics

	Breast cancer screening			Cervical cancer screening		
	%	SE**	N	%	SE	N
Age group						
50-59	62.6	7.87	641	70.8	10.57	641
60-69	49.2	5.86	333	75.6	3.78	333
70-79	47.6	8.18	266	66.0	6.58	266
80+	29.9	9.02	92	52.5	7.38	92
Total	**54.0**	**4.28**	**1332**	**69.8**	**5.65**	**1332**
Marital status						
Never married	27.6	10.14	142	58.4	13.09	142
Currently married	64.7	5.53	762	73.7	8.96	762
Cohabiting	43.6	17.80	25	78.4	9.10	25
Separated/divorced	58.2	10.41	84	58.4	10.84	84
Widowed	39.9	7.32	319	67.8	5.90	319
Total	**54.0**	**4.28**	**1332**	**69.8**	**5.65**	**1332**
Income quintile						
Lowest	33.5	4.82	226	63.7	5.42	226
Second	51.6	9.60	330	73.6	8.72	330
Middle	63.5	12.7	270	54.2	17.99	270
Fourth	56.2	6.11	185	74.9	4.99	185
Highest	61.7	8.03	319	80.2	6.78	319
Total	**54.0**	**4.28**	**1330**	**69.8**	**5.65**	**1330**
Residence						
Urban	58.0	4.73	1109	68.6	6.70	1109
Rural	34.1	5.20	223	75.9	3.76	223
Total	**54.0**	**4.28**	**1332**	**69.8**	**5.65**	**1332**

* SE = standard error.

As such, the use of pelvic examinations and mammography were assessed in women in Mexico.

Just over half (54%) of the women in this study had ever received screening for breast cancer (Table 7.10). Women in the 50-59 age group were most likely to have received mammograms (62%), while those aged 80-plus were significantly less likely, at under 30%. Urban residents were 1.7 times more likely to have received screening than rural residents, approximately the same rate of difference as that between the lowest and highest income quintiles.

Meanwhile, 70% of women had been screened for cervical cancer. Rates of screening were highest in the 50-59 age bracket, as well as among the middle and highest income quintiles. In this instance, rural residents were more likely to have received screening than urban ones. Married women were most likely of the marital status groups to have received screening for both cancers.

8. Health Examination and Biomarkers

The addition of direct health examinations and bio-markers to measure the health status of adults was an important methodological contribution to SAGE Wave 1. Biomarkers typically serve as intermediaries for chronic conditions and help to better assess disease prevalence estimates and poor health conditions particularly in rural, illiterate and poor populations with very high levels of undiagnosed diseases. For example, blood pressure and pulse rate can provide information on risk for heart diseases; body mass index (BMI) and waist-hip circumference ratios are indicators of obesity with established health risk thresholds; and, glycated hemoglobin can be used as a disease marker for diabetes.

The incorporation of biomarkers in Wave 1 also complements the WHO approach to measuring health across multiple domains – as biomarkers often measure distinct components of health, rather than the "whole" of an individual's health state. In this instance, self-report of mobility can be assessed against performance on a timed walk and grip strength, or self-reported vision can be compared to results of the tumbling "E" (LogMAR) eye tests.

This chapter will describe the methodology used for health examinations and collection of biomarkers, along with initial results of anthropometric measures of height and weight (used to calculate Body Mass Index (BMI)), hip and waist circumference, systolic and diastolic blood pressure and hypertension, pulse rate, lung function, near and distant vision, grip strength and gait speed.

8.1 Anthropometry

Body mass index (BMI) – weight in kilograms divided by the square of height in meters (kg/m^2) – is commonly used in classifying health risk in adult populations and individuals. BMI provides a useful population-level measure to identify those who are underweight, overweight and obese. Obesity is a well-known risk factor for type-2 diabetes mellitus and is associated with some of the major risk factors for cardiovascular disease (Lee, 2012). Once considered a problem only in high-income countries, overweight and obesity are dramatically on the rise in low- and middle-income countries, particularly in urban settings. The risks of being underweight are also considerable, in addition to inadequate calories for daily mental and physical activities, and include impairments in the immune system, impaired fertility and micro-nutrient deficiencies.

Height, Weight and BMI

Measured height and weight were used to generate BMI, using stadiometers and calibrated weighing scales. A cut-off of <18.5 kg/m^2 is used to define underweight; normal weight is 18.5-24.9 kg/m^2; a BMI of ≥25–29.9 kg/m^2 indicates overweight; and a BMI of ≥30 kg/m^2 indicates obesity (WHO, 1995).

Table 8.1 presents information on distribution of BMI categories. Prevalence of excess weight was 78% overall, recorded as either overweight (just under 50%) or obese (around 29%), reaching 86% in the 50-59 age range. Excess weight declined with age, but over 52% of respondents aged 80-plus were still overweight or obese. Men were significantly (13 percentage points) more likely to be overweight than women, but women were equally more likely to be obese than men. Education did not serve a protective function, with rates of overweight/obesity somewhat evenly spread in the 70-80% range across most of those with any education. Those with no formal education and in the lowest income quintile (in which those with no formal education were more

Table 8.1 Percent distribution of BMI categories, by selected background characteristics

	Body Mass Index								Total Percent	Number
	Underweight		Normal		Overweight		Obese			
	%	SE**	%	SE	%	SE	%	SE		
Age group										
50-59	0.4	0.27	12.9	3.01	54.7	7.57	32.0	6.50	100	1,068
60-69	0.5	0.29	22.6	3.70	47.0	4.05	29.9	2.80	100	542
70-79	0.9	0.49	33.3	5.87	44.4	4.31	21.4	3.60	100	364
80+	1.8	0.82	46.1	4.91	33.9	5.23	18.2	3.68	100	162
Total	**0.6**	**0.19**	**21.4**	**2.27**	**49.4**	**4.10**	**28.6**	**3.18**	**100**	**2,136**
Sex										
Men	0.5	0.22	21.3	3.35	56.5	4.78	21.7	3.67	100	983
Women	0.7	0.29	21.5	3.02	43.3	5.22	34.5	4.68	100	1,153
Total	**0.6**	**0.19**	**21.4**	**2.27**	**49.4**	**4.10**	**28.6**	**3.18**	**100**	**2,136**
Education										
No formal education	1.0	0.45	26.7	4.10	40.4	6.89	31.8	9.29	100	365
Less than primary	0.5	0.24	19.0	3.75	57.5	6.40	23.0	4.12	100	805
Primary school completed	0.2	0.12	20.8	5.67	43.6	8.64	35.4	6.49	100	509
Secondary school completed	0	0	25.0	9.60	48.2	10.20	26.8	9.50	100	214
High school completed	5.1	5.06	12.7	8.55	52.8	15.18	29.5	11.75	100	52
College completed	0.7	0.66	23.6	5.65	49.5	8.10	26.3	7.27	100	107
Post graduate degree completed	0	0	5.2	3.92	53.2	28.57	41.6	28.86	100	56
Total	**0.6**	**0.19**	**21.1**	**2.27**	**49.6**	**4.17**	**28.7**	**3.25**	**100**	**2,107**
Marital status										
Never married	0.9	0.60	33.6	10.09	51.1	12.71	14.4	4.26	100	152
Currently married	0.3	0.12	17.4	2.60	51.1	5.46	31.2	4.53	100	1,500
Cohabiting	2.4	2.35	24.8	9.28	49.3	9.43	23.5	7.74	100	58
Separated/divorced	3.5	3.13	11.9	3.21	49.6	8.53	34.9	7.91	100	84
Widowed	0.8	0.43	34.6	6.88	41.5	6.38	23.0	3.50	100	313
Total	**0.6**	**0.19**	**21.1**	**2.27**	**49.6**	**4.17**	**28.7**	**3.25**	**100**	**2,107**
Income quintile										
Lowest	1.0	0.44	29.6	2.88	48.4	4.49	21.0	3.66	100	319
Second	1.2	0.66	22.0	5.51	48.9	8.53	27.9	8.12	100	540
Middle	0.2	0.18	20.6	6.18	50.3	11.21	28.8	7.92	100	355
Fourth	0.5	0.32	17.5	3.37	47.7	5.71	34.3	5.46	100	346
Highest	0.1	0.09	19.0	4.16	50.8	7.77	30.1	5.92	100	575
Total	**0.6**	**0.19**	**21.4**	**2.27**	**49.4**	**4.10**	**28.6**	**3.19**	**100**	**2,135**
Residence										
Urban	0.5	0.21	20.1	2.47	48.9	4.98	30.5	3.99	100	1,670
Rural	1.1	0.45	26.0	5.29	51.1	6.04	21.8	3.42	100	465
Total	**0.6**	**0.19**	**21.4**	**2.27**	**49.4**	**4.1**	**28.6**	**3.18**	**100**	**2,136**
Number	**13**		**456**		**1,055**		**611**		**2,136**	

* Underweight: <18.5 kg/m^2; normal: 18.5-24.9 kg/m^2; overweight: ≥25–29.9 kg/m^2; obese: ≥30 kg/m^2.

** SE = standard error.

Table 8.2 Mean waist circumference risk categories, by selected background characteristics

	Waist circumference						Total Percent	Number
	No additional risk		Increased risk*		Substantially increased risk*			
	Percent	SE**	Percent	SE	Percent	SE		
Age group								
50-59	19.6	5.88	20.2	5.05	60.2	7.10	100	1,069
60-69	24.6	4.12	22.6	2.67	52.9	3.68	100	546
70-79	19.9	3.80	29.2	6.04	50.9	4.92	100	367
80+	37.1	5.02	20.7	3.49	42.2	5.34	100	158
Total	**22.2**	**3.17**	**22.4**	**2.74**	**55.4**	**3.58**	**100**	**2,141**
Sex								
Men	37.9	5.15	24.4	4.11	37.8	5.28	100	982
Women	8.9	2.24	20.8	3.60	70.4	3.84	100	1,158
Total	**22.2**	**3.17**	**22.4**	**2.74**	**55.4**	**3.58**	**100**	**2,141**
Education								
No formal education	18.4	3.46	24.1	4.42	57.5	6.13	100	363
Less than primary	26.6	6.71	17.9	3.27	55.5	6.95	100	807
Primary school completed	9.7	1.96	26.0	6.69	64.2	6.70	100	511
Secondary school completed	32.2	10.78	27.2	9.52	40.6	9.09	100	213
High school completed	18.3	9.87	30.8	17.12	50.9	15.81	100	52
College completed	26	6.97	26.2	8.28	47.8	7.92	100	108
Post graduate degree completed	44.6	29.08	12.0	9.29	43.4	28.86	100	56
Total	**21.9**	**3.22**	**22.5**	**2.78**	**55.6**	**3.65**	**100**	**2,110**
Marital status								
Never married	20.3	7.74	29.5	9.48	50.1	12.3	100	152
Currently married	23.9	4.23	20.9	3.76	55.2	5.14	100	1,504
Cohabiting	23.4	8.13	38.3	9.82	38.2	7.82	100	58
Separated/divorced	13.8	4.26	14.4	4.54	71.8	6.73	100	84
Widowed	15.1	3.41	25.9	7.51	59.0	6.58	100	311
Total	**21.9**	**3.22**	**0**	**2.78**	**55.6**	**3.65**	**100**	**2,110**
Income quintile								
Lowest	22.1	2.37	28.1	4.13	49.8	4.49	100	321
Second	25.3	8.84	19.9	5.49	54.8	7.74	100	543
Middle	20	6.14	12	3.56	68	8.05	100	350
Fourth	16.1	3.63	31.9	5.82	52	5.33	100	348
Highest	24.4	6.26	22.2	6.27	53.4	7.02	100	578
Total	**22.2**	**3.17**	**22.4**	**2.74**	**55.4**	**3.59**	**100**	**2,140**
Residence								
Urban	17.8	2.73	23.1	3.31	59.1	3.9	100	1,673
Rural	38.1	7.62	19.9	4.14	42.1	5.43	100	468
Total	**22.2**	**3.17**	**22.4**	**2.74**	**55.4**	**3.58**	**100**	**2,141**
Number	**475**		**480**		**1,186**		**2,141**	

* Risk is increased if WC is greater than 94 cm for men and 80 cm for women, and increased substantially if WC is greater than 102 cm for men and 88 cm for women.

** SE = standard error.

likely to be found) had the lowest rates of overweight/obesity—but in both cases, these were still around 70%. Separated/divorced respondents were the most likely of the marital groups to carry excess weight (nearly 85%), but also most likely (if still only at 3.5%) to be underweight. Rural residents were quite a bit less likely to be overweight/obese taken together (around 72%, compared to around 79% in urban areas), although slightly more likely to be overweight.

Hip and waist circumference

Waist circumference (WC) and waist-to-hip ratio (WHR) are important indicators of overall health risk for cardio-vascular and metabolic diseases. People with more weight around their waists are at greater risk of heart disease and diabetes than those with weight around their hips. WC and WHR have been found to be more efficient predictors of mortality and other health outcomes in older people than BMI, as higher BMI in older adults is associated with lower mortality rates (Janssen, 2005; Huxley, 2010; Seidell, 2010; Heim 2011). Elevated WHR, as opposed to high BMI, has been associated with a greater risk of death (Price, 2006; Flicker, 2010). WC is a useful measure of fat distribution in the human body, and was measured midway between the lower rib cage and the iliac crest by trained interviewers.

Table 8.2 shows the distribution health risk from WC categories by selected demographic characteristics. The risk of metabolic complication from higher WC is based on WHO classifications as follows:

● Increased if WC is greater than 94 cm for men and 80 cm for women;

● Substantially increased if WC is greater than 102 cm for men and 88 cm for women (WHO, 2011).

Over 55% of respondents had a waist circumference that placed them at substantially increased risk of health problems, with an additional 22% at increased risk—a total of some 77%. In contrast to the results for overweight/obesity, risky waist circumference (taken as increased risk plus substantially increased risk) did not show a straightforward decrease with age—although respondents aged 80-plus continued to show the lowest levels of risk overall. Similarly, the results by educational levels also did not conform to the overweight/obesity results, with respondents holding a post-graduate degree the least likely to have risky waist circumferences, and those having no formal education sitting in the middle of the range. However, women were again

more likely to be at risk than men (particularly in the 'substantially at risk' category), as were the lowest income earners compared to other income quintiles. Rural residents, meanwhile, were substantially less likely to be at risk than their urban counterparts.

An alarming 84.5% of respondents overall had high-risk waist-to-hip ratios (WHR) (Table 8.3), with the figures rising to 90% or above among respondents aged 50-59, men, and those with post-graduate degrees. No demographic group fell below 72%, the rough figure for respondents aged 70-79; in addition to this group, the never-married and the widowed were the only groups to come in below 75%. Most other demographic groups fell in the 80-89% range, with comparatively little variation around income quintiles, place of residence, or (post-graduate degrees excepted) education. Notably, however, women came in at around 78% (compared, as noted above, to the men at nearly 92%).

8.2 Measured performance tests

The interviewers were trained to conduct face-to-face interviews, physical measurements and performance tests. A manual was available which contained instructions on taking the different measurements, specifying the nature of each test, the instructions to be given before and during the measurement, the equipment to be used, the calibration of the equipment where necessary, and the importance of adhering to a protocol throughout the activity in order to ensure interview consistency and reliability of the measurements obtained. Interviewers were also invited to report observations or problems arising in the administration of the tests.

Half of the respondents were accompanied by another person during the interview; 7% had hearing problems; 9% had problems with eyesight; 1% used a wheel chair; 7% used crutches, a cane or a walker; 14% had difficulty walking; fewer than 1% had paralysis; 2% had difficulty breathing or a chronic cough; fewer than 1% had an extremity amputated; and 7% reported having some other health condition that made performing a given test difficult.

Measured blood pressure

The current Official Mexican Standard (NOM-030-SSA2-1999) considers normal blood pressure to be below

Table 8.3 Mean waist-to-hip circumference ratio risk categories, by selected background characteristics

	Waist-to-hip ratio				Total Percent	Number
	Low risk		High risk*			
	Percent	SE**	Percent	SE		
Age group						
50-59	10.0	2.76	90.0	2.76	100	1,068
60-69	16.5	3.30	83.5	3.30	100	545
70-79	27.6	6.75	72.4	6.75	100	366
80+	21.7	4.32	78.3	4.32	100	157
Total	**15.5**	**2.28**	**84.5**	**2.28**	**100**	**2,136**
Sex						
Men	8.1	2.15	91.9	2.15	100	980
Women	21.8	3.55	78.2	3.55	100	1,156
Total	**15.5**	**2.28**	**84.5**	**2.28**	**100**	**2,136**
Education						
No formal education	15.8	4.90	84.2	4.90	100	361
Less than primary	12.7	3.22	87.3	3.22	100	805
Primary school completed	16.1	5.54	83.9	5.54	100	511
Secondary school completed	21.9	9.37	78.1	9.37	100	213
High school completed	18.8	9.83	81.2	9.83	100	52
College completed	21.6	6.27	78.4	6.27	100	107
Post graduate degree completed	7.6	6.37	92.4	6.37	100	56
Total	**15.4**	**2.31**	**84.6**	**2.31**	**100**	**2,106**
Marital status						
Never married	26.6	9.77	73.4	9.77	100	152
Currently married	11.8	2.37	88.2	2.37	100	1,502
Cohabiting	15.6	7.05	84.4	7.05	100	58
Separated/divorced	17.3	5.47	82.7	5.47	100	84
Widowed	26.8	7.82	73.2	7.82	100	309
Total	**15.4**	**2.31**	**84.6**	**2.31**	**100**	**2,106**
Income quintile						
Lowest	15.8	3.80	84.2	3.80	100	320
Second	18.9	5.65	81.1	5.65	100	543
Middle	11.2	3.27	88.8	3.27	100	349
Fourth	13.0	2.70	87.0	2.70	100	347
Highest	16.3	4.82	83.7	4.82	100	578
Total	**15.5**	**2.27**	**84.5**	**2.27**	**100**	**2,136**
Residence						
Urban	15.7	2.55	84.3	2.55	100	1,669
Rural	14.8	5.04	85.2	5.04	100	467
Total	**15.5**	**2.28**	**84.5**	**2.28**	**100**	**2,136**
Number	**332**		**1,805**		**2,136**	

* High risk is defined as a WHR ratio greater than 0.90 cm for men and 0.85 cm for women.

** SE = standard error.

Table 8.4 Percent distribution of hypertension, by selected background characteristics

| | Hypertension: systolic and/or diastolic* | | | | Total Percent | Number |
| | Yes | | No | | | |
	Percent	SE**	Percent	SE		
Age group						
50-59	45.0	5.41	55.0	5.41	100	1,087
60-69	58.4	3.99	41.6	3.99	100	547
70-79	72.3	3.92	27.7	3.92	100	380
80+	62.0	4.75	38.0	4.75	100	177
Total	**54.5**	**3.33**	**45.5**	**3.33**	**100**	**2,191**
Sex						
Male	54.8	4.98	45.2	4.98	100	1,015
Female	54.1	5.32	45.9	5.32	100	1,176
Total	**54.5**	**3.33**	**45.5**	**3.33**	**100**	**2,191**
Education						
No formal education	70.8	4.31	29.2	4.31	100	376
Less than primary	50.3	7.06	49.7	7.06	100	817
Primary school completed	53.8	7.98	46.2	7.98	100	511
Secondary school completed	38.2	8.84	61.8	8.84	100	219
High school completed	56.4	14.70	43.6	14.7	100	52
College completed	41.8	8.17	58.2	8.17	100	118
Post graduate degree completed	90.7	6.70	9.3	6.70	100	57
Total	**54.2**	**3.36**	**45.8**	**3.36**	**100**	**2,150**
Marital status						
Never married	65.8	9.79	34.2	9.79	100	152
Currently married	50.3	3.95	49.7	3.95	100	1,521
Cohabiting	58.9	9.03	41.1	9.03	100	57
Separated/divorced	43.6	8.15	56.4	8.15	100	98
Widowed	69.5	4.20	30.5	4.20	100	322
Total	**54.2**	**3.36**	**45.8**	**3.36**	**100**	**2,150**
Income quintile						
Lowest	59.4	3.56	40.6	3.56	100	332
Second	67.1	8.70	32.9	8.70	100	556
Middle	42.7	10.35	57.3	10.35	100	364
Fourth	46.0	5.51	54.0	5.51	100	366
Highest	52.2	6.97	47.8	6.97	100	573
Total	**54.4**	**3.33**	**45.6**	**3.33**	**100**	**2,190**
Residence						
Urban	54.0	3.82	46.0	3.82	100	1,719
Rural	56.1	6.97	43.9	6.97	100	472
Total	**54.5**	**3.33**	**45.5**	**3.33**	**100**	**2,191**
Number	**1,193**		**998**		**2,191**	

* Equal or exceeding systolic 140mmHg and/or diastolic 90 mmHg.

** SE = standard error.

140/90 mmHg. Accordingly, optimal arterial pressure is considered to be below 120/80 mmHg, normal arterial pressure 120-129/80-84 mmHg and normal high arterial pressure 130-139/85-89 mmHg. According to this Standard, arterial hypertension is equal or exceeding 140/90 mmHg.[1]

Table 8.4 presents information on the prevalence of hypertension based on measured blood pressure. Over half (54.5%) of the respondents had systolic or diastolic hypertension, with rates peaking in the 70-79 age group (72.3%). Rates were almost identical among men and women and only differed slightly between urban and rural residents, with the latter only two percentage points more at risk. Rates varied more widely across income quintiles (a 15 percentage-point spread) and marital status (26 percentage points), with the widowed and the second income quintile at the greatest risk. They varied even more sharply (a spread of over 50 percentage points) across education levels, with respondents at either end of the education spectrum (no formal education/post-graduate education) at the highest risk and those with a partial secondary education at the lowest.

Lung function (spirometry)

Chronic obstructive pulmonary disease (COPD) is a leading cause of premature death in Mexico (IHME, 2013). In addition, national statistics rank asthma and status asthmaticus 13th and bronchial pneumonia and pneumonia 16th among the leading causes of illness by age group; these conditions were particularly prevalent among persons aged 65 and over (20%).[2]

Around 20% of respondents returned spirometry results indicating some degree of COPD, including around 18% of those respondents who said that they had never been diagnosed with the condition (Table 8.5). Rates of COPD went up with age (from 12.8% among 50-59 year olds to 36.5% among respondents aged 80-plus), were almost identical for men and women, and roughly equivalent among urban and rural residents and among the non-obese and the obese (the latter in fact showing slightly lower levels). Although current

and former smokers had high rates, so did those who had never smoked. Prevalence was also lowest in the highest income quintile. Comparing the lung function test results to self-reported diagnosis (or not) of COPD, over 66% of respondents who said that they had been diagnosed with the condition showed no signs in the spirometry test, while over 13% of those who had never been diagnosed showed a moderate or more severe level of disease on the test. These discrepancies could be related to the small number reporting COPD, or inaccuracies in the administration of the spirometry test – a notoriously difficult test to complete.

Among respondents who returned spirometry results indicating some degree of COPD, most (57%) showed a moderate level of the condition, followed by those (28%) who showed only mild signs. The COPD of some 11% was severe, and that of around 4% very severe. Those very much at the greatest risk of severe or very severe COPD were respondents aged 80-plus (3.7% in each category, or 7.4% in total); no other demographic group showed a combined severe/very severe incidence of over 5.3% (the lowest income quintile). Respondents aged 80-plus were also by far the most likely to show moderate COPD. Among the risk category groups, interestingly, occasional smokers had the highest levels of severe/very severe incidence (again 5.3%); meanwhile, the non-obese were around half as likely as the obese to show severe/very severe incidence. The group with the highest incidence of moderate COPD was the middle income quintile at over 22%, followed by current daily smokers at nearly 16%.

Table 8.6 presents information on the distribution of asthma. The spirometry revealed asthma rates much higher than the rates derived from symptom reporting: fewer than 4% of respondents tested as completely free of asthma, and over 96% of those who said that they had no symptoms in fact showed some signs—mostly mild, but also moderate—of the condition. Spirometry-based incidence increased with age. Women were more likely than men to test as free from the condition, but also to show mild signs. Rural residents were more likely than their urban counterparts to show no signs of asthma in the spirometry; however, if they did show signs, they were more likely to be moderate or severe. Distribution of incidence across the income quintiles did not show strong patterns, although those in the highest income quintile were the least likely to show moderate or severe signs of the disease and those in the second and middle quintiles the most. Among risk factor groups, weight again did not provoke strong

1   Secretaria de Salud de México. NORMA Oficial Mexicana NOM-030-SSA2-1999, Para la prevención, tratamiento y control de la hipertensión arterial. Disponible en http://www.salud.gob.mx/unidades/cdi/nom/030ssa29.html consultada el 30 de julio del 2010.

2   Secretaría de Salud de México. Anuarios de morbilidad. Disponible en http://www.dgepi.salud.gob.mx/infoepi/infodigital.html, consultado el 30 de julio del 2010.

Table 8.5 Distribution of Chronic Obstructive Pulmonary Disease (COPD) severity using spirometry (FEV<2), by selected background characteristics, health risks and self-reported COPD

| | \multicolumn{10}{c}{COPD severity} | Total Percent | Number |
| | None | | Mild | | Moderate | | Severe | | Very severe | | | |
	%	SE*	%	SE	%	SE	%	SE	%	SE		
Age group												
50-59	87.2	2.7	2.9	1.3	8.9	2.8	0.8	0.4	0.2	0.2	100	913
60-69	78.6	2.5	5.2	1.1	12.6	2.0	3.1	0.8	0.4	0.2	100	490
70-79	75.4	3.7	11.0	2.5	9.2	1.9	3.3	1.1	1.1	0.4	100	318
80+	63.5	6.5	8.6	2.4	20.5	5.9	3.7	1.7	3.7	2.8	100	122
Total	**81.3**	**1.7**	**5.3**	**0.8**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,844**
Sex												
Male	81.0	2.9	5.2	1.3	11.4	2.8	1.6	0.5	0.8	0.4	100	884
Female	81.6	2.6	5.4	1.2	10.1	2.0	2.4	0.6	0.5	0.2	100	960
Total	**81.3**	**1.7**	**5.3**	**0.8**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,844**
Residence												
Urban	82.2	1.9	4.9	0.9	10.0	1.5	2.3	0.5	0.6	0.3	100	1,419
Rural	78.1	3.3	6.7	2.1	13.2	4.4	1.2	0.5	0.9	0.4	100	425
Total	**81.3**	**1.7**	**5.3**	**0.8**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,844**
Income quintile												
Lowest	73.6	4.1	9.8	2.5	11.5	2.8	3.5	1.3	1.6	1.2	100	274
Second	85.5	3.1	6.6	2.2	6.9	2.0	0.7	0.3	0.3	0.2	100	490
Middle	68.2	7.3	5.3	1.6	22.1	7.2	2.8	1.7	1.7	0.9	100	244
Fourth	80.4	3.9	5.0	1.4	12.3	3.5	2.2	1.0	0.1	0.1	100	324
Highest	88.3	2.9	1.9	0.8	7.6	2.3	1.9	0.9	0.4	0.2	100	512
Total	**81.3**	**1.7**	**5.3**	**0.8**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,843**
Tobacco use												
Current daily smoker	77.4	4.9	3.7	1.5	15.9	4.1	2.0	1.1	0.9	0.6	100	249
Smoker, not daily	86.3	4.5	1.8	1.8	6.6	2.5	5.3	3.1	0.0	0.0	100	135
Not current smoker	79.4	4.4	6.9	3.3	10.6	2.2	1.6	0.6	1.6	1.0	100	366
Never smoker	82.9	2.7	4.9	1.1	10.0	2.3	1.8	0.6	0.4	0.1	100	1,074
Total	**81.7**	**1.7**	**4.9**	**0.9**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,824**
Obesity												
<30kg/m² (no)	80.2	2.6	5.0	0.9	11.7	2.2	2.5	0.6	0.6	0.3	100	1,245
>=30kg/m² (yes)	83.3	3.3	6.0	2.3	9.1	2.5	1.1	0.6	0.4	0.3	100	571
Total	**81.2**	**1.7**	**5.4**	**0.9**	**10.9**	**1.5**	**2.0**	**0.4**	**0.5**	**0.2**	**100**	**1,816**
Self-reported COPD												
No	82.2	1.6	4.7	0.9	10.5	1.5	1.9	0.4	0.7	0.2	100	1,767
Yes	66.4	9.9	12.0	5.0	15.4	10.4	6.1	2.6	0.2	0.2	100	58
Total	**81.7**	**1.7**	**4.9**	**0.9**	**10.7**	**1.5**	**2.0**	**0.4**	**0.7**	**0.2**	**100**	**1,825**
Number	**1,499**		**98**		**198**		**37**		**12**		**1,844**	

* SE = standard error.

Table 8.6 Distribution of asthma severity using spirometry (FEV<2), by selected background characteristics, health risks and asthma rates derived from symptom-reporting plus algorithm

	None		Mild		Moderate		Severe		Total Percent	Number
	%	**SE***	**%**	**SE**	**%**	**SE**	**%**	**SE**		
Age group										
50-59	2.6	1.9	69.3	7.7	23.3	6.6	4.8	2.5	100	762
60-69	4.6	1.1	64.8	3.6	23.1	3.0	7.4	1.7	100	428
70-79	4.0	1.7	66.1	5.5	23.2	4.1	6.8	1.9	100	263
80+	6.1	2.3	52.5	6.2	29.1	6.1	12.2	4.5	100	94
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.6**	**3.6**	**6.3**	**1.3**	**100**	**1,547**
Sex										
Male	2.7	0.8	62.9	6.7	27.3	6.2	7.1	2.7	100	764
Female	4.6	1.9	70.0	4.1	20.0	3.5	5.5	1.2	100	783
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.6**	**3.6**	**6.3**	**1.3**	**100**	**1,547**
Income quintile										
Lowest	4.5	1.9	54.1	4.6	33.7	4.3	7.8	2.2	100	221
Second	2.5	0.9	68.1	10.8	25.4	11.1	3.9	1.6	100	400
Middle	3.4	1.2	49.9	7.3	28.9	6.8	17.8	8.7	100	191
Fourth	3.9	1.6	63.8	6.5	28.9	6.8	3.3	1.2	100	270
Highest	4.1	3.0	79.4	5.1	12.0	3.4	4.6	1.5	100	465
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.6**	**3.6**	**6.3**	**1.3**	**100**	**1,547**
Residence										
Urban	2.9	0.6	68.1	4.6	23.5	4.5	5.5	1.0	100	1,180
Rural	6.0	3.8	61.2	8.9	23.9	4.7	8.8	4.4	100	367
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.6**	**3.6**	**6.3**	**1.3**	**100**	**1,547**
Tobacco use										
Current daily smoker	3.9	2.3	57.0	12.1	31.1	10.0	8.0	3.4	100	179
Smoker, not daily	1.0	0.7	82.4	5.4	9.9	3.5	6.7	3.4	100	127
Not current smoker	2.4	0.7	70.3	5.3	19.9	4.3	7.3	2.8	100	311
Never smoker	4.3	1.6	64.9	6.0	25.3	5.4	5.4	2.1	100	919
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.6**	**3.7**	**6.2**	**1.3**	**100**	**1,536**
Obesity										
<30kg/m² (no)	1.4	0.3	69.0	5.1	22.7	4.6	6.9	2.0	100	1,031
>=30kg/m² (yes)	4.1	2.9	64.6	6.6	26.3	5.5	5.0	1.7	100	490
Total	**2.3**	**1.0**	**67.6**	**4.1**	**23.9**	**3.7**	**6.3**	**1.3**	**100**	**1,521**
Asthma (algorithm)										
No	3.6	1.1	66.6	4.3	23.6	3.8	6.3	1.4	100	1,486
Yes	4.3	2.6	64.1	11.5	26.7	10.4	4.9	2.4	100	52
Total	**3.6**	**1.0**	**66.5**	**4.1**	**23.7**	**3.7**	**6.2**	**1.3**	**100**	**1,538**
Number	**56**		**1,029**		**365**		**98**		**1,547**	

* SE = standard error.

patterns, although obese respondents were less likely to show no signs of the condition than their non-obese counterparts; among tobacco use groups, meanwhile, current daily smokers showed the highest levels of risk for moderate and severe signs of the disease.

Vision (near and distance, using Tumbling "E" chart)

In addition to the complications associated with chronic degenerative illnesses and disability, alterations in motor coordination, space perception, sharpness of vision and hearing, walking, muscle and bone strength, mobility, and sensory perception of environmental stimuli such as cold and heat have been documented in persons over 60 years of age.

Over 80% of the study's respondents had normal distant vision, while only slightly over 50% had normal near vision (Table 8.7). Distant vision declined steadily and fairly strongly with age; only some 50% of respondents aged 80-plus had normal distant vision, compared with over 85% in the 50-59 age bracket. Near vision declined slightly less regularly with age and did so across a narrower span (less than ten percentage points). Women showed fairly marked lower visual acuity at both the distant and near range than men, raising questions as to whether they might have been less inclined to use spectacles. Respondents in the highest two income quintiles and those higher up the educational scale were notably more likely to show normal vision at both lengths; rural residents had better distant vision than urban ones, but worse near vision. Respondents who had never married, meanwhile, had the best distant vision of the marital status groups, but the worst near vision.

Grip strength (dynamometer)

Several studies of older people have shown that grip strength is a long-term predictor of mortality and disability (Bohannon, 2008; Ling, 2010). Low hand-grip strength has been consistently linked to premature mortality, disability and other health complications in older people. Poor muscular strength has been shown to be associated with increased morbidity and mortality in diverse samples of middle-aged and older adults. Grip strength in SAGE was assessed with the person in an upright seated position with the arm along the side, elbow bent at 90°, and the forearm and wrist were in the neutral position. The dynamometer handle was

adjusted to fit the hand size. Grip strength was assessed twice in each hand, with brief pauses between, and the final result a mean of the best result in each hand.

The mean grip strength for women was 19.3kg, while that for men was 30.3kg (Table 8.8). Grip strength declined with age, and was lower for rural residents than for urban ones; otherwise, it followed few predictable patterns.

Gait speed (timed walk)

Gait speed has been shown to be associated with survival, disability, and cognitive impairment in older adults. Respondents were asked to complete a timed walk over 4 metres, once at a normal or usual pace, and once at a rapid pace. For normal/usual paced walking in community-dwelling older adults, speeds of less than 0.4-0.6 metres/second are considered slow, and possibly an indicator of health risk, but may also need adjustment based on cultural gait norms. Changes in gait speed at rapid pace may provide an early indicator of cognitive change.

The mean time to walk four meters at normal pace was 5.3 seconds, with the oldest respondents (aged 80-plus) at 8.3 seconds (0.48m/s). At rapid pace, even the oldest group was capable of walking four metres in six seconds (Table 8.9). Women were slower than men overall, and rural residents were slower than urban ones. Walking speeds increased with rising income quintiles and for the most part with education levels; meanwhile, widowed respondents were the slowest group, possibly due to their older average age.

Table 8.7 Level of visual acuity (distant and near), by selected background characteristics

	Distant visual acuity				Total Percent	Number
	Normal		Low vision			
	Percent	SE**	Percent	SE		
Age group						
50-59	87.7	6.9	12.3	6.9	100	1,016
60-69	87.2	2.3	12.8	2.3	100	525
70-79	71.4	6.2	28.6	6.2	100	362
80+	50.4	5.7	49.6	5.7	100	133
Total	**82.2**	**3.4**	**17.8**	**3.4**	**100**	**2,036**
Sex						
Male	88.3	2.2	11.7	2.2	100	899
Female	77.4	5.7	22.6	5.7	100	1,137
Total	**82.2**	**3.4**	**17.8**	**3.4**	**100**	**2,036**
Education						
No formal education	79.1	5.9	20.9	5.9	100	350
Less than primary	77.0	7.9	23.0	7.9	100	774
Primary school completed	82.7	6.0	17.3	6.0	100	447
Secondary school completed	95.6	1.8	4.4	1.8	100	214
High school completed	96.2	2.3	3.8	2.3	100	51
College completed	91.9	3.0	8.1	3.0	100	120
Post graduate degree completed	99.5	0.5	0.5	0.5	100	56
Total	**82.6**	**3.5**	**17.4**	**3.5**	**100**	**2,011**
Marital status						
Never married	90.4	3.4	9.6	3.4	100	148
Currently married	85.6	4.9	14.4	4.9	100	1,415
Cohabiting	58.1	9.6	41.9	9.6	100	53
Separated/divorced	88.8	3.7	11.2	3.7	100	96
Widowed	67.0	7.3	33.0	7.3	100	298
Total	**82.6**	**3.5**	**17.4**	**3.5**	**100**	**2,011**
Income quintile						
Lowest	78.3	4.7	21.7	4.7	100	292
Second	78.8	5.8	21.2	5.8	100	478
Middle	67.0	15.3	33.0	15.3	100	343
Fourth	85.9	3.0	14.1	3.0	100	353
Highest	94.0	1.7	6.0	1.7	100	570
Total	**82.2**	**3.4**	**17.8**	**3.4**	**100**	**2,035**
Residence						
Urban	81.1	4.2	18.9	4.2	100	1,594
Rural	86.1	4.0	13.9	4.0	100	441
Total	**82.2**	**3.4**	**17.8**	**3.4**	**100**	**2,036**
Number	**1,674**		**362**		**2,036**	

* Vision tests include the respondent's typical correcting aids (spectacles or other) if used. Normal distant and near visual acuity were classified for values ranging from 0.3 to 2.0 on the LogMAR chart (better than 20/70 vision).

** SE = standard error.

Table 8.7 Continued

	Near visual acuity				Total Percent	Number
	Normal		Low vision			
	Percent	SE	Percent	SE		
Age group						
50-59	52.9	6.7	47.1	6.7	100	1,022
60-69	54.2	3.8	45.8	3.8	100	532
70-79	49.4	6.3	50.6	6.3	100	366
80+	45.7	5.4	54.3	5.4	100	139
Total	**52.1**	**3.5**	**47.9**	**3.5**	**100**	**2,058**
Sex						
Male	55.4	5.3	44.6	5.3	100	913
Female	49.5	4.7	50.5	4.7	100	1,145
Total	**52.1**	**3.5**	**47.9**	**3.5**	**100**	**2,058**
Education						
No formal education	41.3	8.2	58.7	8.2	100	354
Less than primary	41.8	6.7	58.2	6.7	100	780
Primary school completed	72.4	5.0	27.6	5.0	100	455
Secondary school completed	49.6	9.9	50.4	9.9	100	215
High school completed	47.1	15.2	52.9	15.2	100	52
College completed	62.2	8.0	37.8	8.0	100	119
Post graduate degree completed	88.9	8.5	11.1	8.5	100	56
Total	**52.0**	**3.6**	**48.0**	**3.6**	**100**	**2,031**
Marital status						
Never married	36.2	9.5	63.8	9.5	100	151
Currently married	52.2	4.9	47.8	4.9	100	1,428
Cohabiting	47.3	9.6	52.7	9.6	100	53
Separated/divorced	60.2	9.4	39.8	9.4	100	95
Widowed	57.4	5.5	42.6	5.5	100	305
Total	**52.0**	**3.6**	**48.0**	**3.6**	**100**	**2,031**
Income quintile						
Lowest	48.5	4.9	51.5	4.9	100	300
Second	34.3	5.3	65.7	5.3	100	487
Middle	39.1	9.2	60.9	9.2	100	344
Fourth	65.5	4.9	34.5	4.9	100	354
Highest	68.8	5.9	31.2	5.9	100	573
Total	**52.1**	**3.5**	**47.9**	**3.5**	**100**	**2,058**
Residence						
Urban	54.4	4.1	45.6	4.1	100	1,613
Rural	43.8	5.9	56.2	5.9	100	445
Total	**52.1**	**3.5**	**47.9**	**3.5**	**100**	**2,058**
Number	**1,073**		**985**		**2,058**	

Table 8.8 Percent distribution of mean grip strength (in kg) for women and men, by selected background characteristics

	Grip strength (kg), women			Grip strength (kg), men		
	Mean	SE*	Number	Mean	SE	Number
Age group						
50-59	20.8	0.6	577	33.2	1.2	534
60-69	18.9	0.4	307	29.8	0.7	285
70-79	17.3	0.9	242	26.0	0.9	170
80+	15.2	0.6	104	20.2	0.9	94
Total	**19.3**	**0.4**	**1,230**	**30.3**	**0.8**	**1,083**
Education						
No formal education	18.4	0.6	262	28.6	1.9	125
Less than primary	19.7	0.8	474	28.2	0.7	387
Primary school completed	19.5	1.0	227	33.6	1.5	312
Secondary school completed	19.6	0.8	132	27.5	1.9	90
High school completed	19.7	0.7	29	30.7	1.6	24
College completed	19.2	1.2	67	30.8	2.0	57
Post graduate degree completed	14.1	0.7	6	37.4	3.3	51
Total	**19.3**	**0.4**	**1,197**	**30.3**	**0.8**	**1,047**
Marital status						
Never married	19.7	1.9	128	25.2	1.7	30
Currently married	19.9	0.5	685	31.2	0.9	891
Cohabiting	17.0	3.6	22	28.9	1.7	39
Separated/divorced	19.1	0.9	75	25.2	1.7	26
Widowed	18.0	0.6	287	23.4	1.0	61
Total	**19.3**	**0.4**	**1,197**	**30.3**	**0.8**	**1,047**
Income quintile						
Lowest	17.3	0.6	210	27.0	1.7	144
Second	19.5	1.0	302	30.4	1.7	269
Middle	19.8	0.9	252	27.1	0.9	136
Fourth	18.8	0.7	171	31.1	1.1	213
Highest	20.1	0.8	295	32.4	1.5	320
Total	**19.3**	**0.4**	**1,230**	**30.3**	**0.8**	**1,081**
Residence						
Urban	19.5	0.5	1,026	31.0	1.0	796
Rural	18.0	0.6	204	28.6	1.2	287
Total	**19.3**	**0.4**	**1,230**	**30.3**	**0.8**	**1,083**

* SE = Standard error.

Table 8.9 Mean time (in seconds) for normal/usual pace and rapid pace walk over a 4-metre distance, by selected background characteristics

	Normal pace (seconds)		Rapid pace (seconds)		
	Mean	SE*	Mean	SE	Number
Sex					
Male	4.6	0.15	3.0	0.20	1,083
Female	5.8	0.22	3.9	0.11	1,230
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,313**
Age group					
50-59	4.7	0.22	3.0	0.19	1,111
60-69	4.9	0.29	3.4	0.17	592
70-79	6.4	0.36	4.0	0.12	412
80+	8.3	0.43	6.0	0.33	198
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,313**
Education					
No formal education	6.1	0.55	4.0	0.20	387
Less than primary	5.3	0.19	3.5	0.26	861
Primary school completed	4.9	0.29	3.4	0.17	539
Secondary school completed	4.9	0.62	3.2	0.33	223
High school completed	4.9	0.55	3.0	0.39	54
College completed	4.5	0.16	3.1	0.11	124
Post graduate degree completed	5.3	0.55	2.8	0.33	57
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,244**
Marital status					
Never married	5.3	0.29	3.7	0.12	157
Currently married	4.9	0.18	3.3	0.15	1,577
Cohabiting	5.3	0.56	3.3	0.23	62
Separated/divorced	5.1	0.34	3.5	0.24	101
Widowed	6.8	0.52	4.4	0.25	348
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,244**
Income quintile					
Lowest	6.1	0.18	4.1	0.13	353
Second	5.5	0.37	3.3	0.42	571
Middle	5.8	0.36	3.8	0.18	388
Fourth	5.0	0.16	3.6	0.13	384
Highest	4.6	0.32	3.1	0.17	615
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,311**
Residence					
Urban	5.4	0.21	3.6	0.10	1,822
Rural	5.1	0.08	3.2	0.42	491
Total	**5.3**	**0.16**	**3.5**	**0.13**	**2,313**

* SE = Standard error.

9. Health Care Utilization and Health System Responsiveness

This section describes health care use and the responsiveness of the health care system. This section will describe and differentiate health care utilization results in terms of inpatient and outpatient services by selected demographic characteristics, but also by some employment characteristics. Care from public and/or private facilities and any traditional or complementary medicine will also be discussed.

Health care responsiveness can be used as a tool for evaluating the performance of health care systems on a national level. It is related to both patient satisfaction and the interpersonal dimensions of quality of care. Responsiveness is impacted by interactions with the health system.

9.1 Health service utilization

Health care utilization includes both inpatient and outpatient services provided by public and/or private facilities, as well as traditional or complementary medicine.

Table 9.1 presents information on self-reported need for health care and health care received. Around 58% of all respondents reported needing health care services more than three years ago, and around 31% had required care in the last year, for a combined total of nearly 89%. Somewhat more men than women had required care more than three years ago (nearly 61% compared to 56%), but more women than men had required care in the last three years (around 37%, compared to around 24%). Overall, need for health care, whether more than three years ago or in the last three years, was higher at higher ages, as was need in the last three years for all but the oldest respondents. Otherwise, distribution of need did not follow easily discernible patterns. Interestingly, the highest earners

were by far the least likely to describe themselves as never having needed health care, followed by the lowest—a fact that might reflect better health literacy in the first case, and worse overall health in the second.

Of the 31% of respondents who had reported needing health care in the last three years, over 51% had not received care at all. The percentage of those not having received care at all was lowest among the study's oldest respondents (aged 80-plus), at around 42%, and highest in the 70-79 age group, at 54%. Those who had never married were more likely than the average not to have received treatment (nearly 66%); those in the middle income quintile who had the highest rates of having received treatment, followed by the oldest respondents (aged 80-plus).

In terms of care received in the last three years, nearly 38% of respondents who reported needing and receiving health care in the last year had received inpatient care, and around 62% had received outpatient care. The oldest respondents (aged 80-plus) were the most likely of the age groups to have received both inpatient and outpatient care. Men were more likely (by seven percentage points) than women to have received inpatient care, and equally less likely to have received outpatient care. Urban residents were around five percentage points more likely than rural ones to have received inpatient, rather than outpatient treatment— a fact that may reflect better inpatient facilities in urban areas. Respondents from the second income quintile had received the highest level of inpatient treatment among the income groups, but also the highest level of no care at all.

Table 9.2 presents information on receipt of inpatient and outpatient care. Among respondents who had received inpatient care in the previous three years, some 37% had done so for a chronic condition, with

Table 9.1 Percent distribution of respondents needing and receiving health care, by selected background characteristics

	Care need				Services received			
	More than 3 years ago (%)	Less than 3 years ago (%)	Never needed (%)	Number	Inpatient care in the last 3 years (%)	Outpatient care in the last 3 years (%)	Did not receive (%)	Number
Sex								
Male	60.6	24.2	15.2	1028	17.6	30.1	52.3	871
Female	56.0	36.6	7.4	1176	10.6	38.6	50.7	1105
Total	**58.1**	**30.8**	**11.1**	**2204**	**13.7**	**34.9**	**51.4**	**1976**
Age group								
50-59	61.7	25.8	12.5	1082	13.2	34.7	52.2	967
60-69	57.5	35.6	6.8	568	13.0	35.8	51.2	531
70-79	46.8	37.9	15.4	393	14.3	31.8	54.0	331
80+	63.4	30.8	5.8	161	18.3	39.9	41.8	146
Total	**58.1**	**30.8**	**11.1**	**2204**	**13.7**	**34.9**	**51.4**	**1976**
Marital status								
Never married	68.6	27.1	4.4	155	5.8	28.6	65.6	150
Currently married	59.1	29.7	11.2	1548	14.9	35.0	50.1	1383
Cohabiting	60.9	32.2	6.9	61	13.4	26.2	60.5	58
Separated/divorced	53.3	38.9	7.9	99	11.7	30.5	57.8	94
Widowed	49.5	35.2	15.3	341	12.8	40.8	46.4	290
Total	**58.1**	**30.8**	**11.1**	**2204**	**13.7**	**34.9**	**51.4**	**1976**
Income quintile								
Lowest	55.2	38.5	6.3	334	10.6	35.9	53.5	315
Second	49.7	30.4	19.9	549	20.6	19.4	60.0	448
Middle	65.7	20.5	13.8	364	9.1	52.2	38.7	317
Fourth	52.7	35.9	11.4	367	13.2	37.3	49.5	333
Highest	66.3	30.2	3.5	586	12.8	35.3	51.9	559
Total	**58.1**	**30.9**	**11.0**	**2200**	**13.7**	**34.9**	**51.5**	**1973**
Employment								
Public	54.6	36.0	9.3	166	15.9	32.0	52.1	150
Private	61.9	27.9	10.2	332	10.4	30.5	59.1	301
Self	69.8	21.8	8.5	433	21.0	31.9	47.1	405
Informal	59.9	18.9	21.1	284	12.9	47.7	39.4	226
Total	**63.2**	**24.7**	**12.0**	**1215**	**15.7**	**34.8**	**49.5**	**1082**
Residence								
Urban	59.7	30.6	9.7	1729	14.7	34.3	51.0	1569
Rural	52.3	31.7	16.0	475	9.8	37.2	53.0	407
Total	**58.1**	**30.8**	**11.1**	**2204**	**13.7**	**34.9**	**51.4**	**1976**
Number	**1280**	**680**	**244**	**2204**	**270**	**689**	**1016**	**1976**

Table 9.2 Distribution of respondents receiving inpatient care in the previous three years and outpatient care in the previous 12 months, by type of care and selected background characteristics.

	Inpatient (%)				Outpatient (%)			
	Chronic condition*	Acute condition	Other reason	Number	Chronic condition	Acute condition	Other reason	Number
Sex								
Male	43.4	5.8	50.8	39	46.4	11.9	41.7	332
Female	31.9	0.6	67.1	45	30.1	15.4	54.5	514
Total	**37.2**	**3.0**	**59.6**	**84**	**36.5**	**14.0**	**49.5**	**846**
Age group								
50-59	55.8	0	42.8	18	24.6	17.4	57.9	401
60-69	60.0	0	40.0	24	51.3	13.1	35.6	235
70-79	17.3	0	82.7	24	46.1	8.4	45.6	134
80+	14.9	14.2	71.0	18	36.1	9.1	54.9	76
Total	**37.2**	**3.0**	**59.6**	**84**	**36.5**	**14.0**	**49.5**	**846**
Marital status								
Never married	50.9	0	44.8	5	30.6	24.2	45.2	49
Currently married	43.8	0.4	55.8	58	33.1	13.9	53.0	600
Cohabiting	0	0	0	0	62.2	2.3	35.6	20
Separated/divorced	0	0	100.0	1	13.3	23.5	63.2	36
Widowed	15.4	11.7	72.9	19	55.0	10.4	34.5	141
Total	**37.2**	**3.0**	**59.6**	**84**	**36.5**	**14.0**	**49.5**	**846**
Income quintile								
Lowest	20.0	19.8	58.4	13	28.5	19.6	51.9	135
Second	38.0	0	62.0	22	41.0	21.2	37.8	116
Middle	19.1	0	80.9	19	25.8	5.8	68.4	189
Fourth	48.9	0	51.2	20	30.3	11.7	58.0	154
Highest	67.1	0	32.9	10	50.3	15.4	34.3	250
Total	**37.2**	**3.0**	**59.6**	**84**	**36.4**	**14.1**	**49.6**	**844**
Residence								
Urban	35.9	4.2	59.5	60	37.0	14.4	48.6	663
Rural	40.3	0	59.7	24	34.4	12.9	52.7	183
Total	**37.2**	**3.0**	**59.6**	**84**	**36.5**	**14.0**	**49.5**	**846**
Number	**31**	**3**	**50**	**84**	**309**	**119**	**419**	**846**

* Note: Non-communicable and chronic conditions include diabetes, heart disease, oral and swallowing problems, breathing problems, hypertension, stroke, paralysis, and cancers. Acute illnesses are predominantly communicable disease (infection), fever, diarrhoea, colds, headaches and coughing. The "Other" category includes nutritional deficiencies, injury, surgery, depression/anxiety/sleep problems, occupation/work related condition, and pain in joints/arthritis (joints, back, neck).

nearly 60% registering some other complaint; only 3% had received inpatient treatment for an acute illness. Chronic conditions were more commonly noted as the reason for inpatient treatment among men than women, among the top two income quintiles than among the lower three, and also among rural dwellers than urban ones. Respondents aged 80-plus, meanwhile, were considerably more likely than other respondents to have received inpatient treatment for acute illness. The only groups among whom inpatient treatment

was more likely to be related to chronic conditions than to other conditions were those aged 50-59 and 60-69, the never-married, and the highest income quintile, as noted above.

Among respondents who had received outpatient care in the previous 12 months, an almost identical percentage as for inpatient care (nearly 37%) had done so for a chronic condition, while a much higher number had received outpatient than inpatient care for an acute illness (14% compared to the 3% noted above). Other reasons accounted for the remaining nearly 50% of outpatient care. Chronic conditions were more common as a reason for outpatient treatment among men than women, and for the highest income quintile. Apart from these two groups, the other groups among whom outpatient treatment was significantly more likely to be related to chronic conditions than to other conditions were those aged 60-69, the cohabiting and the widowed, and those in the second income quintile.

9.2 Health system responsiveness

The performance of the general health care system at the national level was evaluated against standards of health system responsiveness. Responsiveness has been defined as the way individuals are treated and their perceptions about the environment in which they receive care (Valentine, 2003). The measurement of health system responsiveness typically covers eight domains, which may be divided into two groups. The first group of indicators covers respect for the individual, including dignity, privacy, autonomy (involvement in decision-making about personal health care), choice (of provider) and communication (with provider); the second group is patient-centered, including timeliness/prompt attention, social support, quality of care, infrastructure quality and access/selectiveness.

Health system responsiveness scores are quantitative indicators of the interaction between individuals and their health system. SAGE collected information on respondents' impressions of their most recent inpatient and/or outpatient visit from seven domains, including waiting time, being treated respectfully, receiving clear explanations, being involved in making treatment decisions, talking privately, happiness with providers, and cleanliness of the health facility. Each indicator had one score. Factor analysis was applied to evaluate the total responsiveness score using factor scores. Responsiveness scores were converted to a range

between 0 and 100, with a higher score reflecting better system responsiveness.

Overall, respondents judged outpatient care as slightly more responsive than inpatient care (a mean responsiveness score of 71.2, compared to 69.4 for inpatient care) (Table 9.3). Women found inpatient care quite a bit more responsive than did men, while men found outpatient care somewhat more responsive than did women; rural residents found inpatient care significantly more responsive than did urban ones, but registered very similar scores for outpatient care. Overall, the separated/divorced, the never-married and those in the fourth income quintile rated the responsiveness of inpatient care the best; the cohabiting and the middle income quintile rated it the worst. Meanwhile, the responsiveness of outpatient care was rated highest by the 50-59 age group, with scores fairly similar across the other demographic groups.

Table 9.3 **Mean health care responsiveness scores for inpatient and outpatient services, by selected background characteristics***

	Inpatient	SE**	N	Outpatient	SE	N
Sex						
Male	64.0	7.3	20	73.9	2.0	385
Female	70.7	4.9	81	69.5	2.0	616
Total	**69.4**	**4.2**	**101**	**71.2**	**1.5**	**1001**
Age group						
50-59	72.6	7.4	18	78.5	4.7	401
60-69	72.3	4.8	24	72.2	0.9	235
70-79	74.1	3.9	24	66.5	3.9	135
80+	74.3	1.5	18	73.6	1.0	76
Total	**69.4**	**4.2**	**84**	**71.2**	**1.5**	**847**
Marital status						
Never married	86.8	10.5	15	67.4	2.4	197
Currently married	68.0	3.6	68	71.8	2.1	552
Cohabiting	53.1	5.8	11	75.4	4.2	132
Separated/divorced	87.7	7.4	0	70.6	2.0	67
Widowed	71.3	3.6	6	68.9	3.3	53
Total	**69.4**	**4.2**	**101**	**71.2**	**1.5**	**1001**
Income quintile						
Lowest	64.8	2.8	35	71.1	1.7	169
Second	72.1	4.4	9	74.0	1.6	125
Middle	57.4	5.5	23	70.3	4.0	245
Fourth	87.4	6.0	24	71.1	2.0	160
Highest	67.4	3.9	10	70.8	3.6	300
Total	**69.4**	**4.2**	**101**	**71.2**	**1.5**	**999**
Residence						
Urban	67.0	5.1	79	71.1	2.0	741
Rural	78.1	3.7	22	71.4	1.4	260
Total	**69.4**	**4.2**	**101**	**71.2**	**1.5**	**1001**

* Responsiveness scores range between 0 and 100, with a higher score reflecting better system responsiveness.
** SE = standard error.

10. Well-being and Quality of Life

Life expectancy around the world rose by about two decades during the past half century. This increase has been associated with economic growth and rising levels of happiness globally. An increased interest from scientists in studying happiness and its relationship to health and health-related outcomes on the one hand, and economic development on the other, has also been associated with increasing attention to measures of subjective well-being by policy makers.

Well-being and quality of life encompass subjective individual feelings about physical health, psychological state, degree of independence, social relationships, personal beliefs, and environment. Psychologists, sociologists, economists and others have tried to quantify measurement of this inherently subjective topic using various concepts such as well-being, subjective well-being, happiness and life satisfaction.

There is a well-known interplay between happiness/subjective well-being/life satisfaction and health. An eight-item WHOQOL combined with an adapted version of the Day Reconstruction Method was used in SAGE to assess evaluative well-being and experienced well-being in Mexico.

10.1 Quality of life and life satisfaction (WHOQoL)

In SAGE, an 8-item version of the World Health Organization Quality of Life (WHOQoL) instrument was used to measure evaluative well-being. Evaluative well-being or life satisfaction is often measured with single questions such as "All things considered, how satisfied are you with your life as a whole these days?" or "Taking all things together, these days, would you say you are very happy, happy, neither happy nor unhappy, unhappy or

very unhappy?". These types of overall satisfaction questions can also be asked of specific domains such as health, living environment, and other areas of life. Life satisfaction is expected to be fairly stable over short durations of time (from week to week).

WHO defined quality of life (QoL) as "the individual's perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQOL Group, 1998). The important feature of this definition is that QoL is a matter of the individual's perception of the life that he or she is leading. Based on this definition, it was decided that a multi-dimensional tool was needed to assess quality of life. WHOQoL has been developed through a collaborative effort between international partners, including both developed and developing contexts. It has been used in many different study populations, including a special adaptation for the elderly as part of a study funded by the European Commission (WHOQOL Group, 1998; Power 2005; Schmidt 2006). The measure places primary importance on the perception of the individual and their perception of their own quality of life. It has well established psychometric properties, including the 8-item short version, and has been shown to have good cross-cultural performance (Power, 2005; Schmidt, 2006; da Rocha, 2012).

Table 10.1 presents mean WHOQoL scores, where a lower score reflects better quality of life. The overall mean score was 51.1. Women reported lower quality of life than men, with a mean WHOQoL score of 52.8 compared to 49.1 among men. Notably, older age groups consistently reported better QoL (lower scores) than younger age groups, with scores ranging from 52.4 for the youngest age group to 44.3 for the oldest. Rural respondents had higher scores (worse QoL) than their urban counterparts, while increasing wealth, and for the most part

Table 10.1 Distribution of mean WHOQoL scores, by selected background characteristics

	Mean WHOQoL score		Number
	Mean	SE**	
Sex			
Male	49.1	1.25	1,083
Female	52.8	1.34	1,230
Total	**51.1**	**1.11**	**2,313**
Age group			
50-59	52.4	2.02	1,111
60-69	51.2	1.15	592
70-79	50.5	1.94	412
80+	44.3	1.89	198
Total	**51.1**	**1.11**	**2,313**
Education			
No formal education	53.4	1.37	387
Less than primary	55.3	1.64	861
Primary school completed	51.4	2.22	539
Secondary school completed	51.4	2.28	223
High school completed	47.1	1.90	54
College completed	42.9	1.25	124
Post graduate degree completed	50.4	1.14	57
Total	**51.1**	**1.11**	**2,244**
Marital status			
Never married	53.1	1.47	157
Currently married	52.5	1.45	1,577
Cohabiting	57.1	1.79	62
Separated/divorced	55.7	3.01	101
Widowed	51.3	2.19	348
Total	**51.1**	**1.11**	**2,244**
Income quintile			
Lowest	54.8	1.10	353
Second	52.5	1.85	571
Middle	53.6	3.42	388
Fourth	48.5	1.31	384
Highest	47.6	1.39	615
Total	**51.1**	**1.11**	**2,311**
Residence			
Urban	50.6	1.34	1,822
Rural	52.6	1.64	491
Total	**51.1**	**1.11**	**2,313**

* WHOQoL scores range from 0 to 100, where a lower score reflects better quality of life.
** SE = standard error.

increased education, corresponded with better QoL. Interestingly, the widowed reported the lowest scores (best QoL) of the marital status groups, with those currently married a close second; the cohabiting had the highest scores (worst QoL).

10.2 Happiness and well-being (Day Reconstruction Method)

Happiness plays an important role in chronically ill people in decreasing mortality and seems to offset the negative impact of chronic illness. By and large, however, life circumstances seem to affect happiness only temporarily, and individuals return close to their baseline levels of happiness. The effects of life circumstances such as health, wealth, and marital status on well-being have been shown to be modest, while the effects of nationality and unemployment have had substantial and consistently negative effects on well-being. Social status also appears to play a role in well-being, but many unanswered questions remain about the measurement of well-being and its determinants of such as age, income and health.

The relationship between subjective well-being (SWB) and aging is not quite clear. Individual aspirations and adaptations to health and life circumstances influence happiness over the life course. As health declines with age, happiness tends to decline, especially among those with poorer health. Nevertheless, circumstances such as marriage and the extent and nature of social support clearly modify SWB, depending on the cultural context. The effect of aging on happiness varies internationally, with the decline in life satisfaction with age being more notable in low- and middle-income countries. In high-income countries, this relationship is not monotonic, with a U-shaped relationship with age among the English-speaking high income countries (Deaton, 2008).

Understanding differences in the well-being of older adults across and within countries will have significant implications for national policies (Krueger, 2009). As people live longer and the proportion of the older adult population rises, the way they spend their time, the circumstances in which they live, the nature of their work and leisure lives and changes in these over time, will need to be tracked along with their health and its determinants, in order to inform all aspects of policy-making. Estimates of national well-being (and inequalities within nations) will allow the assessment of how policies affect people's lives and perhaps a

more appropriate allocation of resources. Lessons from comparisons within and across countries will provide important insights into what may be responsible for these differences given the varying contexts of these populations.

For the purposes of measurement, the notion of SWB can thus be separated into experienced happiness and evaluative life satisfaction. Experienced happiness, or the affective experiences of daily life, fluctuates from day-to-day depending on how people use their time, their set of activities and interactions with others. Experienced happiness is often measured using the Experience Sampling Method (ESM) where respondents are prompted at random intervals to record their feelings and activities (Csikszentmihalyi, 1987; Stone, 1999). A reasonable approximation of this gold standard ESM technique is the Day Reconstruction Method (DRM) combining experiential and time use assessments (Kahneman, 2004). The methodology entails asking participants to think about the preceding day, break it down into episodes and then describe each episode in terms of the activity engaged in, the accompanying positive and negative emotions, the amount of control the respondent had over the activity and the context in which the activity was carried out. The DRM is used to increase the accuracy of emotional recall, and is a method of combining experiential and time use assessments. This assessment of experienced well-being adds information to the WHOQoL life satisfaction when assessing the impact of happiness on health. The WHO Quality of Life (WHOQoL) eight-item instrument was used for measuring evaluative well-being.

SAGE used an adapted version of the DRM developed with the assistance of Prof. Kahneman to measure experienced well-being (happiness). A composite score is generated for the DRM and is presented as a U-index (Table 10.2). The U-index is the average amount of time people spend in an unpleasant state in a given day (the proportion of time, aggregated over all respondents, in which the highest-rated feeling was a negative one).

Women, respondents with lower education levels, and (in contrast to the WHOQoL results) the widowed had higher scores, meaning, these respondents spent more time in an unpleasant state in an average day (Table 10.2). Urban residents had higher U-index scores than rural ones (more time in unpleasant state). Interestingly, the oldest respondents (aged 80-plus) had the lowest score of all the age groups (least time in an unpleasant state). Income levels showed inconsistent results. A benefit to using the U-index is that it reduces the interpersonal

Table 10.2 Distribution of mean WHOQoL scores, by selected background characteristics

	Mean U-index*		Number
	Mean	SE**	
Sex			
Male	0.027	0.007	1,083
Female	0.041	0.018	1,230
Total	**0.035**	**0.011**	**2,313**
Age group			
50-59	0.041	0.019	1,111
60-69	0.023	0.004	592
70-79	0.042	0.015	412
80+	0.022	0.008	198
Total	**0.035**	**0.011**	**2,313**
Education			
No formal education	0.042	0.016	387
Less than primary	0.036	0.021	861
Primary school completed	0.049	0.015	539
Secondary school completed	0.015	0.008	223
High school completed	0.001	0.001	54
College completed	0.005	0.003	124
Post graduate degree completed	0.001	0.001	57
Total	**0.035**	**0.011**	**2,244**
Marital status			
Never married	0.038	0.014	157
Currently married	0.035	0.016	1,577
Cohabiting	0.008	0.005	62
Separated/divorced	0.023	0.011	101
Widowed	0.040	0.014	348
Total	**0.035**	**0.011**	**2,244**
Income quintile			
Lowest	0.053	0.015	353
Second	0.018	0.007	571
Middle	0.057	0.024	388
Fourth	0.013	0.005	384
Highest	0.039	0.031	615
Total	**0.035**	**0.011**	**2,311**
Residence			
Urban	0.038	0.013	1,822
Rural	0.025	0.006	491
Total	**0.035**	**0.011**	**2,313**

* Proportion of time spent in an unpleasant state.

** SE = standard error.

differences in the use of survey response scales; however, another way to examine the results of the DRM, is to break down the amount of time during the day that a person spends in a positive state, negative state, or a net affect based on amount of time spent in both positive and negative states (duration-weighted net affect). Looking at the results this way, the DRM results showed that people were more likely to spend larger portions of their day in a positive emotional state (data not shown).

11. Mortality

Verbal autopsies refer to the process of interviewing close caregivers, relatives, friends or witnesses about the details of a death for the deceased in question, using this information to arrive at a probable cause of death. Verbal autopsies were conducted for each SAGE household where a death had occurred over the last two years. If a respondent was selected to complete the individual questionnaire, the verbal autopsy was completed regardless of the time elapsed since the death.

Table 11.1 provides follow-up on persons who had been interviewed during the 2003 WHS (World Health Survey)/ SAGE Wave 0 and were recorded as deceased in SAGE Wave 1. The greatest losses were recorded among persons aged 70 years and over; in that age group, 41 of 658 WHS/SAGE Wave 0 respondents had passed away, against none in the 18 to 49 year age group. Only two of the 379 WHS respondents aged 50 to 59 years and 17 of the 498 respondents aged 60 to 69 years had passed away. In terms of sex, 680 men and 1,279 women participated in the WHS, of whom 146 men and 128 women had since passed away.

Table 11.1 WHS/SAGE Wave 0 follow-up: verbal autopsies completed, by age group and sex

	WHS/SAGE Wave 0 respondents	Mortality attrition in SAGE Wave 1
Age group (in years)		
18-49	425	0
50-59	379	2
60-69	498	17
70+	658	41
Sex		
Male	680	128
Female	1279	146
Total	**1960**	**274**

Albala C, Lebrão ML, León Díaz EM, Ham-Chande R, et al. Encuesta Salud, Bienestar y Envejecimiento (SABE): metodología de la encuesta y perfil de la población estudiada. *Rev Panam Salud Publica*. 2005;17(5/6):307–22.

Armstrong T, Bull F. Development of the World Health Organization Global Physical Activity Questionnaire (GPAQ). *J Public Health*. 2006;14(2):66-76.

Atun R, de Andrade LOM, Almeida G, Cotlear D, et al. Health-system reform and universal health coverage in Latin America. *Lancet*. 2014;dx.doi.org/10.1016/S0140-6736(14)61646-9

Bohannon RW. Hand-grip dynamometry predicts future outcomes in aging adults. *J Geriatr Phys Ther*. 2008;31(1):3-10.

Bull FC, Maslin TS, Armstrong T. Global Physical Activity Questionnaire (GPAQ): nine country reliability and validity study. *J Phys Act Health*. 2009;6:790–804.

CONAPO. Envejecimiento de la Población de México Reto del siglo XXI. Disponible en: www.conapo.gob.mx/index.php?option=com_content&view=article&id=340&Itemid=15

CONAPO. *Principales causas de mortalidad en México 1980 – 2007. Documento de Trabajo para el XLIII Periodo de Sesiones de la Comisión de Población y Desarrollo "Salud, morbilidad, mortalidad y desarrollo"*. Nueva York, 2 a 16 de abril de 2010. Disponible en: www.conapo.gob.mx/publicaciones/mortalidad/Mortalidad xcausas_80_07.pdf

Csikszentmihalyi M, Larson R. Validity and reliability of the Experience Sampling Method. *J Nerv Ment Dis*. 1987;175:526-36.

Deaton A. Income, health, and well-being around the world: evidence from the Gallup World Poll. *J Econ Perspect*. 2008;22(2):53-72.

ENASEM [Estudio Nacional sobre Salud y Envejecimiento en México]. Disponible en: www.bdsocial.org.mx/index.php?option=com_content&view=article&id=30&Itemid=85

Fillenbaum GG, Dellinger D, Maddox G, Pfieffer E. Assessment of individual functional status in a program evaluation and resource allocation model. In: *Multidimensional Functional Assessment: The OARS Methodology*, 2nd ed. Durham, NC: Duke University; 1978.

Flicker L, McCaul KA, Hankey GJ, Jamrozik K, Brown WJ, Byles JE, Almeida OP. Body mass index and survival in men and women aged 70 to 75. *J Am Geriatr Soc*. 2010;58(2):234-41.

2010 GBD Profile: Mexico. www.healthmetricsandevaluation.org/sites/default/files/country-profiles/GBD%20Country%20Report%20-%20Mexico.pdf. Seattle, WA: IHME. 2013.

Ham-Chande R, Gutiérrez-Robledo LM, PRESENTACIÓN: Salud y envejecimiento en el siglo XX. *Salud Pública de México*. 2007;49 (suplemento 4).

Heim N, Snijder MB, Heymans MW, Deeg DJ, Seidell JC, Visser M. Optimal cutoff values for high-risk waist circumference in older adults based on related health outcomes. *Am J Epidemiol*. 2011;174(4):479-89.

Hoos T, Espinoza N, Marshall S, Arrendondo EM. Validity of the Global Physical Activity Questionnaire (GPAQ) in adult Latinas. *J Phys Act Health*. 2012;9(5):698-705.

Huxley R, Mendis S, Zheleznyakov E, Reddy S, Chan J. Body mass index, waist circumference and waist:hip ratio as predictors of cardiovascular risk--a review of the literature. *Eur J Clin Nutr*. 2010;64(1):16-22.

INSP/SEDESOL. Primer seguimiento a la evaluación de impacto del programa de atención a adultos mayores de 70 años y más en zonas rurales (programa 70 y más). Informe de diseño metodológico del primer seguimiento a la evaluación de impacto. Estudio cuantitativo. Mexico City: INSP/SEDESOL. Disponible en: www.sedesol.gob.mx/archivos/802549/file/Planteamiento_Metodologico_Cuantitativo.pdf

Janssen I, Katzmarzyk PT, Ross R. Body Mass Index is inversely related to mortality in older people after adjustment for waist circumference. *JAGS*.2005;53(12):2112-8.

Kahneman D, Krueger AB, Schkade DA, Schwarz N, Stone AA. A survey method for characterizing daily life experience: The Day Reconstruction Method. *Science*. 2004;306(5702):1776-80.

Kane RA, Kane RL. *Assessing the Elderly: A Practical Guide to Measurement*. Lexington, MA: D.C. Health and Company; 1981.

Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the aged. *JAMA*. 1963;185:94-9.

Knaul FM, González-Pier E, Gómez-Dantés O, García-Junco D, et al. The quest for universal health coverage: achieving social protection for all in Mexico. *Lancet*. 2012;380(9849):1259-79.

Kowal P, Chatterji S, Naidoo N, Biritwum R, et al. Data Resource Profile: The World Health Organization Study on global AGEing and adult health (SAGE). *Int J Epidemiol*. 2012;41(6):1639-49.

Krueger AB, Kahneman D, Schkade D, Schwarz N, Stone AA. National time accounting: The currency of life. In: Krueger AB (ed). *Measuring the Subjective Well-Being of Nations: National Accounts of Time Use and Well-Being*. Cambridge: NBER Books; 2009.

Lawson MP, Brody E. Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9:179-86.

Lee JM, Gebremariam A, Vijan S, Gurney JG. Excess body mass index-years, a measure of degree and duration of excess weight, and risk for incident diabetes. *Arch Pediatr Adolesc Med*. 2012;166(1):42-8.

Ling CH, Taekema D, de Craen AJ, Gussekloo J, Westerndorp RG, Maier AB. Handgrip strength and mortality in the oldest old population: the Leiden 85-plus study. *CMAJ*. 2010;182(5):429-35.

McDowell I, Newell C. *Measuring Health: A Guide to Rating Scales and Questionnaires*. New York: Oxford University Press; 1987.

Naidoo N. *SAGE Working Paper No. 5. WHO Study on global AGEing and adult health (SAGE) Waves 0 and 1 – Sampling information for China, Ghana, India, Mexico, Russia and South Africa*. Geneva: WHO; 2012.

NORMA OFICIAL MEXICANA NOM-167-SSA1-1997, PARA LA PRESTACION DE SERVICIOS DE ASISTENCIA SOCIAL PARA MENORES Y ADULTOS MAYORES.

OCDE [ORGANIZACIÓN PARA LA COOPERACIÓN Y EL DESARROLLO ECONÓMICOS]. *Síntesis: Estudio Económico de México 2009.* Disponible en: www.cca.org.mx/funcionarios/emprendegestion publica/descargas/43557478.pdf

OECD Health Statistics 2014. *How does Mexico compare?* 2014. www.oecd.org/els/health-systems/Briefing-Note-MEXICO-2014.pdf

PAHO [Organización Panamericana de la Salud]. *Encuesta Multicéntrica SALUD BIENESTAR Y ENVEJECIMIENTO (SABE) EN AMÉRICA LATINA Y EL CARIBE Informe Preliminar.* DIVISIÓN DE PROMOCIÓN Y PROTECCIÓN DE LA SALUD (HPP). Washington, DC: PAHO; 2001.

Palma-Coca O, Olaiz-Fernández G. Metodología de la Encuesta Nacional de Evaluación del Desempeño. *Salud Publica Mex.* 2005;47(suppl 1):S66-S74.

Palmer M, Harley D. Models and measurement in disability: an international review. *Health Policy Plan*. 2012;27(5):357-64.

Power M, Quinn K, Schmidt S; WHOQOL-OLD Group. Development of the WHOQOL-old module. *Qual Life Res*. 2005;14(10): 2197-214.

Price GM, Uauy R, Breeze E, Bulpitt CJ, Fletcher AE . Weight, shape, and mortality risk in older persons: elevated waist-hip ratio, not high body mass index, is associated with a greater risk of death. *Am J Clin Nutr.* 2006;84 (2):449–60.

da Rocha NS, Power MJ, Bushnell DM, Fleck MP. The EUROHIS-QOL 8-item index: comparative psychometric properties to its parent WHOQOL-BREF. *Value Health*. 2012;15(3):449-57.

Rubio GM, Garfias F. *Análisis comparativo sobre los programas para adultos mayores en México.* CEPAL Naciones Unidas 2010 - Serie Políticas sociales No 161.

Schmidt S, Muhlan H, Power M. The EUROHIS-QOL 8-item index: psychometric results of a cross-cultural field study. *Eur J Public Health*. 2006;16(4):420-8.

Secretaría de Salud. Programa Nacional de Salud 2007-2012. Disponible en: http://portal.salud.gob.mx/sites/salud/descargas/pdf/pnscap1.pdf

Seidell JC. Waist circumference and waist/hip ratio in relation to all-cause mortality, cancer and sleep apnea. *Eur J Clin Nutr.* 2010;64(1):35-41.

Stone AA, Shiffman SS, DeVries MW. Ecological momentary assessment. In: Kahneman D, Diener E, Schwartz N (eds.). *Wellbeing: The foundations of hedonic psychology*. New York: Russell Sage Foundation; 1999 (pp. 26-39).

Üstün TB, Chatterji S, Villanueva M, Bendib L, et al. WHO Multi-country Survey Study on Health and Responsiveness 2000-2001. In: Murray CJL, Evans DB, (eds). *Health system performance assessment: debates, methods and empiricism*. Geneva: World Health Organization; 2003 (pp. 761-97).

Ustun TB, Chatterji S, Kostanjsek N, Rehm J, et al. Developing the World Health Organization Disability Assessment Schedule 2.0. *Bull World Health Organ*. 2010;88(11):815-23.

Valentine NB, De Silva A, Kawabata K, Darby C, Murray CJL, Evans D. Health system responsiveness: concepts, domains and operationalization. In: Murray CJL, Evans DB (eds.). *Health Systems Performance Assessment: Debates, Methods and Empiricism*. Geneva: World Health Organization; 2003 (pp. 573–96).

Weiner JM, Hanley RJ, Clark R, Van Nostrand JF. Measuring the activities of daily living: Comparisons across national surveys. *J Gerontol*. 45(6):S237.

WHO [World Health Organization]. World report on disability. Geneva: WHO; 2011. http://who.int/disabilities/world_report/2011/technical_appendices.pdf

WHO [World Health Organization]. Waist Circumference and Waist–Hip Ratio: Report of a WHO Expert Consultation. Geneva: WHO; 2011.

WHO [World Health Organization]. STEPwise approach to risk factor surveillance. Geneva: WHO; 2009. www.who.int/chp/steps/resources/updates/en/index.html

WHO [World Health Organization]. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. *World Health Organ Tech Rep Ser*. 1995;854:1-452.

WHO/UNICEF Joint Monitoring Programme core questions on drinking-water and sanitation for household surveys. Geneva: WHO; 2006. whqlibdoc.who.int/publications/2006/9789241563260_eng.pdf

WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med*. 1998; 28(3):551-8.

Wong R, Espinoza M, Palloni A. Adultos mayores Mexicanos en contexto socioeconómico amplio: salud y envejecimiento. *Salud Pública de México*. 2007; 49(4):436-47.

Appendices

Appendix 1

WHO Disability Assessment Scale (WHODAS-12 item)

In the last 30 days, how much difficulty did you have . . .*	
1	. . . in standing for long periods (such as 30 minutes)?
2	. . . in taking care of your household responsibilities?
3	. . . in learning a new task, for example, learning how to get to a new place?
4	. . . in joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?
5	. . . concentrating on doing something for 10 minutes?
6	. . . in walking a long distance such as a kilometer (or equivalent)?
7	. . . in washing your whole body?
8	. . . in getting dressed (including, for example, putting on your shoes and socks)?
9	. . . with people you do not know?
10	. . . in maintaining a friendship?
11	. . . in your day to day work?
12	In the last 30 days, how much have you been emotionally affected by your health condition(s)?

* Response scale: 1 = none; 2 = mild; 3 = moderate; 4 = severe; 5 = extreme/cannot do.

Appendix 2

ADL and IADL items

In the last 30 days, how much difficulty did you have . . .*	
ADL	
1	. . . in sitting for long periods?
2	. . . walking 100 meters?
3	. . . standing up from sitting down?
4	. . . in standing for long periods (such as 30 minutes)?
5	. . . with climbing one flight of stairs without resting?
6	. . . with stooping, kneeling or crouching?
7	. . . picking up things with your fingers (such as picking up a coin from a table)?
8	. . . in extending your arms above shoulder level?
9	. . . concentrating on doing something for 10 minutes?
10	. . . in walking a long distance such as a kilometer (or equivalent)?
11	. . . in washing your whole body?
12	. . . in getting dressed (including, for example, putting on your shoes and socks)?
13	. . . with carrying things?
14	. . . with moving around inside your home (such as walking across a room)?
15	. . . with eating (including cutting up your food)?
16	. . . with getting up from lying down?
17	. . . with getting to and using the toilet?
IADL	
1	. . . in taking care of your household responsibilities?
2	. . . in joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?
3	. . . in your day to day work?
4	. . . with getting where you want to go, using private or public transport if needed?
5	. . . getting out of your home?

* Response scale: 1 = none; 2 = mild; 3 = moderate; 4 = severe; 5 = extreme/cannot do. Recoded: (1, 2, 3) = no deficiencies; (4, 5) = yes, deficiencies.

Appendix 3

Education mapping

Education levels, based on UNESCO 1997 international classification scheme		
SAGE Code	**Description**	**Mexico**
	Q0409, Q1016, Q1028, Q1032	
0	No formal schooling	None
1	Less than primary school	1 to 5 (primaria)
2	Primary school completed	6 (primaria completa)
3	Secondary school completed	7 to 9 (secundaria)
4	High school (or equivalent) completed	10 to12 (high school (preparatoria) or professional school)
5	College/Pre-university/University completed	13 to 16
6	University post-graduate degree completed	17+

See ISCED97 classification scheme, www.uis.unesco.org/Library/Documents/isced97-en.pdf

Occupation coding

For Q1027, Q1031 and Q1510 of the SAGE Individual Questionnaire

ILO International Standard Classification of Occupations (ISCO-88)

The revised International Standard Classification of Occupations (ISCO-88) provides a system for classifying and aggregating occupational information obtained by means of population censuses and other statistical surveys, as well as from administrative records.

"In collecting and processing statistics classified by occupation, . . . each country should ensure the possibility of conversion into the ISCO-88 system, to facilitate international use of occupational information." Thus,

ISCO-88 is one of the standards of international labour statistics.

What follows below are the descriptions and codes for the major occupation groups and their breakdowns. A file was provided to the PI that provides additional background and explanation for ISCO-88. Additional information about coding can be found at: www.ilo.org/public/english/bureau/stat/isco/index.htm

The major groups and the breakdowns within each major group are provided below. It also provides an estimation of the skill levels needed for each major group. This document provides the codes and coding techniques for Q1027, Q1031 and Q1510 in the SAGE Individual Questionnaires.

ISCO-88 major groups with number of sub-groups and skill levels

Major groups	Sub-major groups	Minor groups	Unit groups	ISCO skill level
1. Legislators, senior officials and managers	3	8	33	–
2. Professionals	4	18	55	4th
3. Technicians and associate professionals	4	21	73	3rd
4. Clerks	2	7	23	2nd
5. Service workers and shop and market sales workers	2	9	23	2nd
6. Skilled agricultural and fishery workers	2	6	17	2nd
7. Craft and related trades workers	4	16	70	2nd
8. Plant and machine operators and assemblers	3	20	70	2nd
9. Elementary occupations	3	10	25	1st
10. Armed forces	1	1	1	–
Totals	**28**	**116**	**390**	

Appendix 4

Text describing the income or wealth quintiles (permanent income)

Income quintiles were derived from the household ownership of durable goods, dwelling characteristics (type of floors, walls and cooking stove), and access to services such as improved water, sanitation and cooking fuel. Durable goods included number of chairs, tables or cars, and if, for example, the household has electricity, a television, fixed line or mobile phone, a bucket or washing machine. A total of 21 assets were included with overlaps and differences in the asset lists by country.

The results were recoded into dichotomous variables taking the value of 0 if the household did not possess or have access to the good or service, and 1 if it did. The data set was then reshaped, as though each household had multiple observations for wealth (each item being one observation), and was fit as a pure random effect model based on these multiple items per household. The result provides indicator specific thresholds on the latent income scale such that a household is more likely to respond affirmatively than not when its permanent income exceeds this threshold. This "asset ladder" was generated and it is country-specific. Using a Bayesian post-estimation (empirical Bayes) method, households were arranged on the asset ladder, where the raw continuous income estimates are transformed in the final step into quintiles.

The resulting estimates of household permanent income can be compared to the reported income and total household expenditure. Though the correlation coefficients are not very high (both the Pearson and Spearman correlations are less than 0.5) there is a systematic 'upper left triangular' relationship across all countries. Namely, as self-reported income or expenditure increases, our permanent income estimate increases as well. However, our estimates can be high even when self-reported income or expenditure is low, which supports the well-known under-reporting or inadequacies of using income or expenditure indicators as opposed to wealth based on permanent income.

Text describing health score

Valid, reliable, and comparable health measures are essential components to inform clinical practice and health policy. The health module in SAGE included a self-assessment of health consisting of two to three questions pertaining to each of eight health domains (mobility, affect, cognition, self-care, pain, sleep/energy, interpersonal relations and vision). When deriving the SAGE health score, we used the 16 self-reported health state questions in Section 2000 of the questionnaire: Q2002-05, Q2007, Q2008, Q2010-13, Q2016-19, Q2023, and Q2024. Respondents could answer using a five-point scale, from 1=None; 2=Mild; 3=Moderate; 4=Severe; 5=Extreme/Cannot do. As this scale is an ordinal scale, we used an ordinal extension of the Rasch model, the Rating scale model in Winsteps, that keeps the thresholds fixed across items. The item Infit statistics were between 0.7 and 1.3 except for the vision domain, where it was slightly above 1.3. Based on the dimensionality map and the residual correlations, no significant second dimension was found. The item probability curves did not show any disordered threshold. Significant DIF (Differential Item Functioning) was found by country for which adjustments have not yet been made in the current results. The results were rescaled to 0 to 100 where zero is worst health and 100 is best health.