HSRC Human Sciences Research Council

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STUDY ON GLOBAL AGEING AND ADULT HEALTH sage

World Health Organization

South Africa

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

WHO SAGE WAVE 1

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The Study on global AGEing and adult health (SAGE) is part of a Longitudinal Survey Programme in WHO's Multi-Country Studies unit. The main SAGE surveys compile comparable longitudinal information on the health and well-being of adult populations and the ageing process from nationally representative samples in six countries (China, Ghana, India, Mexico, Russian Federation and South Africa). Financial support for SAGE was provided by the US National Institute on Aging and the World Health Organization. The South African Government also provided financial support for SAGE South Africa Wave 1. Each country's national report is a descriptive summary of results, including this report of SAGE Wave 1. Wave 2 will be implemented in 2012/13 and Wave 3 in 2014/15. More information is available at: www.who.int/healthinfo/systems/sage/en/index.html

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

South Africa National Report

Human Sciences Research Council (HSRC)

Study Report November 2012

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Abbreviations and acronyms

ADL	Activities of Daily Living
AHPU	Agincourt Health and Population Unit
AIDS	Acquired Immunodeficiency Syndrome
AU/HAI	African Union/Help Age International
BMI	Body Mass Index
BPM	Beats Per Minute
CDC	Centers for Disease Control and Prevention
CRP	C-reactive protein
CVD	Cardiovascular Disease
DBS	Dry Blood Spot
DHS	Demographic and Health Surveys
DRM	Day Reconstruction Method
EA	Enumeration Area
EBV	Epstein-Barr Virus
ESM	experience sampling method
GDP	Gross Domestic Product
GIS	Geographical Information System
GPS	Global Positioning System
HAST	HIV/AIDS, STIs and TB
HbA_{1c}	Glycosylated Haemoglobin
HDL	High Density Lipoprotein
HDSS	Health and Demographic Surveillance System
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HSRC	Human Sciences Research Council
IADL	Instrumental Activities of Daily Living
INDEPTH	International Network for the Demographic Evaluation of Populations and Their Health in Developing Countries
IPAQ	International Physical Activity Questionnaire
IQ Code	Informant Questionnaire on Cognitive Decline
IRT	Item Response Theory
ISCO	International Standard Classification of Occupations
MRC	Medical Research Council (South Africa)
N	Number
NCD	Non-communicable disease
NDOH	National Department of Health (South Africa)
PSR	Potential Support Rate
PSU	Primary Sampling Unit
SAGE	Study of Global Ageing and Adult Health
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infection
TB	Tuberculosis
UCT	University of Cape Town
UKZN	University of KwaZulu-Natal
UN	United Nations
VP	Visiting Point
WHO	World Health Organization
WHODAS	World Health Organization Disability Assessment Schedule
WHOQoL	World Health Organization Quality of Life
WHR	Waist–Hip Ratio
WHS	World Health Survey

Glossary

AIDS: a disease of the human immune system that is characterized cytologically especially by a reduction in the number of CD4-bearing helper T cells to 20 percent or less of normal thereby rendering the subject highly vulnerable to life-threatening conditions.

Anthropometry: the study of human body measurements especially on a comparative basis.

Biomarkers: a distinctive biological or biologically-derived indicator (as a biochemical metabolite in the body) of a process, event, or condition (as aging, disease, or exposure to a toxic substance).

Blood pressure: pressure exerted by the blood upon the walls of the blood vessels, especially arteries, usually measured on the radial artery by means of a sphygmomanometer.

Body mass index: a measure of body fat that is the ratio of the weight of the body in kilograms to the square of its height in metres, for example a *body mass index* in adults of 25 to 29.9 is considered an indication of being overweight, and 30 or more an indication of obesity.

Breast cancer screening: refers to the use of simple tests, such as mammography, across a healthy population in order to identify individuals who have disease, but do not yet have symptoms of breast cancer. It consists of two x-ray views of each breast.

Caregiving: the provision of support and assistance by any person, formal or informal, with various activities to persons with disabilities or long-term conditions, or persons who are elderly. This person may provide emotional or financial support, as well as hands-on help with different tasks. Caregiving may also be provided from a setting that is located far from the person requiring care.

Cataract: a clouding of the lens of the eye or its surrounding transparent membrane that obstructs the passage of light.

Central obesity: abdominal or truncal obesity is an increased waist-to-hip ratio, waist-to-thigh ratio, waist circumference, and sagittal abdominal diameter, and linked to an increased risk of cardiovascular events.

Cervical cancer screening: a screening for the early detection of a cervical malignancy common in a particular population, the diagnosis of which, if caught early, results in a complete cure or improved long-term survival.

Chronic conditions / disease: a disease which has one or more of the following characteristics: is permanent; leaves residual disability; is caused by non-reversible pathological alternation; requires special training of the patient for rehabilitation; or may be expected to require a long period of supervision, observation or care.

Cognitive capacity: the capacity tested during surveys, studying the process of interpretation of questions and the formation and reporting of responses by respondents to learn how to make the questions more accurately obtain the data the questionnaire is seeking.

C-reactive protein levels: the levels of a protein produced by the liver and found in the blood.

Diastolic blood pressure: the lowest arterial blood pressure of a cardiac cycle occurring during diastole of the heart.

Digit span: the ability of a person to recall a sequence of numbers just spoken.

Disability: any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner, or within the range, considered to be normal for a human being. The term disability reflects the

consequences of impairment in terms of functional performance and activity by the individual. Disabilities thus represent disturbances at the level of the person.

Edentulism: the condition of being without natural teeth

Enumeration area: the smallest geographical unit usually allocated to a single enumerator during census enumeration in South Africa

Epstein-Barr virus: a herpesvirus which is now thought to be a cause of various types of human cancers, including Burkitt's lymphoma and nasopharyngeal carcinoma.

Georeferenced data: data defined by its location on the earth's surface through map projections and coordinate systems.

Grip strength: a measure of muscle strength, evaluated with a Smedley's hand dynamometer.

Haemoglobin: an iron-containing respiratory pigment of vertebrate red blood cells that functions primarily in the transport of oxygen from the lungs to the tissues of the body.

Glycosylated Haemoglobin (Haemoglobin A1c): a stable glycoprotein formed when glucose binds to hemoglobin A in the blood ; *also* : a test that measures the level of hemoglobin A1c in the blood as a means of determining the average blood sugar concentrations for the preceding two to three months.

Happiness: a state of well-being and contentment.

HIV: any of several retroviruses and especially HIV-1 that infect and destroy helper T cells of the immune system causing the marked reduction in their numbers that is diagnostic of AIDS.

Household: a *household* for the South African censuses consists of a person, or a group of persons, who occupy a common dwelling (or part of it) for at least four days a week and who provide themselves jointly with food and other essentials for living.

Mammography: X-ray examination of the breasts for early detection of cancer.

Myer's index: an index that is commonly used to assess accuracy of age reporting.

Obesity: a condition that is characterized by excessive accumulation and storage of fat in the body and that in an adult is typically indicated by a body mass index of 30 or greater.

Population pyramid: a bar graph which displays the age and sex distribution of the population, most commonly of a single country.

Quality of life: a person's ability to enjoy normal or routine activities of life.

Risk factor: something which increases risk or susceptibility to a disease or condition.

Road traffic accidents: collisions that involve at least one vehicle in motion on a road that results in at least one person being killed or injured.

Social security benefits: benefits that include income for eligible persons from social security, old age, disability, and survivors' pension schemes.

Sociodemographic: the characterization of a population through a combination of sociological and demographic characteristics.

Systolic blood pressure: the highest arterial blood pressure of a cardiac cycle occurring immediately after systole of the left ventricle of the heart.

Visual acuity: an objective assessment of vision – measured in SAGE using a Tumbling E chart.

Waist-hip ratio: the ratio of the circumference of the waist to that of the hips.

WHODAS-12: the 12-item Disability Assessment Schedule of the World Health Organization used for measuring health and disability.

WHOQoL scores: a score derived from an instrument developed by the World Health Organization for measuring quality of life – that is an individual's perception 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.

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Foreword

Older persons are becoming a proportionally larger segment of the total population because of lower fertility rates and a decrease in mortality rates. Population ageing is a global phenomenon and the number of older persons in South Africa is dramatically on the rise.

In 2008, 3.5 million persons of the total population were above the age of 60 years. This constitutes 7.3% of the total population. It is projected that this figure will double by 2015 to 6.5 million persons above the age of 60 years, constituting 10.5% of the population.

This demographic ageing has several implications for the public health sector which necessitate the expansion of preventative, promotive, curative and palliative programmes to address chronic diseases, such as cardiovascular diseases, diabetes, chronic respiratory diseases and cancer.

Older persons suffering from chronic diseases must have easy access to affordable and integrated primary health services. Chronic diseases in older persons also need to be managed and controlled to minimise the development of secondary complications including disabilities that will impact negatively on their quality of life and increase health care costs.

One of the government's key priority areas is "A long and healthy life for all South Africans" and the Department's target is to increase life expectancy from the current 54 years for males and 59 years for females to 56 years for males and 61 years for females by 2014. The aim of SAGE was to improve the understanding of the health and well-being of adults aged 50 years or older in low- and middle-income countries. Since there is currently very little data available in South Africa on older persons and ageing, this study provides the long-awaited data needed for effective health policy planning that will enable us to provide older persons with the quality of care that they deserve, thus increasing their life expectancy and quality of life.

I would like to thank to the World Health Organisation for embarking on the Study of Global Ageing and Adult Health (SAGE).

In addition my thanks to the Human Sciences Research Council's research team for conducting the study and the World Health Organisation's Multi-Country Studies Unit for providing the technical support.

Dr A. Motsoaledi, MP
Minister of Health

Preface

The World Health Organization (WHO) initiated the Study on Global Ageing and Adult Health (SAGE) in six countries. The aim was to improve understanding of the health and well-being of adults aged 50 years or older in low- and middle-income countries.

The countries studied were China, Ghana, India, Mexico, the Russian Federation and South Africa. The objective of SAGE is to generate data on ageing and on the health and well-being of older adults that is valid and comparable across countries. The study provides information on a wide range of population health, wealth and related indicators. These indicators include household and family support networks and transfers, assets and household income and expenditure, sociodemographic characteristics, work history and benefits, health-state descriptions, anthropometrics, performance tests and biomarkers, risk factors, chronic conditions and health services coverage, health-care use, social cohesion, subjective well-being and quality of life, and the impact of caregiving on individuals. The resulting evidence of SAGE in South Africa will be used to inform policy and planning in the country.

SAGE is a longitudinal survey that will have three or four data collection rounds of the same cohort of people as they age over a period of 5–10 years, with replacements for attrition. This report represents the first round of data collection (SAGE Wave 1), and the results presented here are the baseline for future longitudinal measures. There are plans to also go back to the World Health Survey (SAGE Wave 0) cohort to recover respondents for SAGE Waves 2 and 3. This report has been prepared by the Human Sciences Research Council (HSRC) SAGE Research Team, with the assistance of the WHO SAGE team.

In South Africa, SAGE was carried out in partnership with the HSRC, WHO and the National Department of Health (NDOH). Funding was provided by the NDOH, WHO, United States National Institute on Aging and HSRC. Technical assistance was provided by the WHO Multi-Country Studies Unit, Geneva. Data collection was undertaken at national level using a population-based representative sample of the population aged 50 years or older, with a smaller sample of adults aged 18–49 years for comparison. A large proportion of the planned respondents for SAGE Wave 1 was to come from the SAGE Wave 0 cohort in South Africa; however, a new cohort was selected by the SAGE South Africa team. The aim was to interview 5000 people 50 years or older, and an additional 1000 people aged 18–49 years. Face-to-face interviews were used to collect self-report data and measurements, including health examination, anthropometric and biomarker data.

In addition to the six countries implementing the national level SAGE survey, several countries implemented a short version of the SAGE questionnaire in sub-national areas in health and demographic surveillance system (HDSS) field sites. These field sites are part of INDEPTH – *the International Network for the Demographic Evaluation of Populations and Their Health in Developing Countries*. In South Africa, the Agincourt Health and Population Unit (AHPU) in rural Mpumalanga (an INDEPTH HDSS) incorporated the short SAGE Wave 1 questionnaire into their annual census round in July 2006 (n=4085) and undertook the full SAGE survey in a small sample (n=426). Data on health, disability and subjective well-being, taken from the full SAGE questionnaire, were collected in the short SAGE survey. These two datasets from the AHPU will be compared to the national level SAGE Wave 1 South Africa data at a later stage, and can be used as a field laboratory for the national level SAGE efforts. A Wave 2 is also planned in the AHPU. Cross-site and cross-country analyses are planned for the SAGE data from the eight INDEPTH sites and the six SAGE countries, including South Africa.

In South Africa, SAGE used standardized household and individual questionnaires that were the same as those used in other SAGE countries, with a few country-specific adaptations, such as the asset list, ethnic groups, set of languages spoken and the inclusion of hearing in the list of health domains collected (covering a total of nine health domains). Wave 1 Interviews in South Africa were conducted between March 2007 and October 2008. The length and complexity of the questionnaire and assessment of biomarkers gave rise to some significant complexities when implementing the study. The interviewers were primarily retired or unemployed nurses, to facilitate the taking of dry blood spot specimens.

Throughout conception and implementation of the survey, the SAGE Advisory Committee provided ongoing guidance and oversight. This committee comprised members representing the NDOH, the Medical Research Council (MRC), the University of Cape Town (UCT) and the HSRC. Members met two to three times a year during the period of the study.

The SAGE Advisory Committee, South Africa, comprised:

- Mrs Christelle Kotzenberg, Chairperson, NDOH;
- Ms Sandhya Singh, NDOH;
- Dr Marie Strydom, NDOH;
- Prof Nancy Phaswana-Mafuya, HSRC;
- Prof Karl Peltzer, HSRC;
- Dr Margie Schneider, HSRC;
- Dr Laetitia Rispel (during her employment tenure with HSRC);
- Dr Sebastiana Kalula, Albertina and Walter Sisulu Institute of Ageing in Africa, UCT;
- Dr Debbie Bradshaw, MRC.

This report provides an overview of the first survey results. It will be used for dissemination purposes and to plan further in-depth analyses of the data for publication in academic journals.

Prof Nancy Phaswana-Mafuya
PI SAGE South Africa

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Overview of results

The phenomenon of population ageing has become more significant in South African society during recent decades, with the cohort aged 50 years or older increasing noticeably in both percentage and number. The social, economic and political consequences of population ageing have thus become a significant factor to be taken into account in all planning aspects of policies and programmes. This is particularly the case with regard to the care of older people, including the sustainability of social assistance and services in the light of a growing epidemic of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and non-communicable chronic diseases (NCDs), with the consequent additional social and economic pressures and responsibilities that have been placed on older people.

In South Africa, Wave 1 of the Study of Global Ageing and Adult Health (SAGE) collected data on South Africans aged 50 years or older over the period 2007–2008. This chapter provides a brief overview of key results for this population. Data on younger adults aged 18–49 years was also collected for comparison, and these results will be included in future publications.

1. Sociodemographic characteristics

The overall proportion of male and female household members in the sample was 38% and 60%, respectively. The proportion of male and female household members living in urban and rural areas was the same, with 62% in urban areas and 38% in rural areas. Most respondents (83%) did not have health insurance (the same proportion for males and females). The mean household size was two people, and did not differ between urban and rural areas. Rural households were slightly larger than urban households – 28% and 20%, respectively, had six or more household members. Men and women were heads in 40% (rural) and 42% (urban) of households respectively. In rural areas, older women were more likely to be head of households than in urban areas. Households with only one member, households headed by older women and households where the woman was the main income earner were clustered in the lower wealth quintiles. Almost one third of the households contained two generations in both urban and rural areas. Dual households in which both spouses were aged 50 years or older were likely to be in higher wealth quintiles. The major difference between the sexes was that a larger proportion of women aged 70–79 years were head of household. Another difference between the sexes was that men who were head of households were more likely to have received higher education than women, and to live in a household with higher wealth status. Almost 90% of the population was Black African or Coloured. Most respondents were Christian (85%).

2. Current and past employment, income, transfers of assistance and health expenditures

About 15% of respondents had never worked for pay and 55% were not working at the time of the survey. More females than males had never worked (18% and 10%, respectively); of those who had ever worked, more males than females were still working (39% and 23%, respectively). With regard to residence, 24% in rural areas had never worked, compared to 10% in urban areas. Among those who had ever worked, about half in both urban and rural areas were still working. The most common reason for discontinuing work was health or age related. These reasons were slightly more common among women (77%) than men (72%). As expected, stopping work due to health-related reasons or retirement increased with age, reaching 97% among those

aged 80 years or older. Slightly more people in urban areas stopped working due to health-related reasons than those in rural areas. Those aged 50–69 years were about half as likely to be employed in the public sectors as those aged 70–79 years. There was a trend towards more professional, sales and services occupations in the younger age group. Households represented by higher status occupations tended to fall into the higher quintiles. The largest number of households received transfers from the government in monetary form, and these transfers were most commonly made to other family members (83%). For transfers in terms of actual monetary assistance (in Rand) into the household, government generally provided the most assistance (an average of R7129). In terms of out-of-household transfers, the family transferred the most out (R4381.40) and the community gave the most in terms of hours per week (15 hours).

Among those who had suffered a catastrophic event in the past 30 days, mean household expenditure was less, and they were more likely to be poor (54%) or impoverished (28%), to have higher out-of-pocket expenditure as a percentage of all expenditures (15.0%) and higher out-of-pocket expenditure as a percentage of non-subsistence spending (60%). The poor also had less mean household expenditure (R694), yet spent a lot more on insurance (R5569). At R3607, urban expenditure was more than twice as high as rural expenditure, with 57% of people residing in rural areas. In terms of expenditure quintiles, all people in the lowest quintal were poor and, as expenditure increased, so too did out-of-pocket expenditure as a percentage of all expenditures, and out-of-pocket expenditure as a percentage of non-subsistence spending. In the past 30 days, outpatient health payments held the overall majority of out-of-pocket health payments in all categories. The overall majority used their current income as the payment source for health services.

3. Risk factors and health behaviours

Tobacco use: About 68% of adults had never used tobacco, 19% were current daily tobacco users, 3% not daily tobacco users and 10% not current tobacco users. The mean daily tobacco consumption was 16 tobacco products. More men than women were current daily tobacco users, but the mean daily tobacco consumption was higher for women.

Alcohol consumption: Most adults – across age, gender, type of locality and marital status – were lifetime abstainers from alcohol (76–85%); 12% were non-heavy drinkers, 3% were infrequent heavy drinkers and 1% were frequent heavy drinkers.

Physical inactivity: Overall, 60% did not undertake sufficient daily physical activity. More women than men, adults in lower wealth quintiles and urban residents did not undertake sufficient daily physical activity.

Fruit and vegetable consumption: Overall, 69% did not consume sufficient fruits and vegetables. More women, rural residents, adults with less than primary school education and those in lower wealth quintiles did not consume sufficient fruits and vegetables.

Water and sanitation: Access to water: Most households had access to a safe drinking water source (93%). More households from urban (98%) had a safe drinking water source than rural areas (85%). The prevalence of access to an improved water source increased with wealth. Few people had water on their premises (7%). More people in urban areas (13%) than in rural areas (5%) had water on their premises. Even in households in the highest wealth quintile, only about one fifth had water on their premises.

Improved sanitation: The prevalence of improved sanitation was higher in urban (68%) than in rural areas (50%), and increased dramatically with wealth.

Air pollution: More than three quarters of households used clean fuel for cooking purposes. Only 13% overall used solid fuels; however, 33% of households in rural areas depended on these fuels for cooking, compared to only 2% in urban areas. The use of solid fuel and paraffin fuel decreased with increased wealth: 25% of households in the lowest wealth quintile used solid fuels, compared to only 1% in the highest wealth quintile. There was no difference in the use of paraffin between urban and rural residence.

Recommendation

In line with the results of the study and the United Nations Madrid International Plan of Action on Ageing (UN 2002), policies should promote healthy eating habits (that is, daily consumption of vegetables and fruits), smoking cessation and reduction of harmful consumption of alcohol, an increase in physical activity, better access to improved drinking-water and sanitation, and reduced air pollution.

4. Health state

Respondents were asked to rate their general overall health and their level of difficulty with household and work activities. They were then asked a series of more detailed questions covering multiple dimensions of their health and functioning. The results were consistent for all three types of questions. Women rated their health worse than men, and younger adults (50–59 years) reported better health and functioning than older people, with few reported health differences between urban and rural residents. One difference between urban and rural dwellers was noted: those living in rural areas had more difficulties in doing household or work activities than their urban counterparts (42% of urban dwellers had no difficulties compared to 33% of rural dwellers; 6% of urban dwellers had severe difficulties compared to 16% of rural dwellers). This last result requires further examination to understand its causes.

Recommendation

Self-reported health is a strong predictor of health and mortality, so maintaining and enhancing health status should be a policy and programmatic priority. This requires a broad range of actions that affect individual health, including improvements in the economic and social situation of older people.

5. Morbidity and interventions

Eighteen per cent of men and 29% of women self-reported a diagnosis of arthritis; 4% of men and women had had a stroke; 4–6% had had angina; and 7% of men and 11% of women had been diagnosed with diabetes. In addition, men and women, respectively, self-reported the following diagnoses: 2% and 3% chronic lung disease; 5% asthma (both sexes); 3% depression (both sexes); 25% and 35% hypertension; 8% and 9% edentulism (loss of all teeth); and 5% and 4% cataracts. In the past year, 1–3% of adults had been injured in a traffic accident, from which more than one out of three sustained a disability.

Overall, 32% of women had ever undergone cervical cancer screening during a pelvic examination, and 16% had ever had breast cancer screening. The proportion of both breast cancer and cervical cancer screening was higher in urban areas than in rural areas. In urban areas, the proportion that had ever been screened was 21% for breast cancer and 42% for cervical cancer; in rural areas, it was 6% and 14% for breast and cervical cancer screening, respectively. The higher screening proportions in urban areas than in rural areas might be attributed to availability and accessibility of health facilities and services in urban areas.

Recommendation

The results of this study indicate a need to develop health promotion programmes directed at promoting prevention of chronic diseases, including periodic health examinations and better access for disadvantaged communities to preventive health examinations.

6. Health examination and biomarkers

About three quarters of respondents were either obese (45%) or overweight (27%). The prevalence of obesity among men and women was high: 38% and 51%. Obesity was highest among those aged 60–69 years (50%) and among urban dwellers (47%). Among women, 70.7% had a waist–hip ratio (WHR) indicating central obesity (>0.85); among men, 54% had a WHR ratio higher than the standard average for males (>0.90). Based on waist circumference, overall, 22% of men and 63% of women had central obesity. The mean systolic blood pressure was 146 mm Hg among women and 144 mm Hg among men, indicating a high prevalence of hypertension. The overall mean diastolic blood pressure was 96 mmHg; again these findings clearly put this population in the category of "high blood pressure". A high proportion (71%) had either systolic or diastolic hypertension. Regarding lung function, 8% had severe or very servere chronic obstructive pulmonary disease (COPD), with the highest in the 80+ age group, and 14% had severe asthma. Low near visual acuity (36%) was more common among older people than low distant vision (11%). High-risk glycosylated haemoglobin levels were found among older men (69%) and older women (67%). Finally, the HIV prevalence among the older population was 5% among men and 8% among women, with 3% among those 70 years and above.

Recommendation

The results indicate a need to develop health promotion programmes to modify behavioural risk factors for chronic diseases, including promotion of healthy diet and physical activity programmes.

7. Well-being and quality of life

Subjective well-being and quality of life was assessed using the WHO Quality of Life (WHOQoL) index, which ranges from 0 to 100. The mean WHOQoL score for women (51.5) was comparable to that of men (49.1) and implied that quality of life was moderate. The results of the WHOQoL questions showed that men and women rated their quality of life similarly, with women rating quality of life slightly worse than men.

Recommendation

Improving quality of life for all through access to adequate health care is an absolute imperative. This study raises important long-term policy issues about health status and the determinants of healthy ageing. There is a need to develop sustainable policies for healthy ageing at the local and national levels, to integrate health and older people in all policy areas, and to tackle health inequities at the core of South African policies.

1. Introduction

1.1 Global ageing

Population ageing is the result of decreasing levels of fertility and mortality, which lead to a more rapid increase in older populations. This process, by which older individuals become a proportionally larger share of the total population, was one of the most distinctive demographic events of the 20th century and is likely to remain an important trend throughout the 21st century.

Although population ageing was initially experienced by the more developed countries, the process has recently also become apparent in many less developed countries. In the near future, most countries will face population ageing, although at varying levels of intensity and in different time frames. Increases in the proportions of older people (≥60 years) are being accompanied by declines in the proportions of the young (<15 years). To illustrate the trend towards population ageing, the proportion of older people in the world was 8% in 1950 and 10% in 2000, and is projected to reach 21% in 2050. By 2050, the number of older people in the world will exceed the number of young for the first time in history. Moreover, by 1998, this historic reversal in relative proportions of young and old had already taken place in the more developed regions (UNFPA 2002).

In sub-Saharan Africa (SSA), populations are also ageing. While the median age and proportion of people aged 60 years or older will remain lower than in other world regions, the absolute number of older people in SSA is projected to rise sharply: from 42.6 million in 2010 to 160 million in 2050. This is a more rapid increase than in any other world region and for any other age group (UNPD 2011). Although life expectancy at birth is low in SSA compared to other world regions, life expectancy at age 60 in SSA – currently 15 years for men and 17 years for women – does not differ markedly from that in other developing world regions (UNPD 2011).

As the 21st century began, the world population included about 600 million older people – triple the number recorded 50 years earlier (UNPD 2011). By mid-century, there will be some 2 billion older people: once again, a tripling of this age group in just 50 years. Globally, the population of older people is growing by 2% each year, considerably faster than the population as a whole. For at least the next 25 years, the older population is expected to continue to grow more rapidly than other age groups. The growth rate of those aged 60 years or more will reach 2.8% annually in 2025–2030. Such rapid growth will require far-reaching economic and social adjustments in most countries.

There are marked differences between regions in the number and proportion of older people. In 2010, in the more developed regions, one fifth of the population was aged 60 years or older; by 2050, this proportion is expected to reach one third (UNPD 2011). In the less developed regions, almost 9% of the population was aged 60 years or older in 2010; however, by 2050, older people will make up 20% of the population.

The fastest growing age group in the world is the "oldest-old" – those aged 80 years or older. This group is currently increasing at 3.8% annually, and comprises more than one tenth of the total number of older people (UNPD 2011). By the middle of the 21st century, one fifth of older people will be aged 80 years or older. The majority of older people are women, because life expectancy is higher for women than for men. In 2000, there were 63 million more women than men aged 60 years or older; at the oldest ages, there were two to five times more women than men.

The southern African subregion has the continent's highest percentage of older inhabitants; in 1997, 6.2% of the population was estimated to be 60 years or older (slightly more than in the northern African subregion). Within southern Africa, South Africa has the highest

Table 1.1 Global trends in ageing (regional estimates of the United Nations), 1950–2050

Region	Per cent of population aged 60 years or older				
	1950	1975	2000	2025	2050
Asia	6.7	6.6	8.6	14.8	24.4
Europe	12.1	16.5	20.3	27.3	33.6
Latin America/Caribbean	5.6	6.5	8.4	14.9	25.0
Northern America	12.4	14.6	16.3	24.7	27.0
Oceania	11.2	11.0	13.4	19.1	23.5
Sub-Saharan Africa	5.2	4.8	4.8	5.5	8.3

Source: (UNPD 2011).

proportions of older population, with 13.3% (5.6 million) aged 50 years or older, and nearly 7% (2.9 million) aged 60 years or older (Kinsella and Ferreira 1997). By 2025, it is projected that South Africans aged 50 years or older and 60 years or older will reach 18.4% and 10.5% of the total population, respectively; by 2050, these figures will be 26.1% and 14.8%, respectively – well above the projections for the region (see Table 1.1) (UNPD 2011).

1.2 Emerging health and social trends of ageing

The growing number of older adults places increasing demands on the public health system, and on medical and social services.

> While global aging represents a triumph of medical, social, and economic advances over disease, it also presents tremendous challenges. Global population aging strains social insurance and pension systems and challenges existing models of social support. It affects economic growth, trade, migration, disease patterns and prevalence, and fundamental assumptions about growing older (Dobrianky et al 2007).

Population ageing has major consequences and implications for all facets of human life.

> In the economic area, population ageing will have an impact on economic growth, savings, investment and consumption, labour markets, pensions, taxation and intergenerational transfers. In the social sphere, population ageing affects health and health care, family composition and living arrangements, housing and migration. The health of older people typically deteriorates with increasing age, inducing greater demand for long-term care as the numbers of the oldest-old grow (UNFPA 2002).

Population ageing and rising exposure to modifiable risk factors (including tobacco use, an unhealthy diet, harmful alcohol use and a lack of physical activity) are fostering a growing burden of age-related non-communicable diseases (NCDs) in SSA. Most prominent among the NCDs are diabetes, heart disease and stroke (WHO 2005; WHO 2006). As in other regions, heart disease and stroke are the leading causes of mortality among older adults in SSA (WHO 2005; Steyn et al 2006; WHO 2006; WHO 2008a). At an individual level, older people suffer additionally from other NCDs, particularly musculoskeletal conditions, visual impairments and mental disorders such as dementia and depression, and consequent functional limitations (NPHCDA 1999; Oguntona et al 1999; Clausen et al 2005a; Clausen et al 2005b; Clausen et al 2006; Gureje et al 2006a; Gureje et al 2006b; Kahn et al 2006; Gureje et al 2007). Nevertheless, across communities in SSA, there is only limited understanding of the magnitude, patterns, dynamics, social determinants, and individual and societal impacts of ill-health in older ages.

The potential older support ratio (PSR) – the number of people aged 15–64 years per person aged 65 years or older – indicates the dependency burden on potential workers. The impact of demographic ageing is visible in the PSR, which has fallen and will continue to fall. Between 1950 and 2000, the PSR fell from 12 to 9 people, and by mid-century it is projected to fall to 4 (i.e. 4 working-age people for each person aged 65 years or older). PSRs have important implications for social security schemes, particularly traditional systems in which current workers pay for the benefits of current retirees (UNFPA 2002).

Several of the major emerging trends of global population ageing have been identified (Dobrianky et al 2007):

- NCDs are a growing burden and are now the major cause of death among older people in both more and less developed countries – chronic diseases,

Table 1.2a Population ageing trends in SAGE sites, 1950–2050

Country	Per cent of population aged 60 years or older				
	1950	1975	2000	2025	2050
China	7.5	7.2	10.2	20.2	33.9
Ghana	4.1	4.5	5.2	7.2	11.9
India	5.4	5.6	6.7	11.0	19.1
Mexico	5.4	5.6	7.5	14.2	25.8
Russia	9.2	13.6	18.4	24.0	31.2
South Africa	6.0	5.2	5.9	10.5	14.8

SAGE, Study on global AGEing and adult health
Source: (UNPD 2011)

Table 1.2b Population ageing trends in southern and South Africa, 2000–2020

Region or country	Year	Per cent of ageing trends, by age (in years)		
		50+	60+	70+
Southern Africa[a]	2000	12.4	5.9	2.1
	2010	14.9	7.2	2.6
	2020	16.9	9.2	3.5
South Africa	2000	12.7	5.9	2.1
	2010	15.4	7.4	2.6
	2020	17.7	9.6	3.6

[a] Botswana, Lesotho, Namibia, South Africa, Swaziland.
Source: (UNPD 2011)

which affect older adults disproportionately, contribute to disability, diminished quality of life, and increased costs of health and long-term care.

- Family structures are changing – as people have fewer children and tend to live longer, older people are faced with fewer options for care.
- A shift is occurring in the patterns of work and retirement – shrinking ratios of workers to pensioners, and people spending a larger portion of their lives in retirement, increasingly strain existing health and pension systems.
- Social insurance systems are evolving – as social insurance expenditures escalate, an increasing number of countries are evaluating the sustainability of these systems.
- New economic challenges are emerging – population ageing will have dramatic effects on social entitlement programmes, labour supply, trade and savings worldwide, and may demand new fiscal approaches to accommodate a changing world.

1.3 The ageing situation in South Africa

Tables 1.2a and 1.2b compare past, current and future trends in the population of older people in six countries that participated in the Study on global AGEing and adult health (SAGE) and in the southern African sub-region, respectively. South Africa shows a similar increasing trend of the population aged 60 years or older as other SAGE countries (Table 1.2a), and is ageing slightly faster than the southern African sub-region as a whole, as seen in higher percentages for more recent time periods (Table 1.2b).

1.4 Health and sociodemographics in South Africa

Tables 1.3, 1.4a and 1.4b provide reference information on the health, social and economic situation in South Africa.

Table 1.3 Recent estimates for selected sociodemographic indicators for South Africa

Sociodemographic indicator	Corresponding year or time period	South Africa	Source
Total population	2011	50 459 975	(UNPD 2011)
Male population	2011	25 002 365	(UNPD 2011)
Female population	2011	25 457 610	(UNPD 2011)
Real GDP	2007	R1 750 billion	(UN 2010)
Real GDP per capita	2007	R36 461	(UN 2010)
Annual population growth rate (%)	2001–2002	1.4%	(Statistics South Africa 2003)
Population density (people per square km)	2010	41.4	(UNPD 2009)
Per cent urban population	2010	61.7	(UNPD 2009)
Sex ratio	2010	98.1	(UNPD 2011)
Adult literacy rate (% aged 15 years and older)	2008	88% (females) 90% (males)	(UNESCO 2010)
Crude birth rate[a]	2005–2010	22	(UNPD 2009)
Total fertility rate (children per woman)	2005–2010	2.6	(UNPD 2009)
Proportion of population by age group (in years)	2005	0–14: 29.9% 15–59: 62.5% 60+: 7.6% 80+: 0.6%	(UNPD 2009)

GDP, gross domestic product; R, Rand

[a] Crude birth rate, number of childbirths per 1000 people per year

Table 1.4a Health expenditure in South Africa, by selected health status indicator, 2007

Health status indicator	South Africa
Total expenditure on health as a percentage of GDP	8.6
General government expenditure on health as a percentage of total expenditure on health	41.4
Private expenditure on health as a percentage of total expenditure on health	58.6
General government expenditure on health as a percentage of total government expenditure	10.8
External resources for health as a percentage of total expenditure on health	0.8
Social security expenditure on health as a percentage of general government expenditure on health	3.0
Out-of-pocket expenditure as a percentage of private expenditure on health	29.7
Private prepaid plans as a percentage of private expenditure on health	66.2
Per capita total expenditure on health at average exchange rate (US$)	497
Per capita total expenditure on health (PPP int. $)	819
Per capita government expenditure on health at average exchange rate (US$)	206
Per capita government expenditure on health (PPP int. $)	340

GDP, gross domestic product; PPP, purchasing power parity method in International dollars

Source: (WHO 2010)

Table 1.4b Mortality and life expectancy in South Africa, by sex, 2004

Health status indicators	Sex	South Africa
Under-5 mortality rate per 1000 live births (date or period)	Male	72
	Female	66
	Total	**69**
Infant mortality rate per 1000 live births (date or period)	Male	58
	Female	54
	Total	**56**
Life expectancy at birth, in years (date or period)	Male	50
	Female	53
	Total	**51**
Crude death rate per 1000 population (date or period)	Male	16
	Female	16
	Total	**16**

Source: (WHO 2008a)

1.5 Ageing issues and policy goals for South Africa

Economic security, health and disability, and living conditions in old age are policy concerns throughout the world, but the nature of the problem differs considerably from continent to continent, and between and within countries. In SSA, older people make up a relatively small fraction of the total population. Traditionally, their main source of support has been the household and family, often supplemented by other informal mechanisms, such as kinship networks and mutual aid societies.

Although little careful empirical research has been undertaken on long-term trends in the health and financial well-being of older people, there are a number of reasons to believe that traditional care and social support mechanisms in SSA are under increasing strain. African economies are still heavily dependent on subsistence agriculture, with low average income per capita. Consequently, the region contains a large and growing share of the world's poor. In addition, reductions in fertility and child mortality have meant that, despite the significant impact of the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) epidemic across much of the region, both the absolute size and the proportion of the population aged 60 years or older have grown, and will continue to grow over the next 30 years (Velkoff and Kowal 2006).

In South Africa, older black Africans have worse health outcomes than older people from other racial groups; and the gap in health outcomes is even wider among older black Africans living in rural areas. These aggravated problems are attributed to isolation, poor housing, low income, poor access to health-care facilities, and the political and economic marginalization that resulted from apartheid policies (Panel on Policy Research and Data Needs to Meet the Challenge of Aging in Africa et al 2006).

Most older people in South Africa receive a means-tested, non-contributory state old age pension, which is paid in cash to men and women aged 60 years or more (Panel on Policy Research and Data Needs to Meet the Challenge of Aging in Africa et al 2006). As the main source of income in many South African households, this pension money is often used to provide for the whole household, not only the older person's needs. Thus, older people are likely to be supporting the basic needs of their extended family, including food, clothing and school fees for children.

Furthermore, if household members are infected or affected by HIV/AIDS, older people may be faced with taking on responsibilities such as caregiving, providing for financial or material support during illness, paying for the funeral of the deceased and fostering grandchildren (Ferreira 2004). These factors are likely to have a negative impact on the older people's physical and mental health, and economic well-being.

In response to population ageing globally and in the African region, the United Nations Madrid International Plan of Action on Ageing (UN 2002) and the 2003 African Union Policy Framework and Plan of Action on Ageing (AU/HAI 2003) have urged governments to take account of ageing and older populations. South Africa has pledged action to address the needs and well-being of older persons through the African Union Africa Health Strategy 2007–2013 (African Union 2007). The challenge remains to overcome the policy inaction and research inadequacies (Ferreira 2008; Aboderin 2010).

1.6 Ageing-related studies, data and policy gaps in South Africa

There is a need to build an evidence base that can be used in formulating policies and monitoring their impact. In South Africa, there are currently few data sources on ageing and health, apart from some provincial or local level surveys. A number of smaller scale studies are available, including Makiwane et al (2004), Joubert and Bradshaw (2003/4) and the Agincourt Health and Population Unit (AHPU) (Kowal et al 2010). Available national level data from samples of older people include the 2003 World Health Survey (WHS, discussed in Section 1.7, below), and the 1998 and 2003 South African Demographic and Health Surveys (DHS), although the older age groups are limited in the DHS. In general, existing data are inadequate to inform policy formulation and implementation.

Clearly, there is an urgent need for research to provide a scientific basis to promote and inform policy development that will ensure the well-being of older people now and in the future. This scientific basis will enable South Africa to gain a much fuller understanding than currently exists of the experiences and implications of population ageing in South Africa, in the context of rapid social and economic change.

> The South African government and society are challenged to implement the Act on Older Persons, No 13 of 2006, which forms the cornerstone for services that will facilitate older people's protection and their full integration into South African society (Lombard and Kruger 2009).

The work of SAGE will bridge efforts between existing surveys and data collection, improve cross-population and cross-national comparability, and inform future ageing and health policy in South Africa. The challenge will be to use SAGE results in South Africa to stimulate political action.

1.7 SAGE and the World Health Survey baseline

In 2002–2003, WHO conducted the WHS in 70 countries, including South Africa, as part of its multi-country survey programme.[1] In South Africa, the WHS was a nationally representative household survey that included multiple modules devised to measure health status, risk factors and chronic diseases, health systems coverage and responsiveness, and health-care expenditures. The study used methods that improved comparability within and across countries.

Each WHS country collected information on adults aged 18 years or older, including people aged 50 years or older who were members of the selected households. Ghana, the Russian Federation and South Africa oversampled respondents aged 50 years or older, to obtain more precise estimates of health and well-being, and potential health delivery needs of this sub-population. A secondary purpose was to establish a cohort for follow-up in SAGE, which is a longitudinal household survey. SAGE entails a face-to-face interview and has been conducted in six countries, all of which participated in the 2002–2004 WHS. The six countries are China, Ghana, India, Mexico, the Russian Federation and South Africa.

SAGE was originally intended to have two sampling components – the follow-up of two WHS cohorts, individuals aged 18–49 and aged 50 years or older; and the recruitment of new participants aged 50 years or older, to make the older sample nationally representative. The South African SAGE team chose not to follow-up respondents to the WHS for SAGE Wave 1 (but will return to these households and individuals in SAGE Wave 2); thus, only new recruits participated in the survey. The respondents were selected to meet sample size targets, and to adjust for attrition and other issues inherent to longitudinal survey designs. Depending on funding levels, this survey programme is projected to be repeated twice over a 5–10 year period, with Wave 2 planned for 2012 and Wave 3 planned for 2014.

SAGE survey tools were also implemented in four other data collection efforts:

- eight INDEPTH[2] field sites in low- and middle-income countries, where a full or shortened version of the

1 For more information on the WHS, see http://www.who.int/healthinfo/survey/en/index.html

2 INDEPTH is the International Network for the Demographic Evaluation of Populations and Their Health in Developing Countries. For more information see http://www.indepth-network.org

SAGE questionnaire was used, including in South Africa (with the Agincourt fieldsite);

- Collaborative Research on Ageing in Europe (COURAGE in Europe);
- SAGE-Well-being in Older Persons Study (SAGE-WOPS) in HIV infected and affected adults, including in South Africa (with the Africa Centre for Health and Population Studies); and,
- World Health Survey Plus (WHS+) in the six Gulf Cooperation Council countries.

1.8 SAGE goals and objectives

The goals of SAGE are to:

- promote a better understanding of the effects of ageing on well-being;
- examine the health status of individuals aged 50 years or older, and changes in trends and patterns that occur over time;
- improve the capacity of researchers to analyze the effects of social, economic, health-care and policy changes on current and future health.

In particular, SAGE aims to provide baseline and longitudinal measures of health and health-related outcomes on older people in low- and middle-income countries. It provides reliable and cross-nationally comparable data for examining health differences between groups of individuals across countries and regions. In addition, the health estimates use validated health measurement methods, including the health-state descriptions, Global Physical Activity Questionnaire, WHO Disability Assessment Schedule II (WHODAS II) and WHO Quality of Life instrument (WHOQoL).

Primary objectives of SAGE are to:

- obtain nationally representative, reliable, valid and comparable data on levels of health and a range of key domains for adult populations aged 50 years or older;
- examine patterns and dynamics of age-related changes in health and well-being using longitudinal follow-up of survey respondents, and to investigate socioeconomic consequences of these health changes;
- supplement and cross-validate self-reported measures of health (that is, those who report having been diagnosed with a specific condition) and the "anchoring vignette" approach (a method that uses hypothetical scenarios) to improve comparability of self-reported measures through measured performance tests for selected health domains;
- collect data on health examinations and biomarkers to assess reliability of data on morbidity and risk factors, and monitor the effect of interventions.

Additional objectives of SAGE are to:

- generate a cohort of older adults and another of younger adults that is large enough to compare intermediate outcomes, monitor trends, examine transitions and life events, and address relationships between determinants and health, well-being and health-related outcomes;

- develop a mechanism to link survey data to surveillance data from demographic surveillance sites (such as has already been done with AHPU and the and the Africa Centre Demographic Surveillance Site);
- build linkages with other national and cross-national ageing studies;
- improve methodologies to enhance the reliability and validity of measures of outcomes and determinants;
- examine how the mix and distribution of health, health-care, and socioeconomic and family resources affect key outcomes – namely mortality, morbidity and health-care use;
- provide a public-access information base to engage all stakeholders, including national policy makers and health systems planners, in planning and decision-making processes about the health and well-being of older adults.

1.9 Dissemination

This document presents the SAGE results for the main dimensions of health, social and economic conditions of the older population, with the results analyzed predominantly by age, sex, type of residence (rural or urban location), education, ethnicity and wealth quintiles. These results will be used to develop a range of indicators for engaging researchers, public health officials, policy makers and decision makers. We aim to create a health data collection platform for longitudinal health surveys, and to further develop research methodologies to improve cross-national comparability of data. In addition, we aim to produce the following (both independently and with participating countries and WHO collaborating centres):

- improved research skills among colleagues in South Africa;
- public-access datasets;
- this report;
- policy and research briefs;
- links to surveillance data collection systems and other data collection efforts;
- data for monitoring international, regional and national policy documents, and for monitoring effects of interventions;
- manuscripts for submission to peer-reviewed journals;
- recommendations for research, policy and planning.

2. Methodology

This chapter describes the SAGE sampling design and sample selection process. It also describes survey instruments and implementation, including training, fieldwork and supervision, data collection and data management.

2.1 Sampling design, implementation and size

The SAGE sample design entails a two-stage probabilistic sample that yields national and sub-national estimates to an acceptable precision at provincial level, by residence (urban and rural), and by population group (including Black, Coloured, Indian or Asian and White).

2.1.1 First stage

The first stage of sampling was the selection of primary sampling units (PSUs), using the 2002 HSRC master sample as the sampling frame (HSRC 2005). The master sample is a probabilistic sample of 1000 enumeration areas (EA) drawn from the South African National Census, conducted by Statistics South Africa in 2001 (Statistics South Africa 2003). An EA is the smallest geographical unit allocated to a single enumerator during census enumeration. It constitutes a small piece of land for an enumerator to cover in order to administer a questionnaire during a national population census. The size of most EAs is between 100 and 250 visiting points (VPs). A VP is a separate (non-vacant) residential stand, address, structure or flat in a block of flats or homestead. It is a dwelling and thus often, but not always, corresponds to a household. The terms "household" and "dwelling" are commonly used in the SAGE document in this context. The size of an EA is influenced by terrain and other topological conditions, as well as by literacy levels, sociopolitical and administrative boundaries, and the population density of the area.

In the master sample, each EA is classified by province and by residence. Four types of residence are defined – urban formal, urban informal, rural formal (including commercial farms) and tribal areas (these are in the deep rural areas). In the formal urban areas, race is used as a third stratification variable.

For the SAGE study, a total sample of 600 EAs was drawn from the master sample and used as the PSUs. This stage of selection was done centrally at the HSRC. The master sample was stratified by province, residence and race, and the EAs were then selected with a probability proportional to size, with the estimated number of people aged 50 years or older in each EA as a measure of size. Thus, EAs with a larger number of people aged 50 years or older had a higher chance of being selected.

2.1.2 Second stage

The second stage of the sample design was the selection of VPs – in this case, households – which formed the secondary sampling units. This stage of the process involved geo-referenced aerial photograph maps of urbanized areas on which the locations of households were plotted. From these aerial photographs, the coordinates of each household in the selected EAs were extracted (using ArcView 3.3 Desktop geographical information system [GIS] software) and used to create a list of households. The household list was updated as necessary after a field visit. Once households had been systematically selected from the updated listing, Garmin eTrex global positioning system (GPS) receivers were used to navigate to the households.

To ensure that an adequate number of households with at least one person aged 50 years or older was selected,

30 households were randomly selected from each EA, and screened to identify the presence of a person 50 years or older. If the household had at least one person 50 years or older, then that household was included in the 50 years or older sample. The remaining households (that is, with no member 50 years or older) were used to randomly select two households and, in each of these, one respondent aged 18–49 years was randomly selected using Kish tables (Kish 1965; Kish 1987). A cohort of younger adults (aged 18–49 years) was included for comparison purposes. The sample contained EAs with different numbers of households containing people aged 50 years or older, and only two households with people aged 18–49 years. Altogether, about 18 000 households were targeted (that is, 600 EAs with 30 households in each).

The individual eligible for interview in selected households formed the ultimate sampling unit. The total sample size of individuals was targeted to be 1000 people in the age group 18–49 years, and 5000 people aged 50 years or older. In the sample of households with people aged 50 years or older, anyone aged 50 years or older was eligible for interview. If the household had an eligible member who was unavailable for interview, then up to three revisits were made. In the case that a usual member was at an old-age home or visiting a hospital within 100 km, then an attempt was made to visit the person at that institution for an interview. Although the targeted number of people 50 years or older was 5000 from among the 600 EAs, for the process described above, it was not possible to predict

Table 2.1 Number of selected enumeration areas by province and residence, South Africa, 2007–2008

Province	Residence		
	Urban	Rural	Total
Eastern Cape	49	30	79
Free State	31	14	45
Gauteng	97	2	99
KwaZulu-Natal	82	29	111
Limpopo	18	36	54
Mpumalanga	27	19	46
North West	22	22	44
Northern Cape	37	8	45
Western Cape	69	8	77
Total	**432**	**168**	**600**

Table 2.2 Coverage of enumerator areas by residence, South Africa, 2007–2008

Province	Targeted number of EAs N (% visited)	Residence Number of EAs visited	
		Rural	Urban
Eastern Cape	79 (81)	18	46
Free State	45 (82)	13	24
Gauteng	99 (51)	5	45
KwaZulu-Natal	111 (63)	8	59
Limpopo	54 (78)	28	14
Mpumalanga	46 (50)	12	11
Northern Cape	45 (73)	14	19
North-West	44 (77)	17	17
Western Cape	77 (60)	0	46
Total	**600 (62)**	**115**	**281**

EA, enumeration area

Table 2.3 Number of households visited and individual respondents interviewed by province and residence, South Africa, 2007–2008

Province	Urban		Rural	
	Households	Individual	Households	Individual
Eastern Cape	630	684	311	329
Free State	187	157	104	90
Gauteng	447	542	106	118
KwaZulu-Natal	476	537	105	121
Limpopo	133	118	271	259
Mpumalanga	83	83	189	120
Northern Cape	180	165	127	172
North-West	186	201	185	200
Western Cape	345	323	2	2
Total	**2 667**	**2 810**	**1 339**	**1 411**

the exact number of older people before fieldwork. In the sample of households with people in the age group 18–49 years, two households per EA were selected: a sample size sufficiently large to allow for a margin of refusals. Thus, for the 18–49 age group, 1200 households were selected, from which about 1000 individuals were eligible for interview.

2.1.1 Stratification and allocation of enumeration areas

Table 2.1 presents the allocation of the EAs by province and by residence, with locality categorized into urban and rural. The province and the residence formed the main stratification levels.

Table 2.2 presents the distribution of EAs by province, with residence categorized into urban (which includes urban informal and urban formal areas) and rural (which includes rural formal and tribal areas). A total of 396 EAs were visited: a coverage of 62% of the targeted EAs. Eastern Cape and Free State provinces had the highest coverage (>80% of targeted EAs), and Gauteng and Mpumalanga the lowest (50% and 51%, respectively). The EA coverage was slightly higher in the rural areas (68%) than in the urban areas (65%) (data not shown).

Of the 18 000 households targeted, 4006 urban and rural households were interviewed (Table 2.3) from the 396 EAs visited. A slightly higher proportion of households were visited in urban areas (67%) than rural areas (33%) (data not shown), which reflects the intention of the agreed sampling design to focus on higher density areas as a means to maintain the original (Wave 0) sample and minimize costs. The SAGE South Africa study team did not follow up the Wave 0 sample in Wave 1, but will attempt to do so in Wave 2. Figure 2.1 shows the population pyramid for South Africa based on the SAGE Wave 1 household composition, and weighted to the national population estimates.

2.2 Questionnaires

Respondents were interviewed using the four standard SAGE survey questionnaires:

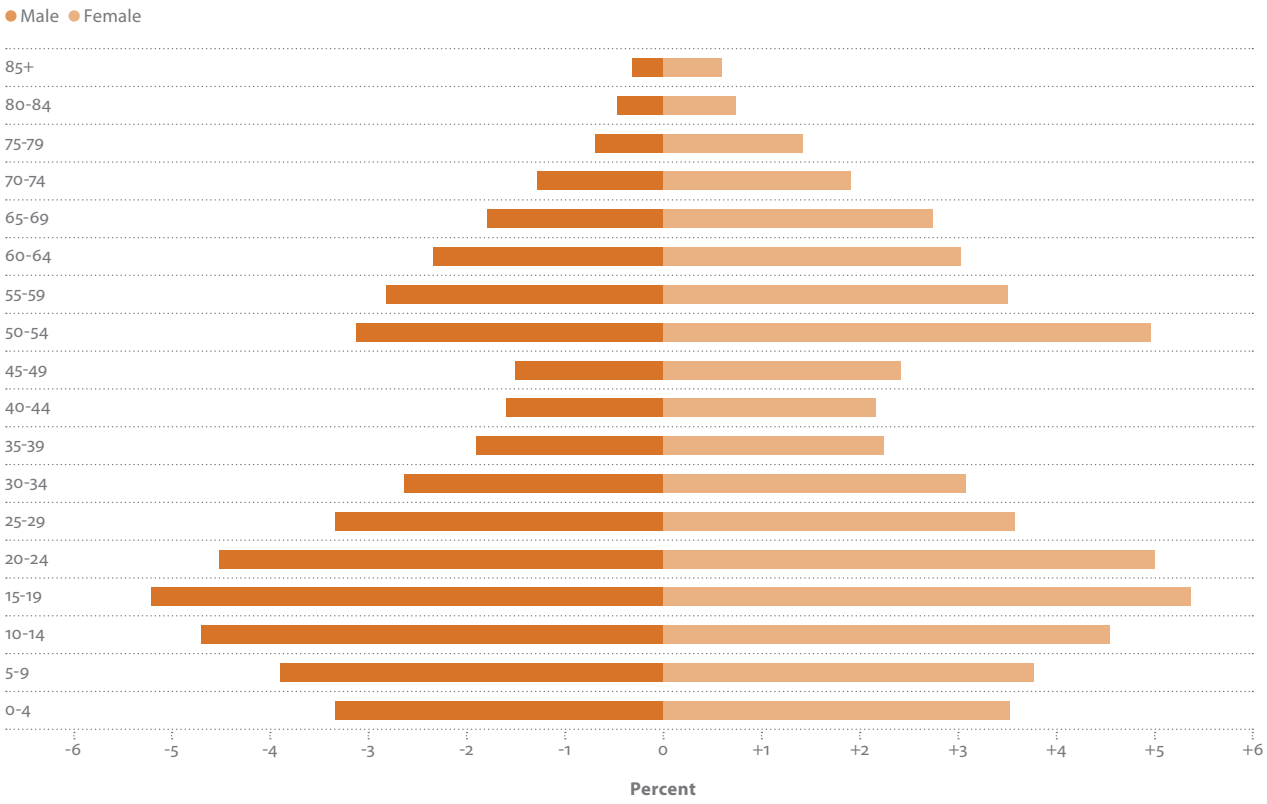
- a household questionnaire;
- an individual questionnaire;
- a proxy respondent questionnaire;
- a verbal autopsy questionnaire.

The procedures for including country-specific adaptations to the standardized questionnaire followed those developed by, and used for, the WHS, and are discussed below. Materials devised for the survey are intended to be culturally neutral and suitable for use with people who cannot read or write.

2.2.1 Household questionnaire

The household questionnaire includes questions about the household members, housing characteristics, assets,

Figure 2.1 Population pyramid derived from the SAGE Wave 1 South Africa household roster data



Source: SAGE-South Africa, 2007-2010

Table 2.4a Household questionnaire sections, South Africa, 2008

Section	Title	Description
0000	Coversheet	Summary of key information for supervisors, interviewers and data-entry clerks, including ID numbers, rotation codes, key dates and quality control checks.
0100	Sampling information	Completed by the interviewer – verifying sampling details necessary for calculating sampling weights.
0200	Geocoding/ GPS information	Completed by the interviewer – using GPS devices.
0300	Recontact information	Specific address and location information for the respondent, plus information about an alternative informant in case of difficulty in locating the respondent.
0350	Contact record	Records the interviewer's attempts to complete the interview.
0400	Household roster	Records information about all of the household members, including sex, age, marital status, education, and care needs. A household is constituted by members who sleep, eat and generally live together for at least four nights a week. In most cases, a household and a family are identical.
0450	Kish tables and household consent	Provides the interviewer with the correct procedure for selecting the eligible respondent for the individual questionnaire; the consent form provides key information about the interview and the study to the potential household respondent, and requests consent to proceed with the household interview.
0500	Housing	Records information about characteristics of the dwelling, including ownership status, materials of the flooring and walls, water supply, and sanitation and type of cooking arrangements. When enquiring about the number of rooms in the household, the toilet and bathroom are excluded, but the kitchen is included.
0600	Household and family support networks and transfers	Records information about cash and non-cash transfers into and out of the household – important for assessing maintenance of well-being and social networks.
0700	Assets and household income	Records information from questions about household income and assets; used to assess the level of income security.
0800	Household expenditures	Records information about health and non-health expenditures for the household, and provides a measure to assess the accuracy of responses about income.
0900	Interviewer observations	Records observations made by the interviewer and provides a subjective evaluation of the accuracy of the information obtained from the respondent.
0910	Verbal autopsy	Follows from Section 0400 with a verbal autopsy questionnaire for each death in the household in the last 24 months. Information is collected for all deaths in the household over the last 24 months in order to examine the distribution and causes of death.

GPS, global positioning system; ID, identity

Table 2.4b Individual questionnaire sections, South Africa, 2007–2008

Section	Title	Description
	Individual or proxy respondent selection and consent form	Starts with filter questions about memory so that the interviewer can assess whether a respondent aged 50 years or older is cognitively and physically able to complete the interview. If the respondent is deemed unable, then the interviewer attempts to administer the proxy respondent questionnaire.
1000	Sociodemographic characteristics	Records information on the characteristics of the individual respondent, including language, race, education and occupation. South Africa's 11 official languages were included as response categories, as were the four races. South African standards for education were used, and were mapped to the International Standard Classification of Education (UNESCO 1997) including: • less than primary school (Grades 1–6) • primary school completed (Grade 7) • secondary school completed (Grade 9) • high school completed (Grade 12) • college/pre-university/university completed (3–4 years) • post-graduate degree completed (masters, doctorate). • Occupation was coded using the ISIC-3 classification scheme.
1500	Work history and benefits	Records details about the respondent's current or past work situation. This section also records whether the person is actively looking for work (unemployed). The latter information allows calculation of labour force participation rate and the proportion of this population group that is in the labour force – that is, either working (employed) or actively looking for work (unemployed).
2000	Health-state descriptions and vignettes	Records overall health, including nine self-rated health domains (mobility, self-care, pain and discomfort, cognition, interpersonal activities, sleep and energy, affect, vision and hearing). It also includes the vignette methodologies, the 12-item version of WHODAS II,[a] and questions on ADLs and IADLs. WHODAS provides a profile of functioning across six activity domains, as well as a general disability score.
2500	Anthropometrics, performance tests and biomarkers	Records the measured blood pressure, height, weight, and waist and hip circumferences. It also asks respondents to complete performance tests. Blood spot samples are collected through a finger-prick.
3000	Risk factors and preventive health behaviours	Records selected risk factors and health behaviours, such as personal decisions and habits that affect health (tobacco and alcohol use, nutrition and physical activity). These areas follow the recommendations of WHO STEPS.[b]
4000	Chronic conditions and health services coverage	Disease recall for 11 health conditions (stroke, angina, arthritis, diabetes, chronic lung disease, asthma, depression, hypertension, cataracts, injuries, and oral health problems – ever diagnosed, ever treated and on treatment now) and common symptoms to improve prevalence estimations.
5000	Health care utilization	Records recent use of health care services and the types of services accessed. Includes questions about inpatient, outpatient and home care over the past 5 years, with specific questions about the type and reason for care over the last 12 months.
6000	Social cohesion/ capital	Records the respondent's connections and participation in the community. This information is used to discern the extent to which social relationships influence health and well-being.
7000	Subjective well-being and quality of life	Records the respondent's perceptions about their quality of life and well-being. The WHOQoL eight-item version[c] was used, together with a new methodology developed and pretested specifically for SAGE – an abbreviated day reconstruction method module (Kahneman et al 2004).
8000	Impact of care giving	Attempts to record the impact of care giving in the household, and how families and households cope and support each other through prolonged illness and death. Information is sought about the members of the household (adults or children) who were ill or died in the last 12 months in order to determine care giving needs. Questions are asked about people in the household who need or needed care due to illness or other reasons, or had been ill and died in the last 12 months.
9000	Interviewer assessment	Records the interviewer's observations about the respondent and impressions of the interview process.

ADLs activities of daily living; IADLs, instrumental activities of daily living; STEPS, step-wise approach to surveillance of risk factors; WHO, World Health Organization; WHODAS II, WHO Disability Assessment Schedule II; WHOQoL, WHO Quality of Life

[a] http://www.who.int/icidh/whodas

[b] http://www.who.int/ncd_surveillance/steps/en

[c] http://depts.washington.edu/yqol/docs/WHOQOL_Info.pdf

Table 2.4c Proxy respondent questionnaire sections and measures, South Africa, 2007–2008

Section	Title	Description
0	Consent form	Signed by the proxy respondent for informed consent.
1	IQ Code	Records information from the proxy respondent, who identifies himself or herself as knowing the respondent well, using the 16-item version of the IQ Code (Q1009–1024).
2	Health-state descriptions	Records information from the proxy respondent about the respondent's overall health and the nine health domains.
4	Chronic conditions and health services coverage	Records information from the proxy respondent about the respondent's disease recall for nine health conditions (angina, arthritis, diabetes, chronic lung disease, depression, hypertension, cataracts, injuries and oral health problems). Questions include: • Was the respondent ever diagnosed? • Was the respondent ever treated? • Was the respondent on treatment now?
5	Health care utilization	Records information from the proxy respondent about the respondent's recent use of health-care services and the types of services accessed. This section includes questions about inpatient, outpatient, and home care over the past 5 years, with specific questions about the type of facility visited and reason for care at the last visit.

IQCode, Informant Questionnaire on Cognitive Decline

income, and transfers between household members and those outside the household. This information provides important background characteristics for analyzing health outcomes. The household informant agrees to be interviewed through understanding and signing of a household consent form.

2.2.2 Individual questionnaire

The individual questionnaire records information about the respondents' health, physical functioning, health risk factors and conditions they may suffer from, health care use, and their perceptions about their own well-being and happiness (Table 2.4b). It also includes a series of performance and anthropometric measures. The individual respondent signs a consent form for the interview, and a separate consent form for the blood sample. It is possible for an individual to be both the household informant and an individual respondent.

2.2.3 Proxy respondent questionnaire

For respondents aged 50 years or older, a short set of questions about memory precedes the main set of questions in the individual questionnaire. These questions allow the interviewer to subjectively determine whether a respondent is cognitively and physically competent to complete the interview. If the respondent is deemed unable to provide reliable results or too ill to participate, then the proxy respondent questionnaire is used with a person who knows the respondent well and is able to accurately answer questions about the respondent's health and well-being on their behalf. The proxy respondent questionnaire consists of a standardized set of screening questions for dementia and cognitive decline. It uses the short form of the Informant Questionnaire on Cognitive Decline (IQ Code) – a standardized set of screening questions for dementia and cognitive decline (Jorm 2010) – together with the sections described in Table 2.4c. The proxy respondent needs to provide specific consent for a proxy interview.

2.2.4 Translation

The translations of SAGE instruments adhered to the WHS translation guidelines, which are available through WHO; another helpful reference was the Cross-Cultural Survey Guidelines website.[3] The translated instruments included the household, individual (all four rotations, A–D), and proxy respondent questionnaires. Consent forms and information sheets were also translated. All documents were translated into six of the major South African languages: Afrikaans, IsiZulu, IsiXhosa, Sepedi, Setswana and Xitsonga. Simultaneous translation was used with respondents who were interviewed in a language for which a formal translated version had not been produced, with emphasis placed on consistent translation of key words and phrases.

All translators were competent in English and in the vernacular in which they were responsible for conducting

3 http://www.ccsg.isr.umich.edu/translation.cfm

interviews. Most translation problems related to lack of vernacular words for some of the technical English terms. For example, most of the legal jargon found in the consent forms is lost in vernacular languages. Similarly, terms such as "anxiety", "depression", "sad" and "stressed" are difficult to explain distinctly in many languages. This problem was mitigated by using both the vernacular explanation and English technical terms as part of an elaborate transmission of meaning.

To check the quality of translation, a list of key words and phrases was provided by WHO for translation and back translation. These key words and phrases were translated from English into vernacular languages by the original translator, then back-translated into English by an independent translator who provided all possible interpretations for the words and phrases. The back-translations were then cross-checked with the original English. If no match was found, both translator and back-translator were consulted to reach a final agreement on the best solution and make changes to the translated questionnaire where necessary. During the entire translation process, the WHO SAGE team was consulted and received translation reports, back-translations and fully translated questionnaires.

Fieldworkers were given a copy of the approved translated documents during training for practice and for field testing. The fieldworkers used the master questionnaires that had been translated into the vernacular for asking questions, but wrote the responses in an English questionnaire.

2.3.1 Health and biomarker measurements

SAGE contribution to direct health examination

In an older or disabled population, performance tests are used not only to estimate the prevalence of selected conditions, but also to provide information about causal pathways from preclinical disease, to clinical disease, to impairments in functional capacity. SAGE also uses performance test results for cross-validation of the anchoring vignette strategy and as an independent test for improving understanding of self-reported health. In a performance test, an individual performs a task in a standardized manner and the result is measured with predetermined, objective criteria, often including time to completion, accuracy of completion or recording maximal effort. By comparing the result of the measured performance tests with self-reported health and vignette responses, it is possible to assess whether adjustments based on the anchoring vignette strategy improve comparability of self-reported health over time and across populations. It is also possible to evaluate specific vignettes and sets of vignettes in terms of overall performance, and to test critical assumptions of the anchoring vignette strategy. Performance measures also quantify physical function along a continuous scale, and are therefore expected to be particularly valuable in detecting change in function over time.

2.3.2 Biomarker measurements

Anthropometric measurements were taken to measure body mass index (BMI) and health risks. Health and performance tests were conducted as a means to verify health and physical functioning, and as a comparison for self-reporting of health. Specific measures and tests conducted as part of SAGE are described below.

Anthropometric measurements

Weight and height for calculation of BMI. Body composition and fatness are represented by BMI, which here was derived from measured weight in kilograms and normalized by dividing by height in metres squared. Both very high and very low BMIs are associated with functional difficulties and disability in old age. Excessively high BMI can exacerbate symptoms associated with particular conditions, such as osteoarthritis of the knee. Low BMI, particularly when it results from weight loss in old age, can be indicative of poor or declining health, and is a risk factor for mortality.

Waist and hip circumferences for calculation of waist–hip ratio (WHR). WHR is the ratio of the circumference of the waist to that of the hips. It is calculated by measuring the smallest circumference of the natural waist, and dividing it by the hip circumference. This measure of obesity is an independent risk factor for cardiovascular disease (CVD) and other health outcomes, and may have a stronger relation to risk of CVD than does BMI.

Four meter timed walk at a normal and rapid pace. The ability to walk is essential for many tasks of daily life and may predict health outcomes such as frailty, mortality and health-care needs. Respondents were timed while they covered a set distance (4 m), once at a "normal" and once at a "rapid" pace, using a walking aid if necessary. This measure of mobility was also used to validate self-reported mobility in Section 2000 (Table 2.4b).

Hand grip strength. One grip test was conducted for each hand.[4] The respondent repeated the grip exercise twice for each hand, and the better of two measurements was recorded. The grip strength is measured in mean maximum hand grip strength (kilograms).This test of upper extremity function is a proxy for physical functioning and, in further analyses, is often used to test associations between grip strength and health outcomes (disability, morbidity and mortality), in particular among older people.

Spirometry.[5] Lung function measures, such as forced expiratory volume in the first second (FEV1) and forced vital capacity (FVC) were obtained to screen for diseases such as chronic lung disease or asthma.

Blood pressure. Blood pressure was measured three times on the right arm or wrist of the seated respondent using an automated recording device.[6]

Eyesight. LogMAR eye charts[7] were used to assess levels of myopia and hyperopia. The test used standard lighting and corrected vision as per the individual respondent's situation. The acuity test was administered in a "forced-choice" fashion; that is, the respondent was instructed to provide a response, and to guess when uncertain. (This procedure yields more reliable data than procedures that allow an individual to decide when to terminate the test.)

Cognition tests

A battery of cognition tests were administered. The tests were selected from a list recommended by experts on performance tests in ageing surveys[8] and from experience with other surveys conducted at WHO. By calibrating self-reported health status and vignette response patterns, the results assist in determining levels and trends in health inequalities, planning and monitoring interventions, and evaluating policies. The tests are easy to administer, and fieldworkers were given additional training and testing to make sure they conducted the tests correctly.

The three cognition tests, which together measure concentration, attention and immediate memory, were the following:

- **Verbal fluency:** Respondents were asked to produce as many words (names of animals) as possible in a one-minute time span. This test measures the ability to retrieve information from semantic memory.
- **Immediate and delayed verbal recall:** The person administering the test presented 10 words verbally, repeating the words three times to saturate the learning curve. After about 10 minutes, the respondent was asked to recall as many of the 10 words as possible, to test delayed recall and recognition. Thus, verbal recall scores indicate the average number of words recalled out of the 10 words presented. This test assesses learning capacity, memory storage and memory retrieval.
- **Digit span (forward and backward):** For the forward test, participants are read a series of digits (for example, "8, 3, 4") and must immediately repeat them back. If they recall the numbers correctly, they are given a longer series of digits, until failure. In the backward test, the person must repeat the numbers read to them, but in reverse order. The length of the longest list a person can remember in this fashion is that person's digit span and is an estimate of working memory.

Blood samples

Dry blood spot (DBS) samples were collected. The respondent first signed a separate informed consent form (that included consent for taking and storing a blood spot sample for current and future analyses). A small amount of whole blood (5 spots) was then collected on filter-paper from the respondent by way of a finger-prick, using sterile techniques. Universal precaution procedures were applied while obtaining the blood specimen, and the specimens were handled appropriately after the collection and during transport to the laboratory for storage, as outlined below.

2.3.3 Biomarker implementation

Fieldworkers were trained on how to safely collect and store the samples (which were stored at Global Laboratories in Durban at -20C within a maximum of 14 days from collection). Procedures for response to blood

4 Smedley's Hand Dynamometer, Scandidact, Oldenvej 45, and 3490 Kvistgard, Denmark.

5 MIR SpiroDoc Diagnostic Portable Spirometer, Medical International Research, Via del Maggiolino, 125 – 00155 Rome, Italy.

6 OMRON R6 Wrist Blood Pressure Monitor, HEM-6000-E, Omron Healthcare Europe, B.V., Hoofddorp, and The Netherlands.

7 Tumbling "E" Chart for 4 m testing and Tumbling "E" Near Vision Card for 40 cm testing. Precision Vision Ltd., 944 First Street LaSalle, IL 61301, USA.

8 Draft document, *Comparisons between self-report items (function, mobility), performance testing, and vignettes*. Correspondence with Dr T Seeman, from the US National Institute on Aging.

exposure were reviewed during training, and guidelines were provided to all fieldworkers. Biohazardous materials were handled properly, and disposed of with medical waste at local health-care facilities. Respondents were provided with information about possible untoward effects of providing the sample, and were informed that these tests were not for the direct health benefit of the respondents, but that the results would assist health systems planning in their country. Samples were coded using the respondent identification (ID) number, which was generated by WHO and assigned by the fieldwork supervisors. Access to the ID numbers was restricted to laboratory staff and primary investigators. The blood sample was coded and linked with a barcode to the individual questionnaire and to a respondent, through a system that ensures confidentiality and anonymity.

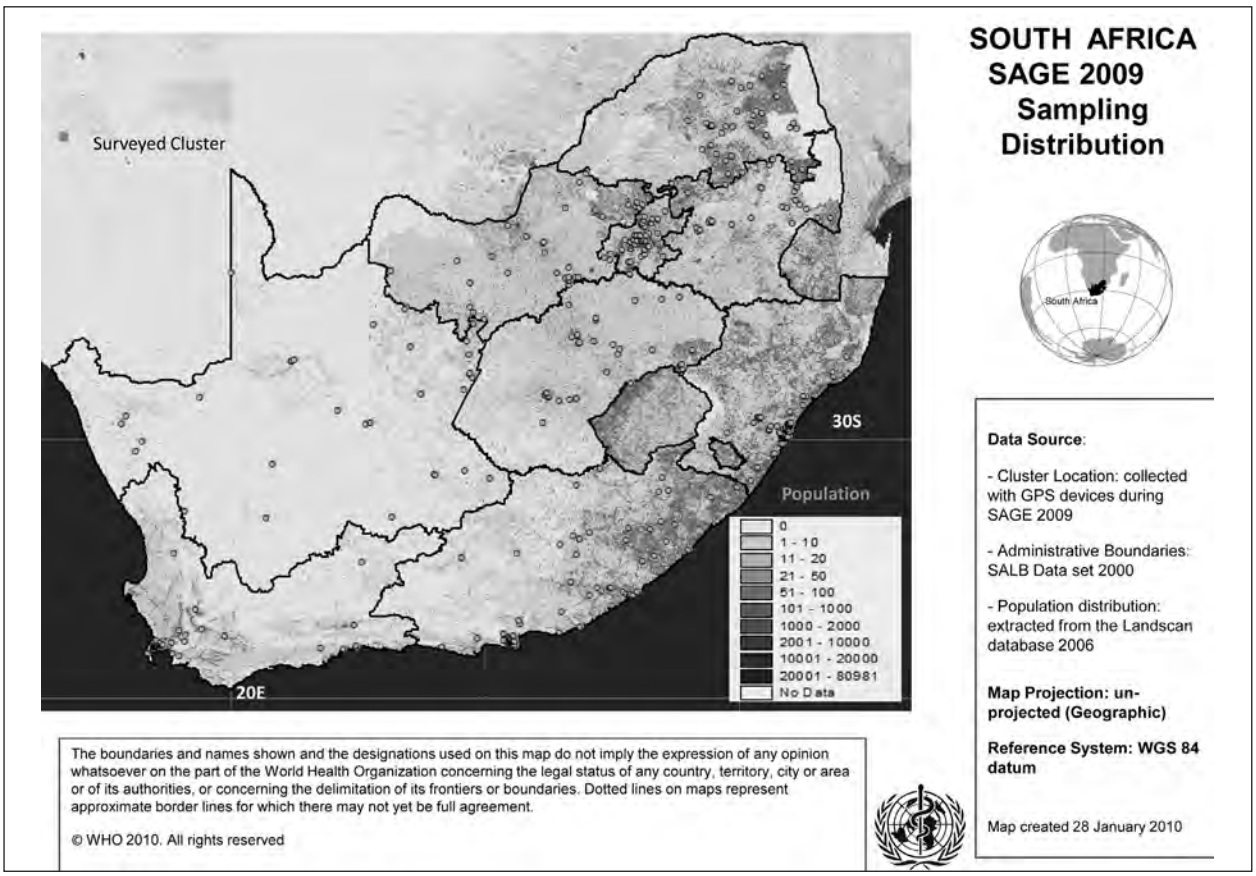
Blood analyses were tested for markers of anaemia (haemoglobin), diabetes (glycosylated haemoglobin [HbA_{1c}]), CVD (total and high density lipoprotein [HDL] cholesterol, and C-reactive protein [CRP]) and chronic infection status (hepatitis B and Epstein-Barr virus [EBV]). These are tests for poor nutrition, stress, chronic conditions and other independent and additive risk factors that contribute to a variety of health problems and outcomes. Further tests are planned in the future, including total cholesterol and HDL fraction, hepatitis B and interleukin-6.

Qualified health professionals who were part of the survey team reviewed the results of the biomarkers and performance tests. Interviewers provided a sheet to the respondent with the readings from these tests on the day of the interview. If the results suggested the need for further investigation, respondents were encouraged to take the sheet of results to their nearest or usual health-care provider. No blood results were given to the respondents.

2.4 Georeference data

Georeference data gave the physical location of EAs and households selected for SAGE (Figure 2.2); they included GIS coordinates of latitude and longitude. As described in Section 2.1, georeferenced aerial photograph maps provided the basis for the household listing, from which households were selected for the sample. During the interview phase, the coordinates of the selected household were confirmed with Garmin eTrex

Figure 2.2 Location of enumeration areas, South Africa 2007–2008



GPS receivers, and were registered to be stored in the SAGE database.

Geographical data served several purposes. First, the accurate recording of coordinates of sampled households was necessary to assist with finding respondents for the next round of the SAGE longitudinal data collection. Second, the EA and household GIS coordinates were stored in the SAGE database to be used for further spatial analyses of health and illness data. Finally, the data may eventually be linked with other data sources (for example, with health facilities in South Africa) to measure distance between selected households and health-care facilities.

2.5 Data collection procedures and data management

2.5.1 Data collection

Fieldworkers conducted face-to-face interviews with respondents. Appointments with respondents were made through telephone contact. If a respondent was unavailable during the first visit, at least two additional visits were attempted. Respondents were given incentives in cash (R20) or in-kind (aqueous creams donated by Johnson and Johnson). Fieldwork began in March 2007 and ended in September 2008.

Two teams were organized for each of the nine provinces. The teams consisted of one supervisor and three to five fieldworkers. Male and female interviewers were recruited in order to conduct, as far as possible, same-sex interviews. In the case where mixed sex interviews were arranged, and the respondent was uncomfortable or unwilling to answer, we offered to have sensitive questions asked by a same-sex interviewer. Interviewers travelled in small teams, so any problems or a need to change the sex of the interviewer could be arranged on the spot. Each team had a professional nurse whose main responsibility was to collect DBS samples. In a few cases, drivers were hired for the field teams. The teams travelled in groups of three to five, using one vehicle. Where there were more than four fieldworkers, the team was divided into two groups, with one supervisor and two vehicles. Otherwise, all teams had one supervisor and a coordinator from the HSRC. The coordinator spent the initial couple of weeks in the field with the team. For the remaining period, the coordinator was in regular contact with the team. The average number of interviews conducted per fieldworker per day was two household and two individual interviews. The team supervisor completed 30 screening questionnaires per EA.

Quality of collected data was checked throughout all stages of data collection. Once the fieldworkers had completed the interviews, they checked their questionnaires while still at the respondents' homes. Once they were sure that there was a correctly recorded response for every question, they handed the completed questionnaire with the DBS sample to the field supervisor. The supervisor then checked the questionnaire and tracking sheets for completeness, consistency and quality. A form called a tracking sheet was used to track day-to-day progress throughout the interview process, identify and correct any errors that data collectors committed, deal with missing information and undertake other daily activities. Questionnaire and anthropometric data were recorded on a separate questionnaire tracking sheet, and the DBS data on a specimen tracking sheet. Tracking sheets were maintained by each data collector, checked by the field supervisor and captured by checkers based in the office. The following aspects were captured:

- questionnaire number;
- participant number;
- age of participant;
- sex of participant;
- race of participant;
- date on which data were collected;
- type of anthropometric measurement done;
- whether DBS was collected;
- data collector number;
- field supervisor number and signature.

Tracking sheets provided a snap-shot of the progress that was made each day; for example, by showing the number of people interviewed and the number who gave DBS samples. The sheets could also be used to analyze collector and supervisor performance in terms of number of refusals to give interviews and DBS samples.

If corrections were needed, the fieldworker returned to the respondent's home to make corrections. The supervisors were silent observers during 5% of the interviews, as part of quality assurance procedures. Once interviews in the EA were completed, all questionnaires were packed in boxes and posted to the HSRC in Pretoria Central Office, where the provincial coordinator re-checked the questionnaires against the tracking sheets.

The DBS samples were also checked by the field supervisor while in the field, to ensure that they were correctly labeled. Checking of DBS samples refers to checking through the zip-locked plastic containing the filter-paper cards on which the DBS was placed, to see whether the spots are adequate for testing. The filter-paper cards themselves were not touched by hand, to avoid contamination. The checked samples were posted to the laboratory every second day. The coordinators handed all completed EAs to the project manager for quality assurance and data capturing.

The coordinators also conducted field visits and acted as silent observers for quality assurance. While in the central HSRC office, they called the field supervisors daily to solve problems and document progress. The principal investigators, project manager and WHO staff also conducted field visits as silent observers for quality assurance. Overall, the principal investigators provided the direction of the study at the conceptual level, whereas the project manager dealt with issues of the programme, timelines and budget. The project manager reported directly to the principal investigators.

2.5.2 Data management and data entry

The data were captured in a CSPro software application provided by WHO. Eight computers were networked – seven for data capture and one for the supervisor. The supervisor maintained the control file that contained all of the data entered. Seven data capturers and the supervisor were trained on CSPro data entry over 3 days. Data capturing started on 3 November 2008 and was completed on 20 January 2009. Throughout the data-entry process, WHO headquarters was provided with progress updates on how many questionnaires had been entered and on data cleaning issues. The final raw dataset was sent to WHO for further cleaning and weighting. The resulting weighted dataset was then returned to South Africa, together with the agreed set of results in tabular format. STATA version 10 and SAS version 9 were used to produce the results.

The data cleaning process involved:

- verifying questionnaires to identify and correct data inconsistencies;
- reconciling EA numbers;
- identifying and eliminating duplicate cases;
- correcting miscodes that were a result of errors in fieldwork or data capture;
- reconciling questionnaires with screening data.

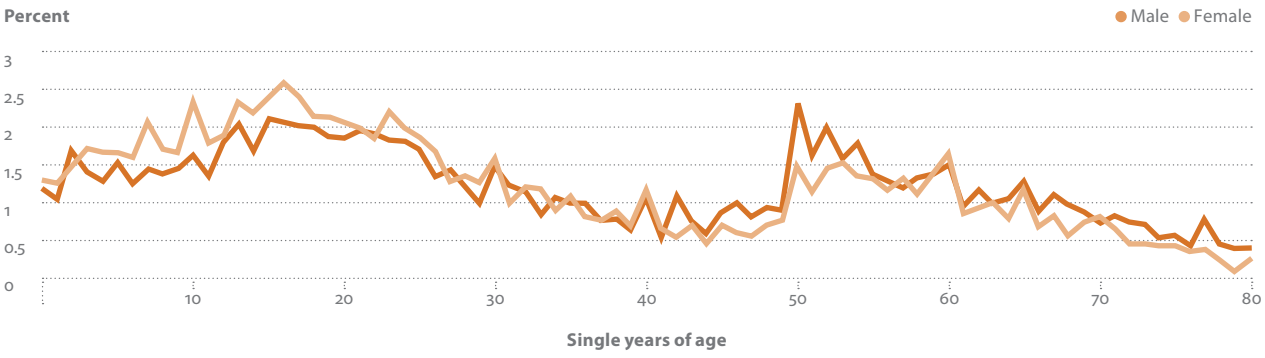
2.6 Survey metrics and data quality

2.6.1 Age reporting

Between the ages of 25 and 50 years, the SAGE sample population of household members closely approximated the national population, except for males aged 50–55 years, where the sample contained a slightly higher proportion, because households were sampled contingent on having a member aged 50 years or older. Oddly, however, there were relatively few people aged 70 years or older in the sample compared to the general population.

The Myer's Index is commonly used to assess accuracy of age reporting; it also indicates any age heaping on an end digit. The Myer's Index for the SAGE Wave 1 sample was 3.3, with no evidence of age heaping in the sample (Figure 2.3).

Figure 2.3 Myer's Index: measure of age reporting or age heaping



Source: SAGE 2009

Table 2.5 **Individual response rates by background characteristics, South Africa, 2007–2008**

Characteristics	Individuals contacted	Individual response rate (%)	Blood specimen response rate
Age group (years)			
50–59	2 280	74	86.4
60–69	1 570	78	90.8
70–79	838	80	79.8
80+	335	75	77.9
Sex			
Male	2 030	81	86.5
Female	2 993	74	86.5
Residence			
Urban	3 379	76	84.8
Rural	2 993	43	89.7
Total	**6 372**	**60**	**86.5**

2.7 Response rate

The overall response rate among those aged 50 years or older was 60% (Table 2.5). Interestingly, men were more likely than women to complete the survey. The response rate among men and women is based on those whose sex was indicated, whereas the overall response rate includes all those that participated in the study. Those for whom sex was not indicated were excluded when computing response rate by sex because their sex was missing. Those in urban areas were also more likely to participate than those in the rural areas.

The blood specimen response rate was conditional on the individual response rate.

3. Household and individual characteristics

3.1 Household population

This section summarizes the information gathered through the household questionnaire, which included questions about age, sex, education and marital status of all household members. This section also includes a summary of information about the household head and main wage earner, household health insurance coverage and the need for care for a health condition.

3.1.1 Sociodemographics of household population

Age and sex are important variables that form the basis for further demographic analysis. Table 3.1 presents the household composition by age and sex. The overall proportion of male and female household members in the sample was 45% and 55%, respectively.

Medical insurance facilitates people's access to care and, in some cases, may save the life of the person enrolled. Most South Africans did not have health insurance coverage (Table 3.2). Among those who did have health insurance, about half had mandatory insurance and about half had voluntary insurance, with a small percentage of both sexes covered by both types of insurance.

A total of 95% of South African household members from SAGE did not have outstanding informal health-care needs due to a health condition (Table 3.2). Chapter 9 describes in more detail those individuals who required formal health-care services (inpatient, outpatient, home care or traditional healer). Based on the low endorsement of informal health-care needs reported by the household respondent, it would be tempting to conclude that more extensive health insurance coverage is not needed, because households have only a low burden of health problems. However, over 75% of men and women needed formal health care within the last 3 years (Chapter 9), suggesting possible issues with reliability of household respondent reporting. Another explanation is that the health care received was highly effective and minimized the need for follow-on care at home. These results merit further consideration.

3.1.2 Household size, household head and main income earner

The mean household size in both urban and rural areas was two people (Table 3.3). Over half of urban and rural households had two to five members, and 20% were living alone. Rural households were slightly larger than urban households, with 28% and 20%, respectively, having six or more household members.

The sample was selected to be representative of the population aged 50 years or older, so the findings are not representative of the entire general adult population. In this sample, men and women aged 50 or older were heads in 40% and 42% of households, respectively. In rural areas, older women were more likely to be heads of households than men. Keeping in mind the same sampling bias due to selection of households with an older member, older women and men were most likely to be the main income earner (this may also be a function of the pension system benefits).

Households with only one member were clustered in the lower and middle-income categories; households with two to five members were more likely to be in the highest wealth quintiles (Table 3.4). Households with 6–10 members were distributed fairly evenly between wealth categories except for the lowest quintile, where fewer households were represented.

Table 3.1 Profile of household member age group and residence by sex, South Africa, 2007–2008

Characteristics	Male	Female	Total	Number of household members at time of survey
Age group (years)				
0–4	7.3	6.7	7.0	1 103
5–9	8.6	6.6	7.5	1 185
10–14	9.5	8.5	8.9	1 419
15–19	11.7	9.5	10.5	1 663
20–24	9.9	10.0	9.9	1 576
25–29	7.7	6.5	7.0	1 115
30–34	6.4	5.5	5.9	936
35–39	4.3	3.5	3.8	608
40–44	3.4	4.7	4.1	657
45–49	3.3	4.2	3.8	608
50–54	7.1	9.0	8.2	1 293
55–59	5.7	6.8	6.3	1 000
60–64	5.3	5.5	5.4	860
65–69	3.8	4.6	4.2	667
70–74	2.8	3.1	2.9	466
75–79	1.4	3	2.3	360
80+	2.0	2.3	2.2	342
Total	**100.0**	**100.0**	**100.0**	–
Number of household members[a]	**7 078**	**8 793**	–	**16 041**
Residence				
Urban	61.6	61.9	61.7	9 904
Rural	38.4	38.1	38.3	6 137
Total	**100.0**	**100.0**	**100.0**	–
Number of household members	**7 162**	**8 879**	–	**16 041**

[a] Total includes 170 members whose age or sex was not stated.

Table 3.2 Household members' insurance coverage and health-care needs, per cent distribution by sex, South Africa, 2007–2008

Characteristics	Male	Female	Total	Number of household members
Insured				
Mandatory	7.7	6.0	6.8	1 084
Voluntary	7.1	8.4	7.8	1 252
Both	2.8	2.3	2.5	405
None	82.5	83.3	82.9	13 300
Informal health-care needs				
Yes	0.8	1.1	1.0	156
No	95.8	94.9	95.3	15 284
Don't know or missing	3.4	4.0	3.7	601
Total	**100.0**	**100.0**	**100.0**	–
Number of household members	**7 162**	**8 879**	–	**16 041**

Table 3.3 Residence percent distribution, by household size, age of household head and main income earner

Characteristics	Residence		Total	Number
	Urban	Rural		
Household size				
1 member	64.9	35.1	100	798
2–5	68.3	31.7	100	2 272
6–10	59.7	40.3	100	847
11+	37.7	62.3	100	67
Mean household size	**2.0**	**2.1**	**2.0**	–
Houeholhead				
Women age 18–49	64.3	35.7	100	266
Women age 50+	62.5	37.5	100	1 670
Men age 18–49	72.2	27.8	100	398
Men age 50+	66.8	33.2	100	1 590
Mean age of household head	**57.5**	**60.3**	**58.5**	–
Main income earner				
Women age 18–49	68.0	32.0	100	355
Women age 50+	60.7	39.3	100	1 536
Men age 18–49	74.0	26.0	100	502
Men age 50+	67.2	32.8	100	1 452
Total	**65.6**	**34.4**	**100**	**3,845**
Mean age of main income earner	**54.8**	**57.9**	**55.9**	–

SE, standard error

Households headed by older women were more likely to be clustered in the lowest and middle wealth quintiles, while more households headed by men were in the highest – in particular, by older men, where a relatively large share of the households were in the highest wealth category.

Households where the main income earner was a man, either younger or older, were likely to be in a higher wealth category. The opposite trend was seen for older women, but there was no clear direction for households headed by younger women.

3.1.3 Living arrangements

Table 3.5 describes different living arrangements by single or dual occupancy, and by the number of generations in the household, in urban and rural areas. Households with dual occupancy in a dwelling were broken down by age group for the individual with a partner or spouse aged under or over 50 years. Although the individual respondents aged 18–49 years were not included in this report, the younger households have been included in this chapter. More of the urban than the rural households were single member households, with slightly more older households than younger ones. In the older households in urban settings, dual occupancy was more likely to be two adults aged 50 years or older.

In terms of the number of generations in households, more urban households comprised a single generation than did rural households. Most households had two generations (about 30% in urban and rural areas), followed by three generations (23–27%). Less than 10% of households were skip-generational (that is, where a grandparent resides with grandchildren, but not with children).

Single-person households in which the person is aged 50 years or older tended to be clustered in the lower

Table 3.4 Wealth quintile percent distribution, by household size, age of household head and main income earner, South Africa, 2007–2008

Characteristics	Wealth quintile					Total	Number
	Lowest	Second	Middle	Fourth	Highest		
Household size							
1 member	32.3	22.5	23.8	12.8	8.6	100	772
2–5	20.6	18.2	19.3	19.7	22.3	100	2 190
6–10	16.1	20.9	21.2	20.6	21.2	100	819
11+	16.2	36.5	19.0	22.0	6.3	100	65
Number	842	767	791	714	732	–	3 846
Mean household size	**1.9**	**2.1**	**2.0**	**2.1**	**2.2**	**2.0**	–
Household head							
Women aged 18–49	23.4	22.1	21.7	19.2	13.6	100	264
Women aged 50+	26.6	19.9	25.6	17.1	10.7	100	1 628
Men aged 18–49	14.5	19.1	22.1	17.6	26.7	100	380
Men aged 50+	18.5	19.8	14.9	20.2	26.6	100	1 574
Number	842	767	791	714	732	–	3 846
Mean age of household head	**59.6**	**58.3**	**58.3**	**59.7**	**58.8**	**58.5**	–
Mai income earner							
Women aged 18–49	19.3	16.9	26.4	19.9	17.4	100	349
Women aged 50+	27.3	20.6	23.7	19.0	9.5	100	1 510
Men aged 18–49	11.7	19.3	19.9	17.1	32.0	100	484
Men aged 50+	20.3	20.6	15.7	18.4	25.0	100	1 427
Total %	**21.9**	**20.1**	**20.5**	**18.6**	**19.0**	**100**	–
Number	**825**	**757**	**771**	**702**	**715**	–	**3 770**
Mean age of main earner	**58.8**	**57.2**	**55.8**	**57.1**	**54.4**	**55.9**	–

SE, standard error

a Number does not include 138 households with insufficient information.

wealth quintiles (Table 3.6). Dual households in which both spouses are aged 50 years or older were likely to be in higher wealth quintiles; there was no clear pattern when the spouse was under the age of 50 years. In terms of generations, one-, two- and three-generation households generally fared better financially than skip-generation households; in the latter, the largest proportions fell in the lowest wealth quintiles.

3.1.4 Household head characteristics

Income status varied by household socioeconomic characteristics. Since the sample of older households was selected on the basis of having at least one member aged 50 years or older, results in Table 3.7 cannot be generalized to the adult population in South Africa; however, results can be compared across sexes. With regard to age, the major difference between the sexes was that a larger proportion of women aged 70–79 years were heads of household. Another difference was that men who were heads of household were more likely to have received higher education than women, and to live in households with high wealth status. There was little difference between men and women in terms of whether they lived in urban or rural areas.

Table 3.5 Urban or rural residence percent distribution, by various household (n=3 984) living arrangements South Africa, 2007–2008

Living arrangement	Residence			
	Urban	SE	Rural	SE
Single-person household, with person aged 50+				
No	64.8	1.8	35.2	1.8
Yes	67.4	5.9	32.6	5.9
Dual 50+, with spouse aged <50				
No	65.3	1.71	34.7	1.71
Yes	63.6	14.77	36.4	14.77
Dual 50+, with spouse aged 50+				
No	64.1	1.74	35.9	1.74
Yes	82.7	3.76	17.3	3.76
Multigenerational households[a]				
One generation				
No	63.6	1.79	36.4	1.79
Yes	80.2	3.21	19.8	3.21
Two generations				
No	64.6	2.05	35.4	2.05
Yes	66.9	2.6	33.1	2.6
Skip generation[b]				
No	66.1	1.72	33.9	1.72
Yes	47.1	6.46	52.9	6.46
Three generations				
No	66.7	2.05	33.3	2.05
Yes	60.9	2.88	39.1	2.88
Total per cent	**65.3**	**1.7**	**34.7**	**1.7**
Number	**2 600**	–	**1 384**	–

SE, standard error

[a] Generations are calculated from the household roster. Thus, one = for example, a married couple without children; two = for example, a parent and child or a grandparent and child; three = for example, a grandparent, parent and child; skip-generation = for example, a grandparent and grandchild.

[b] Skip-generation households are a type of two-generation household, and are therefore not included in the column totals.

3.2 Individual respondents

This section describes results from the individual questionnaire, with the focus on respondents aged 50 years or older. Health results comparing these respondents to the study sample of individuals aged 18–49 years will be published in peer-reviewed journals.

3.2.1 Main background characteristics of respondents

Table 3.8 shows that, among people aged 50 years or older, about half of men and women were in the 50–59 age group, with the proportion of men diminishing in older age groups. Overall, there were more women than

Table 3.6 Living arrangements of households, per cent distribution by wealth quintile

Living arrangements	Wealth quintile						Number
	Lowest	Second	Middle	Fourth	Highest	Total	
Single-person household, with person aged 50+							
No	19.4	19.3	20.2	19.6	21.5	100	3 163
Yes	33.3	23.0	22.2	13.8	7.7	100	683
Dual 50+ household, spouse aged <50							
No	22.1	20.1	20.3	18.6	18.9	100	3 799
Yes	7.6	4.5	39.9	16.4	31.6	100	47
Dual 50+ household, spouse aged 50+							
No	22.5	20.5	20.6	18.8	17.8	100	3 608
Yes	13.6	12.2	20.3	15.6	38.3	100	238
Multigenerational household							
One generation							
No	22.8	21.0	20.1	18.8	17.4	100	3 461
Yes	14.0	10.8	25.2	16.1	33.8	100	385
Two generations							
No	23.2	20.2	21.3	17.9	17.4	100	2 708
Yes	18.8	19.3	18.9	20.1	22.9	100	1 138
Skip generation							
No	21.5	19.4	20.7	18.9	19.6	100	3 664
Yes	30.7	31.4	18.6	12.4	6.9	100	182
Three generations							
No	23.9	20.0	20.6	17.8	17.8	100	2 900
Yes	15.8	19.8	20.6	21.0	22.8	100	945
Total per cent	**21.9**	**19.9**	**20.6**	**18.6**	**19.0**	**100**	**3 846**
Number[a]	**842**	**767**	**791**	**714**	**732**	–	**3 984**

[a] Number includes 138 cases with missing information on wealth quintile.

men aged 50 years or older; indeed, South Africa has among the lowest sex ratios in the world (Timæus 1999).

Only half of respondents were currently married, and there was a wide difference between the sexes, with more than twice as many men as women being married. A significant number of respondents had never been married, especially women. Prevalence of widowhood was high, especially among women. The reason for high widowhood among women is related to higher male mortality in South Africa, and the fact that remarriage among women is uncommon.

Education levels were low among older people: half of the adult respondents had no formal education or less than primary education (Table 3.8). This is mainly because older people in South Africa grew up during apartheid, when there were few educational opportunities for most of the population. Men and women had similar levels of schooling; however, men were more likely to have finished college or a postgraduate degree. (Note: the error terms for these estimates are large because 20% of respondents did not have their education level recorded.)

Table 3.7 Household head sex percent distribution, by sociodemographic characteristics

Sociodemographic characteristics	Male	Female	Total	Number
Age group (household head)				
18–29	3.2	1.5	2.3	94
30–39	6.9	4.5	5.7	229
40–49	10.0	7.8	8.9	358
50–59	35.1	36.1	35.6	1 428
60–69	27.8	26.6	27.2	1 093
70–79	10.8	17.4	14.1	565
80+	6.2	6.2	6.2	249
Residence (household)				
Urban	67.9	62.8	65.4	2 625
Rural	32.1	37.2	34.6	1 390
Education (household head)				
No formal education	20.0	25.5	22.7	895
Less than primary	17.0	22.5	19.7	777
Primary school completed	22.2	19.5	20.8	821
Secondary school completed	15.5	19.3	17.4	685
High school completed	15.9	8.9	12.5	491
College completed	6.2	3.7	4.9	194
Postgraduate degree completed	3.3	0.6	2.0	79
Missing	–	–	–	74
Wealth quintile (household)				
Lowest	17.7	26.2	21.9	862
Second	19.7	20.2	19.9	785
Middle	16.3	25.0	20.6	809
Fourth	19.7	17.4	18.6	730
Highest	26.6	11.1	19.0	748
Missing	–	–	–	82
Total per cent	**100.0**	**100.0**	**100.0**	–
Number of households	**2 035**	**1 980**	–	**4 016**

In terms of wealth status, the main difference between men and women was that men were more likely than women to live in households in the highest wealth categories.

Most South Africans were Christian, followed by those declaring no religion. All other religions claimed few adherents (Table 3.9). The three major languages spoken as mother tongue were Afrikaans, Xhosa and Zulu, each of which represented about 18% of the older adult population.

Almost 90% of the population was Black African or Coloured, and most of the remainder were White or of Indian or Asian descent.

Table 3.8 Sociodemographic characteristics of adults aged 50 years or older, per cent distribution by sex

Sociodemographic characteristics	Men	Women	Total	Number
Age group (years)				
50–59	52.2	48.1	49.9	1 914
60–69	30.5	30.7	30.6	1 174
70–79	11.4	16.0	14.0	536
80+	5.8	5.3	5.5	212
Residence				
Urban	65.8	64.1	64.9	2 489
Rural	34.2	35.9	35.1	1 348
Marital status				
Never married	8.3	18.6	14.1	539
Currently married	71.9	31.9	49.5	1 901
Cohabiting	7.4	3.8	5.4	207
Separated or divorced	3.8	7.4	5.8	224
Widowed	7.6	35.9	23.5	900
Don't know	0.9	2.3	1.7	65
Education				
No formal education	22.2	27.1	25.2	774
Less than primary	25.2	23.2	24.0	738
Primary school completed	22.0	22.7	22.4	688
Secondary school completed	12.6	15.3	14.2	438
High school completed	9.1	8.0	8.4	260
College completed	5.4	3.0	3.9	121
Postgraduate degree completed	3.6	0.7	1.8	56
Missing	–	–	–	761
Wealth quintile				
Lowest	20.3	21.0	20.7	791
Second	20.2	19.6	19.9	759
Middle	13.2	22.2	18.2	696
Fourth	20.1	19.6	19.8	757
Highest	26.1	17.6	21.3	815
Total	**100.0**	**100.0**	**100.0**	–
Number	**1 690**	**2 146**	–	**3 836**

Table 3.9 Religion, language and ethnicity of adults aged 50 years or older, per cent distribution by sex

Characteristics	Male	Female	Total	Number
Religion				
None	7.4	4.3	5.5	175
Buddhism	0.4	0.2	0.3	9
Chinese traditional religion	0.6	0.6	0.6	20
Christianity	83.9	87.7	86.1	2 724
Hinduism	1.1	1.6	1.4	44
Islam	1.8	2.7	2.4	75
Primal indigenous	2.0	2.3	2.2	69
Other	2.5	0.6	1.4	44
Refused	0.3	0	0.1	3
Missing	–	–	–	673
Mother tongue				
Afrikaans	15.8	16.9	16.5	519
English	9.5	7.6	8.3	263
Ndebele	1.3	1.3	1.3	41
Sotho, northern	9.0	8.7	8.8	279
Sotho, southern	9.2	9.8	9.6	301
Swazi	2.8	2.8	2.8	87
Tsonga	7.4	5.4	6.2	195
Tswana	8.9	7.4	8.0	251
Venda	1.0	0.7	0.8	25
Xhosa	15.8	19.7	18.1	571
Zulu	16.8	18.6	17.9	564
Other	2.6	1.2	1.8	56
Missing	–	–	–	684
Ethnic background				
African/black	73.7	74.0	73.9	2 337
White	10.7	8.3	9.3	293
Coloured	11.8	13.5	12.8	406
Indian/Asian	3.7	3.9	3.8	121
Don't know	0	0.1	0.1	2
Other	0.1	0.1	0.1	3
Missing	–	–	–	674
Total	**100.0**	**100.0**	**100.0**	**–**
Number	**1 690**	**2 146**	**–**	**3 836**

4. Work, income, transfers and consumption

This chapter presents results on individual work histories and current work status, type of employment, and usual occupation (either current or, if retired, over the course of the respondent's working life). It also describes household transfers of assistance (social, emotional and financial), expenditures on health care, and information about care and support provided in the household.

4.1 Work history

Respondents were asked whether they had ever worked for pay, the type of work, place of work and for how long they had worked. Further questions were asked about the age at which the respondent started working and, if the person was no longer working, the age at which the respondent stopped working and why. Occupation responses were written verbatim by the interviewer, then coded and mapped to the International Standard Classifications of Occupations (ISCO) scheme by an individual on the SAGE South Africa team assigned the task (ILO 1988).

Among respondents aged 50 years or older, 15% had never worked for pay and 55% were currently not working (Table 4.1). More females than males had never worked and, of those who had ever worked, more men than women were still working. A higher percentage of people in rural areas had never worked, compared to those in urban areas. A considerable increase in those not currently working for pay was seen in the 60–69 year age group – probably related to eligibility requirements for the South African pension system and benefits.

Among those who had ever worked, about one-third in both urban and rural areas were still working. Notably, 10% of respondents aged 80 years or older were still working, 11% of the 70–79 age group and 18% of the 60–69 age group.

Table 4.2 shows that the most common reasons for discontinuing work were related to health or age. These reasons were slightly more common among women than men. As expected, stopping work due to health-related reasons or retirement increased with age, reaching 97% among those aged 80 years or older. Almost a third of those in the 50–59 age group were laid off or could not find a job. Slightly more people in urban areas stopped work due to health- or age-related reasons than in rural areas and among widows versus non-widows.

4.2 Household income and transfers

Income data are difficult to obtain accurately in household surveys; however, the indicators of income need to be estimated because of the important interrelationship between health and wealth. The 2001 WHO World Health Survey/SAGE Wave 0 relied on permanent income estimates derived from household assets and characteristics of the dwelling (Ferguson et al 2003). In addition to these variables, Wave 1 of SAGE obtained information on retirement and retirement benefits, financial security, income, consumption and financial transfers. There is evidence that pensions protect health status in all members of households in which resources are pooled, and that, in those households where resources are not pooled, the health benefits for the pension recipient are considerable (Case 2004). However, such benefits may be different for men and women (Schatz et al 2011). Also, the magnitude of the impact differs by ethnicity and geographical region (Ferreira 2006). The information from SAGE Wave 1 in South Africa permits a fuller and more recent examination of health and wealth dynamics, which are important for examining trends in health and well-being over time, and the impacts of different governmental and development policies.

Table 4.1 **Work status of adults aged 50 years or older, per cent distribution by background characteristics**

Characteristics	Have worked for pay		Never worked for pay	Total	Number
	Currently working	Currently not working			
Sex					
Male	39.3	50.6	10.1	100.0	1 613
Female	22.7	58.9	18.4	100.0	2 051
Age group (years)					
50–59	44.7	43.3	12.0	100.0	1 834
60–69	18.3	65.2	16.5	100.0	1 123
70–79	10.5	69.3	20.2	100.0	503
80+	9.6	73.8	16.6	100.0	204
Residence					
Urban	32.6	57.5	9.9	100.0	2 371
Rural	25.1	51.1	23.7	100.0	1 292
Education					
No formal education	25.0	53.4	21.6	100.0	782
Less than primary	27.7	60.2	12.2	100.0	766
Primary school completed	27.3	60.2	12.5	100.0	697
Secondary school completed	35.5	52.3	12.2	100.0	445
High school completed	39.8	50.7	9.6	100.0	264
College completed	45.6	50.6	3.9	100.0	123
Postgraduate degree completed	56.6	43.4	0.0	100.0	58
Missing	–	–	–	–	529
Marital status					
Never married	26.0	51.5	22.5	100.0	753
Currently married	33.1	54.8	12.1	100.0	736
Cohabiting	33.3	50.6	16.2	100.0	664
Separated or divorced	25.0	63.3	11.7	100.0	720
Widowed	33.0	55.2	11.8	100.0	776
Total respondents	**30.0**	**55.3**	**14.8**	**100.0**	**3 664**

4.2.1 Types of employment

Table 4.3 shows that over half of adults were employed in the private sector (56%), and about one-fifth in the public sector (19%). Men were more likely to be employed in any employment type, except for informal employment, where women were almost twice as likely as men to be employed. There was no clear pattern of employment type by wealth quintile – approximately the same proportions of households were found across wealth quintiles for each employment type. Both rural and urban households had a similar distribution of employment types. With regard to age, younger age groups (50–69 years) were about half as likely to be employed in the public sector as the older age group (70–79 years).

4.2.2 Occupational categories

Table 4.4 presents occupation categories for adults aged 50 years or older. Over half of adults worked in

Table 4.2 Reasons for discontinuation of work for adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Background characteristics	Reasons for discontinuation of work				Total	Number
	Homemaker / Family-related	Health, old-age-related / retired	Laid off, cannot find job	Other		
Sex						
Male	8.8	72.2	17.5	1.6	100.0	839
Female	10.4	77.3	11.1	1.3	100.0	1 263
Age group (years)						
50–59	14.5	53.1	29.2	3.2	100.0	800
60–69	7.4	87.3	5.1	0.2	100.0	772
70–79	7.8	88.8	3.0	0.5	100.0	383
80+	1.0	96.9	2.1	0.0	100.0	147
Residence						
Urban	9.0	76.3	13.4	1.3	100.0	1 404
Rural	11.1	73.0	14.2	1.6	100.0	697
Marital status						
Never married	7.0	72.2	19.8	1.0	100.0	295
Currently married	12.7	72.6	13.3	1.4	100.0	1 014
Cohabiting	10.4	56.3	31.8	1.6	100.0	100
Separated or divorced	5.6	80.0	12.3	2.1	100.0	114
Widowed	6.8	84.1	7.7	1.4	100.0	541
Wealth quintile						
Lowest	6.9	68.7	22.3	2.1	100.0	390
Second	9.6	72.8	16.7	1.0	100.0	420
Middle	9.8	77.6	11.6	0.9	100.0	359
Fourth	6.9	80.6	10.7	1.8	100.0	470
Highest	14.9	76.6	7.4	1.2	100.0	450
Total number for this question	**9.7**	**75.4**	**13.5**	**1.4**	**100.0**	**2 102**

elementary occupations (Group 9); that is, occupations consisting of simple and routine tasks that mainly require the use of hand-held tools and often some physical effort, using ISCO 88 (ILO 1988). Two thirds of women were in this occupational category, compared to only one third of men. Men were more evenly distributed across occupations, with craft and trade workers (Group 7), and plant and machine operators (Group 8) being the second most popular occupations. Agriculture and senior official (Groups 6 and 1) were the least common occupations, especially for women.

Looking at wealth, households represented by higher status occupations (for instance, senior official, professional and technician) tended to fall into the higher quintiles, whereas households with unskilled occupations (including crafts and trade, plant and elementary occupations) were more likely to fall in the lower wealth quintiles.

Table 4.5 shows that wealth in a household was mainly derived from two main sources: wages and pensions. In comparing the sexes, men were more likely than women to obtain their income from wages and trading, whereas women were more likely than men to

Table 4.3 **Types of employment of adults aged 50 years or older who have ever worked, per cent distribution by background characteristics, South Africa, 2007–2008**

Background characteristics	Employment type				Total	Total number
	Public sector	Private sector	Self-employed	Informal employment		
Sex						
Male	21.0	59.6	4.7	14.7	100.0	1 440
Female	16.3	52.4	3.6	27.7	100.0	1 647
Age group (years)						
50–59	16.1	57.4	5.6	21.0	100.0	1 604
60–69	17.0	56.0	3.0	24.0	100.0	923
70–79	30.4	50.7	1.1	17.7	100.0	395
80+	21.4	51.1	3.3	24.3	100.0	164
Residence						
Urban	19.6	54.5	4.5	21.4	100.0	2 118
Rural	16.0	58.5	3.3	22.2	100.0	968
arital status						
Never married	9.9	57.3	2.2	29.5	100.0	446
Currently married	22.7	54.7	4.6	15.2	100.0	1551
Cohabiting	9.0	52.7	2.8	35.5	100.0	180
Separated/divorced	15.2	57.8	6.9	17.5	100.0	203
Widowed	14.8	49.3	3.0	26.4	100.0	814
Wealth quintill						
Lowest	12.1	57.1	0.9	29.1	100.0	588
Second	10.5	61.0	2.0	34.3	100.0	663
Middle	13.1	54.1	3.7	24.9	100.0	621
Fourth	18.1	53.5	5.6	18.6	100.0	661
Highest	32.8	44.8	7.2	10.8	100.0	705
Totals	**17.7**	**54.0**	**4.0**	**21.2**	**100.0**	**3239**

obtain their income from rental and pension. Those who earned wages fell within the highest wealth quintile, followed closely by those who received a pension. More of the urban respondents obtained their income from wages, and more of the rural respondents obtained their income from a pension. More men and more of the urban dwellers believed their level of income to be sufficient; however, overall, just 14% believed they had enough money to cover daily needs and obligations. Married respondents had a higher monthly income than respondents of other types of marital status; they also reported better health state (see Tables 6.1 and 6.3 in Chapter 6).

4.2.3 Transfers of assistance or support

Table 4.6 shows the number of households with monetary or non-monetary transfers into or out of the household, and the percentage to or from the family and community, or from the government. Households may have received or provided more than one type of transfer, including monetary, non-monetary and in-kind assistance. The most common transfers into households were financial, followed by non-monetary transfers (for instance, giving cooked or uncooked food) or in-kind support (for instance, helping with household or garden chores, transport and collection of medication); many

Table 4.4 Occupations of adults aged 50 years or older who have ever worked, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristics	Occupation group[a]									Total	Total number
	1	2	3	4	5	6	7	8	9		
Sex											
Male	4.9	8.3	6.0	6.9	8.2	2.4	13.3	14.0	36.0	100.0	674
Female	1.1	8.1	3.5	4.3	9.0	0.2	3.0	3.4	67.5	100.0	937
Age group (years)											
50–59	2.1	9.1	4.2	4.2	10.0	1.5	9.4	8.9	50.5	100.0	837
60–69	5.2	9.0	3.4	4.2	7.2	0.8	6.3	5.7	58.3	100.0	478
70–79	0.6	4.3	10.5	15.7	6.7	0.6	3.2	5.3	53.1	100.0	190
80+	0.0	4.8	1.2	1.2	7.8	0.4	2.2	13.0	69.4	100.0	106
Residence											
Urban	3.4	9.2	5.2	6.5	9.0	1.0	7.5	8.4	49.7	100.0	1 078
Rural	1.3	6.1	3.2	3.0	8.0	1.4	6.8	–	63.8	100.0	533
Marital status											
Never married	6.4	2.4	1.9	3.2	10.1	1.1	4.5	5.1	67.9	100.0	275
Currently married	2.7	11.1	5.4	7.7	8.4	1.1	9.9	10.9	43.0	100.0	732
Cohabiting	0.6	1.8	4.7	2.5	11.1	1.4	16.5	13.9	47.6	100.0	103
Separated or divorced	1.7	7.7	3.4	3.1	13.3	3.6	4.4	1.0	61.8	100.0	96
Widowed	1.0	9.6	4.9	4.1	6.7	0.6	2.3	3.4	67.5	100.0	362
Wealth quintile											
Lowest	0.7	1.0	0.0	1.6	7.2	1.1	9.2	8.5	70.8	100.0	314
Second	0.7	1.8	2.6	1.9	9.2	0.9	8.7	11.1	63.1	100.0	349
Middle	0.3	1.7	4.0	3.7	8.2	2.6	8.5	5.9	65.2	100.0	298
Fourth	6.1	10.1	4.6	6.6	11.9	0.9	3.9	5.2	50.9	100.0	316
Highest	5.7	25.9	11.0	13.1	6.9	0.4	6.3	8.1	22.8	100.0	332
Total respondents	**43**	**132**	**73**	**87**	**139**	**18**	**117**	**126**	**876**	**100.0**	**1 611**

[a] ISCO-88 major occupation groups: 1 = Legislators, senior officials and managers; 2 = Professionals; 3 = Technicians and associate professionals; 4 = Clerks; 5 = Service workers and shop and market sales workers; 6 = Skilled agricultural and fishery workers; 7 = Craft and related trades workers; 8 = Plant and machine operators and assemblers; 9 = Elementary occupations.

households received transfers from the government. The most common transfers out of the households were also cash, and these transfers were most commonly made to other family members (83%).

Table 4.7 shows that the highest level of actual monetary assistance (in Rand) into the household was from the South African Government, which provided significantly more than the next highest source (family) or of cash transfer into the household. When non-monetary transfers were given an estimated value in Rand, family living outside the household was shown to be giving the most. In-kind assistance was provided by both the family and community, but the community source provided more assistance.

In terms of transfers out of the household, family members were most often the recipients of the cash transfers. Family members not living in the household were also most often the recipients of non-monetary assistance. Household members provided more in-kind assistance to members of the community or to community service.

4.3 Household expenditures on health

Various subsections in the SAGE questionnaire covering expenditure and consumption cover different time periods. The aim is to maximize the capture of accurate

Table 4.5 Per cent distribution of income sources, mean monthly household income and perceptions of income sufficiency, by background characteristics, South Africa, 2007–2008

Background characteristic	Wages (%)	Trading (%)	Rental (%)	Pension (%)	Other (%)	Mean monthly HH income (Rand)	Income sufficient (%)	Total N
Sex								
Male	57.8	9.4	2.7	40.5	3.6	6 619.16	17.5	1 970
Female	42.1	7.3	3.6	51.8	2.0	3 412.30	10.4	1 906
Residence								
Urban	55.6	8.7	4.2	40.6	3.6	6 053.82	17.9	2 574
Rural	38.9	7.5	1.1	55.6	1.4	3 063.78	6.5	1 362
Marital status								
Never married	50.8	4.9	2.7	36.4	1.0	2 881.60	12.2	673
Currently married	60.4	9.5	3.2	41.4	4.0	7 796.63	17.8	1 597
Cohabiting	62.1	17.8	2.2	29.1	0.1	2 318.30	7.6	193
Separated or divorced	50.9	10.9	4.5	33.5	3.4	3 328.55	17.1	293
Widowed	32.4	6.4	3.1	65.2	2.9	3 668.61	9.7	1 043
Wealth quintile								
Lowest	41.9	5.1	1.6	46.4	1.1	2 804.44	5.6	826
Second	47.2	7.9	1.8	48.3	1.1	2 892.57	7.0	756
Middle	48.4	9.3	4.4	45.8	0.9	3 228.01	6.7	778
Fourth	54.6	8.3	2.6	52.0	2.3	4 580.52	10.8	702
Highest	67.8	11.8	5.9	44.1	9.8	13 619.80	41.9	718
Total	**49.8**	**8.3**	**3.1**	**45.8**	**2.8**	**5 002.68**	**13.9**	**3 963**

HH, household

Table 4.6 Transfers of assistance sent or received by households, distribution or transfer, South Africa, 2007–2008

Type of transfer	Transfer of assistance (%)							
	Into households				Out of households			
	Monetary	Non-monetary assistance	In-kind assistance	Number	Monetary	Non-monetary assistance	In-kind assistance	Number
Family	78.6	36.4	9.5	374	83.2	33.9	7.9	467
Community	49.1	43.5	17.9	63	63.3	47.7	20.2	196
Government	87.4	3.9	–	788	–	–	–	0

Table 4.7 Average amount of monetary assistance sent or time of assistance received by households that sent or received transfers, by type of transfer, in the previous 12 months

Type of transfer	Transfer of assistance							
	Into households				Out of households			
	Monetary (Rand)	Non-monetary (estimated value in Rand)	Hours of assistance per week	Number	Monetary (Rand)	Non-monetary (estimated value in Rand)	Hours of assistance per week	Number
Family	2 893.30	1 073.10	10.1	374	4 381.40	1 258.10	3.9	467
Community	1 930.30	172.60	12.5	63	1 629.60	575.03	15.0	196
Government	7 128.60	288.00	–	788	–	–	–	0

information on specific events or expenditures, while minimizing recall biases. Health expenditures were captured for two periods: the past 30 days, to capture more detailed information about recent health expenses, and the past year, to capture a broader picture of overall annual household health costs.

With growing populations of older people who may be more financially vulnerable and in poorer health, a concern of many governments and health systems is the possibility that ill-health requiring health care may lead to catastrophic financial payments and subsequent impoverishment. The use of "catastrophic expenditure" in the section below refers to an expenditure on health, in relation to the proportion of overall household income paid for accessing health services, that results in the household falling below the poverty threshold (Xu et al 2003). Box 4.1, below, provides a guide to the different variables used in Tables 4.8–4.10.

Respondents who had catastrophic expenditures in the past year had a higher mean household expenditure than those who did not have catastrophic expenditures (Table 4.8). Similarly, catastrophic expenditures were more common among the poor than the non-poor, with the poor having both higher relative and absolute out-of-pocket costs.

There was also a considerable difference in mean household expenditure between urban and rural dwellers. Mean household expenditure in urban dwellings was more than twice that of rural dwellings, and mean out-of-pocket health costs were more than three times higher in urban dwellings. The poor had lower mean household expenditure than the non-poor, and lower out-of-pocket costs.

Table 4.8 also shows that the relationship between expenditure levels and out-of-pocket expenditure as a percentage of non-subsistence spending is not linear, even though the absolute levels of out-of-pocket costs increased when going from lower to higher expenditure quintiles. The expenditure quintile profile shows that the second lowest expenditure quintile had the highest out-of-pocket expenditure as a percentage of non-subsistence spending.

The lowest and second-lowest expenditure quintiles were also at greatest risk of becoming poor as a result of health expenditures (that is, to experience catastrophic health expenditure). A lower percentage of respondents with health insurance than without health insurance had catastrophic expenses, indicating somewhat of a protective effect of health insurance.

Households with a household member aged 50 years or older had higher mean household expenditures and higher out-of-pocket health costs than households without an older member. The households with an older member also had higher relative out-of-pocket expenditures – both as percentage of all expenditures and of non-subsistence expenditures – and were more likely to have catastrophic expenditures than those without an older member.

Box 4.1 Guide to variables included in Tables 4.8–4.10

1. **Household expenditure:** comprised of both monetary and in-kind payments for all goods and services and the money value of the consumption of home-made products.
2. **Poor:** a household is considered poor when its total household expenditure is smaller than its subsistence spending. Subsistence spending and poverty-line household subsistence spending is the minimum requirement by a household to maintain a basic life in society. An estimated food poverty line was used as the definition of subsistence spending for calculating catastrophic expenditures. The poverty line was set at the level of the household food expenditure for a household whose food share of total household spending is at the median of the country. Food expenditure is the amount spent on all foodstuffs by the household plus the value of the family's own food production consumed within the household. It excludes expenditure on alcoholic beverages, tobacco and food consumption outside the home (for instance, in hotels and restaurants).
3. **Impoverished:** a non-poor household is considered to be impoverished by health payments when it becomes poor after paying for health.
4. **Out-of-pocket payments:** are payments made by households at the point of receiving health services. They include doctor's consultation fees, purchases of medication, hospital bills and spending on alternative or traditional medicines. Such payments exclude expenditure on health-related transportation and special nutrition and insurance reimbursement.
5. **Catastrophic expenditure:** occurs when a household's total out-of-pocket health payments equal or exceed 40% of the household's capacity to pay or of non-subsistence spending.
6. **Capacity to pay:** is a household's non-subsistence spending.
7. **Expenditure quintile:** is derived from total household expenditure after adjusting for household size using an equivalence scale.

Table 4.8 Mean household and out-of-pocket health expenditures, and percentage of households with health expenses in the past 12 months, by selected individual and household characteristics, South Africa, 2007–2008

Individual or household characteristic	Mean EXP (Rand)	Poor (%)	Impoverished (%)	Catastrophic expenditure (%)	OOP as % of all EXP	OOP as % non-subsistence EXP (capacity to pay)	Mean OOP (Rand)	Number
Catastrophic expenditure?								
No	2 712	38.0	0.8	–	1.6	2.9	82	3 114
Yes	2 995	53.6	15.0	–	28.4	60.3	1 447	212
Residence								
Rural	1 388	57.0	3.1	10.7	3.9	9.2	70	1 172
Urban	3 460	29.1	0.9	4.0	3.0	5.1	222	2 154
Poor								
No	4 029	–	2.8	4.8	3.8	6.2	264	2 030
Yes	694	–	0.0	8.8	2.6	7.0	18	1 296
Insurance coverage								
No	1 853	46.2	2.0	7.6	3.2	6.9	88	2 444
Yes	5 162	19.0	0.8	2.9	3.8	5.5	391	882
Expenditure quintile								
Lowest	496	100.0	0.0	7.6	1.9	5.5	11	669
Second	908	94.8	0.4	9.7	3.1	8.3	25	661
Middle	1 363	0.0	7.5	5.1	2.5	6.3	37	666
Fourth	2 215	0.0	0.6	4.0	3.3	5.6	78	670
Highest	8 736	0.0	0.0	5.4	5.9	6.9	698	659
50-plus member[a]								
No	2 573	42.5	0.5	3.8	2.5	4.3	118	468
Yes	2 755	38.4	1.9	6.8	3.5	6.9	177	2 858
Total	**2 730**	**39.0**	**1.7**	**6.4**	**3.3**	**6.5**	**169**	**3 326**

EXP, household expenditure; OOP, out-of-pocket payment

[a] Indicates whether a person aged 50 years or older resided in the household

Note: See Box 4.1 (above) for explanation of terms used in this table

Table 4.9 shows that in the previous 30 days, outpatient health payments generated the largest percentage of out-of-pocket health payments in all categories. Households without a resident aged 50 years or older were more likely to have out-of-pocket costs for inpatient and outpatient care than those with an older person. Households with a resident aged 50 years or older were more likely to have had out-of-pocket costs for accessing traditional care, health aids and long-term care.

Table 4.10 includes a summary of financial sources used for payment of health services among households that had health-care expenditures in the past 12 months. In all categories, the majority used their current income as the payment source, with use of savings a distant second. Rural households and those whose respondents did not have health insurance coverage were more likely to have had to sell items and borrow from relatives.

Tables 4.8–4.10 provide intriguing insights into the impacts of health costs on financial well-being in households. These results will be explored in more detail to assess the policy messages and planning that will be needed to minimize the interrelationships between health-care needs and costs, and various mitigating factors.

Table 4.9 Households with out-of-pocket health payments in the past 30 days, per cent distribution by type of purchase or service, South Africa, 2007–2008

Individual or household characteristic	Inpatient (%)	Outpatient (%)	Traditional (%)	Drugs (%)	Other (%)	Health aids (%)	Ambulance (%)	Long-term care (%)	Total (%)	Number
Catastrophic expenditure?										
No	2.7	43.7	2.2	16.2	30.6	3.1	0.4	1.1	100.0	3 114
Yes	3.3	67.4	5.0	5.0	16.7	1.1	0.1	1.4	100.0	212
Poor										
No	3.1	56.0	3.3	10.3	23.7	2.1	0.2	1.3	100.0	2 030
Yes	0.5	71.2	12.7	6.2	7.2	0.7	1.3	0.2	100.0	1 296
Insurance coverage										
No	0.4	51.1	9.1	12.6	24.6	1.4	0.5	0.3	100.0	2 444
Yes	4.7	60.2	0.4	8.5	22.0	2.4	0.0	1.9	100.0	882
Residence										
Rural	1.0	50.9	12.9	13.7	19.1	1.3	0.4	0.6	100.0	1 172
Urban	3.4	57.7	2.1	9.5	23.7	2.2	0.2	1.4	100.0	2 154
Expenditure quintile										
Lowest	1.1	67.7	10.8	4.7	13.0	1.1	1.5	0.2	100.0	669
Second	0.3	73.6	13.2	6.6	4.4	0.5	1.2	0.2	100.0	662
Middle	0.8	68.9	9.5	12.6	6.9	1.0	0.2	0.0	100.0	666
Fourth	0.9	60.7	10.7	11.6	12.3	2.6	0.0	1.0	100.0	670
Highest	3.5	54.8	2.1	10.0	25.9	2.1	0.2	1.4	100.0	659
50-plus member[a]										
No	6.3	74.3	1.4	11.2	5.4	1.2	0.1	0.1	100.0	468
Yes	2.7	54.7	4.0	10.0	24.9	2.1	0.2	1.4	100.0	2 858
Total	**3.0**	**56.7**	**3.7**	**10.1**	**23.0**	**2.0**	**0.2**	**1.3**	**100.0**	**3 326**

[a] Indicates whether a person aged 50 years or older resided in the household

Note: See Box 4.1 (above) for explanation of terms used in this table

4.4 Impact of caregiving

This section discusses the type of care and support received and provided by households to and from other household members, friends, members of the community and the government. Unpaid, informal care giving is a huge and under-recognized benefit for governments; it most often unfavorably burdens women, with possible impacts on their health, earning opportunities and well-being (Ferreira et al 2001; Ferreira 2004).

Questions were asked about the type of care and support received or provided in various forms, including financial, social or emotional, physical, health or personal care, and support. Unfortunately, this section was not well endorsed, with only 108 respondents answering it, which is most certainly an underestimation of current caregiving levels.

Table 4.11 presents the health state of caregivers and non-caregivers by different background characteristics, as well as the type of care that was provided to either adults or children. Health-state scores were derived from self-reported health in nine health domains covering affect, cognition, interpersonal activities and relationships, mobility, pain, self-care, sleep or energy, vision and hearing. Item response theory (IRT) was then used to generate a composite score. The scores were transformed into a continuous cardinal scale, from 0 (worst health) to 100 (best health). The health-state score is described in more detail in Chapter 6, below, but is used here to emphasize the health impacts of caregiving on the care provider.

Table 4.10 Financial sources used for payment of health services among households that paid for health services in the previous 12 months, per cent distribution by selected financial and background characteristics, South Africa, 2007–2008

Financial or background characteristic	Savings	Sold items	Borrow from relatives	Borrow from others	Health insurance	Current income	Other	Total %	Number
Hospitalization in last 12 months									
No	6.8	1.2	2.8	1.4	4.9	54.1	2.5	73.7	3 230
Yes	4.5	2.0	3.2	2.2	5.8	56.5	0.3	74.5	96
Insurance coverage									
No	4.2	1.7	3.9	0.5	2.1	49.6	1.8	63.8	2 444
Yes	11.1	0.4	0.7	3.4	10.6	63.8	3.3	93.3	882
Residence									
Rural	3.5	2.9	4.6	0.5	1.5	42.4	1.2	56.6	1 172
Urban	8.3	0.3	1.8	2.0	7.0	61.4	3.0	83.8	2 154
Expenditure quintile									
Lowest	0.0	0.6	1.3	0.0	0.0	36.5	1.0	39.4	669
Second	1.7	1.3	2.5	0.4	0.0	29.1	1.3	36.3	662
Middle	0.9	0.6	3.1	0.6	1.0	52.5	0.5	59.2	666
Fourth	9.2	0.8	2.2	0.9	4.6	61.8	3.4	82.9	670
Highest	13.0	2.1	3.9	3.6	12.0	70.6	3.6	108.8	659
50-plus member[a]									
No	6.9	0.5	0.9	3.2	1.6	64.1	0.0	77.2	468
Yes	6.5	1.4	3.1	1.2	5.5	52.9	2.6	73.2	2 858
Total	**6.5**	**1.3**	**2.8**	**1.5**	**5.0**	**54.4**	**2.3**	**75.1**	**3 326**

[a] Indicates whether a person aged 50-plus resides in the household.

Table 4.11 The health-state score for caregivers and non-caregivers by background characteristics, and the distribution of the type of care provided to adults and children by a caregiver, South Africa, 2007–2008

Characteristics	Health score[a] mean (SE)												
			Financial		Social/ emotional		Health		Physical		Personal[a]		
	Care-givers	Non-care-givers	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Total
Sex													
Male	59.1 (5.0)	64.5 (0.9)	52.4 (11.5)	63.5 (19.2)	53.0 (12.5)	56.7 (21.8)	55.8 (13.3)	44.3 (28.5)	32.1 (8.9)	49.1 (29.8)	36.0 (9.5)	0 (0.0)	40
Female	60.7 (2.8)	59.9 (0.8)	47.6 (11.5)	36.5 (19.2)	47.0 (12.5)	43.3 (21.8)	44.2 (13.3)	55.7 (28.5)	67.9 (8.9)	50.9 (29.8)	64.0 (9.5)	100 (0.0)	68
Residence													
Urban	55.0 (1.8)	62.6 (0.8)	70.8 (8.9)	48.2 (27.2)	74.8 (8.2)	41.8 (29.0)	76.0 (9.0)	71.9 (19.0)	72.5 (8.4)	49.1 (29.8)	70.8 (8.6)	0.0	69
Rural	68.6 (4.9)	60.6 (1.1)	29.2 (8.9)	51.8 (27.2)	25.2 (8.2)	58.2 (29.0)	24.0 (9.0)	28.1 (19.0)	27.5 (8.4)	50.9 (29.2)	29.2 (8.6)	100 (0.0)	39

SE, standard error

[a] Health scores: 0 represents worst health and 100 (maximum score) represents best health.

Table 4.11 shows that there were similar levels of health for male and female caregivers, and better health in male non-caregivers than in female non-caregivers. Both caregivers and non-caregivers had a decline in health with increasing age (data not shown). Male caregivers had a lower health score than those who did not give care but, among females, there was no difference in health between the two groups. Urban-dwelling non-caregivers had slightly better health than urban caregivers, whereas, rural-dwelling non-caregivers had poorer health than rural caregivers.

Female caregivers were less likely to provide financial and social or emotional support than their male counterparts (Table 4.11), but more likely to provide physical and personal care. Male caregivers were more likely to provide health care to adults, and female caregivers were more likely to provide health care to children.

Urban dwelling caregivers were more likely to provide all types of support to adults than their rural counterparts. They were also more likely to provide health care to adults and children than rural dwelling caregivers; however, rural caregivers were more likely to provide financial, social or emotional and physical support to children than urban caregivers.

5. Risk factors and health behaviour

This chapter describes the risks to health and the extent to which these risks are present in the population. Risk factors have a significant impact on the mortality and morbidity caused by NCDs; hence, by measuring risk factors it is possible to improve health promotion efforts aimed at risk modification.

The SAGE modules contain five major risk factors and are based on the WHO STEPS approach to surveillance of NCD risk factors. The types of data collected include tobacco use, alcohol consumption, intake of fruit and vegetables, physical activity levels and environmental risk factors. The use of tobacco and consumption of alcohol has a considerable detrimental impact on the health of individuals; the nutritional content of food (measured as the consumption of fruits and vegetables) and the level of physical activity are directly associated with health. SAGE also asks questions on food security, a topic that is particularly important for vulnerable groups that are more prone to suffering negative effects of globalization, inequality, environmental damage and financial crises.

Environmental risk factors such as access to improved drinking water, improved sanitation facilities and the type of fuel used for cooking (and the ventilation of such fuels) are important determinants of health. Interventions to promote safe environments offer a large potential for disease prevention, and can help to reduce health inequality.

5.1 Tobacco use and alcohol consumption

Respondents were asked about their current use of tobacco products, including use by inhaling, sniffing and chewing, as well as the duration and quantity of their daily tobacco use. These questions were based on the *Guidelines for controlling and monitoring the tobacco epidemic* (WHO 1998).

Alcohol content and quantity of commercially available and home-brewed beverages were used to define a "standard drink". Questions were asked about individual consumption patterns, including frequency and quantity.

For both tobacco use and alcohol consumption, "intensity" patterns and duration must be quantified accurately to reliably measure these major risk factors over time, and to compare them with measures from other surveys.

5.1.1 Tobacco use

Two thirds of adults had never used tobacco, and this finding was consistent across age groups; however, more women than men had never used tobacco (Table 5.1). About 20% of adults used tobacco daily, with slightly more in the younger age group (50-59) than in the older age groups (60+). This is related to the fact that the older age groups had more former tobacco users, who had since stopped using tobacco.

A larger proportion of men than women were current daily tobacco users. Cohabiting and separated or divorced individuals were more likely to smoke than others by about 10 percentage points; cohabiting individuals were, overall, the least likely to have never used tobacco. Current tobacco use did not vary substantially by education, wealth status or residence.

Average daily tobacco consumption was 16 tobacco products per day (Table 5.2). Women who used tobacco were less likely than men to be daily tobacco users, but used tobacco almost twice as much as men. Other groups that tended to use tobacco more than the overall average were those with less than primary education, those who had never been married or were cohabiting, and those in households in the lowest wealth quintile.

Table 5.1 Frequency of tobacco use among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Background characteristics	Tobacco use					Number
	Current use	Use, not daily	No current use	Never used	Total	
Age group (years)						
50–59	21.2	4.2	8.4	66.2	100.0	1 824
60–69	17.8	3.1	10.1	69.1	100.0	1 109
70+	17.3	1.5	11.6	69.7	100.0	699
Sex						
Male	22.9	4.5	12.9	59.7	100.0	1 604
Female	16.6	2.4	6.8	74.1	100.0	2 028
Residence						
Urban	19.2	3.5	10.4	66.9	100.0	2 379
Rural	19.7	3.2	7.9	69.2	100.0	1 253
Education						
No formal education	18.8	3.4	12.3	65.5	100.0	720
Less than primary	20.8	5.6	9.4	64.2	100.0	716
Primary school completed	21.3	2.5	10.6	65.6	100.0	657
Secondary school completed	18.3	1.2	6.6	73.9	100.0	417
High school completed	16.4	1.3	10.3	72.0	100.0	251
College completed	20.0	3.8	9 .0	67.2	100.0	120
Postgraduate degree completed	9.7	–	6.3	84.1	100.0	55
Missing	–	–	–	–	–	1 416
Marital status						
Never married	16.2	2.7	7.9	73.1	100.0	515
Currently married	19.6	3.3	10.1	67.0	100.0	1 804
Cohabiting	27.6	8.6	20.5	43.2	100.0	200
Separated or divorced	28.1	4.4	9.7	57.7	100.0	209
Widowed	17.4	2.4	6.4	73.8	100.0	843
Don't know	10.3	4.6	10.1	75.0	100.0	61
Wealth quintile						
Lowest	20.8	2.7	9.2	67.2	100.0	718
Second	17.7	6.7	8.8	66.7	100.0	720
Middle	22.3	2.2	11.0	64.5	100.0	676
Fourth	18.1	3.3	8.4	70.2	100.0	724
Highest	18.2	2.0	10.1	69.7	100.0	776
Total	**19.4**	**3.4**	–	**67.7**	**100.0**	**3 632**

Table 5.2 Mean daily tobacco consumption among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Background characteristics	Mean daily tobacco consumption[a]		Number
	Mean for tobacco use	SE	
Age group (years)			
50–59	17.0	4.05	386
60–69	14.0	2.91	197
70+	15.8	5.33	121
Sex			
Male	11.8	1.94	367
Female	20.5	4.79	337
Residence			
Urban	14.2	1.79	458
Rural	19.3	6.24	246
Education			
No formal education	17.9	5.26	135
Less than primary	22.5	9.68	149
Primary school completed	10.3	2.05	140
Secondary school completed	14.8	3.83	76
High school completed	19.0	5.91	41
College or postgraduate degree completed	9.7	2.39	29
Missing	–	–	134
Marital status			
Never married	29.0	16.67	84
Currently married	13.1	2.38	354
Cohabiting	21.0	7.36	55
Separated or divorced	18.0	4.40	59
Widowed	12.6	2.68	146
Missing	23.3	12.18	6
Wealth quintile			
Lowest	23.2	10.01	149
Second	18.9	6.05	127
Middle	11.1	3.03	151
Fourth	14.5	2.68	131
Highest	12.5	1.63	141
Total	**16.0**	**2.46**	**704**

SE, standard error

[a] Tobacco consumption refers to use of any tobacco products, including manufactured cigarettes, handrolled cigarettes, pipefuls of tobacco, cigars, cheroots, cigarillos, bidis and smokeless tobacco

Table 5.3 Alcohol consumption among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Background characteristics	Alcohol consumption (%)[a]				Total	Number
	Life-time abstainer	Non-heavy drinker	Infrequent heavy drinker (binge)	Frequent, heavy drinker		
Age group (years)						
50–59	81.6	13.8	3.7	0.9	100.0	1 653
60–69	85.6	10.1	2.8	1.5	100.0	993
70+	90.3	7.8	1.2	0.6	100.0	627
Sex						
Male	76.3	17.7	4.7	1.3	100.0	1 419
Female	90.7	6.8	1.7	0.8	100.0	1 854
Residence						
Urban	84.2	11.5	3.3	1.0	100.0	2 140
Rural	85.0	11.6	2.3	1.0	100.0	1 133
Education						
No formal education	83.5	11.9	3.3	1.3	100.0	650
Less than primary	85.5	10.9	2.6	1.0	100.0	609
Primary school completed	81.0	12.3	5.5	1.1	100.0	587
Secondary school completed	91.6	7.2	1.0	0.2	100.0	387
High school completed	81.8	12.2	3.5	2.5	100.0	230
College completed	77.4	17.6	5 .0	0.0	100.0	109
Postgraduate degree completed	92.3	4.6	3 .0	0.0	100.0	48
Missing	–	–	–	–	–	653
Marital status						
Never married	84.8	12.2	1.9	1.1	100.0	456
Currently married	83.7	12.8	2.7	0.8	100.0	1 635
Cohabiting	67.4	18.1	12.3	2.3	100.0	165
Separated or divorced	79.3	11.5	7.1	2.1	100.0	182
Widowed	90.8	7.1	1.3	0.8	100.0	777
Don't know	85.0	10.9	2.7	1.4	100.0	59
Wealth quintile						
Lowest	84.3	12.4	2.3	1.0	100.0	657
Second	77.6	16.0	4.7	1.8	100.0	634
Middle	86.9	8.4	3.6	1.1	100.0	622
Fourth	87.8	9.7	2.2	0.3	100.0	647
Highest	85.9	10.8	2.3	1.0	100.0	698
Total	**84.5**	**11.5**	**3.0**	**1.0**	**100.0**	**3 837**

[a] Alcohol consumption categories are defined as: lifetime abstainer (never consumed alcoholic beverage); non-heavy drinker (social drinkers, <2 days per week with 5 or more standard drinks/day in last 7 days); infrequent heavy drinker (binge drinkers, 2–3 days per week with 5+ standard drinks/day in last 7 days); and frequent heavy drinker (4 or more days per week with 5+ standard drinks/day in last 7 days).

5.1.2 Alcohol consumption

Most adults were lifetime abstainers from alcohol, and this was the case across all background characteristics: age, sex, residence and marital status (Table 5.3). Cohabiting individuals were the least likely to abstain, although still most did so. Among those who consumed alcohol, almost all were non-heavy (that is, social) drinkers. Among social drinkers, males were more likely to be social drinkers than females, as were those who had completed college, and those who were cohabiting; the latter were also the most likely to be binge drinkers. Only about 1% of adults were frequent, heavy drinkers, and there was little variation by background characteristics.

5.2 Diet and physical activity

SAGE asks respondents about the quantity of fruit and vegetables consumed in a typical 24-hour period. The focus is on food availability and access, as well as known health risks from insufficient consumption. Availability means sufficient quantities of specific types of food, and access means that incomes are adequate to purchase or barter for appropriate foods in sufficient quantity.

Since the beneficial physiological changes associated with physical activity require a minimum duration and intensity of activity, SAGE asks questions about the type and level of physical activity that the respondent undertakes. This information is processed in a way that makes it possible to compare the results with those from the Global Physical Activity Questionnaire (GPAQ) surveys.[9] Specifically, SAGE differentiates between work and leisure, and recreational and sport-related activities, and records the frequency (number of days) and duration (minutes or hours) of each activity undertaken in the preceding 7 days. Activities are categorized into vigorous-intensity, moderate-intensity and walking.

5.2.1 Diet

Most adults consumed fewer than five fruit or vegetable servings per day (Table 5.4). Among groups most likely to consume sufficient fruits and vegetables were those who completed college and those in the highest wealth quintile. More women than men ate insufficient fruits and vegetables.

9 World Health Organization. (www.who.int/chp/steps/GPAQ/en/index.html)

5.2.2 Physical activity

Most adults did not engage in sufficient physical activity (Table 5.5); on the other hand, more than one quarter engaged in high-level activity – meaning that few people undertook activity at moderate intensity. Those who engaged in high-level activity were concentrated in the younger age group (50–59 years), among those cohabiting or never married, and those with no formal education. Sedentary adults were found more frequently in the older age groups and, to a lesser extent, were more likely to be women.

5.3 Access to improved water sources and sanitation

Access to a clean water supply and sanitation is necessary, but not sufficient, for good health and dignity. Two assumptions underpin the association between health and clean water and sanitation:

- adequate quantities of safe water for drinking and other uses promote hygiene and are complementary measures for protecting health;
- adequate sanitation facilities interrupt the transmission of faecal–oral diseases at its most important source, thereby preventing human faecal contamination of water and soil.

Epidemiological evidence suggests that sanitation is at least as effective as improved water supply in preventing disease. To examine the potential health impact of access to clean water and sanitation, SAGE collects information on water and sanitation conditions. The questionnaire module is based on common international survey standards, to generate estimates comparable with those from other sources employing the same standards.

Most households had access to a safe drinking water source (Table 5.6). This included not only piped water into households but also a public standpipe, a tube-well or borehole, a protected dug well, a protected spring, rainwater collection and so on. More households from urban areas had a safe drinking water source than did their rural counterparts. The prevalence of access to an improved water source increased with wealth, with almost all households in the highest wealth quintile having access to such a water source.

Table 5.4 Intake of fruits and vegetables among adults aged 50 years or older, percentage with insufficient intake by background characteristics, South Africa, 2007–2008

Characteristics	Insufficient intake of fruits and vegetables[a]	Number
Age group (years)		
50–59	69.6	1 914
60–69	67.6	1 174
70+	67.5	749
Residence		
Urban	65.0	2 489
Rural	75.1	1 348
Sex		
Male	64.8	1 690
Female	71.5	2 147
Education		
No formal education	79.4	774
Less than primary	73.4	738
Primary school completed	69.6	688
Secondary school completed	71.5	438
High school completed	55.6	260
College completed	48.4	121
Postgraduate degree completed	31.9	56
Missing	–	762
Marital status		
Never married	73.1	539
Currently married	65.5	1 901
Cohabiting	64.8	207
Separated or divorced	72.4	224
Widowed	71.6	900
Don't know	76.9	65
Wealth quintile		
Lowest	75.3	791
Second	73.7	759
Middle	69.5	696
Fourth	69.6	757
Highest	54.9	815
Number	**68.5**	**3 836**

[a] Insufficient intake of fruit or vegetables: less than five servings in a typical day on average in the last 7 days.

Table 5.5 Level of physical activity among adults aged 50 years or older, percentage distribution by background characteristics, South Africa, 2007–2008

Background characteristics	Physical activity[a]			Total	Number
	Low level	Moderate level	High level		
Age group (years)					
50–59	54.1	10.9	35.0	100.0	1 754
60–69	63.5	12.8	23.7	100.0	1 090
70–79	68.3	16.1	15.6	100.0	492
80+	73.8	10.6	15.6	100.0	201
Sex					
Male	56.2	14.3	29.5	100.0	1 553
Female	63.2	10.5	26.3	100.0	1 985
Residence					
Urban	61.6	12.7	25.6	100.0	2 317
Rural	57.2	11.1	31.7	100.0	1 220
Education					
No formal education	55.1	10.8	34.1	100.0	711
Less than primary	57.3	15.8	26.9	100.0	682
Primary school completed	64.6	12.6	22.8	100.0	642
Secondary school completed	57.5	14.8	27.7	100.0	396
High school completed	66.9	5.3	27.9	100.0	250
College completed	49.8	19.4	30.8	100.0	116
Postgraduate degree completed	48.7	35.5	15.8	100.0	54
Missing	–	–	–	–	687
Marital status					
Never married	61.1	6.4	32.5	100.0	499
Currently married	59.4	14.2	26.4	100.0	1 758
Cohabiting	46.0	8.6	45.4	100.0	195
Separated or divorced	60.0	13.4	26.5	100.0	209
Widowed	64.5	11.4	24.1	100.0	820
Don't know	58.3	19.2	22.4	100.0	58
Wealth quintile					
Lowest	60.9	9.6	29.5	100.0	700
Second	59.7	10.2	30.0	100.0	707
Middle	58.7	13.3	28.0	100.0	663
Fourth	62.9	15.2	21.9	100.0	701
Highest	58.7	12.3	29.0	100.0	750
Total	**60.1**	**12.2**	**27.7**	**100.0**	**3 837**

[a] Levels of physical activity criteria:

High physical activity: a person reaching any of the following criteria is classified in this category: vigorous-intensity activity on at least 3 days achieving a minimum of at least 1500 MET(metabolic equivalent)-minutes per week OR; 7 or more days of any combination of walking, moderate or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes per week.

Moderate physical activity: a person not meeting the criteria for the 'high' category, but meeting any of the following criteria is classified in this category: 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: a person not meeting any of the above mentioned criteria falls in this category.

Source: (WHO 2009).

Table 5.6 Drinking water source according to households with improved and unimproved sanitation, by selected household characteristics

Characteristic	Drinking water source		Number of households
	Improved[a]	Unimproved[b]	
Residence			
Urban	97.7	2.3	2 538
Rural	84.6	15.4	1 355
Income quintile			
Lowest	80.7	19.3	832
Second	92.5	7.5	767
Middle	97.2	2.8	791
Fourth	98.2	1.8	714
Highest	99.6	0.4	732
Total	**93.2**	**6.8**	**3 893**
Number of households	**3 627**	**266**	**–**

[a] Improved drinking-water source refers to piped into household or yard or plot, or public standpipe, tube-well or borehole, protected dug well, protected spring, rainwater collection or bottled water.

[b] Unprotected dug well, unprotected spring, surface water and tanker truck are unimproved sources.

Table 5.7 Amount of time taken to collect drinking water among households, by wealth and residence, South Africa, 2007–2008

Characteristic	Time to collect drinking water (round trip)				Number of households
	Water on premises	<30 minutes	>30 minutes	Don't know	
Residence					
Urban	12.6	63.8	18.2	5.4	352
Rural	5.0	66.3	25.1	3.6	761
Wealth quintile					
Lowest	2.8	66.4	26.8	4.0	535
Second	11.4	64.7	23.0	0.9	256
Middle	13.1	58.1	20.1	8.7	173
Fourth	10.0	75.0	8.1	6.9	109
Highest	19.3	71.4	7.9	1.4	24
Total	**7.4**	**65.5**	**22.9**	**4.2**	**–**
Total number of households that responded to this question	**83**	**729**	**255**	**47**	**1 114**

Few people had water on their premises (Table 5.7). The rate of those with water on their premises was higher in urban areas than in rural areas. Even in households in the highest wealth quintile, only about one fifth had water on their premises. It took people in rural areas significantly more time to collect water compared to people in urban areas (Table 5.7).

Most of the people who collected drinking water were adult women (Table 5.8), and this was more common in rural areas than in urban areas. In rural areas, girls were more likely than boys to collect drinking water, but the opposite was true for urban areas.

Most households had improved sanitation conditions (62%) (Table 5.9). The prevalence of improved sanitation was higher in urban areas than in rural areas, and increased dramatically with wealth.

5.4 Indoor air pollution

The use of solid fuels such as wood, coal, agricultural and crop residues can have serious effects on respiratory health. Traditional, low-efficiency stoves using these fuels produce heavy smoke that contains fine

Table 5.8 Per cent distribution by the person who usually collects drinking water for the household, by wealth and residence, South Africa, 2007–2008

Characteristic	Person who usually collects drinking water							No. of households
	Adult man	Adult woman	Boys (<15 years)	Girls (<15 years)	Other	Do not know	Total	
Residence								
Urban	15.0	47.5	5.4	1.7	1.9	28.5	100.0	289
Rural	12.0	67.1	4.8	9.1	1.5	5.4	100.0	696
Wealth quintile								
Lowest	13.1	61.6	4.2	6.4	1.4	13.3	100.0	499
Second	12.1	65.0	4.4	4.3	2.2	12.0	100.0	225
Middle	11.2	59.2	6.3	11.6	1.6	10.2	100.0	135
Fourth	12.6	61.3	2.1	8.8	2.0	13.3	100.0	91
Highest	0.0	37.0	43.0	15.2	2.5	2.2	100.0	19
Total number of respondents to this question	**12.9**	**61.4**	**5.0**	**6.9**	**1.7**	**12.2**	**100.0**	**984**

Table 5.9 Households with improved and unimproved sanitation, percentage by wealth and residence, South Africa 2007–2008

Characteristic	Sanitation		Number of households
	Improved[a]	Unimproved[b]	
Residence			
Urban	67.5	32.5	2 532
Rural	50.3	49.7	1 363
Wealth quintile			
Lowest	34.0	66.0	842
Second	50.3	49.7	767
Middle	67.4	32.6	791
Fourth	77.1	22.9	714
Highest	82.9	17.1	726
Total	**61.5**	**38.5**	**3 895**

[a] Improved sanitation: connection to septic system, pour-flush latrine, covered dry latrine (with privacy) (provided facilities are not shared).

[b] Unimproved facility: uncovered dry latrine (without privacy), bucket latrine, no facilities(open defecation)

particles, carbon monoxide and carcinogenic compounds. Women are at high risk of chronic respiratory disease and eye conditions because they usually spend more time in the home, particularly for cooking. SAGE collects information on indoor air pollution based on common international survey standards, thus ensuring comparability with estimates from other sources using the same standards.

Overall, more than three quarters of households used clean fuel (electricity, gas) for cooking purposes (Table 5.10). Only 13% overall used solid fuels; however, 33% of households in rural areas depended on these fuels for cooking, compared to only 2% in urban areas. As expected, the use of solid fuel and paraffin fuel decreased with increased wealth: 25% of households in the lowest wealth quintile used solid fuels, compared to only 1% in the highest wealth quintile. There was no difference in the use of paraffin between urban and rural residence.

Only about one quarter of households burning solid fuels had a chimney or hood; among those households, food was mostly prepared in a room or building separate from that used for sleeping (Table 5.11). In households with no chimney, about three quarters prepared food outside or in a separate building, thus minimizing health risks. However, most of the remainder of these households prepared food in the same house (although rarely in the room used for sleeping).

Table 5.10 Cooking fuel used among all households, per cent distribution by wealth and residence, South Africa, 2007–2008

Characteristics of household	Cooking fuel used				Number of households
	Clean fuel	Kerosene or paraffin	Solid fuel[a]	Total	
Residence					
Urban	87.8	9.7	2.4	100.0	2 524
Rural	58.3	8.9	32.7	100.0	1 359
Wealth quintile					
Lowest	44.5	30.4	25.1	100.0	838
Second	74.8	8.3	16.9	100.0	766
Middle	83.5	3.2	13.3	100.0	777
Fourth	92.3	0.9	6.9	100.0	714
Highest	97.8	1.5	0.7	100.0	732
Total	**77.5**	**9.5**	**13.0**	**100.0**	**3 883**

[a] Coal, charcoal, wood, agriculture or crop, animal dung, shrubs or grass and other

Table 5.11 Cooking location among households using solid fuel, per cent distribution by fire or stove covering, South Africa, 2007–2008

Cooking location (where cooking usually done)	Fire or stove covering			Number of households
	With chimney or hood	Without chimney or hood	Don't know	
In room used for living or sleeping	84.6	15.4	0	35
In separate room used as kitchen	45.1	50.3	4.6	119
In separate building used as kitchen	15.5	75.3	9.2	132
Outdoor	4.6	91	4.4	166
Don't know	4	11.4	84.5	44
Per cent using solid fuel	**22.8**	**64.7**	**12.5**	
Number of households using solid fuel	**113**	**321**	**62**	**496**

6. Health state

This chapter presents results on self-reported ratings of overall health and functioning. These ratings included measurement of health using a single overall general self-rated health, self-reported health state covering nine health domains (used to generate the SAGE composite health state score) and measurement of disability using WHODAS-II (Üstün TB et al 2010), activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Figure 6.1 contains multiple health measures and helps to visualize health levels across different ages and different measures.

6.1 Self-reported health and functioning

Results from the questions on overall general self-reported health have been researched in epidemiological surveys (Ounpuu et al 2000). Self-rated health is often a good predictor for numerous health-related outcomes. The self-rated health measure entails a respondent rating his or her own health "today" ("In general, how would you rate your health today?"). This question is thought to be less susceptible to the problems associated with measures of health that do not specify a time period, and is believed to produce a more reliable assessment. Respondents are encouraged to take into account both their physical and mental health when giving their responses.

Overall, more than three quarters of adults rated their health as moderate or good, while few reported very good or very bad health (Table 6.1). On balance, men reported very good or good health more often than women. Increasing age was associated with less good health, and increasing wealth was associated with better health.

Reported health did not differ substantially by residence, except that more adults in rural areas reported their health status as bad. This may indicate more difficulties with work activities in rural households than in urban households, potentially due to rural households having less access to health care. In relation to marital status, good health was comparatively low for widowed people. This result could be confounded by the factor of age, because widowed respondents are more likely to be older. Currently-married people were more likely to report very good health than those in other categories of marital status; however, few adults across all groups self-assessed as having very good health.

In addition to a self-rating of the current level of health, respondents were also asked how much difficulty they have carrying out work or household activities because of a health condition. The time period was specified as "in the last 30 days", and the respondents were asked to provide an average of good and bad days. This indicator is intended to measure the impact of health on a person's functioning.

Table 6.2 shows the self-rated difficulty in carrying out work or household activities. More than half of men and women had at least some difficulty with work or household activities, with most within that group rating their difficulty as moderate. The proportion of adults with severe or extreme difficulty was quite high, including 11% of women reported having severe difficulty.

6.1.1 Health-state scores

WHO's approach to measuring health states uses multiple domains of health that explain 80% of the variance in an individual's health (Ustun et al 2003). This approach provides scalable levels of health and the ability to decompose a single score into meaningful components. Health scores were calculated based

Table 6.1 Overall self-rated health status among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Self-rated overall general health						Number
	Very good	Good	Moderate	Bad	Very bad	Total	
Sex							
Male	6.8	35.5	40.5	15.9	1.3	100.0	1 615
Female	3.4	31.1	47.7	16.7	1.0	100.0	2 061
Age group (years)							
50–59	7.2	37.8	39.6	14.5	1.0	100.0	1 832
60–69	3.1	30.7	47.4	17.6	1.3	100.0	1 126
70–79	2.1	25.3	54.5	17.2	1.0	100.0	514
80+	1.6	22.5	48.6	24.4	3.0	100.0	204
Residence							
Urban	5.3	36.1	43.7	13.8	1.1	100.0	2 382
Rural	4.2	27.3	46.0	21.2	1.2	100.0	1 293
Marital status							
Never married	2.1	30.9	45.2	20.7	1.1	100.0	512
Currently married	6.7	36.5	42.9	13.2	0.7	100.0	1 819
Cohabiting	5.4	41.0	34.4	17.8	1.5	100.0	193
Separated or divorced	5.0	35.1	40.4	15.1	4.4	100.0	217
Widowed	2.6	24.6	51.1	20.6	1.2	100.0	867
Wealth quintiles							
Lowest	2.6	24.4	45.2	25.4	2.5	100.0	755
Second	3.4	32.5	45.9	16.7	1.5	100.0	735
Middle	3.5	33.7	44.3	17.4	1.1	100.0	668
Fourth	5.3	31.2	48.1	15.0	0.4	100.0	724
Highest	9.5	42.8	39.6	7.9	0.3	100.0	778
Total	**4.9**	**33.0**	**44.6**	**16.4**	**1.1**	**100.0**	–
Number	**180**	**1 214**	**1 637**	**602**	**42**	–	**3 676**

on self-reported health in nine health domains: affect, cognition, interpersonal activities and relationships, mobility, pain, self-care, sleep and energy, vision and hearing. Each domain included at least two questions. Asking more than one question about difficulties in a given domain provides more robust assessments of individual health levels and reduces measurement error for any single self-reported item. IRT was used to score the responses to the self-reported health questions using a partial credit model that served to generate a composite health-state score (Andrich 2004; Wilson et al 2006). An item calibration was obtained for each item. To determine how well each item contributed to common global health measurement, chi-square fit statistics were calculated. The calibration for each of the health items was taken into account and the raw scores were transformed through Rasch modelling into a continuous cardinal scale from 0 (worst health) to 100 (maximum score, best health).

On average, men had better health scores than women (Table 6.3). Health scores also showed predictable patterns, with health declining with increasing age and increasing health with increasing levels of education. Married or cohabiting respondents had better health than those who were widowed, divorced, separated or

Table 6.2 Self-rated difficulty with work or household activities among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Self-rated difficulty with work or household activities						Number
	None	Mild	Moderate	Severe	Extreme	Total	
Sex							
Male	42.6	17.3	31.8	7.5	0.8	100.0	1 607
Female	34.9	16.3	36.2	11.2	1.4	100.0	2 046
Age groups (years)							
50–59	47.1	15.6	29.1	7.4	0.8	100.0	1 826
60–69	35.1	18.4	34.6	10.5	1.5	100.0	1 116
70–79	21.8	17.9	46.1	13.2	0.9	100.0	511
80+	18.2	15.0	50.2	14.3	2.4	100.0	200
Residence							
Urban	41.5	18.3	32.7	6.2	1.3	100.0	2 365
Rural	32.5	13.8	37.1	15.6	0.9	100.0	1 287
Marital status							
Never married	39.7	14.5	35.3	9.4	1.1	100.0	508
Currently married	43.2	17.4	31.7	6.8	0.9	100.0	1 812
Cohabiting	46.3	19.6	26.0	7.4	0.7	100.0	190
Separated or divorced	31.5	16.1	33.8	12.7	5.8	100.0	211
Widowed	27.4	15.8	41.0	15.1	0.6	100.0	864
Wealth quintile							
Lowest	28.6	15.6	39.7	14.7	1.4	100.0	751
Second	34.0	16.7	37.7	10.5	1.1	100.0	732
Middle	37.0	19.1	31.9	9.2	2.8	100.0	664
Fourth	39.8	16.5	33.1	10.1	0.5	100.0	722
Highest	51.6	15.7	29.0	3.6	0.2	100.0	768
Total	**38.3**	**16.7**	**34.3**	**9.6**	**1.1**	**100.0**	–
Number	**1 399**	**611**	**1 252**	**349**	**41**	–	**3 653**

never married. Those in the highest wealth quintile had better health than those in the lowest wealth quintile.

To better understand the determinants of health and the possible differences between perceived health and true levels of health, further disaggregation of health into specific health domains is warranted.

6.2 Disability

This section summarizes the results of ADLs and IADLs, which indicate levels of functioning or disability. ADLs consist of items such as eating, getting out of bed, personal hygiene and getting around in the home. IADLs consist of items that require higher level functioning, keeping one's life-space in order and obtaining resources (for instance, managing money, using a telephone and using transport).

This section also presents a summary measure based on WHODAS-2, which contains many of the most commonly asked ADL and IADL questions, with response categories that provide an estimate of severity of disability through asking about level of difficulty with each activity. Levels range from "no difficulty at all" to "extreme

Table 6.3 Mean health-state scores among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Health-state score	Standard error	Number
Sex			
Male	64.5	0.9	1 617
Female	60.0	0.8	2 063
Total	**62.0**	**0.7**	**3 680**
Age group (years)			
50–59	64.6	0.9	1 833
60–69	61.5	1.0	1 128
70–79	57.3	1.3	514
80+	52.1	1.7	205
Total	**62.0**	**0.7**	**3 680**
Residence			
Urban	62.5	0.8	2 385
Rural	60.9	1.1	1 294
Total	**62.0**	**1.0**	**3 679**
Education			
No formal education	58.5	1.1	785
Less than primary	59.6	1.1	767
Primary school completed	60.4	1.2	700
Secondary school completed	64.5	1.6	454
High school completed	69.3	2.1	264
College completed	73.2	2.1	124
Postgraduate degree completed	79.8	4.5	58
Total	**62.0**	**1.0**	**3 152**
Marital status			
Never married	60.8	1.4	512
Currently married	64.9	0.8	1 821
Cohabiting	62.3	2.6	193
Separated or divorced	58.4	2.3	217
Widowed	57.2	0.9	868
Total	**62.0**	**0.7**	**3 611**
Wealth quintile			
Lowest	60.2	1.3	756
Second	61.2	1.4	736
Middle	61.0	1.4	669
Fourth	61.6	1.3	724
Highest	65.5	1.5	779
Total	**62.0**	**0.7**	**3 664**

Table 6.4 Difficulty in carrying out activities of daily living and overall mean WHODAS score among adults aged 50 years or older, per cent distribution by background characteristics

Characteristic	Number of activities of daily living deficiencies				Number
	0	1	2 or more	Total	
Sex					
Male	69.9	7.8	22.3	100.0	1 664
Female	60.7	8.4	30.9	100.0	2 113
Age group (years)					
50–59	75.0	7.2	17.8	100.0	1 879
60–69	60.5	8.3	31.2	100.0	1 160
70–79	49.9	8.7	41.4	100.0	528
80+	33.7	14.5	51.9	100.0	210
Residence					
Urban	65.1	8.5	26.5	100.0	2 444
Rural	64.2	7.5	28.3	100.0	1 332
Education					
No formal education	59.2	8.2	32.6	100.0	773
Less than primary	63.3	9.6	27.0	100.0	733
Primary school completed	59.7	8.7	31.6	100.0	681
Secondary school completed	70.2	7.0	22.8	100.0	434
High school completed	77.1	6.8	16.1	100.0	259
College completed	90.7	1.6	7.7	100.0	121
Postgraduate degree completed	78.6	7.6	13.8	100.0	56
Missing	–	–	–	–	719
Marital status					
Never married	69.9	6.2	23.9	100.0	527
Currently married	68.1	8.1	23.8	100.0	1 867
Cohabiting	72.1	10.2	17.8	100.0	206
Separated or divorced	61.9	6.4	31.8	100.0	223
Widowed	53.1	9.6	37.3	100.0	890
Don't know	74.4	1.8	23.8	100.0	64
Wealth quintile					
Lowest	65.9	7.8	26.4	100.0	783
Second	63.9	6.2	29.9	100.0	751
Middle	63.1	9.6	27.2	100.0	689
Fourth	59.5	10.5	30.1	100.0	738
Highest	70.7	6.4	22.9	100.0	798
Total	**64.8**	**8.1**	**27.1**	**100.0**	–
Number	**2 445**	**307**	**1,024**	–	**3 776**
Mean WHODAS score	**10.2**	**23.4**	**44.7**	**20.3**	–

WHODAS, World Health Organization Disability Assessment Schedule

Table 6.5 Difficulty in carrying out instrumental activities of daily living (IADLs) and overall WHODAS score among adults aged 50 years or older, distribution by background characteristics

Characteristic	Number of IADL deficiencies				Number
	0	1	2 or more	Total	
Sex					
Male	87.4	6.8	5.8	100.0	1 664
Female	82.8	6.1	11.1	100.0	2 111
Age group (years)					
50–59	91.9	3.9	4.3	100.0	1 878
60–69	82.8	8.0	9.3	100.0	1 160
70–79	74.7	10.0	15.3	100.0	528
80+	58.9	11.8	29.3	100.0	210
Residence					
Urban	86.4	5.0	8.6	100.0	2 443
Rural	82.0	9.0	9.0	100.0	1 332
Education					
No formal education	81.0	6.4	12.6	100.0	773
Less than primary	85.3	6.4	8.3	100.0	733
Primary school completed	82.3	8.7	9.0	100.0	681
Secondary school completed	85.6	7.3	7.1	100.0	434
High school completed	91.5	1.9	6.7	100.0	259
College completed	95.6	2.7	1.8	100.0	121
Postgraduate degree completed	96.1	0.5	3.5	100.0	56
Missing	–	–	–	–	718
Marital status					
Never married	86.6	6.5	6.9	100.0	525
Currently married	88.3	5.6	6.1	100.0	1 867
Cohabiting	89.3	0.8	9.9	100.0	206
Separated or divorced	77.6	4.6	17.8	100.0	223
Widowed	77.4	9.9	12.7	100.0	890
Don't know	83.8	5.6	10.6	100.0	64
Wealth quintile					
Lowest	81.0	8.4	10.5	100.0	783
Second	84.4	6.6	9.0	100.0	751
Middle	86.7	4.4	8.8	100.0	687
Fourth	83.3	8.2	8.5	100.0	738
Highest	88.5	4.5	7.0	100.0	798
Total	**84.8**	**6.4**	**8.7**	**100.0**	–
Number	**3 203**	**242**	**330**	–	**3 775**
Mean WHODAS-2 score	**14.8**	**43.4**	**60.3**	**20.6**	–

WHODAS-2, World Health Organization Disability Assessment Schedule, Version 2

difficulty/cannot do". The composite WHODAS score is scaled from 0 (no disability) to 100 (high disability).

Table 6.4 presents results related to difficulties in carrying out ADLs among adults aged 50 years or older. About two thirds of older adults had no difficulties in functioning, with men being more likely than women to be in this category. For respondents reporting some level of difficulty with functioning, women had higher rates than men, particularly for those with difficulties with 2 or more ADLs . Examining patterns by age, the proportion of people with no difficulty decreased with age, implying that difficulty in functioning increases with increasing age. Higher levels of education were associated with better functioning. Trends by marital status showed that those who were widowed had the greatest difficulty, while those who were cohabiting had the least. However, these results are likely to be confounded by age. The patterns found in difficulty with ADLs did not differ significantly between urban and rural areas.

The mean WHODAS scores increased with increasing levels of ADL deficiencies, and demonstrated good face validity. Overall, the mean disability score was 20 (out of 100), suggesting a low level of disability.

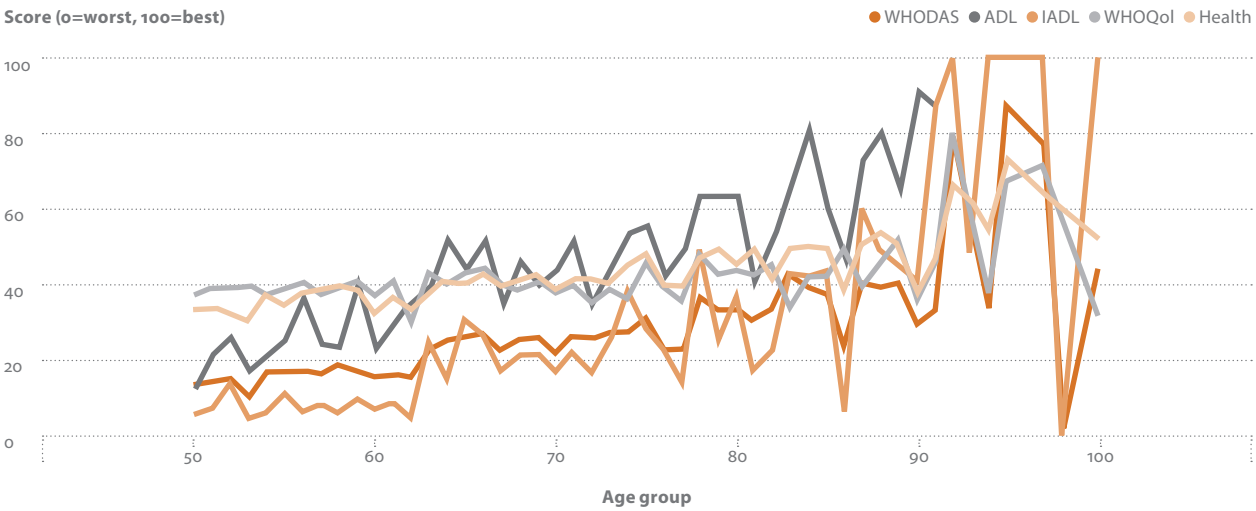
Table 6.5 presents results related to difficulties in carrying out IADLs among adults aged 50 years or older. Adults had less difficulty with carrying out IADLs than with the ADLs reported above. Since IADLs represent higher order functioning, these results were largely as expected, in that older adults had more difficulty with IADLs than younger adults; those who were less educated had more difficulty than those with higher education; those in households with higher wealth status and in urban areas had less difficulty than those in rural areas; women had slightly more difficulty than men; and those who were separated, divorced or widowed had the most difficulty.

The health status score, WHODAS-2, ADL and IADL measures are plotted in Figure 6.1. In addition, the WHO Quality of Life (WHOQoL) measure of subjective well-being and life satisfaction is included (discussed in more detail in Chapter 10). The health, functioning/disability and quality of life measures were converted to a scale of 0 to 100, where zero was best (health, functioning or quality of life) and 100 was worst for Figure 6.1. The variability in disability scores were larger than the other measures over all age ranges, and even more marked after age 80 because of the smaller number of persons in the sample. Subjective well-being (WHOQoL) was largely stable across all ages, worsening slightly in the mid-80s, whereas functioning/disability (WHODAS, ADL, IADL) changed the most. Disability increased with increasing age, with what looks like stepped increases after age 60 and again after age 80. Health state (health) increased steadily with increasing age.

6.3 Cognitive capacity

A battery of cognition tests was used to measure cognitive performance, in order to measure objective indicators of various aspects of cognition (see Section 2.3.2 in Chapter 2). The cognition tests included verbal recall, verbal fluency and digit span (forward and backward).

Figure 6.1 Mean health, disability and well-being measures by age in South Africa



6.3.1 Verbal recall

The overall mean score for verbal recall for adults aged 50 years or older was 5.9, indicating that almost six words, on average, were recalled (Table 6.6). Recall patterns were similar for most groups, but were particularly low in the group aged 80 years or older, and particularly high in the group who had completed a graduate degree.

6.3.2 Verbal fluency

The overall mean score for verbal fluency for adults aged 50 years or older was 9.9 (Table 6.6, below). As with verbal recall, scores were similar across most groups, but were particularly low in the group aged 80 years or older, and particularly high in the group who had completed a graduate degree. The mean verbal fluency scores were slightly higher for men than for women; also, they consistently decreased with an increase in age and increased with an increase in wealth.

6.3.3 Digit span

The overall mean score for forward digit span (FDS) in adults aged 50 years or older was 5.1 (Table 6.6). The mean cognitive scores based on the forward digit span were similar in men and women. The mean cognitive scores decreased consistently with an increase in age

Table 6.6 Results for each cognition test by background characteristics

Background characteristics	Mean verbal recall[a]		Mean verbal fluency[b]		Mean BDS		Mean FDS		Mean overall cognition score		N
		SE		SE		SE		SE		SE	
Sex											
Male	6.0	0.1	10.2	0.2	3.4	0.1	5.3	0.07	57.3	0.76	1,690
Female	5.8	0.1	9.8	0.12	3.0	0.1	5.0	0.07	54.8	0.61	2,147
Age group (years)											
50–59	6.1	0.1	10.3	0.2	3.4	0.1	5.4	0.08	58.6	0.67	1,914
60–69	5.8	0.1	9.8	0.2	3.1	0.1	5.0	0.09	55.3	0.82	1,174
70+	10.3	–	17.6	–	5.2	–	9.0	–	97.4	–	748
Residence											
Urban	5.9	0.1	10.0	0.2	3.5	0.1	5.4	0.07	57.0	0.07	2,489
Rural	5.8	0.1	9.9	0.2	2.6	0.1	4.7	0.09	53.9	0.89	1,348
Marital status											
Never married	5.8	0.1	9.6	0.23	3.0	0.1	4.9	0.11	54.5	0.93	539
Currently married	6.1	0.1	10.5	0.2	3.4	0.1	5.4	0.09	58.3	0.76	1,901
Cohabiting	6.1	0.2	9.5	0.3	3.2	0.2	5.1	0.12	56.9	1.45	207
Separated or divorced	5.6	0.1	9.3	0.4	2.9	0.2	5.3	0.15	52.8	1.23	224
Widowed	5.5	0.1	9.3	0.2	2.7	0.1	4.8	0.09	52.4	0.88	900
Wealth quintiles											
Lowest	5.7	0.1	9.0	0.3	2.7	0.1	4.6	0.11	53.1	0.81	791
Second	5.8	0.1	9.6	0.2	2.9	0.1	4.9	0.12	54.3	1.09	759
Middle	5.6	0.1	9.8	0.3	2.9	0.1	5.0	0.11	53.3	0.96	696
Fourth	5.8	0.01	10.3	0.4	3.2	0.1	5.4	0.14	55.7	0.98	757
Highest	6.4	0.1	10.9	0.3	4.0	0.1	5.8	0.13	62.5	1.36	815

[a] List of 10 words

[b] Average number of animals

BDS, backward digit span; FDS, forward digit span; SE, standard error

group, and with increases in the level of education and wealth. Similar patterns of results were seen with backward digit span (BDS), a more cognitively challenging task, but the overall mean was substantially lower than for the forward digit span.

6.3.4 Overall cognition

The tests selected – word list recall, verbal fluency and digit span – accurately measure the cognitive domains most affected by impairment and the early stages of dementia. Importantly, these tests can be implemented by trained lay interviewers.

The mean verbal recall, mean verbal fluency, mean backward digit span and mean forward digit span did not differ between males and females (Table 6.6). The overall cognitive score consists of a summation of the results, and conversion to a scale of 0 to 100, where 0 represents worst cognition and 100 best cognitive functioning. Table 6.6 presents the overall cognitive scores by various background factors. The overall mean cognitive score was 56. The variation in scores was not great, but there were slight differences showing the following trends: men had higher cognitive scores than women, and cognitive scores consistently decreased with an increase in age groups, and increased with an increase in wealth.

7. Morbidity and interventions

South Africa is in the midst of a health transition, with a significant rise in NCDs driven by an ageing population and an increase in behavioural risk factors (Mayosi et al 2009). SAGE gathered evidence on a range of chronic diseases that contribute to a large portion of the burden of disease for NCDs that are prevalent among older adults. The information gathered also helps to determine how many people are potentially in need of certain health interventions. Questions include self-reported conditions and, for some conditions, reporting of symptoms. Prevalence rates are presented for self-reporting of ever having been diagnosed and, when available, for symptom reporting of ever having had a relevant symptom, for comparison.

This section presents results for:

- a range of chronic diseases;
- injuries from accidents, issues of need (percentage of respondents reporting any health problem or injury in the past 12 months);
- issues of health coverage (percentage of respondents reporting a health problem or injury and receiving medical care in the last 12 months);
- preventive health measures, including screening for cervical and breast cancer.

7.1 Chronic conditions

A chronic disease is one that is long lasting or recurrent and in this case, non-communicable. Older people often have one or more chronic diseases. In most countries, as the population ages, the contribution of chronic conditions to overall disease burden increases. The contributing factors to these diseases are many and varied, and include global, social and individual factors.

7.1.1 Single chronic conditions

From the information generated by SAGE, prevalence rates are calculated for selected chronic conditions, first from self-reported information and, when possible, from symptom-reported information. The chronic conditions assessed include arthritis, stroke, angina pectoris, diabetes mellitus, chronic obstructive lung disease, asthma, depression, hypertension, cataracts and edentulism.

Arthritis and stroke

Arthritis is an inflammation of the joints. Therapies for arthritis include exercise, weight control, rest and relief from stress on joints, nondrug pain-relief techniques, medications to control pain, surgery, and complementary and alternative therapies.

About a quarter of older adults in South Africa self-reported having arthritis (24%), and 17% from symptom-reporting (Table 7.1). The self-reported prevalence of arthritis was higher among females than males; however, the symptom-reported arthritis was only slightly higher among females than males. The prevalence of arthritis was higher in urban areas than in rural areas.

A stroke is a disease of the circulatory system; it occurs when a blood clot blocks or ruptures an artery to the brain. The self-reported prevalence of stroke was 3.3% among adults aged 50 years or older, with the highest prevalence among adults aged 80 years or older (8%). This is probably an underestimate of the true prevalence, since SAGE captures information on those who survived an acute attack but not from those who died. The percentage of people on current or routine ongoing therapy was high overall (about 74% for both self-reporting and symptom reporting).

Table 7.1 Per cent distribution of arthritis and stroke (% reporting condition and current or routine therapy) and symptom-based reporting of arthritis among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Arthritis					Stroke			
	SR	Sx	CTx	RTx	Number	SR	CTx	RTx	Number
Sex									
Male	18.4	22.4	77.0	83.1	328	4.2	75.5	76.9	61
Female	29.4	31.7	76.7	90.9	591	3.9	71.0	70.9	50
Age group (years)									
50–59	21.5	24.9	75.0	89.2	418	2.3	59.3	61.9	39
60–69	29.7	32.5	74.9	87.7	331	3.9	85.3	87.5	40
70–79	22.8	23.0	81.9	83.0	105	3.3	66.2	58.1	17
80+	28.2	37.1	90.1	94.9	66	8.0	87.9	87.9	15
Residence									
Urban	26.3	28.7	74.0	86.4	629	3.2	67.7	72.5	71
Rural	21.3	25.4	83.2	92.6	289	3.4	83.9	77.0	39
Marital status									
Never married	22.4	24.3	84.9	96.4	114	1.4	61.1	61.1	7
Currently married	21.2	25.0	79.9	83.0	413	4.0	74.8	76.9	66
Cohabiting	11.0	19.7	50.9	93.3	36	0.6	100.0	100.0	1
Separated or divorced	32.5	35.5	61.3	97.7	69	5.1	59.3	59.3	10
Widowed	33.4	34.5	76.7	88.8	266	2.9	82.6	80.8	24
Wealth quintiles									
Lowest	21.0	25.8	91.5	96.0	175	3.5	66.3	62.3	24
Second	21.7	28.4	68.5	88.7	192	1.3	41.0	60.9	9
Middle	22.9	27.2	75.1	95.2	166	3.4	62.2	53.0	22
Fourth	30.0	28.2	76.5	82.4	185	4.4	87.8	89.4	28
Highest	26.9	28.3	74.0	82.7	196	3.8	83.1	90.3	26
Total	**24.0**	**16.7**	**76.1**	**81.7**	**918**	**3.3**	**73.4**	**74.2**	**111**

SR, self-reported prevalence of a diagnosed condition; Sx, symptom-based prevalence of condition; CTx, current therapy (in past 2 weeks); RTx, routine ongoing therapy (past 12 months).

Note: Prevalence was recorded as "ever having being diagnosed with" or "having symptoms of".

Angina and diabetes

Angina is pain or discomfort in the chest that occurs when the heart does not receive sufficient oxygenated blood. Overall, the prevalence of angina was 5.3% by self-report and 8.9% by symptom-based reporting among adults aged 50 years or older (Table 7.2). The symptom-based reporting, which was based on the Rose questionnaire, provides a more accurate estimate of the true level of angina in the population (Rose 1962). Angina appeared to be more common among females than males using either self-report or symptom-based reporting, and peaked in the 60–69 year age group. Urban dwellers had higher levels than rural dwellers by self-report, but lower levels than rural respondents by symptom reporting – perhaps related to access to health-care services. Less than half of all adults were on current or chronic therapy.

Diabetes is a metabolic disease in which the person has high blood sugar. Overall, 9% of South African adults aged 50 years or older had this condition, by self-report (Table 7.2). The highest prevalence of diabetes was found in adults in the 70–79 age group, urban residents, widows

Table 7.2 Per cent distribution of self-reported angina and diabetes mellitus, and current or routine therapy and symptom-based reporting of angina among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Angina					Diabetes			
	SR	Sx	CTx	RTx	Number	SR	CTx	RTx	Number
Sex									
Male	3.9	6.9	41.0	41.9	101	7.0	84.4	84.8	106
Female	6.3	10.5	40.9	44.5	203	11.0	84.5	82.3	225
Age group (years)									
50–59	4.9	8.4	43.2	44.8	147	7.1	76.9	75.9	139
60–69	6.3	10.4	40.6	44.7	110	9.1	91.3	92.4	107
70–79	5.6	8.1	44.2	47.6	34	13.2	92.1	88.0	71
80+	1.9	6.9	11.3	11.3	13	6.2	67.4	57.5	14
Residence									
Urban	5.8	8.6	49.2	52.0	186	10.1	84.5	83.0	258
Rural	4.3	9.6	28.1	30.5	118	5.5	84.3	83.2	73
Marital status									
Never married	3.6	4.8	45.4	58.7	24	8.6	98.3	97.9	47
Currently married	5.7	8.7	47.2	48.7	140	8.3	81	78.6	159
Cohabiting	4.5	8.9	38.8	42.3	18	0.9	100	100	2
Separated or divorced	7.3	11.5	46.1	47.4	23	4.4	85.8	100	10
Widowed	5.1	11.6	29.1	31.2	96	11.9	82.9	80.8	109
Wealth quintiles									
Lowest	2.5	6.2	15.0	17.4	40	5.4	89.8	94.5	40
Second	4.4	9.8	27.3	29.8	72	6.3	83.2	76.7	48
Middle	6.3	10.4	46.8	52.8	68	8.7	87.1	86.7	63
Fourth	6.8	11.7	48.5	48.4	78	11.2	82.4	78.5	88
Highest	6.4	6.9	62.9	65.8	47	10.9	84.3	82.9	89
Total	**5.3**	**8.9**	**41.0**	**43.6**	**304**	**8.5**	**84.5**	**83.1**	**331**

SR, self-reported prevalence of a diagnosed condition; Sx, symptom-based prevalence of condition; CTx, current therapy (in past 2 weeks); RTx, routine ongoing therapy (past 12 months).

Note: Total includes about 5% of observations for which information was missing.

Note: Prevalence was recorded as "ever having being diagnosed with" or "having symptoms of".

and people in higher wealth categories. Most adults were on therapy.

Chronic lung disease and asthma

Chronic lung disease refers to conditions where air flow to the lungs is limited and breathing is difficult; such conditions are often due to emphysema and bronchitis. Overall, the self-reported prevalence of chronic lung disease among adults aged 50 years or older was 2%, with rates being higher in women than in men, but similar in urban and rural areas (Table 7.3). About one-third of adults were currently on therapy, and more than half had been on routine therapy over the past year.

Asthma is a respiratory disorder that is characterized by sudden narrowing of the airways, which results in wheezing and shortness of breath. Overall, 5% of older adults in South Africa had asthma by self-report and 7% by symptom-based reporting (Table 7.3). The prevalence was quite consistent across different age groups and types of marital status. Levels were higher in urban

Table 7.3 Per cent distribution of self-reported chronic lung disease and asthma, and current or routine therapy and symptom-based reporting of asthma among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Chronic lung disease				Asthma				
	SR	CTx	RTx	Number	SR	Sx	CTx	RTx	Number
Sex									
Male	2.3	51.8	70.0	24	5.2	8.4	54.2	53.6	114
Female	3.3	31.9	48.9	44	4.7	6.0	52.6	57.6	103
Age group (years)									
50–59	2.2	33.0	54.7	38	4.2	6.3	54.2	57.7	100
60–69	1.6	66.7	85.9	17	6.8	8.0	64.8	65.2	71
70–79	2.3	19.6	21.5	11	2.3	7.2	24.5	24.5	31
80+	0.6	13.5	13.5	1	7.2	7.6	57.0	62.3	14
Residence									
Urban	1.8	45.7	53.5	42	5.3	7.1	58.5	61.6	139
Rural	1.8	15.1	53.6	22	4.2	6.9	44.5	44.7	78
Marital status									
Never married	0.7	39.2	39.2	4	5.6	6.3	72.4	80.3	25
Currently married	2.4	37.0	62.6	40	4.8	8.0	49.3	50.7	128
Cohabiting	5.3	0.0	7.5	8	3.4	5.5	65.3	56.0	9
Separated or divorced	2.2	42.4	64.4	5	2.3	6.9	18.5	27.9	13
Widowed	1.0	54.0	54.7	8	6.0	6.2	64.0	64.5	40
Wealth quintile									
Lowest	1.9	56.9	59.0	12	7.6	8.9	77.2	79.1	55
Second	2.9	5.1	49.2	20	4.5	6.7	36.9	44.4	43
Middle	1.7	47.8	74.4	11	4.6	6.3	58.2	57.2	35
Fourth	1.6	64.3	65.8	10	4.7	6.4	54.6	54.7	42
Highest	1.4	25.7	21.8	10	3.2	7.1	34.8	35.9	42
Total	**1.8**	**35.0**	**53.6**	**64**	**4.9**	**7.1**	**53.5**	**55.5**	**217**

SR, self-reported prevalence of a diagnosed condition; Sx, symptom-based prevalence of condition; CTx, current therapy (in past 2 weeks); RTx, routine ongoing therapy (past 12 months).

Note: Total includes about 5% of observations for which information was missing.

Note: Prevalence was recorded as "ever having being diagnosed with" or "having symptoms of".

areas than in rural areas, and tended to be higher in the lower wealth quintiles. Current and routine therapy levels were both above 50%.

Depression and hypertension

Depression is a mental state of persistent low mood and aversion to activities. Overall, the prevalence of depression among adults aged 50 years or older was 2% by self-report and 5% by symptom-based reporting (based on Diagnostic and Statistical Manual-IV criteria) (Table 7.4). By self-report, levels were the same between the sexes; however, by symptom-reporting, women had higher rates than men. Rates were higher in the 50–59 and 60–69 age groups than in the older age groups. By self-report, levels were the same in urban and rural areas, but higher in rural areas than in urban areas by symptom-reporting. Treatment rates were low, with current treatment below 30% and routine therapy below 40%.

Hypertension is a common disorder in which blood pressure is maintained above normal levels. The large

Table 7.4 Per cent distribution of self-reported depression and hypertension, and current or routine therapy plus symptom-based reporting of depression among adults aged 50 years or older, background characteristics, South Africa, 2007–2008

Characteristic	Depression					Hypertension			
	SR	Sx	CTx	RTx	N	SR	CTx	RTx	N
Sex									
Male	3.0	4.8	38.3	47.6	70	24.7	85.7	84.1	392
Female	2.8	5.3	16.9	28.6	97	34.6	84.9	87.6	708
Age group (years)									
50–59	3.2	5.3	24.8	36.1	89	24.1	79.4	82.0	437
60–69	3.0	5.4	33.1	42.6	52	36.5	88.3	90.1	408
70–79	1.3	3.8	22.3	21.3	18	38.9	92.5	94.4	197
80+	3.1	4.7	1.6	36.1	9	29.1	82.7	66.2	58
Residence									
Urban	2.9	4.6	27.6	43.1	96	32.4	86.3	86.0	771
Rural	2.8	6.1	23.5	27.8	71	26.0	82.7	87.2	329
Marital status									
Never married	1.6	4.4	9.1	26.8	20	27.3	82.3	83.1	139
Currently married	3.3	5.1	38.2	47.0	84	28.8	89.5	88.6	521
Cohabiting	3.5	4.6	1.0	75.3	8	29.4	78.2	81.0	55
Separated or divorced	2.7	4.8	16.0	16.0	9	26.1	80.4	89.4	56
Widowed	2.7	5.9	15.3	17.8	44	36.5	81.3	84.5	313
Wealth quintiles									
Lowest	2.1	5.9	19.7	19.7	38	21.0	87.5	93.8	155
Second	3.1	3.0	20.8	71.6	20	27.0	76.0	79.5	198
Middle	2.6	5.2	29.6	35.5	33	33.0	85.5	88.2	223
Fourth	3.4	6.8	32.6	36.1	44	33.5	85.7	84.4	246
Highest	3.2	4.7	23.3	36.6	31	35.7	91.3	88.7	273
Total	**2.9**	**5.1**	**25.9**	**36.6**	**167**	**30.2**	**85.2**	**86.4**	**1 100**

SR, self-reported prevalence of a diagnosed condition; Sx, symptom-based prevalence of condition; CTx, current therapy (in past 2 weeks); RTx, routine ongoing therapy (past 12 months).

Note: Total includes about 5% of observations for which information was missing. Prevalence was recorded as "ever having being diagnosed with" or "having symptoms of".

discrepancy between self-reported levels (30%) and symptom-reported levels (85%) indicated that a substantial proportion of cases may have been undiagnosed and hence untreated (Table 7.4). Comparison of the prevalence data generated from the two types of reporting showed no clear patterns within demographic groups. However, several groups stood out as being at a higher risk than others, including those in the 70–79 year age group, urban residents and those in households in the higher wealth quintiles. Groups apparently at a lower risk were those who were separated or divorced, or had never married, and those in the 50–59 year age group.

Co-morbidities

A relatively small percentage of older adults in South Africa reported having multiple chronic conditions (see Figure 7.1). Except for men aged 80-plus years, a higher percentage of women than men had two concomitant health conditions. A higher percentage of men age 60-69 years and 80+ years than women had 3+ chronic conditions. While the percentage of respondents with multiple morbidities was low, this constitutes a group with potential for higher health problems, higher health costs and more complex health care needs.

Figure 7.1 Distribution of respondents reporting 0, 1, 2 and 3 or more chronic conditions, by sex and age group

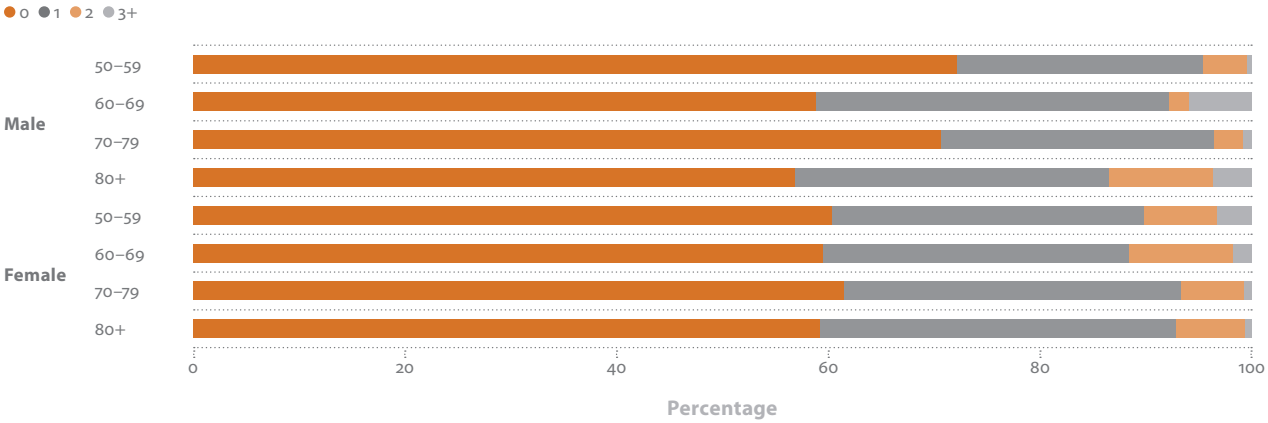
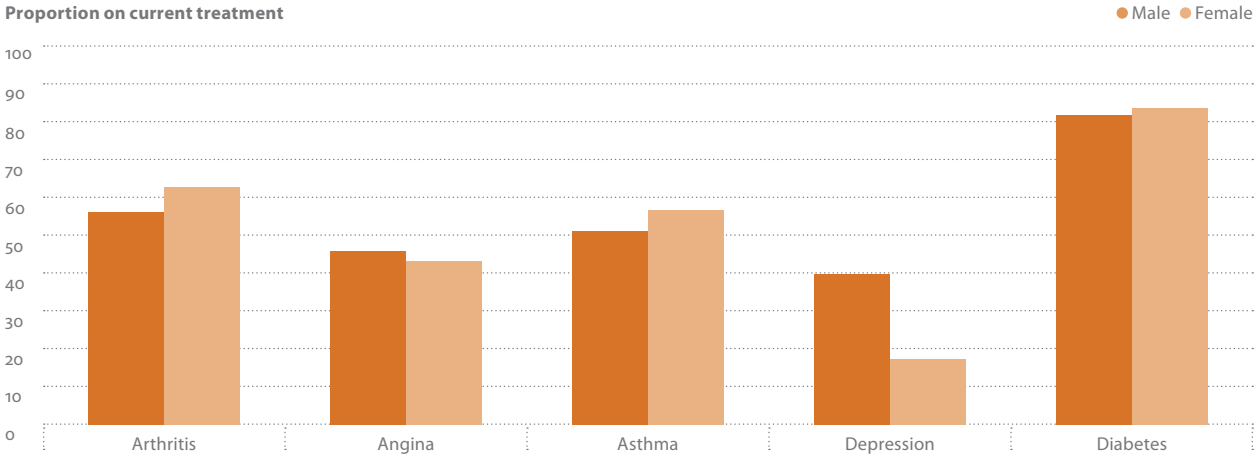


Table 7.5 Unmet need for self-reported single chronic conditions, percentage that had not taken any medication or other treatment for the condition in the past two weeks, by background characteristics, South Africa, 2007–2008

Characteristic	Self-reported single chronic condition							
	Arthritis	Stroke	Angina	Diabetes	Chronic lung disease	Asthma	Depression	Hyper-ten-sion
Sex								
Male	21.7	24.5	11.3	15.6	48.2	7.6	47.8	14.3
Female	25.6	29.0	31.6	15.5	58.1	8.5	38.0	15.1
Age group (years)								
50–59	23.0	40.7	20.7	23.1	67.0	6.8	37.7	20.6
60–69	29.1	14.3	29.9	8.7	33.3	2.8	69.0	11.7
70–79	23.7	33.8	52.2	7.9	80.4	26.1	11.7	7.5
80+	6.4	12.1	0.0	22.9	86.5	22.0	0.0	7.3
Residence								
Urban	23.6	32.3	13.5	15.5	54.3	10.3	34.7	13.7
Rural	25.0	16.1	56.7	15.7	85.0	1.8	56.1	17.3
Marital status								
Never married	17.1	38.9	13.0	1.7	60.8	3.8	78.9	17.7
Currently married	23.6	25.2	21.6	19.0	63.0	10.0	37.8	10.5
Cohabiting	51.5	0.0	0.0	0.0	100	0.0	0.0	11.8
Separated or divorced	28.9	40.7	40.6	14.2	57.6	28.5	0.0	19.6
Widowed	24.5	17.4	37.9	15.5	46.0	6.0	45.5	18.7
Income quintiles								
Lowest	22.7	33.7	43.2	10.2	43.1	0.0	0.0	12.5
Second	21.8	59.0	42.3	16.8	94.1	7.8	42.6	24.0
Middle	19.7	37.8	17.4	12.9	52.2	13.7	25.3	14.5
Fourth	25.4	12.2	8.1	17.6	35.7	16.8	20.6	14.3
Highest	30.5	16.9	24.4	15.7	74.3	12.4	68.8	8.7
Number	**921**	**127**	**188**	**326**	**77**	**173**	**88**	**1 158**
Total	**24.9**	**26.6**	**26.0**	**15.5**	**65.0**	**8.0**	**42.2**	**14.8**

Figure 7.2 Proportion of male and female respondents reporting arthritis, angina, asthma, depression or diabetes and receiving current treatment for the condition.



Unmet need

There are various ways to measure unmet need. For the purposes of SAGE, the indicator is the percentage of those who report having been diagnosed with a specific condition (self-report) who are not currently on therapy. Therapy is defined as medication or other treatment specific to that condition (see description for each chronic condition, above). Among all of the diseases under study, unmet need among adults aged 50 years or older was greatest for chronic lung disease, with 65% of those diagnosed not receiving treatment (Table 7.5). Almost half of adults with diagnosed depression were untreated, and about a quarter of those with arthritis, stroke or angina. About 15% of older adults with diabetes or hypertension were untreated. Asthma was the disease least likely to be diagnosed and treated (8%).

Table 7.6 Injuries among adults aged 50 years or older, percentage by background characteristics, South Africa, 2007–2008

Characteristic	Road traffic accident				All other injuries			
	%	N	% with resulting disability	N	%	N	% with resulting disability	N
Sex								
Male	2.6	1 577	38.2	18	1.7	1 558	48.0	14
Female	1.1	2 018	39.0	19	1.2	2 023	36.2	24
Age group (years)								
50–59	1.1	1 792	18.8	21	0.6	1 789	55.8	14
60–69	0.9	1 099	69.2	11	1.3	1 097	31.5	19
70–79	0.7	489	55.7	4	0.5	494	8.4	4
80+	0.5	190	61.9	1	0.6	189	87.3	2
Residence								
Urban	0.8	2 321	33.8	20	0.7	2 324	42.6	20
Rural	1.2	1 245	44.3	17	0.9	1 243	34.0	16
Wealth quintiles								
Lowest	0.4	707	52.8	3	0.9	705	40.7	6
Second	0.2	718	22.0	2	0.5	718	17.6	5
Middle	1.3	668	49.5	10	0.6	668	43.4	5
Fourth	0.4	715	39.8	11	0.8	714	46.8	9
Highest	0.2	744	27.5	12	1.1	748	38.3	11
Total	**0.9**	**3 566**	**38.6**	**37**	**0.8**	**3 567**	**38.7**	**38**

Table 7.7 Prevalence of edentulism and cataracts among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Edentulism	Number	Cataracts	Number
Sex				
Male	8.2	1 575	4.7	1 569
Female	8.7	2 019	4.2	2 015
Age group (years)				
50–59	5.8	1 790	2.5	1 789
60–69	9.1	1 105	3.9	1 100
70–79	12.9	500	10.1	497
80+	17.1	199	10.5	199
Residence				
Urban	11.1	2 345	5.6	2 337
Rural	3.5	1 248	2.2	1 246
Marital status				
Never married	8.2	501	3.4	499
Currently married	9.2	1 784	4.7	1 780
Cohabiting	1.3	191	2.1	191
Separated or divorced	4.5	209	4.8	208
Widowed	10.0	844	5.2	840
Wealth quintiles				
Lowest	3.9	716	3.0	710
Second	5.3	717	3.9	715
Middle	6.6	665	3.5	664
Fourth	9.6	717	4.5	718
Highest	16.3	762	7.1	759
Total	**8.5**	**3 593**	**4.4**	**3 583**

Figure 7.2 highlights the treatment rates for selected conditions and illustrates data presented in the preceding tables. Diabetes current treatment rates are higher than for all other conditions, and lowest for depression. The proportion on current treatment for angina and depression are below 50% for both men and women. Sex differences are also evident in Figure 7.1, with the largest difference for depression, with a higher proportion of men on current treatment, and asthma, with more women than men on current treatment.

7.2 Injuries from road traffic accidents and from all other accidents

Injuries are the third broad group from which burden of disease is estimated (WHO 2009).[10] The questions in the SAGE questionnaire follow injury surveillance guidelines from WHO and the United States Centers for Disease Control and Prevention (CDC) (Holder et al 2001).

In the past year, less than 1% of South African adults aged 50 years or older sustained an injury from a road traffic accident or other event (Table 7.6). Given the proportions of injury from accidents in the whole population, it is not meaningful to compare small differences between demographic groups. Almost 40% of injuries from road accidents and other accidents resulted in a disabling condition.

7.3 Oral health and cataracts

Sensory deficits in any of the five senses are likely to increase at older ages, as is edentulism. In particular, SAGE asks questions about vision and condition of the teeth, to estimate the prevalence of cataracts and loss of teeth.

Overall, about 9% of adults aged 50 years or older had no natural teeth, and about 4% had been diagnosed with a cataract in the past 5 years (Table 7.7). The prevalence

10 Group I – communicable, maternal, perinatal and nutritional conditions; Group II – NCDs; Group III – injuries and violence.

of edentulism increases with age, as expected; however, it also increases with wealth quintile, which is unexpected, because adults from wealthier households would seem to have more opportunity for preventive dental care. Possibly, those in wealthier households may be more likely to invest in having their teeth pulled and use false teeth instead. There may be a similar explanation for the higher prevalence of edentulism in urban areas than in rural areas.

Having been diagnosed with a cataract in the past 5 years affected just under 5% of the older adult population, and the patterns were similar to those of edentulism (that is, prevalence was higher in higher age groups, and also higher among people in wealthier households).

7.4 Health system coverage: cervical and breast cancer screening

Provision of health services in a country goes beyond use and access – it can be measured more comprehensively through coverage. Coverage provides a strong basis for identifying contributions of health services to health systems goals, such as improving population health. At the individual level, coverage can be defined as the probability of receiving a necessary health intervention, conditional on a health-care need (Shengelia et al 2003). Coverage of a health system answers the question of whether the health system will take care of a sick person and provide appropriate interventions; it

Table 7.8 Mammography and cervical cancer screening among women aged 50 years or older, percentage distribution by background characteristics, South Africa, 2007–2008

Characteristic	Breast cancer screening	Number of women	Cervical cancer screening	Number of women
Age group (years)				
50–59	14.7	971	35.8	963
60–69	17.7	623	29.2	623
70–79	16.8	311	32.0	311
80+	6.7	110	10.4	110
Missing	–	131	–	139
Residence				
Urban	20.9	1 284	41.9	1 277
Rural	6.0	730	14.0	729
Missing	–	132	–	140
Marital status				
Never married	13.4	377	29.3	372
Currently married	19.2	630	35.7	628
Cohabiting	18.0	77	26.6	76
Separated or divorced	21.0	151	43.3	150
Widowed	12.5	736	28.9	735
Missing	–	175	–	185
Wealth quintiles				
Lowest	6.3	410	12.0	411
Second	7.1	403	25.2	404
Middle	9.3	455	26.3	450
Fourth	16.1	395	37.9	393
Highest	43.8	344	63.5	342
Missing	–	139	–	146
Total	**15.5**	**2 014**	**31.8**	**2 006**

can be assessed indirectly through selection of indicator interventions or proxies, such as screening for cervical or breast cancer. This section presents the results relating to coverage; it also highlights two health conditions in need of attention.

In the context of heightened efforts for prevention and early diagnosis, SAGE collected information on screening for two major types of cancers: cervical and breast cancer. Female respondents aged 50 years or older were asked whether they were ever screened for cervical cancer by giving a pap smear, and whether they were ever screened for breast cancer using a mammogram.

In South African females, cancer of the breast was the second leading cancer between 1986 and 1992 (cervical being the leading cancer), but between 1993 and 1995 it overtook cervical cancer, and is now the most common cancer in women (16.6%). However, there are differences between groups: breast cancer ranked the most common cancer in White (17.9%) and Asian (24.4%) women, and the second most common cancer in mixed-race (18.2%) and Black (13.4%) women (Vorobiof et al 2001). Mortality remains high – worldwide at 50% – mainly because of late presentation, advanced stage of disease and absence of a functioning screening process. The etiological link between human papilloma virus (HPV) infection and cervical cancer has been well established, and a number of high-risk HPV genotypes have been identified. HPV infection is the most common sexually transmitted infection (STI) in the world today – up to 80% of sexually active females will harbour HPV at some point in their life (Botha et al 2010).

Overall, 32% of women aged 50 years or older had ever undergone cervical cancer screening during a pelvic exam, and 16% had "ever had" breast cancer screening (Table 7.8). Women with greater wealth and from urban areas had higher rates of cervical and breast cancer screening than women with lower wealth and from rural areas. The prevalence of both breast cancer and cervical cancer screening was higher in urban areas than in rural areas.

8. Health examination and biomarkers

SAGE conducts an array of health examinations, including several biomarkers, to measure health status among the elderly. Biomarkers are important for assessing the prevalence of morbidity and general health conditions, particularly in rural, illiterate and poor populations likely to have higher levels of undiagnosed diseases.

This chapter presents health examination results for BMI from anthropometric measures, hip and waist circumference and ratio, systolic and diastolic blood pressure and hypertension, pulse rate, lung functioning, near and distant vision, grip strength and walking speed.

8.1 Anthropometry

8.1.1 Height, weight and body mass index

BMI is used as an approximation of body composition, in particular, body fat. People who are underweight or obese have higher health risks and mortality rates than those who are of normal weight or even overweight (Flegal et al 2005; Orpana et al 2010). BMI is defined as weight in kilograms divided by height squared in metres (kg/m^2). A cut-off point of <18.5 kg/m^2 is used to define underweight; a BMI of ≥25–29.9 kg/m^2 indicates overweight; and a BMI of ≥30 kg/m^2 indicates obesity. Self-reported height and weight were recorded, as well as measured height (using a stadiometer) and weight (using a calibrated weighing scale). The results for measured height and weight are shown in Table 8.1.

Overall, about three quarters of South African adults aged 50 years or older were either obese or overweight. About a quarter had a normal height and weight profile, and only 3% were underweight. Women were more likely to be obese than men. Obesity tended to rise with education level and with wealth status. In terms of marital status, people who were cohabiting had among the lowest obesity levels; similarly, in terms of age, adults aged 70 years or older had lower levels than other age groups. Obesity levels were higher in urban areas and rural areas. The 2007/08 SAGE Wave 1 results in Table 8.1 are in line with the results from the 2002/03 World Health Survey/SAGE Wave 0 in South Africa (Moore et al 2010); however, there were fewer underweight and overweight people and considerably more obese people in the more recent survey.

8.1.2 Waist circumference and waist–hip ratio (WHR)

Abdominal fat mass can vary dramatically within a narrow range of total body fat or BMI. Therefore, other measures in addition to the measurement of BMI are valuable in identifying individuals at increased risk from obesity-related illnesses due to abdominal fat accumulation. The waist circumference and the WHR are used to define central obesity. Waist circumference of >102 cm in males and >88 cm in females, and WHR (>0.9 for men and >0.85 for women) (WHO 1999; Yusuf et al 2004) are both used as measures of central obesity.

Based on waist circumference, women were at much higher risk for central obesity than men – about one fifth of men and two thirds of women aged 50 years or older had central obesity (Table 8.2). Among men, those in the higher wealth quintile, with postgraduate education and never married were at higher risk of central obesity.

Based on WHR overall, women were again at greater risk of central obesity than men – more than half of men and nearly three quarters of women aged 50 years or older had central obesity (Table 8.3).

Table 8.1 Body mass index among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Body mass index					N
	Underweight (<18.5 kg/m²)	Normal (18.5–24.9 kg/m²)	Overweight (25.0–29.9 kg/m²)	Obese (≥30 kg/m²)	Total	
Sex						
Male	4.2	29.0	28.4	38.3	100.0	1 574
Female	2.6	20.7	26.1	50.6	100.0	1 936
Missing	–	–	–	–	–	326
Age group (years)						
50–59	2.6	24.7	27.3	45.3	100.0	1 732
60–69	3.0	22.2	25.0	49.8	100.0	1 081
70+	5.4	27.3	30.1	37.2	100.0	697
Missing	–	–	–	–	–	326
Residence						
Urban	3.1	20.4	29.2	47.2	100.0	2 263
Rural	3.7	31.8	23.4	41.2	100.0	1 246
Missing	–	–	–	–	–	327
Education						
No formal education	4.6	34.5	24.3	36.6	100.0	719
Less than primary	4.8	25.1	31.3	38.8	100.0	683
Primary school completed	4.6	22.9	26.8	45.7	100.0	620
Secondary school completed	0.3	16.0	28.7	54.9	100.0	420
High school completed	2.8	17.5	36.0	43.8	100.0	225
College completed	0.9	21.9	29.5	47.7	100.0	117
Postgraduate degree completed	0.1	11.8	31.3	56.8	100.0	52
Missing	–	–	–	–	–	1 000
Marital status						
Never married	4.4	25.3	23.6	46.7	100.0	486
Currently married	3.3	24.7	28.6	43.3	100.0	1 741
Cohabiting	5.7	28.3	27.9	38.2	100.0	197
Separated or divorced	3.1	25.1	24.5	47.3	100.0	211
Widowed	2.4	22.5	26.8	48.2	100.0	818
Missing	–	–	–	–	–	383
Wealth quintile						
Lowest	6.5	32.8	24.6	36.1	100.0	715
Second	4.0	31.2	24.3	40.5	100.0	700
Middle	2.8	23.3	25.4	48.6	100.0	649
Fourth	1.7	17.6	25.0	55.6	100.0	664
Highest	1.6	17.4	34.8	46.2	100.0	765
Missing	–	–	–	–	–	343
Total	**3.3**	**24.5**	**27.2**	**45.1**	**100.0**	**–**
Number[a]	**116**	**858**	**953**	**1 582**	–	**3 836**

[a] Includes 327 cases for which information is not available.

Table 8.2 Central obesity according to waist circumferences among adults aged 50 years or older, per cent distribution by background characteristics and sex, South Africa, 2007–2008

Characteristic	Waist circumference		Number
	Male (>102 cm)	Female (>88 cm)	
Age group (years)			
50–59	17.3	62.0	1 572
60–69	29.6	66.6	1 145
70+	23.5	62.7	847
Missing	–	–	160
Residence			
Urban	23.1	65.8	2 307
Rural	20.3	59.6	1 269
Missing	–	–	260
Education			
No formal education	16.5	59.1	731
Less than primary	24.3	67.7	705
Primary school completed	22.6	70.0	642
Secondary school completed	21.0	62.7	417
High school completed	24.7	47.9	244
College completed	16.6	57.1	117
Postgraduate degree completed	47.8	63.3	54
Missing	–	–	926
Marital status			
Never married	29.9	61.6	490
Currently married	23.0	56.3	1 773
Cohabiting	16.8	66.5	198
Separated or divorced	17.3	65.0	216
Widowed	12.4	70.1	841
Missing	–	–	318
Wealth quintile			
Lowest	13.8	53.8	740
Second	13.6	62.5	720
Middle	18.1	70.4	662
Fourth	44.3	61.3	689
Highest	21.9	70.7	748
Missing	–	–	277
Total	**22.1**	**63.1**	**–**
Number[a]	**1 240**	**621**	**3 836**

[a] Includes 261 cases for which information was not available.

Table 8.3 Central obesity according to waist–hip ratio among adults aged 50 years or older, per cent distribution by background characteristics and by sex, South Africa, 2007–2008

Characteristic	Waist–hip ratio		Number
	Male (>90)	Female (>85)	
Age group (years)			
50–59	17.3	67.9	1 770
60–69	29.6	71.2	1 077
70+	23.5	76.4	696
Missing	–	–	293
Residence			
Urban	58.7	71.0	2 283
Rural	54.3	70.1	1 260
Missing	–	–	293
Education			
No formal education	51.0	65.6	724
Less than primary	56.4	74.5	698
Primary school completed	55.4	74.1	639
Secondary school completed	66.0	71.4	414
High school completed	60.3	64.5	243
College completed	57.0	67.3	116
Postgraduate degree completed	69.1	64.0	54
Missing	–	–	948
Marital status			
Never married	64.1	69.3	486
Currently married	56.9	72.1	1 754
Cohabiting	44.2	68.3	196
Separated or divorced	61.8	69.5	215
Widowed	63.7	70.3	833
Missing	–	–	352
Wealth quintile			
Lowest	51.9	53.8	738
Second	50.8	62.5	712
Middle	56.6	70.4	652
Fourth	69.5	61.3	683
Highest	56.5	70.7	741
Missing	–	–	310
Total[a]	**53.7**	**70.7**	**3 836**

[a] Includes 293 cases for which information was not available.

8.2 Performance tests

This section briefly describes each of the performance tests conducted and how they are used to assess health and comparisons to self-reporting. The tests are not intended to serve as a medical diagnosis, but rather to be indicative of a possible problem.

8.2.1 Blood pressure and pulse

Blood pressure (systolic and diastolic) was measured as described in Section 2.3.2. The categories for systolic blood pressure (the top number in a blood pressure reading) measurements include: "normal" (<120 mmHg), "prehypertension" (120–139 mmHg) and "high blood pressure" or "hypertension" (≥140 mmHg).

The overall mean systolic blood pressure for adults aged 50 years or older was 146 mmHg, which put the older population in South Africa in the high blood pressure category (Table 8.4). Systolic blood pressure was slightly higher among women than men, tended to increase with age, and generally decreased with higher education.

The categories for diastolic blood pressure (the bottom number in a blood pressure reading) measurements include: "normal" (<80 mmHg), "prehypertension" (80–89 mmHg) and "high blood pressure" or "hypertension" (>90 mmHg).

The overall mean diastolic blood pressure for adults aged 50 years or older in South Africa was 96 mmHg; again, these findings clearly put this population in the category of "high blood pressure" (Table 8.4). The diastolic pressure did not differ between men and women, but did consistently decrease with age. Interestingly, those in the lowest and second wealth quintiles had the highest mean diastolic blood pressure, with a decrease as wealth increased.

The pulse rate, measured directly by palpating a carotid artery, is an indicator of a person's health. On average, the pulse rate for a healthy adult is 60–100 beats per minute (BPM), although during sleep it may fall to 40 BPM, and during strenuous exercise it may increase to 150–200 BPM.

The overall mean pulse rate was 77 BPM, which was similar in men and women. Given that pulse rates may differ even by multiples of 10 BPM within a given day for a given individual, it was notable how little variation there was between groups. The means ranged well within normal limits, with the lowest being 72 BPM for those who completed college.

Hypertension is a common disorder in which blood pressure remains abnormally high (≥140/90 mmHg). Almost three quarters of adults aged 50 years or older were hypertensive (Table 8.9). The greatest variation was between education levels, but there was no clear increasing trend with level of education, nor were there trends according to other background characteristics.

Older people, as well as females, tended to have the highest percentage of systolic hypertension compared to other groups (Table 8.4). People in the rural areas had a slightly higher percentage of systolic hypertension than those from the urban areas.

A similar proportion of males and females had diastolic hypertension (Table 8.5). However, the results showed a trend of decreasing diastolic hypertension with increase in age group. Similarly, the higher the wealth quintile, the less likely a person was to have diastolic hypertension.

8.2.2 Lung function

Lung function changes with age, often as a result of decreased lung elasticity, thickening of lung tissue and reduced respiratory muscle strength. Forced vital capacity, measured through lung spirometry, is known to decline with increasing age in men and women. These changes are intensified by disease and toxic environmental exposures (smoking and air pollution). Chronic obstructive pulmonary disease (COPD) and asthma are common conditions associated with significant morbidity and mortality in older persons.

COPD severity			
Stage I: mild	**Stage II: moderate**	**Stage III: severe**	**Stage IV: very severe**
$FEV_1/FVC < 70\%$ $FEV_1 \geq 80\%$ predicted	$FEV_1/FVC < 70\%$ FEV_1 50–80% predicted	$FEV_1/FVC < 70\%$ FEV_1 30–50% predicted	$FEV_1/FVC < 70\%$ $FEV_1 < 30\%$ predicted or $FEV_1 < 50\%$ predicted plus chronic respiratory failure

		Asthma severity			
			Persistent		
		Intermittent	Mild	Moderate	Severe
5–11 years		Normal FEV_1 between exacerbations FEV_1 > 80% predicted FEV_1/FVC > 85%	FEV_1 ≥ 80% predicted FEV_1/FVC > 80%	FEV_1 = 60–80% predicted FEV_1/FVC = 75–80%	FEV_1 < 60% predicted FEV_1/FVC < 75%
12+ years	Normal FEV_1/FVC 8–19 yr 85% 20–39 yr 80% 40–59 yr 75% 60–80 yr 70%	Normal FEV_1 between exacerbations FEV_1 > 80% predicted FEV_1/FVC > normal	FEV_1 ≥ 80% predicted FEV_1/FVC normal	FEV_1 60–80% predicted FEV_1/FVC reduced 5%	FEV_1 < 60% predicted FEV_1/FVC reduced > 5%

In tables 8.6a and 8.6b below, COPD is defined using FEV1/FVC>=0.7 to represent normal function.

The patterns of COPD difficulties were variable, with moderate COPD more common in younger than older age groups, and severe/very severe COPD highest in the 80+ age group. Men had higher prevalence and greater severity of COPD than women. Urban dwellers and lower income quintiles also had higher rates. The patterns by tobacco consumption, body mass index and self-reported COPD require additional investigation: in particular, the rates of COPD by measurement in those who did not report having COPD are of concern.

The criteria for normal lung function and asthma is as follows:

- FEV1/FVC >=0.85 for 18-19 year olds;
- FEV1/FVC >=0.80 for 20-39 year olds;
- FEV1/FVC >=0.75 for 40-59 year olds; and
- FEV1/FVC >=0.70 for 60+ year olds.

Again, patterns for asthma were variable by age and SES, but with overall prevalence higher than COPD. The majority respondents with asthma, had mild asthma. Rates were higher in women than men; however, asthma in men tended to be more severe as compared to women. The patterns of asthma by tobacco consumption, body mass index and diagnosis based on symptom-reporting require additional investigation: in particular, the rates of asthma by measurement versus through symptom reporting.

8.2.3 Vision

Sensory deficits increase with age, and the impact of visual difficulties on mobility, falls, frailty, physical and mental health status are important. Individuals with vision of ≤20/70 are considered to have low vision or to be partially sighted for distance or for seeing near.

Having 20/70 vision means that one must be at 20 feet to see what a person with normal vision can see at 70 feet. Visual acuity of ≤20/70 interferes with many activities of daily living and with safe driving of an automobile (distance vision). Respondents' vision was tested as described in Chapter 2, Section 2.3.2.

Overall, about one in ten adults aged 50 years or older fell below normal levels for seeing at a distance. The level of low distant vision was higher among older people. Women were more likely than men to have low distant vision (Table 8.7). People who had completed secondary school and above were less likely to have low distant vision than those with a lower level of education. There was no significant difference in the level of distant vision between those in urban and those in rural areas.

Low near visual acuity was more common among older people than low distant vision; and more than one in three were under the normal level for near vision (Table 8.7). Levels of near vision did not vary predictably within background groups. However, the groups with particularly low risk of seeing poorly up-close included those who were separated or divorced, those who finished high school, and those who finished a postgraduate degree. The group at highest risk was those who were cohabiting.

8.2.4 Grip strength

Grip strength was measured as described above in Section 2.3.2. Overall, among adults aged 50 years or

Table 8.4 Mean systolic and diastolic blood pressures, and pulse rate, by background characteristics, South Africa, 2007–2008

Characteristic	Mean systolic pressure (mmHg)	Mean diastolic pressure (mmHg)	Mean pulse rate (BPM)	Number
Sex				
Male	144.1	96.1	76.6	1 690
Female	146.8	96.6	77.6	2 147
Age group (years)				
50–59	142.7	97.4	78.2	1 914
60–69	148.1	96.3	76.6	1 174
70+	149.3	93.9	75.3	749
Residence				
Urban	144.7	95.4	77.2	2 489
Rural	147.3	98.2	77.0	1 348
Education				
No formal education	148.9	98.0	77.7	774
Less than primary	146.1	97.3	77.5	738
Primary school completed	145.4	96.0	77.7	688
Secondary school completed	146.3	96.0	75.9	438
High school completed	139.7	92.6	76.1	260
College completed	142.6	94.0	72.4	121
Postgraduate degree completed	137.7	92.5	75.5	56
Missing	–	–	–	761
Marital status				
Never married	144.1	97.9	78.5	539
Currently married	144.8	95.5	76.3	1 901
Cohabiting	142.6	97.1	80.9	207
Separated or divorced	148.2	98.9	76.7	224
Widowed	148.0	96.4	77.5	900
Wealth quintile				
Lowest	144.1	97.5	79.5	791
Second	147.1	98.7	78.1	759
Middle	148.1	96.9	77.5	696
Fourth	144.0	94.2	75.5	757
Highest	144.9	94.5	75.2	815
Total	**145.6**	**96.4**	**77.2**	**3 836**

BPM, beats per minute

Table 8.5 Systolic, diastolic, and systolic or diastolic hypertension among adults aged 50 years or older, by background characteristics, South Africa, 2007–2008

Characteristic	Hypertension measure			Number
	Systolic (>140 mmHg)	Diastolic (>90 mmHg)	Systolic or diastolic (>140/90 mmHg)	
Age group (years)				
50–59	50.4	64.7	70.3	1 862
60–69	61.1	61.6	73.4	1 152
70+	62.4	54.7	71.3	728
Sex				
Male	53.4	61.6	70.2	1 644
Female	58.0	62.0	72.4	2 098
Residence				
Urban	54.9	59.7	70.1	2 423
Rural	58.0	65.7	73.9	1 319
Education				
No formal education	60.9	63.5	73.8	753
Less than primary	59.4	67.4	75.3	731
Primary school completed	55.9	64.1	71.7	681
Secondary school completed	54.4	59.2	70.2	431
High school completed	44.7	48.6	64.4	258
College completed	52.8	54.9	67.6	120
Postgraduate degree completed	52.3	66.9	82.5	56
Missing	–	–	–	806
Marital status				
Never married	57.2	66.6	76.6	526
Currently married	54.0	58.4	68.2	1 846
Cohabiting	55.0	64.1	69.1	206
Separated or divorced	60.9	70.4	74.9	222
Widowed	57.9	63.3	74.9	879
Wealth quintile				
Lowest	54.3	66.6	72.2	776
Second	57.2	63.7	71.5	737
Middle	60.8	63.0	73.3	686
Fourth	54.3	57.9	69.3	733
Highest	53.7	58.2	70.8	792
Total[a]	**56.0**	**61.8**	**71.4**	**3 836**

[a] Includes 97 cases for which information is not available.

Table 8.6a Distribution of COPD severity by background characteristics, South Africa, 2007–2008

	COPD severity					Total Percent	Number
	None Percent	Mild Percent	Moderate Percent	Severe Percent	Very severe Percent		
Age group							
50-59	70.3	9.0	13.1	4.5	3.1	100	1,594
60-69	73.0	8.3	11.7	4.0	2.9	100	962
70-79	75.5	6.9	11.0	5.0	1.7	100	414
80+	59.5	8.5	7.4	9.7	14.9	100	163
Total	**71.2**	**8.5**	**12.1**	**4.7**	**3.5**	**100**	**3,134**
Sex							
Male	68.9	2.7	16.0	7.3	5.2	100	1,416
Female	73.2	13.3	8.9	2.6	2.0	100	1,718
Total	**71.2**	**8.5**	**12.1**	**4.7**	**3.5**	**100**	**3,134**
Residence							
Urban	69.5	8.9	13.2	5.3	3.0	100	2,070
Rural	74.5	7.7	9.8	3.5	4.4	100	1,064
Total	**71.2**	**8.5**	**12.1**	**4.7**	**3.5**	**100**	**3,134**
Income quintile							
Lowest	63.0	11.5	15.1	4.6	5.7	100	593
Second	68.8	8.7	12.6	6.0	3.9	100	616
Middle	71.0	9.7	13.7	3.5	2.1	100	569
Fourth	80.8	5.0	8.2	4.2	1.8	100	654
Highest	71.5	8.0	11.5	5.0	4.0	100	689
Total	**71.2**	**8.5**	**12.1**	**4.7**	**3.5**	**100**	**3,121**
Tobacco use							
Current daily smoker	74.7	5.5	7.5	6.1	6.2	100	591
Smoker, not daily	80.9	3.3	8.5	6.0	1.3	100	100
Not current smoker	57.1	9.5	23.7	8.0	1.7	100	301
Never smoker	71.9	9.5	11.8	3.9	2.9	100	2,085
Total	**71.3**	**8.5**	**12.1**	**4.8**	**3.3**	**100**	**3,078**
BMI (not obese, obese)							
<30kg/m²	64.2	8.7	16.3	6.0	4.7	100	1,590
>=30kg/m²	79.1	8.6	8.0	3.0	1.2	100	1,365
Total	**71.1**	**8.6**	**12.5**	**4.6**	**3.1**	**100**	**2,955**
Self-reported COPD							
No	71.2	8.7	12.2	4.6	3.3	100	3,042
Yes	74.3	3.3	3.9	7.4	11.1	100	84
Total	**71.3**	**8.5**	**12**	**4.7**	**3.5**	**100**	**3,126**
Number	**2,232**	**266**	**379**	**147**	**109**	**3,134**	–

BMI, body mass index, FEF, forced expiratory flow; FET, forced expiratory time; FEV, forced expiratory volume

Table 8.6b Distribution of asthma severity by background characteristics, South Africa, 2007–2008

	Asthma severity				Total Percent	Number
	None Percent	Mild Percent	Moderate Percent	Severe Percent		
Age group						
50-59	10.4	54.7	17.5	17.5	100	1,245
60-69	12.7	56.0	20.9	10.4	100	797
70-79	14.0	50.8	25.1	10.1	100	355
80+	11.6	45.4	16.0	27.0	100	138
Total	**11.7**	**54.0**	**19.5**	**14.8**	**100**	**2,536**
Sex						
Male	12.4	41.9	23.3	22.3	100	1,201
Female	11.0	64.9	16.1	7.9	100	1,335
Total	**11.7**	**54.0**	**19.5**	**14.8**	**100**	**2,536**
Residence						
Urban	11.4	54.0	18.7	15.9	100	1,662
Rural	12.2	54.0	21.2	12.6	100	874
Total	**11.7**	**54.0**	**19.5**	**14.8**	**100**	**2,535**
Income quintile						
Lowest	13.5	48.0	18.2	20.3	100	440
Second	14.8	49.3	18.9	17.1	100	493
Middle	9.3	59.2	19.4	12.2	100	450
Fourth	11.5	55.2	24.2	9.0	100	557
Highest	9.3	57.7	17.0	16.0	100	584
Total	**11.6**	**54.1**	**19.6**	**14.7**	**100**	**2,524**
Tobacco use						
Current daily smoker	12.6	50.0	19.7	17.8	100	501
Smoker, not daily	16.3	47.8	24.1	11.7	100	89
Not current smoker	10.7	43.2	18.8	27.3	100	237
Never smoker	11.5	57.0	19.4	12.2	100	1,662
Total	**11.8**	**53.9**	**19.6**	**14.7**	**100**	**2,489**
BMI (Not obese, obese)						
<30kg/m²	8.8	50.4	20.2	20.6	100	1,273
>=30kg/m²	11.0	61.1	20.3	7.7	100	1,122
Total	**9.8**	**55.4**	**20.2**	**14.6**	**100**	**2,396**
Asthma (Algorithm)						
No	11.1	54.7	19.7	14.5	100	2,371
Yes	20.5	45.2	18.0	16.3	100	155
Total	**11.7**	**54.1**	**19.6**	**14.6**	**100**	**2,527**
Number	**296**	**1,369**	**496**	**374**	**2,535**	–

Table 8.7 Low visual acuity among adults aged 50 years or older, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Low visual acuity			
	Distant vision cut-off ≤20/70	Number	Near vision cut-off ≤20/70	Number
Sex				
Male	9.4	1 595	34.1	1 634
Female	12.8	2 022	36.7	2 084
Missing	–	219	–	–
Age group (years)				
50–59	8.7	1 812	32.1	1 851
60–69	12.6	1 113	39.7	1 144
70+	15.8	692	37.8	724
Missing	–	219	–	–
Residence				
Urban	11.2	2 382	35.1	2 420
Rural	11.4	1 235	36.3	1 298
Missing	–	219	–	–
Education				
No formal education	13.9	721	38.0	751
Less than primary	11.5	702	38.6	726
Primary school completed	14.1	650	34.2	672
Secondary school completed	8.7	418	32.8	426
High school completed	8.5	253	28.6	257
College completed	6.1	118	41.6	121
Postgraduate degree completed	2.7	55	7.1	55
Missing	–	919	–	828
Marital status				
Never married	11.8	503	40.5	517
Currently married	9.7	1 800	33.5	1 846
Cohabiting	6.9	201	44.0	205
Separated or divorced	14.0	212	28.8	215
Widowed	13.7	837	36.6	872
Missing	–	283	–	181
Wealth quintile				
Lowest	16.3	698	34.4	745
Second	10.6	719	37.6	742
Middle	8.3	668	36.7	687
Fourth	12.3	732	32.8	741
Highest	9.1	782	36.6	786
Missing	–	237	–	–
Total	**11.3**	**3 836**	**35.6**	**3 836**

older, mean maximum grip strength averaged 34 kg (Table 8.8). Mean maximum grip strength was higher among men than women. It was also higher among younger adults and decreased with age.

8.2.5 Mobility

Respondents' timed 4 meter walks at rapid and normal speeds were compared, as described in Section 2.3.2.

Table 8.8 Mean grip strength in kilograms among adults aged 50 years or older, by background characteristics, South Africa 2007–2008

Characteristic	Mean maximum grip strength (kg)	Number
Sex		
Male	38.5	1 690
Female	30.7	2 147
Age group (years)		
50–59	36.3	1 914
60–69	34.0	1 174
70+	29.3	749
Residence		
Urban	34.5	2 489
Rural	33.8	1 348
Education		
No formal education	–	–
Less than primary	34.9	738
Primary school completed	32.0	688
Secondary school completed	35.4	438
High school completed	37.8	260
College completed	41.4	121
Postgraduate degree completed	47.9	56
Missing	–	1 535
Marital status		
Never married	32.7	539
Currently married	36.7	1 901
Cohabiting	37.0	207
Separated or divorced	31.4	224
Widowed	29.6	900
Wealth quintile		
Lowest	32.5	791
Second	33.7	759
Middle	33.7	696
Fourth	35.3	757
Highest	35.9	815
Total	**34.3**	**3 836**

The overall mean time to cover the distance at a normal pace was 7.2 seconds, and this time varies by less than 2 seconds between demographic groups (Table 8.9). A full 2-second gap was found between those aged 50–69 years and those aged 70 years or older.

The overall mean time to cover the distance at a rapid pace was 5.4 seconds. This was less than 2 seconds faster than at normal pace. At with normal pace, a gap of about 2 seconds was found between the youngest and oldest age groups.

8.3 Blood analysis

As a means to assess individual and population health within epidemiological and health studies, self-reporting of health and health conditions balances the ease of collection with inherent biases. One problem is the difficulty of accurately measuring health. Biomarkers promise to provide a more accurate and objective measure of health risks and health conditions, which does not rely on the memory of respondents.

Use of dried blood spot (DBS) samples provides a relatively low-cost and efficient method of collecting samples in large health studies (McDade et al 2007). Information about collection techniques, consent and tests undertaken on the DBS samples is provided in Chapter 2.

8.3.1 Haemoglobin

Anaemia is difficult to assess through interview; it can be associated with non-specific complaints such as fatigue or decline in physical performance, and can have a significant effect on the quality of life of older

Table 8.9 Mean time in seconds to walk 4 metres among adults aged 50 years or older, by background characteristics, South Africa 2007–2008

Characteristic	Mean time in seconds		Number
	Normal walking pace	Rapid walking pace	
Sex			
Male	7.0	5.3	1 690
Female	7.4	5.4	2 147
Age group (years)			
50–59	6.8	4.9	1 914
60–69	6.9	5.4	1 174
70+	8.9	6.6	749
Residence			
Urban	7.6	5.9	2 489
Rural	6.5	4.4	1 348
Marital status			
Never married	7.7	5.4	539
Currently married	7.2	5.3	1 901
Cohabiting	6.2	4.7	207
Separated or divorced	6.4	4.6	224
Widowed	7.3	5.9	900
Wealth quintiles			
Lowest	7.0	5.1	791
Second	6.8	5.6	759
Middle	8.0	6.3	696
Fourth	7.2	4.8	757
Highest	7.3	5.1	815
Total	**7.2**	**5.4**	**3 836**

Table 8.10 Percentage with high risk haemoglobin and glycosylated haemoglobin levels, by background characteristics

Characteristic	High risk Hgb	N	High risk HbA1c(%)	N
Sex				
Male	87.2	1194/1369	69.3	1134/1637
Female	86.8	1580/1821	66.8	1472/2203
Age group (years)				
50–59	86.8	1214/1398	68.7	1164/1695
60–69	85.3	884/1036	67.5	832/1232
70+	–	678/758	66.9	612/915
Residence				
Urban	87.4	1762/2016	70.2	1797/2561
Rural	86.2	1009/1171	63.2	807/1276
Marital status				
Never married	87.4	353/404	69.0	353/512
Currently married	86.4	1297/1501	67.2	1215/1808
Cohabiting	88.4	152/172	63.3	126/199
Separated or divorced	87.9	175/199	74.8	172/230
Widowed	87.7	746/851	67.8	692/1020
Wealth quintiles				
Lowest	85.1	516/606	67.5	492/729
Second	85.2	530/622	68.3	514/753
Middle	88.0	536/609	66.2	484/731
Fourth	87.2	570/654	66.2	524/792
Highest	88.9	605/682	71.2	581/816
Self-reported diabetes mellitus				
Yes	–	–	58.4	167/286
No	–	–	61.6	1876/3047

Hgb, haemoglobin; HbA1c, glycosylated haemoglobin – high risk is defined as >7%.

individuals (Fomovska et al 2008). Haemoglobin levels can be used to assess levels of anaemia, because the condition is associated with a low level of haemoglobin.

Anaemia is associated with an increased risk of cardiovascular disease, cognitive dysfunction and poor outcomes in many chronic diseases. Among the older population, anaemia can be an independent risk factor for death.

8.3.2 Glycosylated haemoglobin

HbA_{1c} is formed by binding of circulating glucose to haemoglobin; higher levels of glucose in the blood contribute to more binding and consequently to higher levels of HbA_{1c}. It is a more comprehensive measure of blood sugar levels than fasting blood glucose, because it measures exposure to glucose over the entire 90–120 day life span of the red blood cell.

High HbA_{1c} concentrations are associated with microvascular and macrovascular complications of diabetes, risk of death and CVD. An HbA_{1c} level of <6% is considered normal. WHO formally accepted HbA_{1c} as a test for diagnosing diabetes mellitus in 2011 (WHO 2011). For this report, HbA_{1c} of 7% or higher is used as a lower threshold for higher risk of complications due to diabetes. A higher percentage of men and urban dwellers had high-risk HbA_{1c} levels. Similarly, a higher percentage of respondents

Table 8.11 HIV status and Epstein-Barr virus levels, by background characteristics

Characteristic	Weighted HIV+ prevalence	Unweighted N HIV+/Total N	Mean EBV	N
Sex				
Male	4.9%	56/1188	2.87	1469
Female	7.5%	91/1681	2.85	1952
Age group (years)				
50–59	8.6%	96/1224	2.87	1362
60–69	5.0%	35/944	2.92	1000
70+	3.3%	16/701	2.85	535
Residence				
Urban	5.5%	85/1816	2.86	2169
Rural	7.9%	62/1052	2.86	1249
Marital status				
Never married/ Currently married/ cohabiting/separated/divorced	4.6%	61/1469	–	–
Widowed	8.4%	82/1356	–	–
Wealth quintiles				
Lowest	9.2%	42/595	2.93	663
Second	5.2%	29/610	2.94	671
Middle	8.0%	37/575	2.85	646
Fourth	7.7%	33/566	2.82	696
Highest	0.7%	5/514	2.78	726

HIV, human immunodeficiency virus; EBV, Epstein-Barr virus

who reported not having diabetes had high-risk glycosylated haemoglobin levels. This could indicate poor identification of diabetes in the general older adult population or poor understanding of the condition, although the percentage at high risk did not differ much from those who reported having diabetes. This could indicate poor treatment of the condition or poor adherence to prescribed therapies.

8.3.3 HIV status

Older adults are often sexually active and are thus open to infection with HIV. Also, older adults often play a critical role as caregivers in households, families and communities – another possible source of infection when care is provided to people who are infected with HIV. Nevertheless, little is known about rates of HIV infection in older adults. Generally, there is little data on HIV infection in people aged 50 years or older around the world; the few studies that have been undertaken among older adults were mainly undertaken in developed countries (Negin and Cumming 2010). Due to individual and systematic factors, older adults are less likely to be tested for HIV (Negin et al 2011). SAGE Wave 1 in South Africa will provide much needed prevalence data on rates of HIV infection in older adults.

The prevalence of HIV+ status was higher in women than men in this sample (Table 8.11). It was also higher in rural dwelling and the poorest respondents. A gradient was seen by age, with as much as 3.3% of those aged 70-plus HIV-positive. These rates are comparable with other published results in South Africa for adults aged 50 years and older (Shisana, et al. 2005; Shisana, et al. 2008; Negin and Cumming 2010).

8.3.4 Epstein-Barr virus

EBV is a member of the herpes virus family, infecting about 90% of the world's population (Mihai et al 2008). Infection is lifelong, but usually remains asymptomatic. Elevated levels of antibodies to EBV indicate lower func-

tioning of parts of the immune system, and have been linked to psychosocial stress. Compromised immunity due to any factor (including immunosenescence) also increases the risk for pathological EBV infection. In SAGE Wave 1, EBV was measured to assess levels of chronic infectious diseases, and the resulting impact on immune systems and contributions to other chronic conditions.

The results of EBV exposure by sociodemographic variables provide an insight into the basic distribution, but not into the true value of EBV as a marker for the impact of chronic infectious disease. Eight percent of the population were EBV negative (296/3717) with a non-significant difference between urban and rural dwellers. Of those who were EBV positive, the mean was 2.86 with a range between 0.125 and 5.964. Table 8.11 shows minimal or no difference in mean EBV by sex, age or residence, but a slight decline in mean EBV with increasing income quintile. A more revealing result into the value of EBV is by looking at respondents with an immune-modulating condition - HIV-positive respondents had a mean EBV of 3.54 and HIV-negative respondents a mean of 2.81 (data not shown). EBV status will be used as a co-variate in future analyses into differences in health outcomes and wellbeing.

9. Health-care use and health system responsiveness

This section describes respondents' health-care use and associated costs, and the responsiveness of the health-care system. Health-care use is differentiated here in terms of inpatient and outpatient services, and results are presented by selected background characteristics.

The performance of the general health-care system at the national level was evaluated using indicators of health-care responsiveness, including seven domains of interpersonal dimensions of quality of care: dignity, confidentiality, prompt attention, autonomy, quality, access and communication.

9.1 Health service use

Table 9.1 presents the distribution of adults aged 50 years or older who needed health-care services within the past 3 years or more than 3 years ago. The table also shows the proportion that received health care among those who needed health-care services within the past 3 years.

Overall, 76% of adults needed health care in the past 3 years; this level did not differ significantly between men and women. Among those needing health-care services, there was a moderate increase through age 70-79. Among those who needed services in the past 3 years, more than half received outpatient care and about a third received no care.

Among those needing inpatient care, the highest proportions of those who received it (about 20%) were employed in the public sector and in the highest wealth quintiles, while the lowest proportion (about 6%) were never married, in the lowest wealth quintiles and either informally employed, unemployed or retired.

Those least likely to receive health care when they need it (almost 50%, compared to 33% of the overall average) were cohabiting and self-employed adults.

9.1.1 Inpatient care

Table 9.2 shows that 20% of respondents who received inpatient care in the past 3 years received care for a non-communicable condition, only 2% for an acute condition and 45% for some other condition. The percentage needing hospitalization for chronic conditions increased with increasing age and increasing wealth, and was higher in urban areas than rural areas.

9.1.2 Outpatient care

Outpatient care needs were higher than inpatient care needs. Table 9.3 shows that more than half of respondents who received outpatient care in the last 12 months received care for a chronic NCD condition, and only about a tenth received care for an acute condition. The care needs for chronic conditions were higher in women and in urban dwellers, and tended to increase with age. The percentage needing care for acute diseases was higher in men and rural residents.

9.2 Health insurance coverage

Health insurance coverage in older adults was generally low, with 80% having no coverage (Table 9.4). Eight per cent had mandatory insurance coverage, 9% had voluntary insurance and just 4% had both types of health insurance. Without insurance, the risk of catastrophic expenditures is high (as outlined in Chapter 4), and poses a considerable risk for financially vulnerable older people on a fixed income.

Table 9.1 Need for health care among adults aged 50 years or older, and type of care received among those needing health care in the past 3 years, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Needed health care			Health care received in the past 3 years				
	>3 years ago	<3 years ago	Never needed	N[a]	Inpatient care[b]	Out-patient care	Did not receive health care	N
Sex								
Male	24.2	75.3	0.5	1 576	12.0	49.9	38.1	1 298
Female	22.7	76.3	1.0	2 017	11.3	59.4	29.2	1 661
Missing	–	–	–	243	–	–	–	–
Age group (years)								
50–59	26.6	72.8	0.6	1 786	11.6	50.9	37.4	1 423
60–69	22.7	76.5	0.8	1 106	10.5	60.0	29.5	911
70–79	14.6	84.2	1.2	501	12.6	60.8	26.7	457
80+	20.4	78.7	0.9	200	15.3	51.1	33.6	168
Missing	–	–	–	243	–	–	–	–
Residence								
Urban	20.9	78.4	0.7	2 351	13.4	53.3	33.3	1 989
Rural	28.0	71.0	1.0	1 241	8.0	59.0	33.0	969
Missing	–	–	–	244	–	–	–	–
Marital status								
Never married	29.1	70.7	0.2	502	6.3	59.7	34.0	386
Currently married	20.8	78.7	0.5	1 785	13.3	52.6	34.1	1 515
Cohabiting	41.7	57.7	0.6	190	16.5	36.1	47.4	129
Separated or divorced	20.8	77.1	2.1	209	7.8	57.8	34.4	175
Widowed	21.3	77.3	1.4	842	10.7	61.8	27.5	701
Missing	–	–	–	308	–	–	–	–
Wealth quintiles								
Lowest	28.6	70.7	0.7	716	6.3	57.5	36.2	550
Second	27.4	71.6	1.0	717	10.1	52.8	37.2	557
Middle	23.3	75.5	1.2	666	10.2	56.4	33.4	544
Fourth	17.9	81.2	1.0	715	9.9	60.7	29.4	619
Highest	19.8	80.1	0.2	764	19.9	49.9	30.2	675
Missing	–	–	–	258	–	–	–	–
Employment status								
Public sector	19.3	79.6	1.1	551	21.1	52.1	26.8	470
Private sector	22.3	77.0	0.7	1 674	9.4	52.6	37.9	1 409
Self employed	22.9	76.6	0.5	125	8.5	42.7	48.9	103
Informal employment Not employed Retired	33.8	65.1	1.2	649	6.0	59.0	35.0	467
Missing	–	–	–	837	–	–	–	–
Total %	**23.3**	**75.6**	**0.8**	**–**	**11.6**	**55.0**	**33.0**	**–**
Total N[a]	**839**	**2 725**	**28**	**3 836**	**344**	**1 635**	**980**	**2 959**

[a] Number includes 244 cases for which information was missing on whether health care was needed.

[b] Inpatient care also includes persons who received inpatient and outpatient care.

Table 9.2 Type of condition for which inpatient care was obtained among adults aged 50 years or older who received care in the previous 12 months, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Chronic non-communicable condition	Acute condition	Other	Total	Number
Sex					
Male	34.8	3.3	61.9	100.0	92
Female	27.8	1.7	70.6	100.0	137
Missing	–	–	–	–	115
Age group (years)					
50–59	21.0	3.0	76.0	100.0	106
60–69	23.9	2.0	74.1	100.0	59
70–79	44.6	1.0	54.4	100.0	44
80+	71.6	2.7	25.7	100.0	20
Missing	–	–	–	–	115
Residence					
Urban	35.8	0.4	63.9	100.0	175
Rural	14.0	9.0	77.0	100.0	54
Missing	–	–	–	–	115
Marital status					
Never married	10.8	2.7	86.6	100.0	20
Currently married	34.3	0.6	65.1	100.0	134
Cohabiting	8.6	0	91.4	100.0	11
Separated or divorced	11.1	0	89.0	100.0	14
Widowed	40.9	8.1	51.0	100.0	49
Missing	–	–	–	–	116
Wealth quintiles					
Lowest	5.7	10.3	84.0	100.0	23
Second	19.4	2.7	78.0	100.0	29
Middle	27.1	2.9	70.0	100.0	45
Fourth	36.1	2.2	61.8	100.0	36
Highest	40.1	0	59.9	100.0	94
Missing	–	–	–	–	117
Total %	**20.3**	**1.5**	**44.5**	**66.3**	–
Total N[a]	**70**	**5**	**153**	**344**	

[a] Total does not include 116 people who received inpatient care.

9.3 Health system responsiveness

The Department of Health's strategic framework for 2002–2004 identified improvements in quality of care as one of the four key challenges currently facing the health sector in South Africa (DPSA 1997). Quality of care is concerned with the interface between provider and patients, and between health services and community. A quality perspective changes the focus of development of health systems from establishing structures to addressing what happens in the structures. Improving quality can, therefore, be regarded as a second phase of health-care transformation in South Africa, concerned with ensuring quality of service delivery. The first phase of transformation was concerned with creating coherent health-care structures (DPSA 1997).

Table 9.3 Type of condition for which outpatient care was obtained among adults aged 50 years or older who received care in the previous 12 months, per cent distribution by background characteristics, South Africa, 2007–2008

Characteristic	Chronic non-communicable condition	Acute condition	Other	Total	Number
Sex					
Male	55.1	10.6	34.3	100.0	721
Female	60.5	9.1	30.4	100.0	1 110
Age group (years)					
50–59	53.1	11.4	35.4	100.0	824
60–69	61.1	7.9	31.0	100.0	598
70–79	67.0	9.1	23.9	100.0	319
80+	57.1	8.6	34.3	100.0	91
Residence					
Urban	60.6	9.0	30.5	100.0	1 215
Rural	54.0	11.0	35.0	100.0	615
Marital status					
Never married	57.6	7.9	34.6	100.0	244
Currently married	60.5	8.4	31.1	100.0	900
Cohabiting	58.7	16.5	24.8	100.0	65
Separated or divorced	48.4	13.0	38.6	100.0	111
Widowed	57.6	11.3	31.1	100.0	480
Wealth quintiles					
Lowest	56.9	7.4	35.8	100.0	325
Second	53.0	12.8	34.2	100.0	328
Middle	57.8	8.9	33.3	100.0	347
Fourth	62.4	9.4	28.2	100.0	412
Highest	60.2	10.3	29.5	100.0	413
Total	**58.4**	**9.7**	**31.9**	**100.0**	**1 832**

Table 9.4 Percentage of respondents with health insurance coverage (mandatory, voluntary, both and none), by background characteristics, South Africa, 2007–2008

Characteristic	Mandatory	Voluntary	Mandatory and voluntary	None	Number
Residence					
Urban	11.3	10.0	4.7	74.0	2 415
Rural	2.7	6.0	1.7	89.6	1 306
Wealth quintiles					
Lowest	2.6	6.3	2.9	88.2	764
Second	5.7	6.0	3.6	84.8	745
Middle	4.5	7.1	2.2	86.2	671
Fourth	6.3	7.3	3.6	82.8	736
Highest	21.7	15.6	5.7	57.0	790
Total %	**8.3**	**8.6**	**3.7**	**79.5**	**100**
Total N	**310**	**318**	**135**	**2 959**	**3 722**

Health system responsiveness scores quantify the way health systems treat people with regard to core domains (see text box below). These domains, which characterize people's interactions with health systems, can be used to monitor the performance of the health care system (Kowal 2011).

Group	Domain	Issue
Interpersonal	Dignity	Talked respectfully Privacy
	Communication	Clear explanations Time for questions
	Autonomy	Treatment information Patient involvement
	Confidentiality	Talk privately Confidentiality of records
Structural	Choice of health care provider	Choice of provider
	Quality of basic amenities	Cleanliness Space
	Access to support	Family visit External contact
	Prompt attention	Travel time Waiting time

Table 9.5 Mean health-care responsiveness scores for seven domains for adults aged 50 years or older who received inpatient care, by background characteristics, South Africa, 2007–2008

Characteristic	Dignity	Confidentiality	Prompt attention	Autonomy	Quality	Access	Communication	Overall
Sex								
Male	73	72	67	65	71	68	67	63
Female	75	77	69	65	78	75	72	68
Age group (years)								
50–59	74	75	64	64	75	72	67	64
60–69	69	74	69	61	68	72	69	63
70–79	80	75	74	70	81	72	76	71
80+	73	73	74	73	74	72	74	67
Residence								
Urban	73	74	68	66	72	71	69	65
Rural	77	78	69	61	83	75	70	69
Marital status								
Never married	70	72	64	63	83	68	66	64
Currently married	75	75	71	66	75	73	72	67
Cohabiting	73	79	43	59	73	77	53	59
Separated or divorced	73	78	71	70	71	71	74	67
Widowed	72	73	71	66	72	67	69	63
Wealth quintiles								
Lowest	55	65	47	51	68	48	56	45
Second	69	73	52	58	68	69	56	58
Middle	76	70	73	58	79	70	69	66
Fourth	73	73	67	69	69	67	72	64
Highest	79	81	77	72	79	81	77	74
Total	**74**	**75**	**68**	**65**	**75**	**72**	**70**	**66**

Table 9.6 Mean health-care responsiveness scores for seven domains for adults aged 50 years or older who received outpatient care, by background characteristics, South Africa, 2007–2008

Characteristic	Dignity	Confidentiality	Prompt attention	Autonomy	Quality	Access	Communication	Overall
Sex								
Male	73	72.4	60.5	68.1	77.0	70.9	72.4	66.8
Female	70	70.8	56.8	65.5	74.1	68.2	69.4	63.7
Age group (years)								
50–59	69.6	71.5	54.8	66.6	75.8	69.2	71.0	64.7
60–69	71.4	71.0	60.7	65.8	75.0	69.6	69.7	64.8
70–79	72.8	72.2	62.5	67.9	74.5	69.3	71.5	66.1
80+	73.4	70.3	59.0	66.5	74.8	67.1	69.4	64.7
Residence								
Urban	71.0	72.3	58.1	67.0	76.9	69.7	70.7	65.4
Rural	70.8	69.7	58.7	65.7	72.1	68.5	70.5	64.1
Marital status								
Never married	66.4	66.2	51.7	64.9	69.2	65.8	67.4	60.3
Currently married	72.6	72.6	60.8	67.6	77.0	71.3	72.3	66.9
Cohabiting	72.4	73.7	45.4	67.3	78.3	68.1	73.1	65.8
Separated or divorced	68.9	74.0	61.0	64.3	76.0	69.9	64.2	63.4
Widowed	70.9.	71.2	58.3	66.3	74.2	67.7	70.4	64.3
Wealth quintiles								
Lowest	66.7	66.7	55.8	62.0	70.9	63.1	66.8	59.6
Second	68.1	70.2	52.7	64.9	72.5	66.7	67.7	62.1
Middle	66.6	67.7	55.7	61.6	72.1	66.4	65.6	60.2
Fourth	72.5	73.1	56.0	67.6	77.4	71.1	73.3	67.0
Highest	78.4	77.5	68.8	74.4	81.2	76.6	77.1	73.3
Total	**70.9**	**71.4**	**58.3**	**66.6**	**75.3**	**69.3**	**70.6**	**64.9**

Responsiveness relates to patients' experiences with the health system, with a focus on the interpersonal aspects of the care; it differs from patient satisfaction – a construct that reflects people's expectations in addition to their experiences. For each of the items, the degree of responsiveness was estimated by the percentage of "good" or "very good" answers, and the percentage of positive answers to other dichotomous variables (yes or no).

Results are presented by different population groups within the country expressed on a range from 0 (lowest responsiveness) to 100 (highest responsiveness) (Table 9.5). A description of each of the responsiveness domains is available in the text box above and in Kowal et al. (2011).

According to the evaluation of inpatient care (Table 9.5), autonomy and prompt attention showed the lowest degree of responsiveness among all the areas analysed. The aspects related to confidentiality, quality and dignity had the highest responsiveness scores. Overall, health-care responsiveness appeared to increase with increasing wealth of respondents.

According to the evaluation of outpatient care (Table 9.6), prompt attention showed the lowest degree of responsiveness among all the areas analysed, and the aspects related to quality, confidentiality, dignity and communication had the highest responsiveness scores. Overall, health-care responsiveness appeared to increase with increasing wealth of participants.

Overall health-care responsiveness was 66 for inpatient care and 65 for outpatient care. This result is similar to a previous study among the adult population in South Africa (68 for inpatients and 67 for outpatients) (Peltzer 2009); however, the responsiveness was much lower than for Brazil (80 for outpatients and 76 for inpatients), and for Israel and 14 European countries (81 and higher) for both outpatient and inpatient care (Valentine et al 2003; Gouveia et al 2005; Goldwag and Rosen 2007). The sequential cross-sectional data from South Africa (Peltzer used World Health Survey/SAGE Wave 0 data for the 2009 publication) suggest declining responsiveness over time.

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. The call for governments to focus on the well-being of their population as a means of measuring progress has meant that the science of well-being has become mainstream in health and social policy (Beddington et al 2008; Stiglitz et al 2009). However, the science is still nascent, and controversies abound with regard to conceptualization, measurement and translation of findings into interventions at the individual and population level.

Nonetheless, some preliminary findings are intriguing. For example, analysis of data from the German Socio-economic Panel survey shows that, after controlling for initial health conditions, happiness extends life expectancy. A 10% increase in happiness decreases the probability of death by 4%. In chronically ill people, happiness helps to decrease mortality, and seems to offset the negative impact of chronic illness. Marriage also decreases mortality, possibly by increasing happiness. However, life circumstances, by and large, seem to affect happiness only temporarily, and individuals soon return close to their baseline levels of happiness. This finding suggests that individuals may have a "set-point" for happiness (their temperament) which, in turn, may be under some form of genetic control. The effects of life circumstances such as health, wealth and marital status on well-being are modest, whereas the effects of unemployment have substantial and consistently negative effects on well-being. Social status also appears to affect well-being, but many questions remain about the measurement of well-being and its determinants, such as age, income and health.

The relationship between subjective well-being and ageing is unclear. Individual aspirations and adaptations to circumstances of health and life influence happiness over the course of life. 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 subjective well-being, depending on the cultural context. The effect of ageing 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 – among the English-speaking high-income countries, the relationship is U-shaped (Deaton 2008).

Understanding differences in the well-being of older adults across and within countries will have significant implications for national policies. 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 activities, and changes in these over time, will need to be tracked along with their health and its determinants to inform all aspects of policy-making. Estimates of national well-being (and inequalities within nations) will make it possible to assess how policies affect people's lives, and perhaps to allocate resources more appropriately. 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 subjective well-being can thus be separated into experienced happiness (the affective experiences of daily life) and evaluative life satisfaction. Experienced happiness fluctuates from day-to-day, depending on how people use their time. SAGE used the Day Reconstruction Method (DRM) to measure this component of subjective well-being (Kahneman et al 2004).

Evaluative 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 (for instance, from week to week).

In SAGE, the DRM, developed with Dr Kahneman, was used for measuring experienced well-being (happiness) and the eight-item WHOQoL for measuring evaluative well-being (Power 2003; Kahneman et al 2004).

The DRM results showed that people were more likely to spend larger portions of their day in a positive emotional state (Figure 10.1). Consistent with many reports of happiness, duration-weighted (that is, the amount of time in a day) net affect was lowest in the middle ages from 40-44 to about 55-59 years, with more positive overall experienced well-being in earlier and later adulthood. Negative affect does not imply lack of positive affect, nor the reverse, but was shown to be more consistent over all age groups than positive affect. Positive affect seemed lowest in the late-30s to early-40s, followed by a slow increase through older ages. Experienced well-being adds information to the WHOQoL life satisfaction when assessing impact on health.

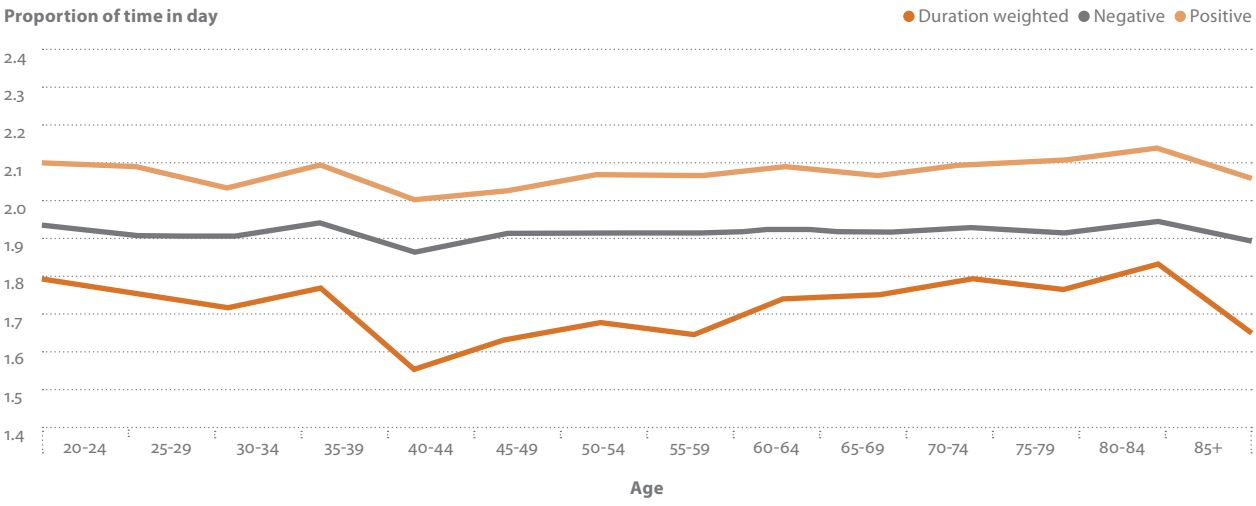
10.1 Happiness and well-being

Experienced happiness is often measured using the experience sampling method (ESM), a gold-standard technique in which respondents are prompted at random intervals to record their feelings and activities (Csikszentmihalyi and Larson 1987; Stone et al 1999). The DRM, which combines experiential and time-use assessments, is a reasonable approximation of the ESM technique. The methodology of the DRM 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.

10.2 Quality of life and satisfaction

WHO has defined quality of life 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 quality of life is a matter of the individual's perception of the life that he or she is leading. In SAGE, the WHOQoL instrument was used to measure evaluative well-being. A shortened version of the full WHOQoL instrument, the WHOQoL-8, was used in this survey. WHOQoL scores range from 0 to 100, but in contrast to the other composite scores presented earlier, a higher score indicates poorer self-reported quality of life.

Figure 10.1 Positive, negative and duration-weighted net affect, from the Day Reconstruction Method, by age groups



Source: SAGE 2007-2010

Table 10.1 Mean WHOQoL scores among adults aged 50 years or older, by background characteristics

Characteristic	Mean WHOQoL score	Number
Sex		
Male	49.1	1 690
Female	51.5	2 147
Age group (years)		
50–59	49.8	1 914
60–69	51.2	1 174
70+	51.0	749
Residence		
Urban	49.2	2 489
Rural	52.7	1 348
Education		
No formal education	53.9	774
Less than primary	53.5	738
Primary school completed	53.0	688
Secondary school completed	47.3	438
High school completed	44.0	260
College completed	43.5	121
Postgraduate degree completed	40.9	56
Marital status		
Never married	53.2	539
Currently married	47.9	1 901
Cohabiting	53.8	207
Separated or divorced	53.6	224
Widowed	52.6	900
Don't know	51.3	65
Wealth quintile		
Lowest	55.8	791
Second	53.8	759
Middle	52.3	696
Fourth	48.7	757
Highest	42.5	815
Total number	**50.5**	**3 836**

WHOQoL, World Health Organization Quality of Life

WHOQoL was developed through a collaborative effort between international partners, including developed- and developing-country contexts. It has been used in many different study populations, including a special adaptation for older adults as part of a study funded by the European Commission (Power et al 2005). WHOQoL places primary importance on the individual and his or her perception of quality of life. The tool's well-established psychometric properties, including an eight-item short version, have been shown to have good cross-cultural performance (Power 2003; Power et al 2005).

As shown in Figure 6.1, the overall mean score for adults aged 50 years or older in South Africa remains relatively constant over the different age groups. Women had slightly worse evaluative well-being than men, and rural worse than urban dwellers. Clearer patterns were evident by socioeconomic status, with worse well-being reported in lower levels of wealth and education. Currently married respondents reported better well-being than all other marital status groups.

The combined experienced and evaluative well-being of older South Africans suggests considerable resilience in dealing with life events and the ability to maintain levels of well-being into older ages. These data can contribute to ongoing efforts to develop National Well-Being Accounts and Gross National Happiness (instead of GDP) as alternative economic measures (see for example, Stiglitz J et al. http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf and UN High Level Meeting on "Happiness and Well Being: Defining a New Economic Paradigm" on 2nd April 2012 at the United Nations headquarters in New York, http://www.2apr.gov.bt/images/stories/coredoc/highlevelmeeting.pdf).

11. Emerging policy issues

The preceding chapters set out the aims, methods and findings of the SAGE survey. This chapter considers examples of issues arising from the major findings that are important for policies within South Africa and beyond.

A number of policies at an international, regional (African) and national level address ageing, and many of these policies refer to the importance of health and well-being in the older sectors of society. The importance lies partly with the individual and partly with the health systems of countries, and of South Africa in particular.

It is crucial to maintain the good health and well-being of individuals as they age. Thus, the needs of older people must be understood and taken into account in developing and implementing policies. The corollary to ageing populations and maintaining a good level of health and well-being is the provision of effective and accessible health-care services that meet the needs of older people.

Here, the findings from SAGE are discussed in relation to ensuring health and well-being through service provision, and acting as indicators for monitoring and evaluating both individual health and well-being, and systems for health-care provision.

11.1 Madrid International Plan of Ageing

The Madrid International Plan of Ageing was presented to the United Nations (UN) Assembly in 2002 (UN 2002). It reported progress over the preceding 20 years in implementing the Vienna Plan of Action on Ageing as part of the UN's social development platform. The Madrid Plan lists the different areas of concern that should be addressed to meet the needs of older people. These are presented in Box 11.1, below.

The African Union produced a companion document: the African Union Policy Framework and Plan of Action on Ageing.[11] This document was approved by the 38th Ordinary Session of the Assembly of Heads of State and Government in Durban, South Africa, in July 2002. It operationalizes the Madrid Plan for African countries and governments. SAGE provides data for monitoring the implementation of the Madrid Plan and the African Union Framework and Plan. The UN plans to review the Madrid Plan in the next few years – along with HelpAge International's continuing work with "citizens monitoring groups" – to monitor the uptake by governments.[12]

The SAGE findings provide a baseline against which to monitor the different aspects presented in Box 11.1. Further rounds of SAGE data collection will allow for an analysis of trends in the realization of the rights of older persons, as shown by the following examples:

- In terms of risk factors, the trend should show no increase or lowered rates of smoking and alcohol consumption, and increased rates of physical activity, especially by women and those living in urban areas and in the lower wealth quintiles. Policies should thus promote healthy eating habits, cessation in smoking and harmful alcohol intake, and increased physical activity.
- The level of health measured in the health examination component of SAGE suggests a high prevalence of obesity, especially in urban areas, associated with a high prevalence of hypertension. These results suggest the need for health promotion and adequate health-care services to manage these conditions. Trends should show a decrease in the proportion of the population with these negative markers.

11 Available at http://pfcmc.com/ageing/documents/implementation/AUFrameworkBook.pdf

12 Available at http://www.helpage.org/

Box 11.1 Madrid International Plan on Ageing, 2002

A. Advancing health and well-being into old age
1. Health promotion and well-being throughout life
● Reduction of the cumulative effects of factors that increase the risk of disease and consequently potential dependence in older age.
● Development of policies to prevent ill-health among older persons.
● Access to food and adequate nutrition for all older persons.
2. Universal and equal access to health-care services
● Elimination of social and economic inequalities based on age, gender or any other ground, including linguistic barriers, to ensure that older persons have universal and equal access to health care.
● Development and strengthening of primary health-care services to meet the needs of older persons.
3. Older persons and HIV/AIDS
● Improvement in the assessment of the impact of HIV/AIDS on the health of older persons, both for those who are infected and those who are caregivers for infected or surviving family members.
● Provision of adequate information, training in caregiving skills, treatment, medical care and social support to older persons living with HIV/AIDS and their caregivers.
● Enhancement and recognition of the contribution of older persons to development in their role as caregivers for children with chronic diseases, including HIV/AIDS, and as surrogate parents.
4. Training of care providers and health professionals
● Provision of improved information and training for health professionals and para-professionals on the needs of older persons.
5. Mental health needs of older persons
● Development of comprehensive mental health-care services ranging from prevention to early intervention, the provision of treatment services and the management of mental health problems in older persons.
6. Older persons and disabilities
● Maintenance of maximum functional capacity throughout the life course and promotion of the full participation of older persons with disabilities.
B. Ensuring enabling and supportive environments
7. Housing and the living environment
● Promotion of "ageing in place" in the community with due regard to individual preferences and affordable housing options for older persons.
● Improvement in housing and environmental design to promote independent living by taking into account the needs of older persons in particular those with disabilities.
● Improved availability of accessible and affordable transportation for older persons.
8. Care and support for caregivers
● Provision of a continuum of care and services for older persons from various sources and support for caregivers.
● Support the caregiving role of older persons, particularly older women.
9. Neglect, abuse and violence
● Elimination of all forms of neglect, abuse and violence of older persons.
● Creation of support services to address elder abuse.
10. Images of ageing
● Enhancement of public recognition of the authority, wisdom, productivity and other important contributions of older persons.

Thus, the policy imperatives set out in the Madrid Plan remain pertinent in the areas that require attention. The following sections consider the South African context.

11.2 Improved access to primary health-care services

For many decades, the vast majority of the South African population was denied access to adequate health-care services. In 1994, the democratic government inherited a highly fragmented health sector. Since then, the transformation of health services to redress inequalities in health status has been a high priority for the government. The legal situation with regard to health services summarized in Section 27 of the *Constitution of South Africa* (1996) states that

> "Everyone has the right of access to health care services . . . and no one may be refused emergency medical treatment."

Primary health care is free to all older people. The primary health-care package includes prevention and the treatment of conditions or diseases of older people. Specific responsibilities of primary health care include:

- identification of older people with common chronic conditions or diseases associated with ageing;
- identification of older people at risk;
- health promotion activities;
- case management, including therapeutic education, emergency care, management of referrals from other levels of care and, where facilities allow, treatment of certain conditions;
- pharmaceutical services for common chronic conditions;
- liaison with community-based organizations dealing with older people.

11.2.1 Protection of human rights

The *Constitution of South Africa* (1996) contains a Bill of Rights, which is the cornerstone of democracy in the country. Some of the provisions in the Bill of Rights, which are of particular relevance to older people, include:

- equality before the law;
- prohibition against unfair discrimination on the grounds of race, gender, sex, age, marital status, ethnic or social origin, colour, sexual orientation, disability, religion, conscience, belief, culture and language;
- right to have dignity respected and protected;
- freedom from all forms of violence;
- right to bodily and psychological integrity;
- protection against arbitrary deprivation of property;
- right to access to adequate housing;
- right to access to food, water and social security.

The National Department of Health (NDOH) produced the *Patients' Rights Charter* in 1999 as a common standard for achieving the realization of health rights under the *Constitution of South Africa* (1996). The NDOH has also produced a range of health promotion policies and guidelines. Some of these are specific to older people, while others are inclusive of older people.

11.2.2 Protection of the welfare of older persons

The Aged Persons Act 1967 provides for the protection and welfare of certain older and disabled people, for the care of their interests, for the establishment and registration of certain institutions, and for the accommodation and care of such people in such institutions. The Act was amended a number of times before April 1994. Further amendments were made in November 1994; for example, to repeal certain discriminatory provisions. In November 1998, further amendments were made to provide for the establishment of representative management committees for homes for the aged, to require reporting on the abuse of aged people, and to regulate the prevention of the abuse of aged people. The NDOH is currently drafting a bill on the status of older people.

11.2.3 Economic security for the elderly

The Social Assistance Act 1992 (South Africa 1992) provides for the payment of social grants (social security) to South African citizens with limited means. This is a non-contributory scheme and is thus fully funded by the state. Older people are eligible for the old-age grant from the age of 60 years, although until recently men were only eligible from 65 years of age. A disability grant is payable to disabled adults, but when a disabled person reaches the age of 60 years, the disability grant is automatically changed to an old-age grant. An older person who becomes disabled after the age of 60 years is eligible only for the old-age grant, not the disability grant.

11.2.4 Housing security for the elderly

The Rental Housing Act 1999 protects older people from discrimination and unfair practices in the leasing of property. Violations of the Act are to be reported to the Rental Housing Tribunal.

11.2.5 Protection of elderly people from abuse

The Domestic Violence Act 1998 requires the South African Police Service or relevant authority to intervene in cases of suspected abuse. The Act provides for the issuing of protective orders on behalf of the abused person. The abuser may be arrested or removed from the household.

11.2.6 Health promotion policies and guidelines

The NDOH has produced a range of health promotion policies and guidelines, some specific to older people

and others inclusive of older people. These are summarized in Table 11.1, below.

11.3 Emerging research issues

The ageing of individuals and populations, and the changing position and well-being of older people in SSA in general, and in South Africa in particular, present key challenges for African countries. A strong knowledge base of information is needed to inform the development of appropriate policies and programmes. Five key areas of research – all closely interrelated – emerge as essential to understanding the situation of older people in South Africa, and will be necessary precursors to the development of sound ageing policy in the country. These research areas are:

- income, wealth, and expenditure;
- health and well-being;
- the nature of family support and social networks;
- the changing roles and responsibilities of older people as a function of the AIDS crisis;
- the nature and role of various types of formal and informal social protection scheme.

Each of these areas is discussed below.

11.3.1 Income, wealth and expenditure

Measuring individual or household income in SSA is challenging, particularly in communities in which a significant fraction of the population is still engaged in subsistence agriculture. In most surveys of income and expenditure, rates of non-response to questions related to earnings tend to be high and non-random. Also, sources of income that are infrequent (such as crops that are harvested only in periods of drought, or cash remittances from distant family members) can easily be overlooked or underreported. Further compounding these measurement problems, older people in SSA typically live with other family members (Lam et al 2006; Van de Walle 2006; Kyobutungi et al 2010).

Households containing only older people constitute a very small percentage of households in SSA (Kakwani and Subbarao 2005); the current study was consistent with this finding. Resources that come into households are typically shared in some fashion among various household members, and it is often difficult, if not impossible, to determine how these resources are divided (Deaton and Paxons 1994). Household wealth was gauged in terms of possessions of basic household items (such as tables, chairs, beds, mosquito nets and shoes), housing type (that is, the type of construction materials used to build the house), the number of animals or the amount of landholdings.

Kakwani and Subbarao (2005) recently investigated differences in the prevalence of poverty by household composition. Drawing on household survey information collected from 1998 to 2001, the authors presented a profile of older people in 15 low-income SSA countries. This regionally representative sample included countries in east and west Africa, francophone and anglophone countries, and countries with various levels of

Table 11.1 Health promotion policies and guidelines that include older people

Specific to older people	Inclusive of older people
• National guideline on prevention, early detection or identification and intervention in physical abuse • Guidelines for foot health at primary level • Guidelines on active ageing • Interdepartmental strategy on elder abuse • Guidelines on cataract surgery • National guidelines for prevention of falls in older persons • National guidelines on psychogeriatrics of falls (draft) • National guidelines on the prevention and management of substance abuse amongst older persons (draft) • Guidelines on early detection and management of arthritis or rheumatism in older persons • Golden hints for golden years • Playing cards with HIV/AIDS messages • Breast cancer information document	• National guidelines on home-community-based care • National guidelines on osteoporosis • National guidelines on stroke and transient ischaemia attack • Cervical cancer screening programme • National rehabilitation policy • National guidelines on long-term domiciliary oxygen therapy • National programme for the control and management of hypertension at primary level • National guideline on primary prevention of chronic diseases of lifestyle (including supportive educational material) • National programme for control and management of diabetes type 2 • Management of obesity • Screening programme for prostate cancer

HIV prevalence and incidence. Households containing older people only, or older people and children only, had higher income shortfalls than households with no older people, and the differences were statistically significant in most cases (Kakwani and Subbarao 2005). Furthermore, the size of the gap among households headed by older people was much higher than among those not headed by older people. There were also significant rural–urban differences – in every country, a much higher proportion of single older people who were poor were living in rural areas.

Similar results were found for SAGE. For example, SAGE found that women had lower income than men, and that female-headed households were more prone to poverty than male-headed households. The extent and nature of gender inequalities can be explained by differences in the socioeconomic characteristics and living arrangements of older women and men. However, more research is needed on the health and socio-economic status of elderly women, particularly those who are widowed and childless, and thus may be especially vulnerable to poverty. Some provinces of South Africa are still heavily patriarchic, and in such provinces the status of women can be very low. Women may lack certain rights of ownership to property, and inheritance is through the male side of the family (Toulmin et al 2002). Consequently, when a married man dies, his widow is at risk of dispossession of her house and land by her dead husband's kin.

11.3.2 Health and well-being

Policy and programme development needs to be informed by an understanding of the nature of health problems; socioeconomic, cultural and environmental conditions (social determinants of health); and patterns of health-care use. SAGE collected health data from self-reported questions, anchoring vignettes and DBS samples to improve the comparability of self-reported measures (Murray et al 2002; Murray and Evans 2003; Salomon et al 2004). As in other studies, these data show that the elderly population in South Africa experiences NCDs and risk factors such as hypertension, diabetes, depression, heart disease and injuries that contribute to disability and premature death (Omran 1971; Lopez et al 2006). These findings have implications for the demand for health-care services, health expenditure and health budgets.

In 2001, communicable, maternal, perinatal and nutritional conditions accounted for 70% of the burden of disease in SSA, while NCDs and injuries accounted for 21 and 8%, respectively (Lopez et al 2006). On the basis of 1990 data, Murray and Lopez (1996) predict that communicable diseases will decline to around 40% of the burden of disease (as measured in disability-adjusted life-years) by 2020 in Africa, while NCDs and injuries will grow. However, life expectancy in SSA was 6 years lower in 2001 than it was in 1990 (Lopez et al 2006), reinforcing the point that a considerable degree of uncertainty surrounds the estimates of the burden of disease in SSA (Cooper et al 1998; Mathers et al 2006). These estimates may also not reflect conditions that prevail among the poorest deciles of the population (Gwatkin et al 1999). However, the drop in life expectancy can also be attributed to the increase in HIV and AIDS deaths as the epidemic increased significantly during the 1990s.

The rising burden of chronic disease and associated risk factors affecting older people places a heavy burden on the health system. There is a need to emphasize prevention rather than care (Feachem et al 1992; Poullier et al 2003; Tollman et al 2006), and to improve allocation of resources. This study typically found that the government struggles to provide health-care services to older people in rural areas, who still tend to have far poorer access to any kind of service than do urban dwellers (National Research Council Committee on Population, 2006). The above discussion highlights the need for a better understanding of the magnitude and underlying causes of ill-health and morbidity among older people in SSA. There is a need to understand how these patterns are evolving over time, the implications of those changes for older people and their families, and patterns of health-care use over time.

11.3.3 The nature of family support and social networks

The projected increase in absolute numbers of older people in SSA and South Africa (particularly the projected rise in the "oldest-old" category), as well as the projected growth in the proportion of the general population over the age of 60 years, are likely to have profound implications for families and kin networks. Hence, a major question for policy makers is whether the traditional family in South Africa can cope successfully with the background, health, social and economic changes that are taking place, and whether that family can continue to provide older people with the range of support that they need. The SAGE results showed

clearly that traditional support systems based on family and kinship ties currently represent a way of life for most people in South Africa.

The AIDS epidemic has placed enormous strains on traditional institutions. Zimmer and Dayton (2005) examined data from DHS conducted in 24 countries, and found that 59% of older adults in SSA lived with a child, and 46% with a grandchild. Similar results were observed in the current study. In countries with high AIDS-related mortality, such as South Africa, older adults are more likely to be living with orphans. The net implications of economic development on the welfare of older people in South Africa and SSA in general are difficult to determine.

The general view among researchers working in this area in Africa is that the situation of older people is getting worse. Although there are a number of possible reasons for this situation, not all social changes are necessarily detrimental. Hence, there is an empirical question as to whether the situation of older people has improved or worsened. More work, building on new and existing analytical frameworks, is needed to develop testable hypotheses about the pathways and mechanisms by which the forces of migration, modernization, urbanization and change are affecting traditional social relations.

11.3.4 Changing roles and responsibilities of older people in an era of AIDS

No analysis of the situation of older people in South Africa would be complete without acknowledgement of the fact that the country is experiencing a severe HIV/AIDS pandemic that has important implications for older people. The country is home to more than 60% of all people living with HIV: about 25.8 million in 2008 (UNAIDS 2008). Since the start of the epidemic, HIV/AIDS has infected about 50 million Africans, of whom more than 22 million have died. Even if new transmissions were halted today, millions of Africans who are currently infected would still develop AIDS and die over the next 5–10 years.

The epidemic can affect the lives of older people in many different ways. Knodel (2005) has developed a framework to examine a broad range of potential pathways through which AIDS can adversely affect the well-being of parents of adult children with AIDS, and the possible demographic, psychological, economic or social consequences.

Older people most directly affected by the epidemic are likely to be either infected by the virus themselves or parents of infected adult-age children. Not only do parents of adult children with AIDS have to face the pain of seeing their own children suffer and die, but they can also face serious economic hardship, both in the short-term (due to unforeseen medical expenses and funeral costs) and in the long term (due to being deprived of one of their primary sources of economic support in old age). In addition, older people, particularly elderly women, are frequently left to care for grandchildren. Thus, these older people face the double burden of having to replace lost sources of income while supporting additional family members.

Older people may also suffer indirect health consequences, such as the mental and physical fatigue associated with caregiving, additional labour force participation, exposure to tuberculosis (TB) or other opportunistic infections brought into the household by the person with HIV. They may also suffer stigmatization and isolation following the death of household members due to AIDS (WHO 2002; Dayton and Ainsworth 2004; Knodel 2005). AIDS is also likely to have important indirect impacts on society in general, such as the demand and availability of health services, the per capita income growth and the macroeconomic performance (Cohen and Menken 2006; Mosam and Dlova 2006; Marais 2007).Finally, older people may be directly affected by the virus themselves. About 6% of officially reported AIDS cases in Africa in 1999 affected people aged 50 years or older (Knodel 2005). The official number of AIDS cases worldwide is widely acknowledged to represent merely the tip of the iceberg with regard to the true extent of the epidemic, but it is the only readily available source of data for comparing caseloads by age. However, with more than 1 in every 10 adults in Africa estimated to be infected with HIV, many older people in Africa are being affected indirectly by sickness and death among the younger generation. This can have many direct and indirect consequences for the material well-being of the older people.

While most of the attention to date has focused on how the pandemic affects people with HIV and their surviving orphans, greater recognition needs to be given to the consequences of the pandemic for older people. There is still little research on the impact of HIV/AIDS on older people in SSA. As with one study conducted in Kwa-Zulu Natal (Hosegood and Timæus), the current study found that older people have maintained their traditional role as a major resource in society, caring for children and maintaining rural households

(a role they had even before the HIV epidemic). This situation is partly due to a generous social-pension programme, and high rates of rural unemployment and underemployment. A recent study of the experiences and needs of older people in Mpumalanga, South Africa, supports this contention (Makiwane et al 2004). The authors of that study found that almost one in three older people were either caring for sick adults living in the household, or were raising grandchildren whose own parents were either dead or away in the cities on a long-term basis. The authors also found that 60% of all orphans in Mpumalanga were being cared for by their grandparents (Makiwane et al 2004). In the absence of detailed longitudinal data, simulation models can be employed to provide critical insights into how the AIDS epidemic may affect certain key demographic variables, such as residential patterns and kinship networks, over a protracted period.

11.3.5 Formal and informal forms of social protection

While policy makers in SSA in general, and South Africa in particular, are becoming increasingly aware of the needs of older people, there is general agreement that the types of social welfare programme in place in other parts of the world are too expensive to replicate in SSA, given the size of countries' economies (Kalasa 2001). Thus, there is a need to find alternative approaches that might achieve a similar function at a lower cost. "Social protection" is a concept that is gaining increasing attention in development circles as a useful policy framework for addressing issues of poverty and vulnerability (Bonilla-Garcia and Gruat 2003).

Social protection is defined as "the set of public measures that a society provides for its members to protect them against economic and social distress that would be caused by the absence or a substantial reduction of income from work as a result of various contingencies (sickness, maternity, employment injury, unemployment, invalidity, old age, and death of the breadwinner); the provision of health care; and, the provision of benefits for families with children" (Bonilla-Garcia and Gruat 2003: p13). Such protection is broader than, but includes, social security programmes. Traditionally, social protection for older people in SSA has been provided by both formal and informal programmes, and by practices that have been developed to reduce poverty and vulnerability in old age. However, with per capita income below a few hundred US dollars in most SSA countries, it is no surprise to find that formal social security systems across the region cover only a small fraction of the population. In most countries in SSA, formal social security programmes never reach the urban or rural poor; exceptions are Mauritius, Seychelles and a few countries in southern Africa (including South Africa, Botswana, Lesotho and Namibia – all of which operate social-pension schemes aimed at comprehensive coverage). Except for these few countries, the extended family unit remains the main source of support for most older people in SSA when they can no longer work.

11.3.6 Contributory and non-contributory social security programmes

Social security comprises both contributory and non-contributory schemes. Contributory schemes are those where benefits depend on having contributed as a worker or in a private capacity to a scheme, while non-contributory ones are available to people who have not contributed to any scheme.

Contributory social security schemes

Contributory social security programmes are well developed in many western countries, and are an important policy instrument that governments can use to redistribute wealth, combat poverty and reduce inequalities between various segments of society. However, in SSA, current contributory social security schemes are extremely marginal, both in terms of percentage of labour force covered and size of pensions received. In most SSA settings, national social insurance schemes cover less than 5% of the labour force and expend less than 1.5% of their gross domestic product (GDP) on pensions (Fox and Palmer 2001). Consequently, in most countries in SSA, social security programmes have only a modest effect on poverty alleviation. The largest social security programmes for older people in SSA are occupational pension schemes, but typically these programmes cover only people who have worked in the public sector, in state enterprises or in large private firms in the modern sector. Still excluded from formal contributory social security schemes are the self-employed, workers in the informal sector, domestic workers, and the vast majority of the population living in rural areas and engaged in subsistence agriculture or other forms of subsistence living, such as nomadic pastoralism. Such people must rely on their families for support and protection when they can no longer

work, if they are not eligible for a social assistance grant or if none exists.

Bailey (2004) identifies several distinct patterns of contributory social security schemes that have developed in SSA. Even though most countries did not introduce programmes until after their independence, most schemes have been strongly influenced by their countries' colonial heritage, with the types of programmes in anglophone Africa differing from those in francophone Africa.

Voluntary private pensions are found in many countries, although their coverage tends to be restricted to formal sector workers. In West Africa, several francophone countries established a voluntary plan during the colonial period for government employees. For example, the West African Retirement Pensions Fund was modeled on a programme for French civil servants that linked benefits to length of service and average earnings (Bailey and Turner 2001). Even today, Senegal has a social security programme that determines benefits through a formula that is quite similar to the system used in France (Bailey and Turner 2001). Cote d'Ivoire, Mali and other countries in the region have similar defined-benefit programmes, with workers contributing 4–9% of their earnings to the schemes (Bailey and Turner 2001).

Social security programmes in the countries that were former British colonies are generally more modest than those in francophone Africa. In several former British colonies, provident funds, such as the Nigerian National Provident Fund, were established. Seen as relatively easy to operate, such funds amounted to compulsory interest-bearing individual savings accounts for workers; they were financed from contributions from both employees and employers (Bailey 2004). Most social security programmes offer survivor and disability benefits; however, most provident funds provide only a single lump-sum amount at retirement. Generally, the level of the lump-sum payment is extremely modest and cannot actually support anyone in retirement. In 1993–1994, for example, retirees enrolled in the Zambian National Provident Fund each received, on average, a lump-sum payment of around US$10 (Mukuka et al 2002). In a number of countries (for example, Ghana, Nigeria and Zambia) these early provident funds have now been converted to defined-benefit social security systems. In some countries, for instance, Sierra Leone, Eritrea and Somalia, efforts to introduce schemes have been stalled by armed conflicts. In other places, for instance, Liberia and the Democratic Republic of the Congo, social security programmes that once existed have been dismantled and destroyed by armed conflicts.

Non-contributory social assistance schemes

There is growing acknowledgement of the importance of social cash transfers in alleviating poverty, and a number of African countries are starting to provide social cash transfers to the poorest households (usually the poorest 10–15% of households). In Zambia, social cash transfer has resulted in significant improvements in the well-being of poor households; for example, through increased use of primary health-care services and better school attendance by children (Schüring, 2009). These government financed non-contributory social assistance schemes currently exist in a number of countries (for instance, in Ghana, Lesotho, Malawi and Zambia), and are being piloted in Uganda.

The extent of social cash transfers in different countries varies according to the availability of financing from government and development-aid funders. Botswana, for example, has a universal flat-rate pension scheme for all residents over the age of 65 years. South Africa has a means-tested benefit for people aged 60 years or older, and Mauritius offers a basic pension to all residents aged 60 years or older, with supplemented earnings-related benefits (Bailey 2004).

The South African social assistance scheme was introduced in 1928 as a measure to provide for the poorest retired white workers. The scheme was extended to all South Africans in 1944, and in 1993 the value was equalized for all segments of society, shortly before the first democratic elections in 1994. The value for the old-age grant at the time of writing this report is R1080 (about US$ 150) per month. The pension is means-tested, but the level is set at a point at which 80% of all age-eligible Africans may receive the pension (Lam et al 2006). Essentially a by-product of the dismantling of the apartheid system, the programme, which was originally designed to provide protection for poor white people, is viewed in South Africa today as a way to achieve several broad development goals. These goals include providing assistance to households in rural areas, targeting women and keeping significant numbers of households out of poverty (Arlington and Lund 1995). The social assistance grant is the sole or major source of income for many poverty-stricken families (Van Zyl 2003).

A considerable body of research has been conducted on the effects of such a large and generous transfer scheme on the welfare of older people and extended family members (Arlington and Lund 1995; Case and Deaton 1998; Alderman 1999; Bertrand et al 2003; Duflo 2003; Ferreira et al 2003; Case 2004; Posel 2004; Lam et al 2006).

Case and Deaton (Case and Deaton 1998) argue that the pension programme is effective in reaching the poorest households and is a useful tool for reaching the poor in general, not just older people. Because so many older people in South Africa's African population live in multi-generation households (in part because young people tend to join households that receive a pension), the social assistance programme transfers money into households with children. About one third of all children aged 4 years or younger live in households in which older people receive a social assistance grant, and the percentage of children living with pensioners is even higher among the poorest income quintiles (Alderman 1999). Case (2004) also found that, in the Western Cape, in households that pool income, the social assistance grant appears to protect the health status of all adults and children in the household. Duflo (2003) found that the impact of the programme depends on the gender of the recipient: grants received by men had little effect on children's health status, but grants received by women had a large impact.

11.4 Conclusions

This chapter discussed some of the findings of SAGE in relation to those from other studies in the region of SSA. The results show largely similar trends when compared to other available studies. The challenge is to use these data, together with later rounds of the SAGE data collection, to determine trends. The impact of policy implementation can only be fully understood through the direction of these trends.

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