



INDIA

# Study on global AGEing and adult health (SAGE), Wave 1, 2007



WHO SAGE WAVE 1



## International Institute for Population Sciences

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# Study on global AGEing and adult health (SAGE) Wave 1, 2007

## India National Report

International Institute for Population Sciences

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## Executive summary

Population ageing is one of the distinctive phenomena of the twentieth century and will surely remain an important challenge throughout the twenty-first century. Population ageing – a process of progressive increase in the numbers of older people relative to the rest of the population – was long thought of as primarily an issue for the developed world. However, in recent years, many countries in the developing world are also beginning to experience population ageing.

This demographic trend poses new challenges, including for the developing world. Population ageing may be seen as a human success story—a triumph of public health programs, medical advancements, and economic development over diseases and injuries that have limited human life expectancy for years. At the same time, however, it has a profound impact on socioeconomic issues such as economic growth, savings, investment, retirement, pensions, labour markets and intergenerational transfers. Population ageing also increases the health needs of societies as the older population forms a larger and larger proportion of a country's population.

India is no exception to the process of population ageing. The population of India has increased from 361 million in 1951 to 1.21 billion in 2011. During this period, the number of persons aged 60-plus increased from 19.6 million (5% of the total population) in 1951 to 98 million (9% of the total population) in 2011. Meanwhile, the proportion of persons aged 60-plus in India is projected to grow to 11% in 2025 and 19% in 2050. These trends clearly point to population ageing as a major challenge, and indicate that considerable resources will need to be directed towards the support, care and medical treatment of older persons.

As populations age, there is an increasing need for valid and comparable data on the health and well-being of older adults. Older persons in India face a number of problems, ranging from the absence of ensured income

sufficient to support themselves and their dependants to ill health, absence of social security, loss of a productive social role and recognition, and non-availability of opportunities for creative use of free time. However, India currently lacks an evidence base on the health, economic status, quality of life and well-being of the older population. In view of this gap in evidence for policy, the Study on global AGEing and adult health (SAGE) Wave 1 was implemented in India in 2007 as part of a multi-country study in six of the 70 countries that participated in the 2003 World Health Survey. SAGE is a longitudinal, household health survey; Wave 1 is the first follow-up of respondents for the SAGE survey programme in India (with the 2003 World Health Survey serving as the baseline or SAGE Wave 0). It is anticipated that the SAGE results will help inform medical professionals and policy makers as to how health, social, environmental and economic policies, programmes and realities across different countries affect the health status of individuals and populations over a lifetime and at older ages.

### Objectives

The specific objectives of SAGE are to:

- Obtain reliable, valid and comparable data on levels of health across a range of key domains for adult populations aged 50-plus in nationally representative samples;
- Examine patterns and dynamics of age-related changes in health and well-being, using longitudinal follow-up of survey respondents as they age, and investigate socio-economic consequences of these health changes;
- Supplement and cross-validate self-reported measures of health, and the anchoring vignette approach

to improving comparability of self-reported measures, through measured performance tests for selected health domains

- Collect data on health examinations and biomarkers to improve the reliability of self-reported health data and to monitor the effect of interventions.

## Sample and interview

The 2007/08 SAGE Wave 1 India was implemented in six states selected to ensure a nationally representative sample—Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal. The same primary sampling units (PSUs) and households covered in the 2003 World Health Survey (WHS) comprised the base-line sample for SAGE Wave 1 India in 2007-08. SAGE Wave 1 India included a total of 11,230 completed individual inter-views from 9,626 households; 4,670 interviews with persons aged 18-49 (3,625 women and 1,045 men) and 6,560 interviews with persons aged 50-plus (3,256 women and 3,304 men). Face-to-face interviews were used to collect information about the physical characteristics of the dwelling/household; a household roster, including the sex, age, marital status, education, and care needs of each household member; cash and non-cash transfers into and out of the household; household income and expenditures; work history and benefits; health and health behaviours; chronic conditions; health care utilization; social networks; subjective well-being and quality of life; and impact of care giving. The health status of individuals was also assessed with the help of the following biomarkers: anthropometry (weight, height, BMI, waist-to-hip ratio); physical tests (timed walk, hand grip strength, lung function, vision tests, blood pressure); cognition tests (verbal fluency, immediate and delayed verbal recall, digit span); and blood tests (from consenting respondents, to test for anaemia, diabetes, and cardiovascular disease).

## Households

SAGE Wave 1 India (hereafter SAGE India) interviewed a total of 9,626 households in the six surveyed states. Almost one-half of these households had six or more members; some 2% of the households were single-member households; and 8% of the households were large households with 11 or more members. Men headed 91% of the households. Slightly more than half (52%) of the households were headed by persons aged 50-plus;

about 11% were headed by a person older than 70. Three-quarters of all households were from rural areas. Seventy-three percent of household heads reported following the Hindu religion; only 10% were Muslim and the remaining 16% were of other religions. Only 7% of heads belonged to scheduled tribes, and 19% to scheduled castes.<sup>1</sup>

Of the households surveyed, 31% households had two or more older adults (defined as adults aged 50-plus); 36% of households had a single older adult, and the remaining 33% contained only younger adults (defined as adults aged 18-49). Most of the households were multigenerational households: only 7% were single-generation households, 47% were two-generation households and 45% of households contained three or more generations. Multigenerational households with three or more generations were more common in rural areas (46%) than urban areas (41%).

Of the 11,230 adult respondents interviewed, over three-fifths were older adults, i.e. aged 50-plus. Among older adults, roughly half were aged 50-59, roughly 30% were aged 60-69, 17% were aged 70-79 and 4% were in the 80-plus age group. Age distribution did not differ much between the sexes. Approximately equal proportions of older men and women were interviewed. Among younger adults, there was an over-representation of women, as a part of a nested sub-study related to reproductive health of young married women.

Education levels differed clearly between the sexes, particularly in the older cohort. While around 31% of older men had no formal education, the equivalent proportion among older women was 73%. Around two-fifths (39%) of older men had completed at least secondary schooling and 9% had completed college education; however, only 9% of older women had completed secondary schooling and 2% had completed college. Among the older men, 91% were currently married and 7% were widowed; however, a substantial proportion (37%) of older women were widowed.

## Employment, income and expenditures

Labour force participation rates were high across the survey. Among older respondents, 73% had ever worked

<sup>1</sup> Scheduled castes and tribes are groups recognised in the Constitution of India as historically disadvantaged.

– slightly higher than the 70% ever-worked rate among younger respondents. Indeed, 43% of older respondents were still working, as well as 60% of younger respondents. Current work participation rates tended to rise with age up to the 40-49 age group, which had the highest work participation rate of the study (69%); after this age, participation rates began to drop, from 56% in the 50-59 age bracket to a low of 12% among respondents aged 80-plus. In every age group, the work participation rate among men was much higher than that of women: for example, nearly two thirds of older men were working, compared to one-fifth of older women.

Of the older respondents who had ever worked, about 30% had already stopped working. Most of these persons (73%) had stopped working because of health problems, old age or retirement; about 11% cited a family-related reason, and 16% cited other reasons. The proportion stopping work due to health reasons increased substantially with age of respondent; unsurprisingly, most persons aged 80-plus (92%) had stopped working for this reason.

Despite the predictable overall decline in work participation among older respondents, it is interesting to note that a significant number of older adults (43% as noted above) were still working. This figure included 25% of persons aged 70-79 and about one in eight (12%) of respondents aged 80-plus. Among the working older respondents, large proportions either were self-employed (54%) or were working in the informal sector (27%); only a small proportion worked in either the public (10%) or private sectors (9%). Older men were most likely to be self-employed (59%), whereas older women were most likely to be working in the informal sector (43%).

SAGE India also collected data on household income as part of the household questionnaire. The estimated per capita mean household income was 1,121 rupees (Rs.) per month. Age, education and gender all played a role in earning levels: the mean monthly income of the household headed by a college-educated person was almost three times higher than the mean monthly income of households headed by person with no formal education, while the income level of male-headed households was much higher than that of female-headed households and that of households headed by an older person was higher than that of those headed by a younger person.

Most of the study's households received income from multiple sources. The most important source of house-

hold income was wages/salaries, which were received by more than two-thirds (68%) of households, compared to the 35% of households that received income from trade/business, the second-largest listed source. However, a large proportion of households (46%) reported receiving income from unspecified other sources, probably including agriculture/farm income or remittances. Only about one in 10 households received income from a pension. Sources of income varied depending on whether the head of the household was male or female as well as by age of the head of household: a relatively higher proportion of the male-headed households received income from trade/business and other sources, whereas female-headed households were more likely to derive their income from pensions.

Worryingly, the majority (55%) of the households did not find their income sufficient to take care of their needs. Interestingly, although (as noted above) male-headed households had much higher income levels than female-headed households, almost equal proportions of both types of households perceived their household incomes as adequate.

Along with data on household income, SAGE India also collected data on family support networks and transfers. In all, 32% of the study's households received monetary assistance and 12% received non-monetary (in-kind) assistance, either from family members and the community or from the Indian Government. A smaller proportion of households provided monetary (18%) or in-kind (8%) assistance to other family or community members. A very small (4%) proportion of households received assistance in household chores from either family or community members, and only a small proportion (6%) provided assistance to other family or community members. A higher proportion of female-headed households received all three types of support (monetary, in-kind and assistance in work), and a relatively lower proportion of such households provided monetary and in-kind support to others. For example, 48% of households headed by younger women received monetary support and 23% received in-kind support, compared to 30% and 13% of the households headed by younger men. The proportion of households that received monetary support and assistance in work did not vary much with income (a 7% spread overall); non-monetary assistance, however, varied more greatly, with 18% of lowest-quintile households receiving in-kind support compared to only 5% of highest-quintile households. Only a small proportion – about 4-5% – of older respondents reported that they provided financial, emotional, health, physical or personal help during the 12 months

prior to the survey to an adult household member, and less than one percent provided in-kind help to child.

## Health behaviours

SAGE India collected data on five major factors that increase or reduce the risk of certain health conditions: tobacco use, alcohol consumption, intake of fruits and vegetables, physical activity levels, and environmental risk factors such as access to improved drinking water and improved sanitation facilities and the type of fuel used for cooking. The SAGE questions were based on the WHO recommendations from the STEPS guidelines for NCD surveillance. The study found that:

*Tobacco use among older Indians is high.* The estimated prevalence of tobacco use among older respondents was 50%, dropping only slightly in younger respondents to 40%. A remarkably high proportion of older tobacco users (47.1%) were consuming tobacco daily, with daily use among older men almost double that of older women (63.1% compared to 30.5%). Most of the older female tobacco users used smokeless tobacco, whereas among older men use of smoking and smokeless tobacco was more or less equal.

*Alcohol use among older Indians is low.* Only about 16% of older respondents (29% of men and 2% of women) reported alcohol consumption, with the substantial majority of these only drinking infrequently. Interestingly, among older adults who drank at all, older women were actually more likely to be heavy drinkers (either frequent or infrequent) than older male drinkers (one-third, compared to one-quarter).

*Older Indians are not eating enough fruits and vegetables.* Among the older population, insufficient intake of fruits/vegetables was rampant, with 91% of older respondents eating fewer than five servings of fruits and vegetables a day. The proportion with sufficient intake of fruits/vegetables was relatively lower among older women than among older men.

*Older Indians are reasonably active.* Among both men and women, the proportion of persons with no physical activity in the previous seven days increased with age; however, only a little more than a quarter (26%) of older respondents reported no physical activity, and a full 30% of older men undertook vigorous activity (compared 17% among older women). Among the oldest respondents aged 80-plus, inactivity rose, with 53% of men and 60% of women reporting no physical

activity. However, it is notable that about a third of these oldest respondents engaged in vigorous or moderate physical activity.

*Indian households' access to improved drinking water is rising, but most still lack toilet facilities and are using dirty fuels.* For India as a whole, 88% of households reported using improved sources for drinking water, and about one-third of households had water sources within the household premises. Nearly 13%, however, still had to spend 30 minutes or longer on each trip to fetch water. By contrast, the majority of households (59%) did not have any toilet facility, and an additional 10% were using unimproved facilities. Meanwhile, most households used dirty fuels (79% solid fuel, 1% kerosene) for cooking; only 20% used LPG or electricity. Among the 54% of households using solid fuel inside the house (12% in a room used for living or sleeping, 42% in a separate kitchen), little more than a quarter had a stove covered with a chimney or hood. Paradoxically, of the individual states, Uttar Pradesh had the best figures for improved water supply (96%) but the worst for toilet facilities (69%) and for clean fuel (used by only 11.8%).

## Health

A main objective of SAGE Wave 1 was to obtain data on levels of health in older populations. Measurements of health included self-reported ratings on overall general health as well as in relation to eight health domains, disability, and activities of daily living/instrumental activities of daily living (ADL/IADL). Health was also assessed through anthropometric measures and more objective performance tests and biomarkers.

Perhaps unsurprisingly, self-reported health status showed a progressive deterioration with increasing age. The proportion of persons who reported their health as good declined from 71% in younger adults to 12% in the study's oldest respondents aged 80-plus; by the same token, the proportion who reported their health status as bad increased from 4% among the study's youngest respondents (aged 18-29 years) to 47% among the oldest. Less than a third (31%) of older adults reported their health status as good, while 47% reported their health status as moderate and 22% as bad. The self-reported health status of older women was worse than older men: 76% of older women reported their current health status as moderate or bad, compared to 64% among older men.



A substantially higher proportion of older adults had difficulty in work or household activities. Fifty-three percent of older respondents reported having at least some difficulty with work or household activities, as against 28% of younger respondents; meanwhile, 20% of older persons reported severe difficulty with work. Older women were more likely to have difficulty with work or daily activity than older men: 59% of older women reported some difficulty with work, compared to 48% of older men, with a further 24% of older women, against 16% of older men, reporting severe difficulty.

In order to better understand the determinants of health, and the possible differences between perceived and true levels of health, SAGE India respondents were asked their situation in the past 30 days with regard to eight domains of health, including mobility, self-care, pain and discomfort, cognition, interpersonal activities, sleep and energy, affect, and vision, in order to generate an overall health score. Health status worsened with age, as reflected in lower health scores and higher disability scores for older adults in comparison to younger adults. Mean health scores, based on the eight health domains, declined by 15 points between the two age cohorts (from 68.4 in the 18-49 age group to 53.6 among the 50-plus age group) and mean disability scores increased by 16 points (from 12.3 to 28). The increase in disability scores with increasing age was relatively higher than the decrease in health scores. The health status of men was better than that of women in both age cohorts, and disability scores were also lower.

With increasing age, there was a sharp increase in the proportion of persons experiencing deficiencies in relation to their ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs).<sup>2</sup> The majority of older persons (52%) had at least one ADL deficiency, and 40% had two or more ADL deficiencies. The prevalence of deficiencies in daily activities was much higher among older women than older men: about 63% and 34% of older women had at least one ADL and IADL deficiency respectively, compared to 42% and 21% of older men.

<sup>2</sup> Activities of daily living (ADL) refer to daily self-care activities, typically within an individual's place of residence, and include more basic activities such as eating, bathing and toileting. Service or care-giving issues are typically triggered when a person has two or more ADL deficiencies. Instrumental activities of daily living (IADLs) include more complex activities, such as heavy or light housework, laundry, preparing meals, shopping for daily necessities, getting around outside, travelling, managing money and using a telephone.

Cognition also declined with age, both overall and in individual tests. The overall cognition score of older respondents was almost 9 points lower (48.9, compared to 58 points) than the overall score of younger respondents. The difference was quite stark between the youngest and oldest respondents, with a reduction in the overall cognition score from 62.4 for the 18-29 age group to 39.1 for respondents aged 80-plus. The scores of women were consistently lower than those of their male counterparts, across age cohort and individual tests as well as overall. The difference between sexes was more notable in the older age cohort, with a gap of 6.4 points, compared to 2.7 points for the younger cohort. (Table not shown)

## Chronic conditions and treatment

SAGE India gathered evidence on a selected range of chronic diseases that contribute to a large portion of the burden of non-communicable diseases more widely prevalent among older adults. These included arthritis, stroke, angina, diabetes mellitus, chronic lung disease, asthma, and depression. SAGE India also collected data on hypertension, edentulism, injuries and preventative health measures, including cataract surgery and cancer screening.

Chronic disease prevalence was higher among older than younger respondents, with arthritis as the most prevalent chronic disease among older respondents (18%) and hypertension a close second with a prevalence of 17%. For both conditions, prevalence was higher among older women than among older men. No other disease had a prevalence exceeding 10% among older adults – although prevalence was higher among older men than older women for each of the conditions.

Four conditions have a method of generating prevalence through symptom reporting: arthritis, asthma, angina and depression. The symptom-based prevalence of arthritis and asthma was lower by 2-3% than the self-reported prevalence among older respondents. However, the symptom-based prevalence of angina and depression was substantially higher than the self-reported prevalence of these diseases. For example, 4% of older respondents reported being diagnosed with depression but prevalence was 19% when generated by symptom reporting.

SAGE India revealed high levels of unmet need for medication or treatment among older, but also younger respondents. Among older respondents, the highest unmet need for medication or treatment was reported for depression (64%).

Meanwhile, about 41% of older persons diagnosed with either chronic lung disease or stroke also had unmet need for medication or treatment, as did about a quarter of older persons diagnosed with arthritis, angina, diabetes, asthma, or hypertension. By comparison, the highest level of unmet need for medication and treatment among younger persons was reported for stroke (83%).

The prevalence of morbidity and particularly of multiple co-morbidities was higher in the older age cohort. Twenty-six percent of older respondents reported having a single chronic health condition, while 16% had multiple morbidities. The proportion of persons with at least one condition increased from 9% in the 18-29 age group to 43% for 80 plus group.

While levels of injury due to accident were comparatively low among SAGE Wave 1 India's older respondents, the chances of such injury leading to disability were higher. Among the older respondents, 2% had been injured in road traffic accidents in the 12 months prior to the survey, and another 9% had been injured in other accidents: about a third of the former group, and a quarter of the latter, suffered disability as a consequence.

The proportion of respondents with edentulism or cataracts increased with age, to 30% among respondents aged 80-plus. The prevalence of cataracts was much higher for older respondents aged 80-plus, of whom one-third had been diagnosed with cataracts in at least one eye. Among older persons, women were more likely to experience both edentulism and cataracts. Older urban respondents were more likely to report edentulism than their rural counterparts, though both were equally likely to have cataracts.

## Health examination and biomarkers

Slow walking speed may be a predictor of functioning and cognition, as well as adverse results such as hospitalization, dependence and mortality. Normal walking time to cover four meters increased from four seconds among younger respondents aged 18-29 years to seven seconds among older adults aged 80-plus, while rapid

walking time to cover four meters increased from three seconds among young adults aged 18-29 years to five seconds among adults aged 80-plus.

Blood pressure is a major etiologic pathway in the development of chronic diseases such as heart disease (angina, heart attack and heart failure), stroke, peripheral vascular disease, eye diseases including blindness, and kidney damage. Three readings of blood pressure were taken from each respondent, with the average of the second and third readings used for analysis. About one in six young adults and one in three older adults had hypertension (either systolic or diastolic). Among the older respondents aged 50-plus, the average systolic blood pressure was 124 mmHg and diastolic blood pressure was 81 mmHg. Based on a critical limit classification of blood pressure, among older adults the prevalence of systolic pre-hypertension was 34% and diastolic pre-hypertension was 29%. Indeed, for India as a whole, 32% of younger 33% older adults had either systolic and/or diastolic pre-hypertension. The prevalence of hypertension did not vary much between men and women.

Lung disease was also widespread among the study's participants. Half of the study's older adults as well as 42% of younger adults had mild to severe levels of chronic obstructive lung disease based on spirometry testing. The prevalence of moderate to severe levels of obstruction in lung function was relatively higher among women than among men.

Visual impairment is associated with functional limitations and lowered well-being, and also affects health-related quality of life through its effect on self-care and treatment-seeking behaviour. For SAGE India, both near and distance vision were measured for both eyes. The prevalence of low near and distance vision was high among older respondents, with 70% overall showing impairments in either near or distance vision. The problem of low near vision increased particularly noticeably with age, especially after age 40.

In order to assess levels of undiagnosed disease, the measured prevalence of two major chronic conditions, hypertension and vision acuity, was compared with their respective self-reported prevalence. Notably, the study's results suggest that more than 25% of older adults have hypertension but remained undiagnosed due to lack of awareness and access to health care – a pattern more pronounced among respondents with no education and in the poorest wealth quintile.

Similarly, the percentage of older respondents who were diagnosed negative but measured positive for reduced visual acuity was around 35% men and around 45% among women.

## Health care utilisation, health system responsiveness and health financing

The availability, accessibility and affordability of health care services contribute to a population's health status. In order to determine the responsiveness of the Indian health care system, SAGE India asked respondents to assess their need for inpatient and outpatient treatment over the previous year, and to assess the services they had received against the criteria of prompt attention, dignity/respect, communication, choice, confidentiality, access to support and quality of care. About four in five respondents, both younger and older, reported the need for health care during the previous 12 months; around 9% had required health care prior to, but not during that period, and about 12% had never required any health care. Across all age groups, a higher proportion of women than men reported the need for health care; however, the proportion of men reporting the need for health care increased with age, although this age trend was not observed among women.

Among older adults who needed health care in the past year, 15% received inpatient care, 80% received outpatient care and a small proportion (6%) had not received any care. Among respondents aged 50-plus who received inpatient care, 22% received treatment for non-communicable chronic diseases, 16% received health care for acute diseases and 69% received health care for other diseases. Women were more likely to use inpatient care for acute diseases while men were more likely to use inpatient care for chronic diseases. Among older respondents who received outpatient care, 19% received care for chronic diseases, 42% received care for acute diseases and 39% received care for other conditions.

Health system responsiveness for those who received services was measured through questions in seven domains: access, choice, communication, confidentiality, dignity/respect, quality and prompt attention. Respondents were asked to rate their satisfaction with each domain, with an overall score generated by summing all the responses. Taking both age cohorts together, outpatient care services were more responsive than inpatient services.

Disturbingly, the study found that out-of-pocket (OOP) expenditure on health imposed a significant burden on many of the study's households. The mean household monthly OOP expenditure was Rs. 6,671, with an average of Rs. 846 – 13% of household expenditure or 22% of non-subsistence expenditure—spent on health, discounting for health insurance and other health benefits. Perhaps unsurprisingly given these figures, 33% of households living below the poverty line had incurred catastrophic health expenditure, defined as occurring when a household's total OOP health payments equalled or exceeded 40% of household's capacity to pay or non-subsistence spending. Furthermore, out of all households which had incurred catastrophic health expenditures, 24% had become impoverished as a consequence.

Mean OOP health payments in households which had incurred catastrophic health expenditure was Rs. 2,370, compared to only Rs. 369 for households without catastrophic health payments. A major part of total OOP expenditure on health care (58%) was spent on medications, while 13% went to outpatient care, 9% to inpatient care, and 6% to long-term care. Diagnostic tests, traditional health care and health aids each accounted for 3% of total OOP health expenditure. Households with catastrophic OOP health expenditure spent one-sixth of their health expenditure on inpatient care.

SAGE India's results revealed drastically low levels of health insurance coverage among respondents. Most households (74%) financed their health care expenditure from current income, with 26% supplementing from their savings. About a fifth of households needed to borrow money from relatives and 8% had to sell household assets – rising to a third and 15% respectively where hospitalisation was required. Overall, only about 2% of households had any health insurance coverage.

## Quality of life

Reported quality of life deteriorated with increasing age. A mean score for evaluative well-being was generated and decreased from 55 for younger respondents to 49 for older respondents. Quality of life was lower for women than for men, with the disparity growing with age. Wealthier respondents assessed their quality of life more positively than poorer respondents; urban respondents also scored more positively than those living in rural areas.

# Introduction

## 1.1 Global ageing

Population ageing has been one of the most distinctive phenomena of the twentieth century, and will remain an important issue throughout the twenty-first century. Population ageing is defined as a progressive rise in the number and proportion of older people (conventionally those aged 65-plus) relative to the rest of the population, producing an increase in the median age of the population. The increase in the size and rate of growth of the older population can arise from (a) an increase in the number and proportion of older persons; (b) a decrease in the number and proportion of the younger population (conventionally aged below 15); or (c) both of these factors (Coleman, 2006).

The world's older population has been growing for centuries, but the pace of growth has recently accelerated. Today almost 800 million people are aged 60-plus, accounting for 11% of the world's population (United Nations Population Division (UN PopDiv), 2010). The developed regions of the world have reached a more advanced stage of population ageing, but the developing world is well on its way to a similar scenario. A critical point will be reached in the year 2025, when the global population aged 50-plus is projected to exceed the population below that age. By that year, the median age of the global population is projected

to have increased from the 2005 level of 28 to 33 (UN PopDiv, 2010).

Several demographic indicators are used to compare trends and differentials in ageing: median age and ageing index, for example (see Table 1.1).

- *The median age* is the age that divides the population into two numerically equal groups, one younger and the other older than the median age. From 1950 to 2005, the median age of the world population increased from 24 to 28, and by 2050 half of the world population is projected to be older than 38 years. In 2005, the median age in Europe was 39, more than twice the median age of 19 in Africa.
- *The ageing index* is defined as the number of people aged 60 and above per 100 children below the age of 15. Between 1950 and 2005, the ageing index increased at the global level from 24 to 36 older persons per 100 children. Between 2005 and 2050, the ageing index is expected to rise significantly in every continent (UN PopDiv, 2010). By the year 2050, projections indicate there will be 106 older persons for every 100 children in the world.

The current level and pace of population ageing vary widely across geographic regions, and usually within regions as well. Europe has had the highest proportion

**Table 1.1** Selected ageing indicators, world and regions, 2009

Major areas and regions	Median age	Sex ratios (males per 100 females)		
		60+	65+	80+
World	29.2	83.4	79.0	59.4
More developed regions	39.7	74.3	69.2	50.1
Less developed regions	26.9	88.9	85.4	70.1
Least developed regions	19.7	86.0	85.0	80.4

Source: World Population Prospects, 2010 Revision, UN Population Division.



**Table 1.2** Percentage of population in older ages, by region

Region	60 years and older					80 years and older				
	1950	1975	2000	2025	2050	1950	1975	2000	2025	2050
Asia	6.7	6.6	8.6	14.8	24.4	0.4	0.4	0.9	1.7	4.5
Europe	12.1	16.5	20.3	27.3	33.6	1.1	1.8	3.0	5.3	9.3
Latin America/ Caribbean	5.6	6.5	8.4	14.9	25.0	0.4	0.5	1.0	2.2	5.5
Middle East/ North Africa	5.6	5.4	6.5	10.6	19.4	0.3	0.4	0.5	1.0	2.6
North America	12.4	14.6	16.3	24.7	27.0	1.1	2.1	3.2	4.4	8.0
Oceania	11.2	11.0	13.4	19.1	23.5	1.0	1.3	2.3	3.4	6.3
Sub-Saharan Africa	5.2	4.8	4.8	5.5	8.3	0.3	0.3	0.3	0.5	0.8

Source: World Population Prospects, 2010 Revision, UN Population Division.

of population aged 60 plus for many decades, and will remain a global leader in ageing well into the twenty-first century (Table 1.2). By 2025, the proportion of the European population aged 60-plus is projected to be around 27%, increasing to around 34% by 2050 – by which time every tenth person in Europe is expected to be 80 years or older. By contrast, the proportion of the sub-Saharan African population aged 80-plus years is projected to be only 0.8% in 2050. In sheer numerical terms, the number of older adults in the developing world has been growing at a phenomenal rate, with a large portion of this growth occurring in Asia.

Population ageing also varies by sex. In most countries across the world, the sex ratio (number of males per 100 females) is below 100; women especially outnumber men in older ages, due to higher life

expectancies (refer back to Table 1.1). Consequently, the challenges and problems created by the demographic transition process will be disproportionately faced by females.

Population ageing may be seen as a human success story – the triumph of public health, medical advancements and economic development over diseases and injuries that had limited human life expectancy for years. However, population ageing has a profound impact on the socioeconomic structure of the population, affecting not only societal health needs, but also economic growth, savings, investment, retirement ages and pensions, labour markets and intergenerational transfers. This demographic trend thus creates new challenges, particularly for less developed countries and regions.

**Table 1.3** Ten leading sources of global burden of disease, 2004 and 2030

Rank	Disease or injury, 2004	Disease or injury, 2030
1	Lower respiratory infections	Ischemic heart disease
2	Diarrhoeal diseases	Unipolar depressive disorders
3	Unipolar depressive disorders	Road traffic accidents
4	Ischemic heart disease	Cerebrovascular disease
5	HIV/AIDS	Chronic obstructive pulmonary disease (COPD)
6	Cerebrovascular disease	Lower respiratory infections
7	Prematurity and low birth weight	Hearing loss adult onset
8	Birth asphyxia and birth trauma	Refractive errors
9	Road traffic accidents	HIV/AIDS
10	Neonatal infection and other	Diabetes mellitus

Source: Global Burden of Disease, 2004 Update, World Health Organization, 2008.

## 1.2 Emerging health trends of population ageing

The phenomenon of population ageing is contributing to a health transition that has been occurring throughout the world at different rates and along different paths (Kinsella and Phillips, 2005). This transition was identified in the 1990s in the Global Burden of Diseases study (Murray, 1996), which flagged a noticeable shift in the global burden of disease from infectious diseases to non-communicable diseases (NCDs) and chronic conditions. The study projected that in part due to population ageing, ischemic heart disease, unipolar major depression and cerebrovascular disease – all conditions whose incidence increases with age – would be among the five leading causes of death across the globe by 2020. These conditions also contribute substantially to non-fatal disease burden, as seen in the Burden of Disease update (see Table 1.3).

In addition to the health and social implications, the likely rise in NCDs as a consequence of ageing populations may bring additional economic and financial costs. While health care costs may not increase appreciably with increasing age, greater demand for long-term care is likely to generate increased expenditures (Rechel *et al.*, 2009). In developing countries, where healthcare resources are limited, this situation requires proper management and equitable distribution of the available resources, according to need and following principles of intergenerational solidarity. According to a study for the World Economic Forum, ageing-related chronic illness could result in national loss of \$550 billion in China and \$225 billion in India between 2005 and 2015 (Jha and Anderson, 2007).

### 1.2.1 Population ageing and economic development

Older persons in nearly all settings are on average less likely to be in paid employment than younger adults, thereby relying more on a combination of assets, savings and government and family support (Bloom *et al.*, 2012). At the same time, in many countries older people are working longer. Older persons in low and middle income countries are much more likely to rely on participation in the labour force for income than older adults in higher income countries (International Labour Organization, 2011). If those who are working in older age are made more vulnerable by chronic illness, their financial situation becomes more tenuous. Pensions

can be extremely important, but particularly in developing countries they tend to be small, and coverage is spotty (Bloom, 2012). In many countries, the filial piety underpinning support of older persons is beginning shift (Aboderin, 2005). Social protection programmes are effective means of supporting poorer individuals and families in lower and higher income countries alike, and may even contribute to economic growth; however, the gaps between need and available programmes remain large in most countries.

### 1.2.2 Social aspects of population ageing

The social problems of older adults are emerging issues in all regions of the world. Even in more developed regions where financial security and access to health care are less of a problem than in developing countries and regions, many older adults struggle with social insecurity, vulnerability, and isolation, as well as relative economic deprivation. Major challenges thus are emerging in relation to support for the older population, especially for older women. Because of higher survivorship and lower propensity to remarry, older women are more likely than their male counterparts to live alone and in social isolation: globally, an estimated 19% of women aged 60 or above live alone, compared with just 8% of men in that age group (NSSO, 60<sup>th</sup> Round, 2004-05). In fact, older women are now considered to be the most vulnerable group in most societies (Berkman *et al.*, 2012).

## 1.3 Population ageing in India

Population ageing is a world-wide phenomenon, and India is no exception to this process. The success story of increasing longevity in India is creating a new challenge: ensuring the wellbeing of an enormous number of older adults. Indeed, the nearly 98 million older adults in India represent a larger population than the combined entire populations of several countries in the developed world.

The Indian population has increased from 683 million in 1981 to 1.21 billion in 2011 (Table 1.4), with the proportion of persons aged 60 and over now making up an estimated 9% of the total population (Census of India 2011). This proportion is expected to grow to 11% in 2025 and 19% in 2050 (see Table 1.5). Furthermore, the percentage of the Indian population aged 80-plus has risen to 0.8% in 2007, and is projected to reach 3% of

**Table 1.4 Population and ageing indicators in India, 1981-2011**

	1981	1991	2001	2011
Population size (millions)	683.3	846.3	1027	1210
Decadal growth rate of population (1971-81, 1981-91, 1991-2001, 2001-2011)	24.7	23.7	21.35	17.6
Older population (millions)	43.7	57.0	77.0	98.0
Percentage of older people (60+)	6.5	6.7	7.5	9.0
Life expectancy at birth (years)	55.5	59.4	65.34	NA
Infant mortality rate per 1000	110	80	63 (2002)	50 (2009)

Sources: Indian Economic Survey, 2004-05; Census of India, 2001, 1991, 1981, 2011.

**Table 1.5 Population ageing trends in India, 1950-2050**

Age group (% of population)	1950	1975	2000	2025	2050
0-14 years	37.5	40.2	34.7	25.4	19.0
15-59 years	57.1	54.2	58.6	63.6	61.9
60-plus	5.4	5.6	6.7	11.0	19.1
Median age	21.3	19.7	23.0	29.9	36.6
Ageing index	14.4	13.9	19.2	43.2	100.6
Sex ratio 60+ (men per 100 women)	100.4	105.8	95.8	91.4	89.2

Source: World Population Ageing 1950-2050, UN Population Division, 2010 Revision.

the total population in 2050 (UN PopDiv, 2010). The sex ratio of the older population (60-plus years) is projected to decline from 95.8 men per 100 women in 2000, to 89.2 men per 100 women by 2050.

In terms of the key indicators described above, and applied specifically to India:

- The *median age* in India has increased from 19.7 in 1975 to 23.0 in 2000; it is expected to rise to 29.9 in 2025 and 36.6 in 2050 (UN PopDiv, 2012).
- The *ageing index* was 19.2 in 2000, and is expected to reach 101 in 2050 (Table 1.5).
- The *sex ratio* of men per 100 women is projected to remain relatively constant in the group aged 60-plus (95.8 in 2000 to 89.2 in 2050), but in the population aged 80-plus it is projected to decline from 89.9 in 2000 to 73.3 in 2025 and 71.4 in 2050.

## 1.4 Ageing related programmes and policies in India

Older persons in India face a number of challenging issues, ranging from uncertain and insufficient income

to support themselves and their dependants to ill health, absence of social security, loss of a productive social role and recognition, and lack of opportunities for creative use of free time. The population trends clearly indicate that ageing poses and will continue to pose a considerable challenge in India, and that sizeable resources are and will be required for the support, care and treatment of older persons.

Article 41 of the Directive Principles of state policy in the Constitution of India says that “The state shall, within the limits of its economic capacity and development, make effective provisions for securing the right to work, to education and to public assistance in cases of unemployment, old age sickness and disablement, and in other cases of undeserved want.” Social security is the concurrent responsibility of the central and the state governments. Other sections of the Constitution focus on labour welfare, including conditions of work, provident funds, liability for worker’s compensation, invalidity (i.e. disability), and old age pension and maternity benefits (Article 42).

Recognising the challenges posed by the rising ageing population, the various ministries of the Government of India, including the Ministry of Health and Family

Welfare, the Ministry of Social Justice and Empowerment, and the Ministry of Rural Development, have initiated a number of policies and programmes for older populations. In the mid- to late-1990s, the Ministry of Rural Development initiated two important programmes to improve the economic security of very poor older adults, the National Old-Age Pension Scheme (NOAPS) and the Annapurna Scheme. Under the NOAPS, adults aged 65 or more who are destitute, in the sense of having no regular means of subsistence through individual income or through financial support from family members or other sources, are eligible for an old age pension of 200 rupees (Rs.) per month, paid by the central Government. Under the Annapurna Scheme, indigent adults aged 65-plus who, though eligible for an old age pension under the NOAPS, are not receiving the pension receive 10kgs of food grains per person per month free of cost.

In 1999, the National Policy on Older Persons (NPOP) sought to assure older persons that “their concerns are national concern and they will not live unprotected, ignored or marginalized. It aims to strengthen their legitimate place in society and help older persons to live their last phase of life with purpose, dignity and peace.” The policy visualizes that the state will extend support for financial security, health care, shelter, welfare and other needs of older persons, provide protection against abuse and exploitation, make available opportunities for the development of their potential and provide services so that they can improve the quality of their lives. The NPOP recognizes that older persons are a resource and render useful services in the family and community.

Also in 1999, the Ministry of Social Justice and Empowerment, which has primary responsibility of caring for older persons, commissioned a national project called OASIS (Old Age Social and Income Security) to examine the policy questions associated with old age income security in India. The basic mandate of the project was to make concrete recommendations for actions which the government can take today so that every young person can build up a stock of wealth throughout his or her working life that will serve as a shield against poverty in older age. Traditional informal means of economic support in old age, such as the joint family system in India, are increasingly unable to cope with increased life spans and medical costs during older age. This necessitates the need for introduction of formal, contributory pension arrangements which can supplement informal systems. The project report recommended the forma-

tion of a National Senior Citizen’s Fund for encouraging, catalysing and complementing private sector efforts for the betterment of life of senior citizens in the country.

Another major policy was initiated in 2007, when the Parliament of India passed the *Maintenance and Welfare of Parents and Senior Citizens Act 2007*, which permits older people to make an application against not only their children, but also any relative currently in possession of or slated to inherit their property, for support sufficient to permit them to lead “a normal life”. However, very few older persons are aware of this legislation.

In 2011, the Ministry of Health and Family Welfare initiated geriatric care policies and programmes in selected hospitals and rural health facilities. The National Programme for the Health Care for the Elderly (NPHCE) is an articulation of the international and national commitments of the Government as envisaged under the UN Convention on the Rights of Persons with Disabilities (UNCPRD) and the NPOP. The vision and objectives of the NPHCE emphasize healthy ageing, with a focus on accessible, affordable, and high-quality long-term care and comprehensive and dedicated care services for an ageing population through preventive, curative and rehabilitation services for older adults. The policy also stresses the provision of high quality services through geriatric special care, and especially the need to build capacity at primary health centres for geriatric care to support older persons suffering health shocks. The policy focuses on widening the network of geriatric wards and on providing training for supplying old age care.

In 2012, the Prime Minister of India approved the proposal of the Ministry of Social Justice and Empowerment for the creation of a National Council for Senior Citizens to advise central and state governments on issues related to the welfare of senior citizens. The Council will specially refer to policies, programmes and legislative measures, promotion of physical and financial security, health, productive living and awareness generation and community mobilization among older persons.

## 1.5 Data and policy gaps related to older adults in India

Despite the variety of secondary data reviewed and presented in the previous sections, India lacks an evidence base on the health, economic status, quality of life and wellbeing of older adults. Health research in developing countries, including India, has historically

been heavily focused on the younger population, particularly children and women of reproductive age. However, there is an increasing need for valid and comparable data on the health and wellbeing of older Indians, particularly as cross-national comparability of existing data from other nations is limited (WHO, 2001).

Consequently, there is emerging interest in developing new initiatives in ageing studies. Within India, new research developments will allow for cross-study comparisons on ageing and health. A pilot for the Longitudinal Aging Study in India (LASI) project was conducted in 2010, with a full-scale version proposed to be launched in 2014.

## 1.6 Study on global AGEing and adult health (SAGE)

To address the gap in evidence-based policy, in 2007 the Study on global AGEing and adult health (SAGE) India was initiated by the World Health Organization (WHO) as a part of a study focusing in on six of the 70 countries that participated in the 2003 World Health Survey (WHS). The other five SAGE countries are China, Ghana, Mexico, the Russian Federation and South Africa. The six countries were selected to give a broad representation across different regions, taking into consideration population and health characteristics – median age, life expectancy and sex ratio (Table 1.6) – as well as WHO's ongoing working relationship with the country (WHO, 2007).

SAGE Wave 1 is a longitudinal, face-to-face household survey. The WHS is considered Wave 0; Wave 1 used an updated version of the same sampling frame and included many follow-up respondents. In addition to providing needed health and ageing data for participating countries, SAGE will continue to improve methods for measuring health and wellbeing in ageing and older adults. It is anticipated that the SAGE results will help inform the health, social, environmental and economic policies and programmes that affect the health status of individuals and populations across different countries.

## 1.7 SAGE goals and objectives

The goals of SAGE are to (a) promote a better understanding of the effects of ageing on wellbeing; (b) examine the health status of individuals aged 50-plus as well as changes, trends and patterns that occur over time; and (c) improve the capacity of researchers to analyse the effects of social, economic, health care and policy changes on current and future health. SAGE will provide baseline and longitudinal health-related data on older persons in middle and low income countries. It especially will improve the empirical evidence base on the health and wellbeing of older adults in developing countries, by providing reliable, valid and cross-nationally comparable data, examining health difference across individuals, countries and regions, and providing validated health measurement methods.

**Table 1.6** Demographic indicators in SAGE countries, 2005 and 2025

Region/ country	Sex ratio <sup>1</sup>		Life expectancy at birth both sexes (years)		Median age (years)	
	2005	2025	2000-2005	2020-2025	2005	2025
<b>Africa</b>	<b>99.8</b>	<b>101.1</b>	<b>49.1</b>	<b>55.9</b>	<b>18.9</b>	<b>21.8</b>
Ghana	102.5	103.1	56.7	63.7	19.8	24.7
South Africa	96.5	101.7	49.0	49.3	23.5	26.0
<b>Asia</b>	<b>103.9</b>	<b>102.3</b>	<b>67.3</b>	<b>72.5</b>	<b>27.7</b>	<b>33.7</b>
China	105.6	103.7	71.5	74.5	32.6	39.5
India	105.2	103.0	63.1	70.0	24.3	30.4
<b>Europe</b>	<b>92.7</b>	<b>92.4</b>	<b>73.8</b>	<b>77.0</b>	<b>39.0</b>	<b>44.4</b>
Russian Federation	86.6	84.3	65.4	68.2	37.3	41.7
<b>Latin America and the Caribbean</b>	<b>97.5</b>	<b>96.8</b>	<b>71.6</b>	<b>76.0</b>	<b>25.9</b>	<b>32.3</b>
Mexico	95.6	94.5	74.9	79.0	25.0	33.4

<sup>1</sup> Males per 100 females.

Source: WHO and UN Population Division, 2010.

The data collection domains in SAGE include self-reported assessments of health, using anchoring vignettes for improved comparability across individuals, communities and populations; assessment of perceptions of wellbeing and quality of life; self-reported assessment of functioning, with measured performance tests on a range of different health domains; biomarkers; and the introduction of a longitudinal study design to allow dynamic examination of changes in health expectations and experiences over the life course and investigation of compression of morbidity in aging populations.

## Primary objectives

- To obtain reliable, valid and comparable data on levels of health in a range of key domains for adult populations who are 50 years and older in nationally representative samples;
- To examine patterns and dynamics of age-related changes in health and wellbeing, using longitudinal follow-up of survey respondents as they age, and to investigate socioeconomic consequences of these health changes;
- To supplement and cross-validate self-reported measures of health and the anchoring vignette approach to improving comparability of self-reported measures, through measured performance tests for selected health domains;

- To collect data on health examinations and biomarkers to improve reliability of data on morbidity and risk factors and monitor the effect of interventions.

## Additional objectives

- To generate a large enough cohort of older adult populations, and a comparison cohort of younger populations, to permit follow-up of intermediate outcomes, monitoring of trends, examination of transitions and life events, and addressing relationships between determinants and health, wellbeing and health-related outcomes;
- To develop a mechanism to link survey data to surveillance data from demographic surveillance sites;
- To build linkages with other national and cross-national ageing studies;
- To improve methodologies that enhance the reliability and validity of outcomes and determinants;
- To examine how the mix and distribution of health, health care, socioeconomic and family resources affect key outcomes, including mortality, morbidity and health care utilisation;

To 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 wellbeing of older adults.

**Table 1.7** Selected socio-demographic indicators, states and India

	Assam	West Bengal	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	India
Population (2011)	31,169,272	91,347,736	61,130,704	112,372,972	68,621,012	199,581,477	1,210,193,422
Annual population growth rate (2001-2011)	1.6	1.3	1.5	1.5	2.0	1.8	1.6
Density of population per km <sup>2</sup> (2011)	997	1,092	319	365	201	828	382
Sex ratio (females per 1000 males) (2011)	954	947	968	925	926	908	940
Literacy rate (2011)	73	77	76	83	67	70	74
Crude birth rate (2009)	23.6	17.2	19.5	17.6	27.2	28.7	22.5
Total fertility rate (2008)	2.6	1.9	2.0	2.2	3.1	4.0	2.6
Population 60+ (2011)	6.5	8.5	9.0	9.2	7.3	7.1	8.3

Note: In calculating the literacy rate, the sub-population in the age group 0-6 is excluded from the total population.

Sources: Office of the Register General and Census Commissioner, Census of India, 2011, Provisional Population Tables, New Delhi; Office of the Register General and Census Commissioner; Sample Registration System (2009) January 2011, Office of the Register General of India; Population Projection for India, Office of the Register General and Census Commissioner, Census of India 2001.



## 1.8 Socio-demographic profile of India and the SAGE states

Table 1.7 presents the socio-demographic profile of India and the Indian states selected for inclusion in SAGE: Assam, West Bengal, Karnataka, Maharashtra, Rajasthan, and Uttar Pradesh (see Section 2.2 for more details on this selection process).

- As of the latest census (1st March 2011), the population of India stood at 1.21 billion people.
- Of the states included in SAGE, Uttar Pradesh is the nation's most populous state, accounting for 16% of the total Indian population; Maharashtra and West Bengal rank second and fourth, with 9% and 8% of the total population respectively. Assam has the smallest population, accounting for 3% of the national population.
- Population growth rates in Karnataka, West Bengal, Assam and Maharashtra were lower than the national average of 1.6% during 2001-2011, but Rajasthan and Uttar Pradesh had the country's highest population growth rates, at 2% and 1.8% respectively.
- West Bengal, Assam and Uttar Pradesh have population densities above the national average of 382 persons per square kilometre.
- The sex ratios of the populations in Maharashtra, Uttar Pradesh and Rajasthan are below the national ratio of 940 females per 1000 males, indicating a greater deficit of females in those three states.

- Rajasthan, Uttar Pradesh and Assam have literacy rates below the national average of 74%.
- Assam, Uttar Pradesh and Rajasthan have crude birth rates and total fertility rates higher than the national average.
- Maharashtra, Karnataka and West Bengal are more advanced than the country as a whole in the demographic transition towards an ageing population.

## 1.9 Health status profile for India and the SAGE states

Nation-wide, India has about 67 beds in allopathic establishments (hospitals, dispensaries, community and primary health centres and sub-centres, sanatoria, tuberculosis clinics and other health establishments) per 100,000 persons. In 2002, the combined availability of beds in all allopathic establishments was 89 beds per 100,000 persons (Government of India, 2002a). Maharashtra, Karnataka and West Bengal have a higher bed-population ratio than Assam, Rajasthan and Uttar Pradesh, as well as better availability of health personnel and health infrastructure (see Table 1.7).

In a broad summary of states included in SAGE and this report, Uttar Pradesh and Rajasthan are at the bottom in health outcomes, demographic indicators and availability of health infrastructure compared with

**Table 1.8** Total health professionals and availability of health professionals per 100,000 population, states and India, 2010

Category of health professionals	Assam	West Bengal	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	India
Allopathic doctors (registered under MCI <sup>1</sup> and with state medical councils, 2010)	19,116	58,872	87,320	137,824	28,513	57,944	816,629
General nursing and midwives (2010)	NA	48,470	136,421	93,032	37,667	21,042	1,073,638
Auxiliary nursing and midwives (2010)	19,685	56,302	48,509	33,158	22,239	27,328	576,542
Average population served per dentist (2010)	339,225	227,356	16,849	2,057,741	603,121	709,608	33,722
Women's health visitors and health supervisors (2010)	118	11,938	6,839	566	850	2,763	52,375
Number of beds in government hospitals (2010)	7,622	54,759	63,741	50,003	32,067	56,384	576,793

<sup>1</sup> Medical Council of India

Source: Health Information of India, 2010



the rest of the states. On the other hand, Maharashtra and Karnataka are more advanced both in provision of health facilities and in the demographic transition towards an ageing population.

### **SAGE global coverage**

This work is based in the WHO Multi-Country Studies unit, using a survey platform developed over the last 10 years, and including validated and new assessment methodologies. The survey instruments are based on the WHS programme, with substantial revisions and additions based on a review of other major ageing

surveys, cognitive testing of a draft survey instrument, and recommendations from a group of experts. Data were collected using a standardised questionnaire (with country-specific adaptations) including self-reported and objective health measures (performance tests, anthropometry and biomarkers).

For SAGE Wave 1 in India, a cohort of respondents aged 50-plus was followed from the 2003 WHS/SAGE Wave 0. In addition to this cohort, new respondents have been recruited to meet sample size targets and to adjust for attrition and other biases inherent to longitudinal survey designs. The target sample included adults aged 18-49 years for comparative purposes.



## 2. Methodology

### 2.1 SAGE Wave 1 India: coverage and scope

SAGE Wave 1 India was implemented in the states of Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal – the same states covered in the World Health Survey (WHS) India 2003. Given the remarkable variation in population health indicators across the states of India, the WHS India project team decided to generate state-level estimates, as well as providing pooled estimates for the country. The same primary sampling units and the sample households covered in the WHS were the baseline sample for SAGE India Wave 1; consequently, in India, the WHS is also used as SAGE Wave 0.

### 2.2 Sampling design

SAGE Wave 1 India follows the same households from the same primary sampling units used by the International Institute for Population Sciences when under-

taking the WHS/SAGE Wave 0 India in 2003. WHS/SAGE Wave 0 was conducted in randomly selected six states – Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal – covering an overall sample of 10,279 households. The survey focused on one adult (any person over 18 years) in each household. This individual was randomly selected using Kish grid tables, which helped to select the respondent in the household without any bias to a particular age or sex group.

A systematic random sample selection process was undertaken for the WHS/SAGE Wave 0 that included all states in India. States with a population of five million or more, except Jammu and Kashmir, were grouped into six geographical regions: north, central, northeast, east, west and south. Jammu and Kashmir were not included because of the difficulty of conducting household interviews in these areas. All the states were further classified into six groups according to level of development, based on four important indicators: infant mortality rate, female literacy rate, percentage of safe deliveries (births) and per capita income. The infant

**Table 2.1** Classification of states by region and level of development

Region	Level of development (economic and social)					
	I	II	III	IV	V	VI
North		Punjab	Himachal Pradesh, Uttarakhand	Haryana	<i>Rajasthan</i>	
Central				Madhya Pradesh	Chhattisgarh	<i>Uttar Pradesh</i>
East			<i>West Bengal</i>		Bihar	Orissa, Jharkhand
North east				<i>Assam</i>		
West	<i>Maharashtra</i>	Gujarat				
South	Kerala, Tamil Nadu	<i>Karnataka</i>	Andhra Pradesh			

Note: States in bold italics were selected for the survey.

**Table 2.2** Number of households and individual respondents in the WHS states and India, 2003

State	Number of PSUs surveyed in WHS			Households sampled in WHS	Households interviewed in WHS	Individual interviews completed in WHS	Number of targets in SAGE
	Rural	Urban	Total				
Assam	38	6	44	1, 224	1, 141	1, 046	1, 200
Karnataka	34	16	50	1, 473	1, 451	1, 431	1, 400
Maharashtra	46	27	74	2, 088	2, 035	2, 054	2, 100
Rajasthan	55	14	69	1, 943	1, 882	1, 816	1, 900
Uttar Pradesh	63	12	77	2, 097	2, 051	1, 972	2, 100
West Bengal	52	17	68	1, 925	1, 719	1, 675	1, 900
<b>Total (pooled)</b>	<b>288</b>	<b>92</b>	<b>382</b>	<b>10, 750</b>	<b>10, 279</b>	<b>9, 994</b>	<b>10, 600</b>

mortality rate is a good summary indicator of an area's level of development in terms of mortality and health transition. The female literacy rate is an important determinant of utilization of different services by mothers, and can also be used as a proxy measure of their families' likelihood to use health care services. Percentage of safe deliveries indicates the extent of utilization of health care services and is an important determinant of maternal mortality. Per capita income is commonly used as an indicator of economic development. The six states randomly chosen for the WHS/SAGE Wave 1 include one state from each geographical region as well as from each level of development (Table 2.1).

Maharashtra in the western region represented the highest development category. The other five states, ranked in descending order according to level of development, were Karnataka (from the south), West Bengal (east), Assam (northeast), Rajasthan (north) and Uttar Pradesh (central). A sample size of 10,000 households at national level was targeted. The national sample (plus 10% to account for non-response) was allocated to the six states according to their population size. At the same time, care was taken to have state samples of a sufficient size to generate estimates for individual states as well. The national level estimates were computed by pooling the data of all six states.

## Rural and urban sampling

SAGE used two-stage sampling in rural areas and three-stage sampling in urban areas. The primary sampling units (PSUs) in rural areas were villages, while in urban areas the PSUs were city wards. From each city ward two census enumeration blocks (CEBs) were selected. Households, the last level of selection,

were distributed among rural and urban areas in proportion to their share of the state's population.

The sampling frame in rural and urban areas consisted of a list of villages and CEBs respectively, as per the 2001 census. A sample of PSUs was drawn by probability proportional to size (PPS) sampling.

Table 2.2 presents the sampling distribution of households and individual respondents covered in the six states and India as a whole. There were 288 PSUs in rural areas and 92 PSUs and CEBs in urban areas. A total of 10,750 households were contacted in six states; 10,279 household interviews were completed, comprising a population of 58,343 people. Information on individual health modules was collected from 9994 individual respondents aged 18-plus.

## Rural sampling

Two-stage stratified sampling was used to select households in rural areas. The PSU was the village. These were divided into three categories on the basis of village size:

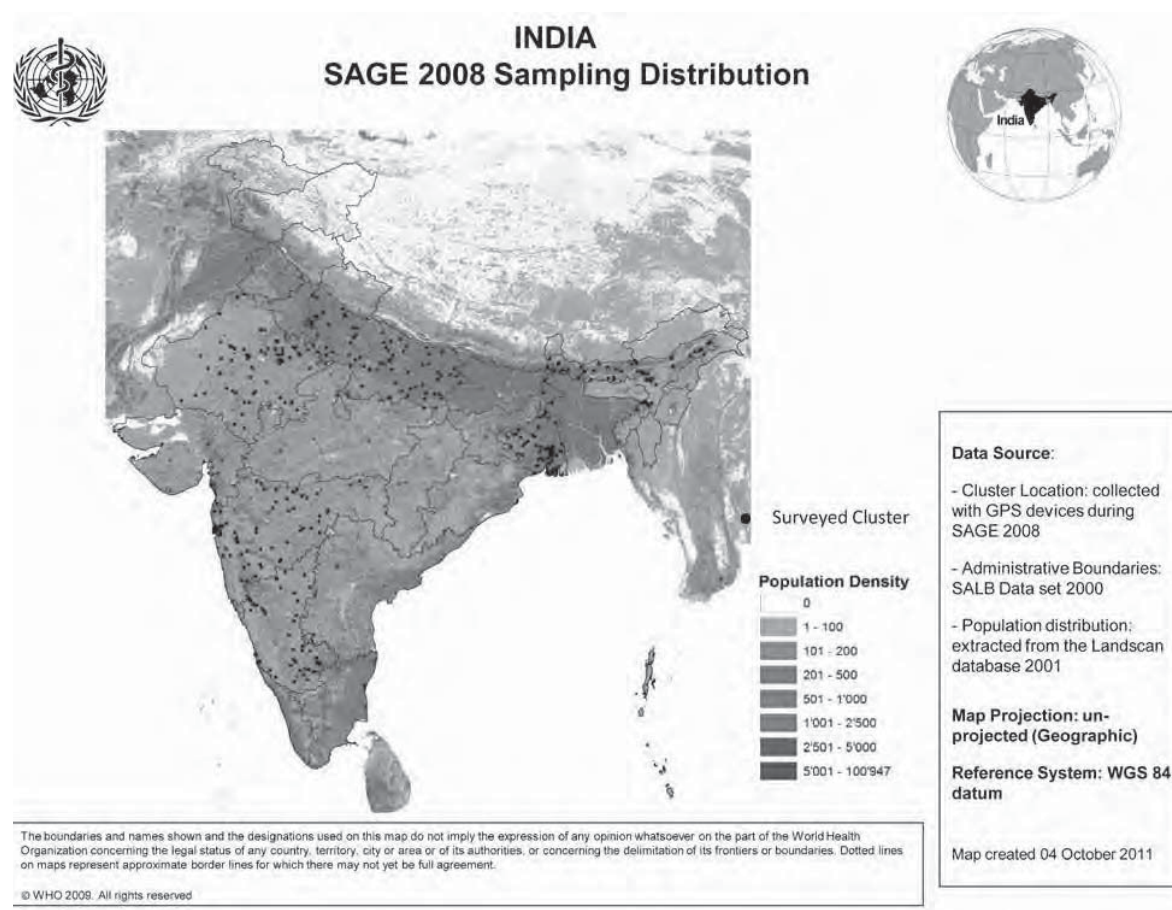
- 1) fewer than 250 households;
- 2) 250-500 households; and
- 3) more than 500 households.

In each village, 28 households (a target of 25, plus an additional three to account for non-response) were selected by systematic sampling for the survey.

## Urban sampling

In the urban areas, a three-stage design was used. All urban wards in each state were arranged according to size of the city/town and geographic region. The cities/

**Figure 2.1** Geographic distribution of PSUs across the SAGE Wave 1 India sample



towns were classified into four categories on the basis of the 1991 census population. Two CEBs were selected from each selected ward. From each CEB, 33 households (a target of 30, plus three for non-response) were selected for the survey.

## Sampling for the households and individuals

A fixed number of sample households were selected by systematic sampling from each PSU in the WHS 2003 states – 28 households in rural areas and 33 in urban areas. From each household, one person aged 18 or above was randomly selected from the roster of household members. Selection was done by using Kish grid tables, ensuring proper representation of both sexes and all age groups above the age of 18. In each household, a general information table was filled in with information about all adult household members, with one key informant answering queries about her/himself as well as the questions related to family members and the household questionnaire.

## 2.3 Sampling coverage

SAGE Wave 1 India (hereafter SAGE India) covered six states, one state from each region. The study's national level estimates were computed by pooling the data of all six states. Allocation of households among the six states was done by their population size.

SAGE India used almost the same sample as the 2003 WHS/SAGE Wave 0. The WHS/Wave 0 was conducted in 288 villages and 92 CEBs; however, in 2007, three villages and one CEB did not return their questionnaires, so SAGE India had only 285 villages and 93 CEBs. The number of villages and CEBs covered in each of the six states is shown in Table 2.3. The rural PSUs were reconfirmed as per the 2001 census village directory.

Table 2.4 represents the sampling distribution of households and individual respondents covered in the SAGE Wave 1 survey in the six SAGE states and India. A total of 10,600 households were covered and 9,626 household interviews were completed, covering a population of 57,082. Information on individual health modules was collected from 11,230 individual respondents.

**Table 2.3** Number of rural and urban PSUs and CEBs selected for SAGE India, 2007

State	Number of rural PSUs (village)	Number of urban CEBs	Total
Assam	37	6	43
Karnataka	34	16	50
Maharashtra	46	27	73
Rajasthan	55	14	69
Uttar Pradesh	63	13	76
West Bengal	50	17	67
<b>Total (pooled)</b>	<b>285</b>	<b>93</b>	<b>378</b>

**Table 2.4** Number of households and individual respondents in the SAGE states and India, 2007

State	Households sampled in SAGE	Households interviewed in SAGE	Household population for households completed	Individual interviews completed in SAGE 1
Assam	1,200	1,074	5,795	1,194
Karnataka	1,400	1,208	6,802	1,553
Maharashtra	2,100	1,851	9,778	1,983
Rajasthan	1,900	1,895	12,658	2,225
Uttar Pradesh	2,100	1,899	13,308	2,201
West Bengal	1,900	1,699	8,741	2,074
<b>Total (pooled)</b>	<b>10,600</b>	<b>9,626</b>	<b>57,082</b>	<b>11,230</b>

<sup>1</sup> Includes 10,736 fully completed interviews and 494 partially completed interviews.

## 2.4 Sampling coverage by age

Wave 1 aimed for a total target sample of 6000 older adults aged 50-plus, plus 3000 young adults aged 18-49. The target sample size was inflated by 10% to account for non-response. The sample of older adults had equal numbers of male and female respondents. However, in the younger sample, a higher number of women than men were recruited because this wave included a nested study with the additional aim of studying reproductive health of women aged 18-49. Additional separate external funding was secured by the SAGE India team for this nested study.

WHS/SAGE Wave 0 India in 2003 included 2800 respondents aged 50-plus; by 2007, this group was reduced to 2300 respondents due to mortality, migration and non-contact. As a consequence, Wave 1 recruited an additional 3700 older respondents from the Wave 0 sample households. In addition, a sample of 4600 young adults aged 18-49 years from the Wave 0 sample households was included. The purpose of selecting a higher number of younger adults was to ensure sufficient young sample progression in subsequent waves, in view of

substantial attrition of older adults expected in future waves. In a small number of cases where it was not possible to recruit from the original WHS sample households, Wave 1 respondents were randomly drawn from non-WHS households from the same PSU.

Table 2.5 shows the sample size of individual interviews by age and sex of respondents for each state. Interviews were completed with 3625 women aged 18-49, 1045 men aged 18-49, and 6,560 persons (3304 male and 3256 female) aged 50-plus. In all, Wave 1 included 11,230 completed interviews from the six states.

## 2.5 Survey metrics and data quality measures

Survey metrics for most modules and questions in Wave 1 were generated as part of Wave 0 outputs. Survey metrics for the new modules/questions were tested, along with an assessment of accuracy of age reporting and response rates as a measure of the representativeness of the population of interest.

**Table 2.5** Number of individuals by younger (18-49) and older (50-plus) age groups, SAGE India, 2007

States	Aged 18-49		Aged 50-plus		Total
	Male	Female	Male	Female	
Assam	114	403	368	309	1,194
Karnataka	130	500	419	504	1,553
Maharashtra	202	683	548	550	1,983
Rajasthan	193	654	677	701	2,225
Uttar Pradesh	213	677	703	608	2,201
West Bengal	193	708	589	584	2,074
India (pooled)	1045	3625	3304	3256	11,230

Note: In older households, all adults 50+ were invited to participate. In younger households (18-49), if a man was selected for interview, only one was invited. If a woman was selected for interview, all eligible females were invited.

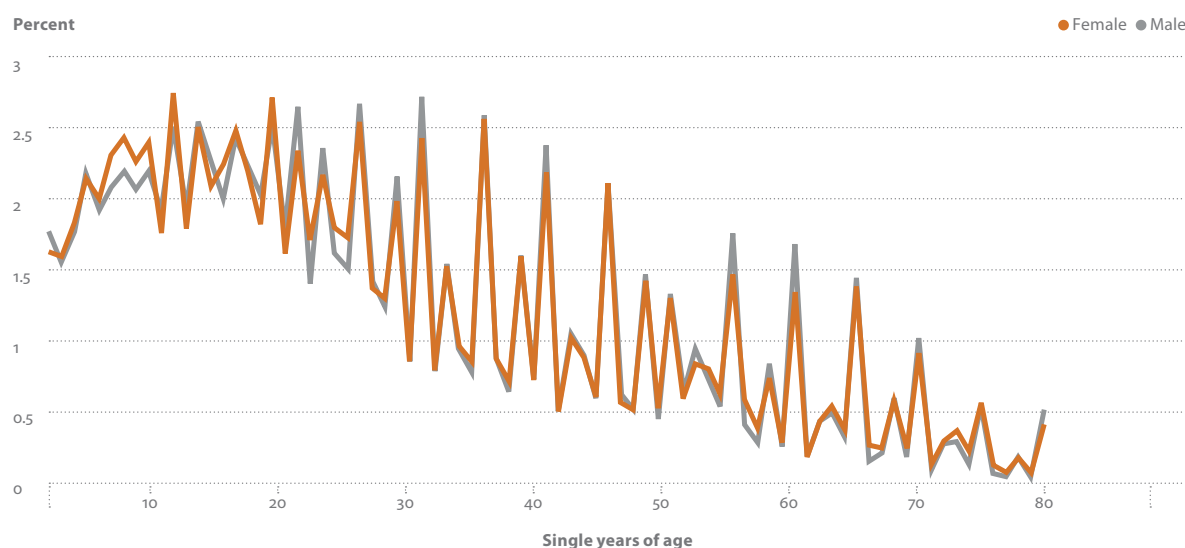
### 2.5.1 Myers' Blended Index

Age is an important study variable in demography and epidemiological studies. Misstatement of age is one example of content error in census and surveys. Age heaping is a common phenomenon and is considered to be a measure of data quality and consistency (Pardeshi, 2010). The approximation of age manifests itself in the phenomenon of age heaping in self-reported or proxy age data.

In this report, age heaping and digit preference were calculated using Myers' Blended Index. Myers' Blended Index is a measure of age heaping that involves a comparison of expected proportions of population at each age with the reported proportions of population at each age. It is calculated for ages 10 and above and shows the excess or deficit of people in ages ending in any of

the 10 digits expressed as percentages, based on the assumption that the population is equally distributed among the different ages. The Index is the absolute value sum of percentage differences between the reported and expected age distribution. It ranges from 0 to 99, with 0 meaning no age heaping and 99 meaning that all ages are reported with the same terminal digit. If the Index is over 60, age heaping is very severe and the data quality is poor (Siegel, 2004).

Figure 2.1 shows Myers' Blended Index for household members in Wave 1. The Index is 17.6, which indicates that a minimum of 17.6% of the population reported ages with an incorrect final digit, with evidence of heaping on end digits 0 and 5. This was the highest among the six SAGE countries, although the index value is still relatively low.

**Figure 2.2** Age heaping using Myers' Blended Index for household members in SAGE India, 2007

Source: SAGE 2007-2010



## 2.5.2. Response rate

Response rates are an indicator of survey quality and the likelihood of non-response bias. Response rates are given here for both the household questionnaire and the individual questionnaire. The household response rate was based on all households drawn into the sample as the denominator. For the individual response rate, this was based on all the persons aged 18-49 and 50-plus from the roster that should have been interviewed from the respondent's household, and was used as the denominator (Table 2.6).

**Table 2.6 Household and individual response and cooperation rates, SAGE India, 2007**

	Response rate
Household	88%
Individual	92%

Note: Response rate = % of persons who completed the interviews among all eligible persons, including those who were not successfully contacted.

From the 9626 households surveyed in the six states combined, a total of 11,230 individuals responded to the individual questionnaire, giving a response rate for the individual questionnaire of 92%. Assam recorded the highest response rate at 95%, followed by Rajasthan and West Bengal with 94% each. Karnataka had the lowest response rate of 89%.

## 2.6 Survey instruments

SAGE India used household, individual, and proxy questionnaires. For deaths recorded in follow-up older households, a verbal autopsy questionnaire was completed. The nested add-on study of younger women included additional set of questions on maternal and child health issues.

### (a) Household questionnaires

The household questionnaire was administered to any household member aged 18-plus. Before administering the interview, consent was sought from the respondent.

The following is a brief description of each section in the household questionnaire.

- *Section 0000*: Summary of key information for supervisors, interviewers and data entry clerks, including

ID numbers, rotation codes, key dates and quality control checks.

- *Section 0100*: Sampling details necessary for calculating sampling weights.
- *Section 0200*: GPS information.
- *Section 0300*: Specific address and location information for the respondent, plus information for a backup informant in cases where the respondent could not be located.
- *Section 0350*: Record of contact with the household
- *Section 0400*: Household roster, with details about all household members, including sex, age, marital status, education and care needs.
- *Section 0450*: Provided the interviewer with the correct procedure for selecting new respondents for the individual questionnaire and the consent form for the informant completing the household questionnaire.
- *Section 0500*: Physical characteristics of the dwelling/household, including ownership status, flooring and wall materials, water supply, sanitation and cooking arrangements.
- *Section 0600*: Cash and non-cash transfers into and out of the household.
- *Section 0700*: Household income and assets.
- *Section 0800*: Household health and non-health expenditures.

The household roster for follow-up respondents differed slightly from that for new households. It included questions about deaths in the household since the last interview, other reasons for departures from the household, and new members of the household since the last interview.

### (b) Individual questionnaire

The individual questionnaire was administered to all adult respondents aged 50-plus in older households, or the selected adult aged 18-49 years in younger households. Respondents were asked to sign a consent form (Appendix 3) prior to the administration of the individual questionnaire, even if the same person had given consent for the household questionnaire. This form also included consent for taking and storing a blood sample for analysis.

The individual questionnaire was divided into nine sections. The first section started with filter questions about memory to assess whether respondents aged

**Table 2.7** Response rate by selected background characteristics of respondents in states and India, 2007

Characteristics	Response rate (%)						
	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group</b>							
18-49	95.6	88.6	91.3	93.4	92.2	94.4	92.5
50-59	95.0	90.1	89.6	94.5	91.8	94.0	92.5
60-69	92.1	88.2	85.6	94.9	92.4	92.0	91.0
70-79	98.0	89.7	90.7	92.2	92.7	92.2	92.12
80+	90.9	90.3	82.5	88.0	88.3	95.2	89.4
<b>Sex</b>							
Male	95.0	88.1	87.7	94.5	94.5	93.9	92.0
Female	94.7	89.6	90.7	93.3	90.4	93.5	91.9
<b>Residence</b>							
Urban	90.7	89.1	89.9	95.8	90.6	90.2	90.8
Rural	95.9	89.0	89.3	93.2	92.3	94.9	92.5
<b>Education</b>							
Illiterate	95.1	89.4	90.1	93.8	92.3	93.7	92.4
Literate	94.7	88.8	89.1	93.7	91.8	93.6	91.8
<b>Total</b>	<b>94.8</b>	<b>89.1</b>	<b>89.5</b>	<b>93.7</b>	<b>92.1</b>	<b>93.6</b>	<b>92.3</b>
<b>No. of individual interviews completed</b>	<b>1194</b>	<b>1553</b>	<b>1983</b>	<b>2225</b>	<b>2201</b>	<b>2074</b>	<b>11230</b>

Note: Response rate = (interview completed + interview partially completed)/ number of respondents contacted.

60-plus were cognitively capable of understanding and completing the survey. If a respondent was not capable of completing the questionnaire, a proxy respondent was selected, and a proxy questionnaire administered.

The following is a brief description of each section in the individual questionnaire.

- *Section 1000*: Individual consent form and background characteristics of the respondent.
- *Section 1500*: Details of current or past work situation, including if the person was currently looking for work (unemployed).
- *Section 2000*: Overall health, abilities in day-to-day life, and eight self-rated health domains (affect, mobility, sleep and energy, cognition, interpersonal activities, vision, self-care, pain, and breathing). This section included the vignette methodology. Functioning was assessed using the 12-item version of the WHO Disability Assessment Schedule WHODAS-2, complemented by an extended set of questions on indicators of functional wellbeing, in particular the ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs) (see Section 6.2 for further discussion).
- *Section 2500*: Blood pressure, height, weight, waist and hip circumferences of the respondent. The respondent was also asked to complete performance tests (vision, lung function, cognition, timed walk) and asked for a blood sample (noted where declined). (See below for further discussion.)
- *Section 3000*: Selected risk factors and health behaviours, including tobacco and alcohol use, diet, food security and physical activity.
- *Section 4000*: Diagnosis, and for some conditions symptoms, of 11 health conditions (stroke, angina, arthritis, diabetes, chronic lung disease, depression, hypertension, cataracts, injuries and oral health problems). Information about treatment-seeking behaviour.
- *Section 5000*: Use of inpatient, outpatient and home-based health care over the previous five years.

- **Section 6000:** Social connections and participation in the community.
- **Section 7000:** Perceptions of quality of life and well-being, using the WHO Quality of Life (WHOQoL) eight-item version along with an abbreviated Day Reconstruction Method (DRM) module for characterising daily life experience and happiness.
- **Section 8000:** Assessment of the impacts of care-giving on the respondent and their household, through questions about care-giving and losses to the household, including loss of support, physical and financial burdens of care-giving, and changes in health status as a result of care given for adult children or orphaned grandchildren/kin.
- **Section 9000:** Interviewer's observations about the respondent and impressions of the interview process.

## Section 2500 details – Biomarker measurements

- **Anthropometry:** Weight and height were measured to calculate Body Mass Index (BMI) as an independent risk factor for several health outcomes. Waist and hip circumferences were measured to calculate waist-to-hip ratio, which is an independent risk factor for cardiovascular disease and other health outcomes.
- **Physical tests:** The following tests were administered:
  - *Four-meter timed walk at normal and rapid pace:* The respondent was allowed to use a walking aid, if necessary.
  - *Hand grip strength:* Using each hand.<sup>1</sup>
  - *Spirometry:* Lung function measures (forced expiratory volume in the first second (FEV<sub>1</sub>) and forced vital capacity (FVC)) were obtained to screen for chronic obstructive pulmonary disorder, using a.<sup>2</sup>
  - *Eyesight:* Tests for myopia and hyperopia were performed using Log MAR charts.<sup>3</sup>
  - *Blood pressure:* Readings were measured twice during the interview, using an automated record-

ing device, both times on the right arm/wrist with the respondent seated.<sup>4</sup>

- **Cognition tests:** A short set of cognition tests measured concentration, attention and memory. This provided an estimate of cognitive ability and impact on health status (for example, dementia). Over time, these tests will provide a basis for examining changes in cognitive function with age.
  - *Verbal fluency:* Ability to produce as many words as possible in a one-minute time span. This test assessed retrieval of information from semantic memory.
  - *Immediate and delayed verbal recall:* Ten words were successively presented, after which the respondent was given the opportunity to recall as many words as possible. This was repeated three times to saturate the learning curve. After about 10 minutes, delayed recall and recognition were tested. This test assesses learning capacity, memory storage and memory retrieval.
  - *Digit span (forward and backward):* Participants were read a series of digits and asked to immediately repeat them back. In the backward test, the person must repeat the numbers in reverse order. These tests measure concentration, attention, and immediate memory.
- **Blood sample:** For respondents who provided consent, a finger-prick using sterile techniques was done to collect a small amount of blood. SAGE plans to use these blood samples to test for anaemia (haemoglobin), diabetes (glycosylated haemoglobin), cardiovascular disease (C-reactive protein) and chronic infection status (Epstein-Barr Virus). The dried blood spot (DBS) samples collected were delivered to a storage facility at the National AIDS Research Institute (NARI) at Pune. Steps for securing and transporting samples to the laboratory followed the WHO protocol.<sup>5</sup> Portable biohazard containers were provided to the fieldworkers for disposal of used lancets and other related material. The samples are stored at NARI at -20°C. Samples will be stored through the next anticipated round of data collection (three years following this round) for two main reasons: 1) to run again in future, using the same assay techniques, to minimise misinter-

<sup>1</sup> Smedley's Hand Dynamometer, Scanditact Aps, Skovdalsvej 4, 8300 Odder, Denmark.

<sup>2</sup> MIR SpiroDoc Diagnostic Portable Spirometer, Medical International Research, via del Maggolino 125, 00155 Roma, Italy.

<sup>3</sup> Tumbling "E" Chart for 4m testing and Tumbling "E" Near Vision Card for 40cm testing, Precision Vision Ltd., 944 First Street, LaSalle IL 61301, USA.

<sup>4</sup> OMRON R6 Wrist Blood Pressure Monitor, HEM-6000-E, Omron Healthcare Europe, Wegelaan 67-69 2312 JD Hoofddorp, The Netherlands.

<sup>5</sup> Guidelines have been drafted and are available on request.



pretation of prevalence rates due to laboratory techniques and 2) to benefit from any potential improvements in assay technologies.

### (c) Proxy questionnaire

For respondents aged 50-plus, a short set of questions about memory preceded the main set of questions in the individual questionnaire. These questions allowed the interviewer to subjectively determine whether a respondent was cognitively and physically competent to complete the interview. If the respondent was deemed unable to provide reliable results or too ill to participate, then the proxy respondent questionnaire was used to interview a person who knew the respondent well and was able to accurately answer questions about the respondent's health and well-being on their behalf. The proxy respondent questionnaire consisted of a standardized set of screening questions for dementia and cognitive decline. The proxy respondent needed to provide specific consent for a proxy interview.

- *Section o: Consent form*
- *Informant Questionnaire on Cognitive Decline (IQ Code):* Sixteen-item version of screening questions for dementia and cognitive decline (Cherbuin and Jorm, 2010).
- *Health state descriptions:* Captured health information in the eight health domains.
- *Chronic conditions and health care service use:* Asked about same conditions as in the individual questionnaire.
- *Health care utilization:* Same strategy as used in the individual questionnaire.

### (d) Women's questionnaire

An additional module containing a women's questionnaire was administered to all currently married women selected for individual interviews (Table 2.8). This module covered:

- *Reproduction:* Children ever born and children surviving, including the sex.
- *Contraceptive use:* Current and lifetime use of contraception, future intention to use contraception, and discontinuation.
- *Reproductive and contraceptive morbidity:* Health problems during pregnancy, contraceptive use, and health care utilization.

**Table 2.8** Number of currently married women aged 18-49 included in SAGE for the additional module on women's health

States	Sample of currently married women included for additional module	Sample of women aged 18-49 included in SAGE
Assam	300	403
Karnataka	377	500
Maharashtra	563	683
Rajasthan	565	654
Uttar Pradesh	579	677
West Bengal	592	707
India (pooled)	2,976	3,624

Note: A separate report is available for this module through IIPS.

## 2.7 Sampling weights

A multi-stage stratified cluster sample design was again used in SAGE Wave 1 India. Household weights for analysis at the household level and individual weights for analysis at the person level were calculated based on the selection probability at each stage of selection.

Household weights were post-stratified by the six states and locality according to the 2006 household projections obtained from the Indian Government's Office of the Registrar General and Census Commissioner's 2006 report *Population Projections for India and States 2001-2026: Report of the technical group on population projections constituted by the national commission on population*. Individual weights were post-stratified by the six states, locality, sex and age-groups (18-49, 50-59, 60-69, 70+) according to the 2006 projected population estimates. A second set of household and individual weights are available which are post-stratified to weight up to the number of households and 18-plus populations respectively in the entire country. Weights are not normalized.

All analyses were carried out using these probability weights, with variance estimations to take into account the complex design implemented in STATA. Design weights were calculated taking the specific sample design into consideration. Both household and individual weights were calculated to perform analysis at the household and individual level.



## 3. Household and individual respondent characteristics

### 3.1 Household profile

SAGE Wave 1 India (hereafter SAGE India) interviewed 9,626 households from six states: Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal. There were a total of 57,082 members of these sampled households. This chapter presents a profile of the selected households and household members. The information on household members and housing characteristics was collected from household informants, usually the head of the household. The information collected from each of the households included a roster of household members; member composition and demographic characteristics, including marital status and education; insurance coverage and care needs of all residents staying in the household for at least four months per year; housing characteristics; and the income/economic situation of the household. These basic household data play an important role in gaining an understanding of the issues related to adult health at the micro level, particularly of older persons.

#### 3.1.1 Socio-demographic characteristics of household population

The socio-demographic profile of the household populations is presented in Table 3.1.1. As shown in Table 3.1.1, the population consisted of 29, 076 males and 28, 006 females, with a sex ratio of 104 males per 100 females. Adults of working age (15-59) accounted for 59% of the household population, while children below the age of 15 accounted for about 31% and people aged 60-plus for about 10%. A little over one-fifth of respondents (13,256 persons) were in urban areas. Children made up a larger share of the population in rural (33%) than in urban (26%) areas; conversely, working age adults and people aged 60-plus made up a larger proportion in urban areas. In both urban and rural areas, there were

more boys than girls under the age of 15. However, women outnumbered men in both urban and rural working age populations. The population aged 60-plus contained more women in urban areas (and in total), but more men in rural areas.

Figure 3.1 shows a graphic representation of the household population as a population pyramid, which looks like a country in the early stages of demographic transition.

Data on marital status was collected for persons aged 15-plus. One-quarter of this adult population had never been married, two thirds were currently married, and widows/widowers and others constituted the remaining nearly 9%. Urban areas had a larger proportion of both men and women who had never been married; this reflects the fact that people tend to get married at younger ages in rural areas.

Data on education was collected for the population aged 7-plus, this being the age of formal entry into school. More than one-quarter of the household population (26 %) had no formal education; slightly more than half (53%) had less than a high school education; and 21% had education at the high school level or above.

Wide differences in education levels were observed between different places of residence and by sex. In rural areas, 30% of the population had no formal education, compared to 17% in urban areas. Meanwhile, in rural areas 17% had an education at the high school level and above, compared to 30% urban areas. Females in both urban and rural areas were more likely to be without formal education and less likely to have a high school or college education than their male counterparts. For example, 42% of females in rural areas had no formal education, compared to 19% of rural males, and only 11% had a high school education and above, compared to 24% for rural males.

**Table 3.1.1** Percent distribution of the household population by age, marital status, education, wealth quintile according to sex and residence, India (pooled), 2007

Background characteristics	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Age group<sup>1</sup></b>									
0-14	26.9	24.6	25.7	33.8	32.7	33.2	32.1	30.7	31.4
15-59	63.9	64.8	64.4	56.8	58.1	57.4	58.5	59.8	59.1
60+	9.2	10.6	9.9	9.5	9.2	9.3	9.4	9.5	9.5
<b>Marital status<sup>2</sup></b>									
Never married	36.1	22.8	29.5	29.9	16.5	23.3	31.5	18.2	25.0
Currently married	61.2	62.7	62.0	65.7	70.9	68.2	64.5	68.7	66.6
Widowed	2.4	13.8	8.1	4.0	11.7	7.8	3.6	12.3	7.9
Other <sup>3</sup>	0.3	0.7	0.5	0.5	0.9	0.7	0.4	0.8	0.6
<b>Education<sup>4</sup></b>									
No formal education	9.1	24.0	16.5	18.6	41.5	29.8	16.2	37.0	26.4
Less than primary	13.2	13.5	13.3	16.9	15.1	16.1	16.0	14.7	15.4
Primary school	18.9	20.6	19.7	21.1	18.8	19.9	20.5	19.2	19.9
Secondary school	23.4	17.9	20.7	20.0	13.5	16.9	20.9	14.7	17.8
High school	20.6	14.7	17.7	16.9	8.7	12.9	17.8	10.2	14.1
College and above	14.8	9.3	12.1	6.6	2.4	4.5	8.6	4.2	6.5
<b>Wealth quintile</b>									
Lowest	11.6	11.9	11.8	23.1	23.3	23.2	20.3	20.5	20.4
Second	16.3	15.6	16.0	24.8	25.2	25.0	22.8	22.8	22.8
Middle	13.4	12.9	13.2	13.3	13.2	13.2	13.3	13.2	13.2
Fourth	25.3	25.7	25.5	19.7	19.1	19.4	21.1	20.8	20.9
Highest	33.3	33.9	33.6	19.1	19.2	19.1	22.6	22.8	22.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number (total)</b>	<b>6,744</b>	<b>6,512</b>	<b>13,256</b>	<b>22,332</b>	<b>21,494</b>	<b>43,826</b>	<b>29,076</b>	<b>28,006</b>	<b>57,082</b>
<b>Number (aged 7-plus)</b>	<b>6,031</b>	<b>5,833</b>	<b>11,864</b>	<b>19,019</b>	<b>18,368</b>	<b>37,387</b>	<b>25,050</b>	<b>24,201</b>	<b>49,251</b>
<b>Number (aged 15-plus)</b>	<b>5,085</b>	<b>4,917</b>	<b>10,002</b>	<b>14,815</b>	<b>14,444</b>	<b>29,259</b>	<b>19,900</b>	<b>19,361</b>	<b>39,261</b>

<sup>1</sup> Age and sex distribution are calculated for the total population (all ages).

<sup>2</sup> Marital status is calculated for the population aged 15-plus.

<sup>3</sup> Includes divorced, separated or cohabiting.

<sup>4</sup> Education is collected for the population aged six and above.

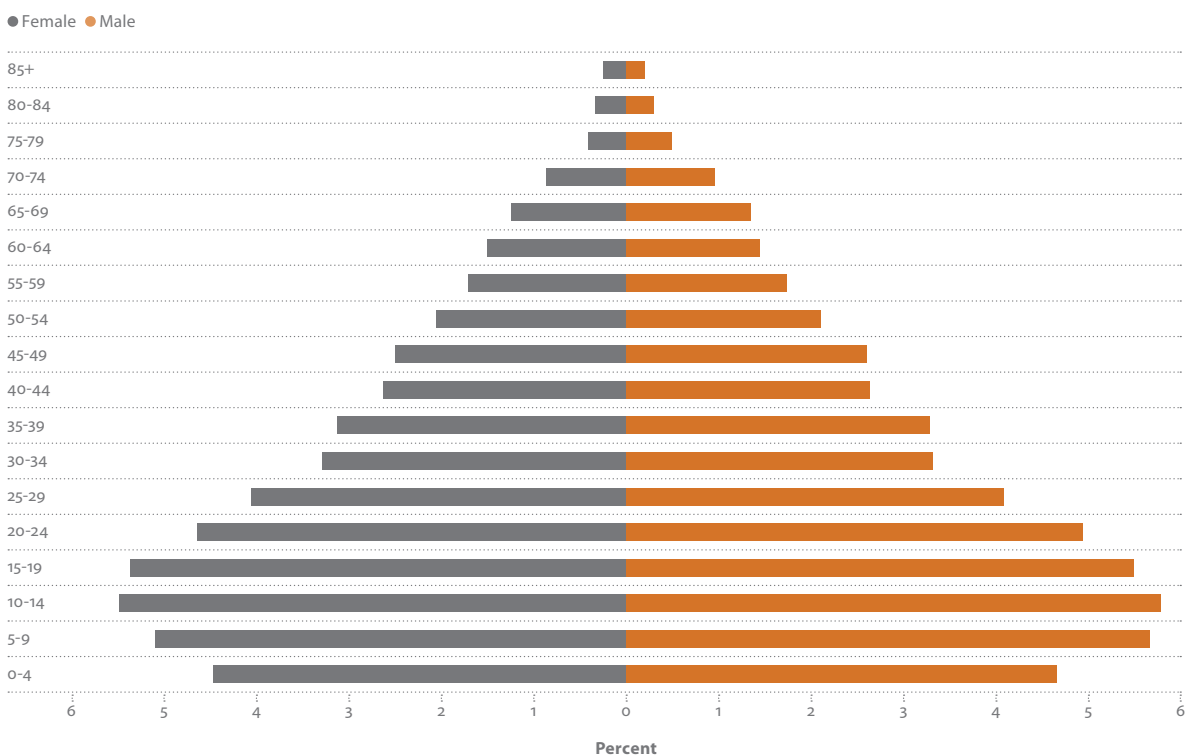
Distribution by wealth quintile shows a relatively higher proportion of poor people in rural areas and of wealthier people in urban areas. About half the rural population belonged to the first and second (lowest) wealth quintiles, compared to 28% of the urban population. Meanwhile, 59% the urban population, but only 39% of the rural population, were in the fourth and fifth (highest) quintiles.

### 3.1.2 State differentials

The demographic and socioeconomic profile of the household population is presented at the state level in Table 3.1.2, and then broken down by urban (Table 3.1.3) and rural (Table 3.1.4) areas.

The states selected for the SAGE India vary widely socio-economically and demographically. The size of the

**Figure 3.1** Population pyramid based on sampled household population



\* Note: Sample size deviations are due to variations in missing values, and are negligible here.

Source: SAGE-India, 2007-2010

child population ranged from 25% of the population in Karnataka to 36% in Uttar Pradesh; the working age population ranged from 55% in Uttar Pradesh to nearly 64% in Karnataka. Adults aged 60-plus accounted for 10% or more of the population in Karnataka, Maharashtra and West Bengal.

All states except Karnataka had more men than women. Uttar Pradesh had the highest sex ratio, with 109 males for every 100 females. Sex ratios were higher in rural than urban areas – even Karnataka's ratio was over 100 in the rural areas of that state.

In all states, less than one-third of the population aged 15-plus had never been married. Assam had the highest proportion of never-married persons (33%) and the lowest proportion of people who were currently married (58%). Urban areas of every state had more never-married people and fewer married people than rural areas.

Among the six states, Maharashtra ranked first and Rajasthan ranked last in educational attainment. The proportion of males with no education at all was lowest in Maharashtra (10%), whereas the rate for females was lowest in Assam (27%). The highest rates of no formal education was for males in Karnataka and for females

in Rajasthan (20.4% and 49.3%, respectively). Karnataka had the highest proportion of males and females with a high school education and above – 34% of males and 23% of females. In all six states the educational attainment of females was significantly lower than that for males. Overall, the proportion of females with no formal education was higher than males by 21 percentage points; in Rajasthan and Uttar Pradesh, the difference was 30 and 24 percentage points, respectively.

To understand the economic status of the households, wealth quintiles were created by dividing the population into five groups based on their economic status. As the wealth quintiles were constructed with pooled data, the number of households in each quintile is roughly equal. Among the six states, West Bengal had the worst economic conditions, with the largest proportion (35%) of population in the lowest wealth quintile and the lowest proportion (12%) in the highest wealth quintile. At the other extreme, Karnataka had only 10% of its population in the lowest quintile and about 55% in the two highest quintiles combined. Looking specifically at rural areas, the pattern was much the same; however, comparing urban areas, the population of Uttar Pradesh was the worst-off, and that of Rajasthan was the best-off.

**Table 3.1.2** Percent distribution of household population by socio-demographic characteristics, states and India (pooled) total, 2007

Background characteristics	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group<sup>1</sup></b>							
0-14	30.0	25.0	27.1	35.1	36.3	26.8	31.4
15-59	62.1	63.5	62.3	56.4	55.0	63.2	59.1
60+	7.9	11.5	10.6	8.5	8.7	10.0	9.5
<b>Sex<sup>1</sup></b>							
Male	50.7	50.0	50.5	51.7	52.1	50.5	51.2
Female	49.3	50.1	49.5	48.4	47.9	49.6	48.8
<b>Marital status<sup>2</sup></b>							
Never married	32.8	27.0	23.7	21.2	25.7	23.9	25.0
Currently married	57.6	62.7	67.9	70.9	66.9	66.5	66.6
Widowed	8.3	9.7	7.7	7.3	7.0	8.9	7.9
Other <sup>3</sup>	1.2	0.6	0.8	0.6	0.4	0.7	0.6
<b>Education<sup>4</sup></b>							
<b>Male</b>							
No formal education	16.0	20.4	10.2	19.1	17.5	15.6	16.2
Less than primary	17.3	16.6	14.6	15.4	16.7	15.9	16.0
Primary school	22.7	13.2	25.5	20.2	16.7	27.6	20.5
Secondary school	21.1	15.5	26.4	20.1	20.1	19.9	20.9
High school	16.3	18.9	14.8	19.3	20.6	13.8	17.8
College and above	6.6	15.5	8.6	6.0	8.5	7.3	8.6
<b>Female</b>							
No formal education	27.4	34.6	27.9	49.3	41.4	33.7	37.0
Less than primary	16.9	14.7	12.3	13.3	15.7	15.9	14.7
Primary school	20.1	14.8	27.9	16.9	14.2	24.1	19.2
Secondary school	19.9	12.8	17.7	10.9	13.8	15.2	14.7
High school	12.7	13.9	10.2	7.1	11.2	7.3	10.2
College and above	3.0	9.2	4.0	2.5	3.7	3.8	4.2
<b>Wealth quintile</b>							
Lowest	19.4	10.0	21.1	12.4	19.7	34.5	20.4
Second	21.5	18.3	16.0	21.1	26.3	27.3	22.8
Middle	18.6	17.1	13.5	13.7	11.2	13.9	13.2
Fourth	20.8	30.0	27.0	21.9	18.6	11.9	20.9
Highest	19.7	24.5	22.5	30.9	24.2	12.4	22.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number (total)</b>	<b>5,803</b>	<b>6,744</b>	<b>9,759</b>	<b>12,740</b>	<b>13,306</b>	<b>8,730</b>	<b>57,082</b>
<b>Number (aged 7-plus)</b>	<b>5,075</b>	<b>5,957</b>	<b>8,647</b>	<b>10,728</b>	<b>11,115</b>	<b>7,729</b>	<b>49,251</b>
<b>Number (aged 15-plus)</b>	<b>4,086</b>	<b>5,025</b>	<b>7,154</b>	<b>8,187</b>	<b>8,489</b>	<b>6,320</b>	<b>39,261</b>

<sup>1</sup> Age and sex distribution are calculated for the total population (all ages).

<sup>2</sup> Marital status is calculated for the population aged 15-plus.

<sup>3</sup> Includes divorced, separated or cohabiting.

<sup>4</sup> Education is collected for the population aged six and above.

**Table 3.1.3** Percent distribution of urban household population by socio-demographic characteristics, states and India (pooled), 2007

Background characteristics	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group<sup>1</sup></b>							
0-14	21.3	21.5	24.7	29.2	31.2	21.5	25.7
15-59	66.7	67.7	65.7	63.7	60.4	65.0	64.4
60+	12.1	10.8	9.6	7.1	8.4	13.5	9.9
<b>Sex<sup>1</sup></b>							
Male	50.0	49.3	50.2	53.1	51.6	50.6	50.8
Female	50.0	50.7	49.8	46.9	48.4	49.4	49.2
<b>Marital status<sup>2</sup></b>							
Never married	39.3	34.7	26.4	31.2	31.5	24.8	29.4
Currently married	50.7	54.8	65.1	61.6	61.3	65.5	62.0
Widowed	9.1	10.0	7.8	6.9	6.9	9.0	8.1
Other <sup>3</sup>	0.9	0.6	0.7	0.3	0.3	0.7	0.5
<b>Education<sup>4</sup></b>							
<b>Male</b>							
No formal education	6.4	13.3	5.4	9.3	14.0	5.9	9.1
Less than primary	14.2	12.8	13.4	10.5	14.9	12.3	13.2
Primary school	24.0	12.5	21.9	17.6	15.7	23.5	18.9
Secondary school	22.0	17.3	30.6	21.8	19.9	21.1	23.4
High school	20.3	21.7	16.1	26.8	22.9	20.5	20.6
College and above	13.1	22.5	12.6	14.0	12.6	16.6	14.8
<b>Female</b>							
No formal education	11.6	23.4	18.5	29.3	35.0	17.4	24.0
Less than primary	13.4	13.7	12.8	9.4	16.3	12.9	13.5
Primary school	21.2	16.0	29.9	18.2	10.0	24.5	20.6
Secondary school	23.6	15.6	18.3	16.2	18.3	18.8	17.9
High school	20.5	17.3	13.6	17.4	13.0	14.4	14.7
College and above	9.7	14.0	6.9	9.5	7.4	12.0	9.3
<b>Wealth quintile</b>							
Lowest	5.8	5.7	12.2	3.9	18.3	12.5	11.7
Second	23.9	16.9	13.2	8.6	21.4	15.5	15.9
Middle	7.8	17.2	12.8	10.7	13.3	14.3	13.4
Fourth	17.4	29.3	31.8	23.4	19.4	21.3	25.5
Highest	45.1	31.0	30.0	53.5	27.6	36.1	33.5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number (total)</b>	<b>861</b>	<b>2,194</b>	<b>3,773</b>	<b>2,597</b>	<b>1,812</b>	<b>2,019</b>	<b>13,256</b>
<b>Number (aged 7-plus)</b>	<b>791</b>	<b>1,965</b>	<b>3,406</b>	<b>2,247</b>	<b>1,602</b>	<b>1,853</b>	<b>11,864</b>
<b>Number (aged 15-plus)</b>	<b>692</b>	<b>1,694</b>	<b>2,894</b>	<b>1,806</b>	<b>1,318</b>	<b>1,598</b>	<b>10,002</b>

<sup>1</sup> Age and sex distribution are calculated for the total population (all ages).

<sup>2</sup> Marital status is calculated for the population aged 15-plus.

<sup>3</sup> Includes divorced, separated or cohabiting.

<sup>4</sup> Education is collected for the population aged six and above.

**Table 3.1.4** Percent distribution of rural household population by socio-demographic characteristics, states and India (pooled), 2007

Background characteristics	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group<sup>1</sup></b>							
0-14	31.4	26.8	28.8	36.7	37.3	28.5	33.3
15-59	61.3	61.3	60.0	54.4	54.0	62.6	57.4
60+	7.3	11.9	11.2	8.8	8.7	8.8	9.3
<b>Sex<sup>1</sup></b>							
Male	50.8	50.3	50.7	51.3	52.2	50.4	51.3
Female	49.2	49.7	49.3	48.7	47.8	49.6	48.7
<b>Marital status<sup>2</sup></b>							
Never married	31.7	22.8	21.7	18.2	24.4	23.6	23.3
Currently married	58.8	67.1	69.9	73.7	68.2	66.9	68.2
Widowed	8.2	9.5	7.6	7.5	7.0	8.8	7.8
Other <sup>3</sup>	1.3	0.6	0.8	0.7	0.5	0.7	0.7
<b>Education<sup>4</sup></b>							
<b>Male</b>							
No formal education	17.5	24.1	13.6	21.4	18.2	18.7	18.6
Less than primary	17.8	18.6	15.4	16.8	17.0	17.1	16.9
Primary school	22.5	13.6	28.0	20.9	16.9	28.9	21.1
Secondary school	21.0	14.4	23.4	19.7	20.2	19.5	20.0
High school	15.7	17.4	13.9	17.1	20.1	11.5	16.9
College and above	5.6	11.9	5.8	3.6	7.7	4.3	6.5
<b>Female</b>							
No formal education	30.0	40.7	34.5	54.7	42.8	39.3	41.5
Less than primary	17.4	15.3	11.8	14.5	15.6	16.9	15.1
Primary school	19.9	14.1	26.5	16.5	15.1	24.0	18.8
Secondary school	19.2	11.3	17.3	9.4	12.8	14.0	13.5
High school	11.5	12.1	7.9	4.3	10.7	4.8	8.7
College and above	1.9	6.6	1.9	0.6	2.9	1.0	2.4
<b>Wealth quintile</b>							
Lowest	21.5	12.3	27.1	14.7	20.0	41.6	23.2
Second	21.0	19.1	17.8	24.4	27.3	31.1	25.0
Middle	20.3	17.1	14.0	14.6	10.8	13.8	13.2
Fourth	21.3	30.4	23.6	21.5	18.5	8.8	19.4
Highest	15.9	21.2	17.4	24.8	23.5	4.8	19.1
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number (total)</b>	<b>4,942</b>	<b>4,550</b>	<b>5,986</b>	<b>10,143</b>	<b>11,494</b>	<b>6,711</b>	<b>43,826</b>
<b>Number (aged 7-plus)</b>	<b>4,284</b>	<b>3,992</b>	<b>5,241</b>	<b>8,481</b>	<b>9,513</b>	<b>5,876</b>	<b>37,387</b>
<b>Number (aged 15-plus)</b>	<b>3,394</b>	<b>3,331</b>	<b>4,260</b>	<b>6,381</b>	<b>7,171</b>	<b>4,722</b>	<b>29,259</b>

1 Age and sex distribution are calculated for the total population (all ages).

2 Marital status is calculated for the population aged 15-plus.

3 Includes divorced, separated or cohabiting.

4 Education is collected for the population aged six and above.



## 3.2 Household size

Table 3.2.1 shows the distribution of households by household size. Almost one-half of households had five or fewer members, and the other half had six or more members. Just 2% were single member households, and 8% were large households with more than 11 members. The mean household size was six persons.

Households in urban areas were comparatively smaller than in rural areas, with a mean household size of 5.5 in urban areas and 6.2 in rural areas. Households from scheduled tribes and households belonging to religions other than Hinduism and Islam were smaller than others.<sup>6</sup> Mean household size increased with income, as did the proportion of large households. For example, the proportion of households with 11 or more members increased from 2% in the lowest quintile to 13% in the highest. The mean size of the highest wealth quintile household (6.9) was larger than the lowest wealth quintile household by two members. Household size did not vary with educational attainment of the head of the household, except in the case of college-educated people: mean household size was around six for no formal education, dropping to 5.4 for households with a college-educated head. Households in Rajasthan and Uttar Pradesh had on average one more member than in the other four states.

### 3.2.1 Household head and main income earners

#### (a) Characteristics of household heads

Table 3.2.2 presents selected characteristics of household heads. Ninety-one percent of households were headed by men and 9% of households were headed by women. Around 50% of the households had heads in the 40-59 age group, while about 10% of the households had heads aged 70-plus. Female heads were slightly older than males. Most of the male heads (92%) were married; most of the female heads (76%) were widowed. The majority of the households with female household heads (around two thirds) were in urban areas.

Almost one-third (31%) of household heads had no formal education and only about one-quarter (23%) had studied beyond high school. Eight percent were

college educated. The educational attainment of female heads was especially low: 64% had no formal education, and only 8% had studied beyond high school. Female heads were more likely than males to be from the lowest wealth quintiles.

Table 3.2.3 shows the distribution of selected background characteristics by the age and sex of heads of household. Male heads of household were found in almost equal proportions below and above the age of 50; female-headed households, by contrast, were more likely to be headed by women aged 50-plus. Higher rates of female-headed households were found in Karnataka (15%) and West Bengal (13%).

The pattern of headship was more or less similar by residence, caste, religion, income and education of the head of household. However, female-headed households were slightly more common in urban than in rural areas, and also among scheduled tribes and religions other than Hinduism and Islam. Female heads were more common in poor households than in wealthy ones: 13% of households in the lowest wealth quintile were headed by women, compared with 7% in the highest quintile. Similarly, women headed 20% of households where the head had no formal education, but only 2% of households with college-educated heads.

Poorer households and households headed by educated persons were more likely to have a younger person (aged 49 or under) as the head of the household. The mean age of the household head increased as wealth quintile increased, but decreased with educational attainment of the head.

#### (b) Main income earner of households

Table 3.2.4 presents the distribution of households by type of main income earner. In most households (94%), men were the main income earners. The mean age of income earners was 45 years, a little lower than for household heads (51 years). People aged 50-plus constituted 52% household heads (3.2.2), but only 36% of main income earners, indicating that not all heads of households (usually men) were breadwinners.

The age and sex distribution of main income earners was similar across urban and rural areas and among different caste groups and religions. With increases in the economic status and education of the heads of household, the share of women as the main income earner decreased and the proportion of older men as

<sup>6</sup> Scheduled tribes and castes are groups recognised in the Constitution of India as historically disadvantaged.



**Table 3.2.1** Percent distribution of household size by residence, caste, religion, wealth quintile, education of household head and state, India (pooled), 2007

Background characteristics	Single person	2-5 persons	6-10 persons	11+ persons	Total	Mean household size
<b>Residence</b>						
Urban	2.2	57.4	34.9	5.4	100	5.5
Rural	1.6	47.1	42.4	8.8	100	6.2
<b>Caste</b>						
Scheduled tribe	1.4	59.1	35.5	4.1	100	5.4
Scheduled caste	1.1	48.0	42.8	8.2	100	6.2
Other <sup>1</sup>	2.0	49.3	40.4	8.3	100	6.1
<b>Religion</b>						
Hindu	1.7	49.5	40.7	8.1	100	6.1
Muslim	2.6	49.9	40.5	7.1	100	5.9
Other <sup>2</sup>	2.2	59.9	32.3	5.6	100	5.5
<b>Wealth quintile</b>						
Lowest	4.5	56.6	36.6	2.4	100	5.0
Second	1.7	49.3	42.0	7.0	100	6.0
Middle	0.3	47.7	44.3	7.8	100	6.2
Fourth	0.8	49.2	39.5	10.5	100	6.3
Highest	0.5	44.3	41.8	13.4	100	6.9
<b>Education of head of household</b>						
No formal education	3.2	44.5	43.5	8.9	100	6.2
Less than primary	1.5	47.9	42.0	8.7	100	6.1
Primary school	1.4	50.0	40.7	8.0	100	6.0
Secondary school	0.5	52.4	40.1	7.0	100	6.0
High school	1.0	51.1	39.9	8.0	100	6.1
College and above	1.5	64.7	28.4	5.4	100	5.4
<b>State</b>						
Assam	1.3	56.2	39.4	3.1	100	5.5
Karnataka	2.1	56.3	36.1	5.5	100	5.6
Maharashtra	1.9	60.1	33.7	4.3	100	5.3
Rajasthan	0.8	38.5	49.1	11.6	100	6.7
Uttar Pradesh	1.4	35.6	49.8	13.2	100	7.0
West Bengal	2.8	63.8	29.7	3.7	100	5.2
<b>Total<sup>3</sup></b>	<b>1.8</b>	<b>49.9</b>	<b>40.4</b>	<b>7.9</b>	<b>100</b>	<b>6.0</b>
<b>Number</b>	<b>164</b>	<b>4,881</b>	<b>3,863</b>	<b>702</b>	<b>9,610</b>	

<sup>1</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>2</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

<sup>3</sup> Includes households where information on education level of head of household was missing.

**Table 3.2.2** Percent distribution of head of household by socio-demographic characteristics and sex, India (pooled), 2007

Background characteristics	Male (%)	Female (%)	Total (%)
<b>Age group</b>			
18-29	4.9	1.6	4.6
30-39	18.2	13.5	17.7
40-49	26.0	22.2	25.6
50-59	23.3	27.2	23.7
60-69	17.2	23.8	17.8
70-79	8.2	9.1	8.3
80+	2.3	2.7	2.3
<b>Marital status</b>			
Never married	1.9	1.0	1.8
Currently married	91.5	21.1	84.8
Widowed	6.3	75.5	12.9
Other <sup>1</sup>	0.3	2.4	0.5
<b>Residence</b>			
Urban	26.1	33.5	26.8
Rural	73.9	66.5	73.2
<b>Caste</b>			
Scheduled tribe	6.7	7.6	6.8
Scheduled caste	18.8	21.5	19.1
Other <sup>2</sup>	74.4	71.0	74.1
<b>Religion</b>			
Hindu	72.8	72.9	72.8
Muslim	10.4	10.2	10.4
Other <sup>3</sup>	16.8	16.9	16.4
<b>Education</b>			
No formal education	27.6	63.6	31.1
Less than primary	12.0	11.9	12.0
Primary school	17.6	11.4	17.2
Secondary school	18.1	4.8	16.8
High school	15.3	6.8	14.5
College and above	9.1	1.6	8.4
<b>Wealth quintile</b>			
Lowest	23.5	34.2	24.6
Second	22.8	23.0	22.8
Middle	13.0	11.6	12.8
Fourth	20.3	16.6	19.9
Highest	20.4	14.7	19.9
<b>State</b>			
Assam	5.4	6.1	5.5
Karnataka	10.4	17.5	11.1
Maharashtra	21.8	19.1	21.6
Rajasthan	12.0	6.9	11.5
Uttar Pradesh	32.5	26.1	31.9
West Bengal	17.9	24.3	18.5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number</b>	<b>8,670</b>	<b>882</b>	<b>9,552</b>

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

the main income earner increased. Karnataka and West Bengal, which had the highest rate of female heads of household, also had the highest rate of women as the main income earner.

### 3.3. Living arrangements

The living arrangements and family structures of survey respondents are presented in Table 3.3.1. Living arrangements serve to highlight family structure, availability of resources, and care and support systems, particularly for the older people in the household.

About one-third of households had no members aged 50-plus. In 36% of households, there was only one person aged 50-plus, and in the remaining 31% there were two or more. This pattern prevailed in both urban and rural areas.

Poorer households were less likely to include people aged 50-plus. In the lowest wealth quintile, 42% of households had no members in this age group, and only 21% had least two. By contrast, in the highest wealth quintile, only 20 % of household had no members aged 50-plus, and 45% had two or more. Households in Assam were least likely to include persons aged 50-plus, while those in Karnataka and Uttar Pradesh were most likely.

The number of generations of family members living in households is presented in Table 3.3.1. Most households in India are multigenerational: only 7% of surveyed households contained one generation, while 47% contained two generations and 45% contained three or more. These multigenerational households were more common in rural areas (46%) than in urban areas (41%). As economic status increased, the proportion of single- and two-generation households decreased and multi-generation households increased. For example, 14% of households in the lowest wealth quintile were single generation households, against only 4% in the highest quintile. Among the six states, Assam had the lowest proportion of households with three or more generations (35%), while Uttar Pradesh had the highest (50%).

An interesting feature from the survey was that there were very few households consisting of skip-generations, that is, for example, households composed of older persons and their grandchildren.

**Table 3.2.3** Percent distribution of household heads by age and sex according to selected characteristics, India (pooled), 2007

Background characteristics	Female 49 or younger	Female 50+	Male 49 or younger	Male 50+	Total	Mean age of household head (years)
<b>Residence</b>						
Urban	3.7	8.2	43.9	44.1	100	50.6
Rural	3.5	5.1	44.5	46.8	100	50.9
<b>Caste</b>						
Scheduled tribe	4.9	6.3	54.8	34.1	100	47.5
Scheduled caste	3.6	4.8	43.5	48.2	100	50.8
Other <sup>1</sup>	3.5	6.2	43.5	46.8	100	51.2
<b>Religion</b>						
Hindu	3.6	5.7	44.6	46.1	100	50.7
Muslim	3.2	6.9	42.5	47.5	100	52.2
Other <sup>2</sup>	4.1	11.2	44.8	39.9	100	50.5
<b>Wealth quintile</b>						
Lowest	5.0	8.3	50.3	36.4	100	48.8
Second	4.2	5.5	47.5	42.8	100	49.9
Middle	3.2	5.4	49.0	42.4	100	49.5
Fourth	3.3	4.6	42.4	49.6	100	51.4
Highest	1.6	5.4	32.4	60.6	100	54.6
<b>Education of head of household</b>						
No formal education	6.1	13.5	33.3	47.1	100	53.6
Less than primary	3.8	5.6	42.2	48.3	100	52.2
Primary school	3.3	3.1	46.2	47.4	100	50.5
Secondary school	1.8	0.9	54.5	42.7	100	47.8
High school	2.3	2.2	51.7	43.9	100	48.8
College and above	0.7	1.1	51.4	46.8	100	48.7
<b>State</b>						
Assam	4.7	5.9	48.2	41.2	100	49.1
Karnataka	5.4	9.7	37.7	47.2	100	52.3
Maharashtra	3.2	5.3	48.5	43.1	100	49.9
Rajasthan	1.9	3.8	49.9	44.5	100	49.4
Uttar Pradesh	3.0	4.8	41.4	50.7	100	51.7
West Bengal	4.7	7.9	44.1	43.4	100	50.8
<b>Total<sup>3</sup></b>	<b>3.6</b>	<b>6.0</b>	<b>44.4</b>	<b>46.1</b>	<b>100</b>	<b>50.8</b>
<b>Number</b>	<b>336</b>	<b>546</b>	<b>4,303</b>	<b>4,367</b>	<b>9,552</b>	

<sup>1</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>2</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

<sup>3</sup> Includes households where information on education level of head of household was missing.

**Table 3.2.4** Percent distribution of main income earner by age and sex according to residence, caste, religion, wealth quintile, education of head of household, India (pooled), 2007

Background characteristics	Female 49 or younger	Female 50+	Male 49 or younger	Male 50+	Total	Mean age of main income earner
<b>Residence</b>						
Urban	4.2	3.8	59.5	32.5	100	45.3
Rural	3.2	2.2	61.6	33.0	100	44.7
<b>Caste</b>						
Scheduled tribe	4.4	1.4	69.7	24.6	100	42.4
Scheduled caste	3.6	1.3	60.1	35.0	100	44.8
Other <sup>1</sup>	3.3	3.1	60.3	33.3	100	45.2
<b>Religion</b>						
Hindu	3.4	2.7	61.2	32.8	100	44.8
Muslim	3.9	2.5	59.6	33.9	100	45.7
Other <sup>2</sup>	2.7	2.6	62.3	32.4	100	45.2
<b>Wealth quintile</b>						
Lowest	5.9	5.4	61.7	27.0	100	44.1
Second	3.1	1.7	66.5	28.7	100	43.3
Middle	2.4	2.0	65.8	29.9	100	44.0
Fourth	3.4	1.5	59.9	35.2	100	45.1
Highest	1.7	2.0	52.0	44.4	100	48.0
<b>Education of head of household</b>						
No formal education	4.7	5.3	59.7	30.3	100	44.4
Less than primary	4.0	2.9	61.5	31.6	100	45.1
Primary school	3.6	1.6	63.0	31.8	100	44.5
Secondary school	2.0	0.4	64.6	33.0	100	44.2
High school	2.6	1.1	59.3	37.1	100	46.1
College and above	2.1	1.6	56.8	39.5	100	46.2
<b>State</b>						
Assam	4.3	3.3	62.2	30.2	100	43.9
Karnataka	6.0	3.5	59.7	30.7	100	44.0
Maharashtra	4.5	2.8	61.9	30.8	100	45.1
Rajasthan	1.7	1.6	69.8	26.9	100	42.3
Uttar Pradesh	1.4	1.8	57.5	39.2	100	46.2
West Bengal	4.9	3.8	60.8	30.5	100	44.9
<b>Total<sup>3</sup></b>	<b>3.4</b>	<b>2.7</b>	<b>61.0</b>	<b>32.9</b>	<b>100</b>	<b>44.9</b>
<b>Number</b>	<b>352</b>	<b>256</b>	<b>5,769</b>	<b>2,943</b>		

<sup>1</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>2</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

<sup>3</sup> Includes households where information on education level of head of household was missing.

**Table 3.3.1** Percent distribution of living arrangement type, by residence, wealth quintiles and states, India (pooled), 2007

Background characteristic	Living arrangements				Multigenerational household				
	Household without member aged 50+	Household with single member aged 50+	Household with two or more members aged 50+	Total	One generation	Two generations	Skip-generation	Three or more generations	Total
<b>Residence</b>									
Urban	32.4	37.8	29.9	100	7.2	50.8	0.8	41.3	100
Rural	33.0	35.5	31.6	100	7.5	45.8	0.8	46.0	100
<b>Wealth quintile</b>									
Lowest	41.6	37.1	21.3	100	13.9	55.2	1.3	29.5	100
Second	36.1	35.6	28.3	100	7.4	48.6	1.0	43.1	100
Middle	35.2	38.2	26.6	100	4.7	46.0	0.9	48.5	100
Fourth	29.5	35.4	35.2	100	4.6	44.9	0.2	50.4	100
Highest	19.9	34.8	45.3	100	4.1	38.3	0.3	57.2	100
<b>State</b>									
Assam	37.7	41.9	20.4	100	5.5	59.2	0.5	34.9	100
Karnataka	26.6	38.7	34.6	100	7.3	43.7	1.2	47.9	100
Maharashtra	34.5	35.4	30.2	100	8.6	49.1	0.8	41.5	100
Rajasthan	36.5	31.8	31.8	100	6.0	46.0	0.5	47.5	100
Uttar Pradesh	30.8	34.2	35.0	100	6.5	43.3	0.6	49.7	100
West Bengal	34.1	39.5	26.4	100	9.3	50.3	1.0	39.4	100
<b>Total</b>	<b>32.8</b>	<b>36.1</b>	<b>31.1</b>	<b>100</b>	<b>7.4</b>	<b>47.1</b>	<b>0.8</b>	<b>44.7</b>	<b>100</b>

## 3.4 Individual respondents

Over 11,230 individual respondents were interviewed from the six selected states. Information related to behavioural issues as well as morbidity and other health aspects was collected from the individual respondents. The socioeconomic and demographic characteristics of the individual respondents aged 50-plus as well as those aged 18-49 are presented in Tables 3.4.1 and 3.4.2 respectively.

### 3.4.1 Respondents by age and sex

Table 3.4.1 presents the basic characteristics of the study's older respondents, aged 50-plus. Among these respondents, almost half (49%) of men were aged 50-59, 30% were aged 60-69, 17% were aged 70-79, and 4% were aged 80-plus. The age distribution of women was similar to men. Among the older men, 91% were currently married, 7% were widowed, and a small proportion either never had married or were divorced/separated. Among older women, a substantial propor-

tion were widowed (37%); this proportion was higher in Assam (45%) and West Bengal (46%).

Nearly three quarters of older respondents (72% of men and 71% of women) were from rural areas. Most respondents were Hindu and were not from scheduled castes or scheduled tribes. Assam had relatively more older respondents from scheduled tribes and West Bengal had more from scheduled castes. In Assam, Uttar Pradesh and West Bengal, there were relatively higher proportions of Muslim respondents.

The educational attainment of older respondents was not high for men, but significantly lower for women than for men: 31% of men, but 73% of women in this age group had no formal education. Around two fifths 40% of older men had completed at least secondary schooling, and 9% had completed college education. However, only 9% of older women had completed secondary schooling, and mere 2% had completed college. Educational attainment was lowest in Rajasthan, where 42% of older men and 87% of older women had no formal education. Among older men, Maharashtra



**Table 3.4.1** Percent distribution of older respondents (50-plus) by socio-demographic characteristic, states and India (pooled) total, 2007

Background characteristics	Male						
	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group</b>							
50-59	54.1	52.0	46.1	49.5	48.8	51.3	49.4
60-69	28.3	28.0	29.9	31.0	30.5	29.9	29.9
70-79	11.9	14.9	22.0	15.8	16.5	14.5	16.8
80+	5.8	5.1	2.0	3.7	4.2	4.4	3.9
<b>Marital status</b>							
Never married	2.0	0.0	0.4	0.9	1.9	1.0	1.1
Currently married	88.8	94.8	95.2	89.3	87.6	94.1	91.4
Widowed	9.0	5.0	4.4	9.8	10.3	4.4	7.3
Other <sup>1</sup>	0.2	0.2	0.0	0.1	0.2	0.4	0.2
<b>Residence</b>							
Urban	11.1	36.2	43.4	22.8	22.1	26.3	28.3
Rural	89.0	63.8	56.6	77.3	77.9	73.7	71.7
<b>Caste</b>							
Scheduled tribe	17.6	3.9	4.6	5.5	1.4	11.8	5.4
Scheduled caste	15.9	10.7	7.5	13.0	19.9	27.7	16.7
Other <sup>2</sup>	66.6	85.5	88.0	81.5	78.0	60.5	77.9
<b>Religion</b>							
Hindu	72.2	90.9	88.5	87.7	81.3	81.6	84.1
Muslim	23.7	7.3	3.6	8.2	17.1	17.2	12.6
Other <sup>3</sup>	4.1	1.9	7.9	4.2	1.6	1.3	3.3
<b>First language</b>							
Hindi	2.6	0.0	3.2	95.9	95.6	1.8	44.2
Assamee	36.3	0.0	0.0	0.7	0.2	0.4	2.1
Bengali	37.2	0.0	0.1	0.0	0.1	88.8	17.6
Marathi	0.0	7.7	90.9	0.0	0.0	0.0	19.6
Kannada	0.0	67.4	0.4	0.0	0.0	0.0	7.8
Other language <sup>4</sup>	23.9	24.9	5.5	3.4	4.1	9.1	8.6
<b>Education</b>							
No formal education	26.6	35.2	20.6	41.9	35.2	25.1	30.7
Less than primary	17.9	16.5	13.1	12.6	11.0	9.6	12.3
Primary school	22.7	8.7	29.7	14.2	11.9	24.3	18.2
Secondary school	14.6	12.0	20.7	11.0	13.4	20.3	15.8
High school	11.8	15.0	9.9	13.6	19.6	10.3	14.4
College and above	6.5	12.6	6.1	6.8	8.9	10.5	8.7
<b>Wealth quintile</b>							
Lowest	20.4	10.1	20.3	13.1	21.2	33.3	21
Second	21.8	14.3	16.6	19.7	24.6	25.2	21.2
Middle	24.4	22.7	22.7	17.1	18.7	14.1	19.3
Fourth	17.0	31.6	20.4	19.8	17.9	11.3	19.0
Highest	16.5	21.3	20.1	30.3	17.7	16.0	19.6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number</b>	<b>368</b>	<b>419</b>	<b>548</b>	<b>677</b>	<b>703</b>	<b>589</b>	<b>3,304</b>

1 Includes divorced, separated or cohabiting

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

4 Includes English, Gujarati, Kashmiri, Konkani, Malayalam, Manipuri, Nepali, Oriya, Punjabi, Sindhi, Tamil, Telugu, Urdu and other.

Background characteristics	Female						
	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group</b>							
50-59	52.6	47.2	44.5	47.5	48.9	49.9	47.8
60-69	29.8	30.7	32.6	32.1	32.8	30.1	31.9
70-79	14.6	16.2	19.7	13.6	12.5	14.3	15.1
80+	3.0	5.9	3.1	6.7	5.9	5.6	5.2
<b>Marital status</b>							
Never married	2.7	0.5	0.2	0.0	0.2	0.3	0.3
Currently married	50.9	59.8	60.7	62.9	70.1	52.9	61.9
Widowed	45.3	39	38.2	36.7	29.1	45.9	37.0
Other <sup>1</sup>	1.2	0.8	1.0	0.4	0.7	1.0	0.8
<b>Residence</b>							
Urban	13.2	36.2	44.6	22.7	21.6	28.2	29.5
Rural	86.8	63.8	55.4	77.3	78.4	71.8	70.5
<b>Caste</b>							
Scheduled tribe	12.6	5.7	5.8	5.5	0.8	11.6	5.5
Scheduled caste	20.3	9.8	11.0	15.4	17.5	24.6	16.2
Other <sup>2</sup>	67.0	84.6	83.1	79.1	81.7	63.8	78.3
<b>Religion</b>							
Hindu	68.5	89.8	89.7	89.3	82.6	78.3	84.5
Muslim	24.5	8.2	3.5	7.0	16.7	18.4	12.2
Other <sup>3</sup>	7.1	2.1	6.9	3.7	0.8	3.3	3.3
<b>First language</b>							
Hindi	2.0	0.0	2.7	96.1	99.2	1.8	43.1
Assamee	32.8	0.0	0.0	0.0	0.0	0.0	1.5
Bengali	44.4	0.0	0.0	1.0	0.2	86.2	17.1
Marathi	0.0	7.3	89.8	0.1	0.0	0.0	21
Kannada	0.0	66.0	0.7	0.0	0.0	0.1	8.8
Other language <sup>4</sup>	20.9	26.7	6.9	2.8	0.6	11.8	8.7
<b>Education</b>							
No formal education	56.1	67.0	66.7	87.4	80.4	65.0	72.6
Less than primary	19.3	15.6	7.2	3.3	4.9	7.1	7.7
Primary school	10.2	8.1	16.9	6.4	8.5	15.2	11.3
Secondary school	9.0	2.7	6.4	1.4	3.6	5.1	4.3
High school	4.2	4.7	2.0	0.6	1.8	3.9	2.6
College and above	1.1	2.0	0.8	0.9	0.8	3.7	1.5
<b>Wealth quintile</b>							
Lowest	18.1	13.8	24.9	15.8	23.1	32.3	22.9
Second	19.6	16.7	17.6	21.3	24.7	28.3	22.0
Middle	29.9	22.0	22.4	16.4	17.6	15.9	19.4
Fourth	14.2	27.0	17.7	18.9	16.7	9.4	17.2
Highest	18.3	20.6	17.4	27.6	18.0	14.1	18.6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number</b>	<b>309</b>	<b>504</b>	<b>550</b>	<b>701</b>	<b>608</b>	<b>584</b>	<b>3,256</b>

**Table 3.4.2** Percent distribution of younger respondents (18-49) by socio-demographic characteristics, states and India (pooled) total, 2007

Background characteristics	Male						
	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group</b>							
18-29	21.4	19.8	26.2	24.0	34.9	23.7	27.4
30-39	44.8	31.1	33.4	39.5	29.9	27.6	32.5
40-49	33.9	49.1	40.4	36.5	35.2	48.7	40.1
<b>Marital status</b>							
Never married	13.7	15.2	11.1	12.1	14.5	17.3	14.0
Currently married	81.1	84.1	88.9	85.5	81.7	80.9	83.7
Widowed	3.5	0.8	0.0	1.9	3.7	1.8	2.1
Other <sup>1</sup>	1.7	0.0	0.0	0.5	0.1	0.0	0.2
<b>Residence</b>							
Urban	15.1	29.5	31.2	22.2	9.2	30.4	21.3
Rural	84.9	70.5	68.8	77.8	90.8	69.6	78.7
<b>Caste</b>							
Scheduled tribe	17.3	9.1	7.0	9.0	1.9	7.6	6.5
Scheduled caste	18.1	16.0	13.7	15.2	26.3	29.1	21.2
Other <sup>2</sup>	64.6	74.9	79.3	75.8	71.8	63.3	72.3
<b>Religion</b>							
Hindu	73.1	89.3	83.7	85.7	84.9	77.9	83.4
Muslim	19.7	10.2	7.0	8.8	13.7	19.1	12.6
Other <sup>3</sup>	7.2	0.6	9.3	5.5	1.4	3.0	4.0
<b>First language</b>							
Hindi	0.0	0.0	11.1	98.0	97.5	5.1	48.6
Assamee	31.2	0.0	0.0	0.1	0.6	0.3	2.2
Bengali	33.9	0.0	0.0	0.0	0.0	87.9	16.3
Marathi	1.6	5.3	85.4	0.0	0.0	0.0	17.0
Kannada	0.0	67.8	0.3	0.0	0.0	0.0	8.1
Other language <sup>4</sup>	33.3	26.9	3.2	1.9	1.9	6.7	7.8
<b>Education</b>							
No formal education	16.7	27.8	10.8	28.3	15.4	25.4	19.4
Less than primary	16.4	14.0	9.1	10.3	5.2	9.6	9.1
Primary school	17.2	10.5	27.0	18.3	9.7	23.4	16.9
Secondary school	20.5	11.6	18.0	11.9	28.1	18.4	20.1
High school	21.2	14.6	20.2	18.4	26.1	17.1	20.8
College and above	8.0	21.6	15.0	12.7	15.6	6.1	13.8
<b>Wealth quintile</b>							
Lowest	19.8	6.2	22.3	17.5	20.9	43.3	22.5
Second	22.2	20.0	13.0	25.1	22.7	24.7	21.1
Middle	31.0	32.8	21.8	20.4	20.5	11.2	21.3
Fourth	11.7	25.5	23.2	17.4	15.2	6.7	16.6
Highest	15.4	15.5	19.7	19.7	20.8	14.1	18.4
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number</b>	<b>114</b>	<b>130</b>	<b>202</b>	<b>193</b>	<b>213</b>	<b>193</b>	<b>1,045</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

<sup>4</sup> Includes English, Gujarati, Kashmiri, Konkani, Malayalam, Manipuri, Nepali, Oriya, Punjabi, Sindhi, Tamil, Telugu, Urdu and other languages.

Background characteristics	Female						
	Assam	Karnataka	Maharashtra	Rajasthan	Uttar Pradesh	West Bengal	India (pooled)
<b>Age group</b>							
18-29	35.8	36.8	38.9	39.7	37.8	29.9	36.7
30-39	44.1	36.2	33.6	34.7	28.9	42.2	34.7
40-49	20.1	27.0	27.5	25.6	33.3	27.9	28.7
<b>Marital status</b>							
Never married	15.6	16.4	10.3	8.6	9.7	7.5	10.5
Currently married	75.4	73.9	81.5	86.7	87.4	85.0	83.3
Widowed	8.2	9.1	5.9	4.1	2.3	7.2	5.3
Other <sup>1</sup>	0.8	0.7	2.2	0.6	0.6	0.3	0.9
<b>Residence</b>							
Urban	12.8	34.0	41.0	24.6	18.1	31.6	27.5
Rural	87.2	66.0	59.0	75.4	81.9	68.4	72.5
<b>Caste</b>							
Scheduled tribe	21.1	7.5	4.7	7.7	0.8	14.8	7.0
Scheduled caste	24.5	14.6	11.5	15.9	20.2	27.0	18.7
Other <sup>2</sup>	54.4	77.9	83.8	76.4	79.0	58.3	74.4
<b>Religion</b>							
Hindu	71.9	88.0	86.9	87.3	84.6	84.2	84.9
Muslim	18.2	11.3	5.0	10.2	14.9	15.0	12.1
Other <sup>3</sup>	9.9	0.8	8.1	2.5	0.5	0.8	3.0
<b>First language</b>							
Hindi	1.4	0.0	4.7	97.3	98.6	2.0	44.3
Assamee	33.2	0.0	0.0	0.0	0.0	0.0	2.1
Bengali	35.4	0.0	0.0	1.1	0.7	86.9	17.8
Marathi	0.0	8.4	83.5	0.0	0.0	0.0	18.5
Kannada	0.0	68.1	0.7	0.0	0.0	0.0	8.0
Other language <sup>4</sup>	30.1	23.5	11.1	1.7	0.7	11.1	9.3
<b>Education</b>							
No formal education	36.1	36.9	26.7	59.9	54.6	35.1	42.7
Less than primary	15.5	9.9	5.5	10.3	3.9	12.1	7.9
Primary school	12.5	14.0	29.1	10.6	10.1	25.8	17.5
Secondary school	22.6	12.6	18.8	8.6	13.4	15.6	14.8
High school	11.7	14.9	13.9	8.4	13.9	7.7	12.1
College and above	1.6	11.7	6.0	2.3	4.3	3.6	5.0
<b>Wealth quintile</b>							
Lowest	23.8	11.5	19.2	11.9	21.8	35.1	21.3
Second	22.8	17.6	16.1	17.3	27.3	24.3	21.8
Middle	23.3	22.6	23.5	20.2	14.0	20.9	19.5
Fourth	17.8	26.9	20.9	22.2	16.1	10.1	18.1
Highest	12.2	21.5	20.3	28.5	20.9	9.7	19.2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number</b>	<b>403</b>	<b>500</b>	<b>683</b>	<b>654</b>	<b>677</b>	<b>708</b>	<b>3,625</b>

had the smallest proportion with no formal education (21%), while Uttar Pradesh had the highest proportion of older men with secondary schooling (42%). Assam had the lowest proportion of older women with no formal education (56%) and the highest proportion with at least secondary schooling (14%).

Older respondents from Karnataka were more likely to be economically better off than average, and those from West Bengal more likely to be worse off. In Karnataka only 10% of older male and 14% of older women belonged to the lowest wealth quintile, whereas in West Bengal one-third of both older men and women were in the lowest quintile.

Table 3.4.2 presents the characteristics of younger respondents, aged 18-49 years. In SAGE India, younger respondents constituted two fifths of the total interviewed respondents. Females were over-represented among these respondents, since part of the study related to the reproductive health of young married women.

Among younger men, 27% were in the youngest age group (18-29), 33% were aged 30-39 and 40% were aged 40-49. Women were relatively younger; more than one-third were in the 18-29 and 30-39 age groups (37% and 35% respectively), again due to oversampling of younger women for the study of reproductive health. More than 83% of younger respondents, both men and women, were currently married; 10-15% had never married and 5% or fewer were widowed. Assam and Karnataka had relatively more widowed women.

Nearly three quarters of younger respondents were from rural areas, and one-quarter from urban areas. Seven percent of younger respondents were from scheduled tribes, about one-fifth from scheduled castes and about three quarters from other castes. Assam had relatively more respondents from scheduled tribes, while West Bengal had more from scheduled castes. Most younger respondents (83% of men and 85% of women) were Hindu; about one in eight were Muslim, and the remaining were from other religions. Assam and West Bengal had relatively higher proportions of Muslim respondents.

About one-fifth of younger men and 43% of younger women had no formal education. Over half (55%) of younger men had completed secondary schooling and 14% had completed college. Among younger women, 32% had completed secondary schooling and 5% had completed college. The proportion of younger respondents with no formal education was lowest in



Maharashtra (11% of men and 27% of women) and highest in Rajasthan (28% of men and 60% of women). However, in higher education Karnataka ranked first: 22% of younger men and 12% of younger women had completed college.

Almost equal proportions of the younger respondents came from each wealth quintile. As observed in relation to households, individual respondents from Karnataka were more likely to be economically better off than average and those from West Bengal more likely to be worse off. In Karnataka, only 6% of younger male and 12% of younger female respondents belonged to the lowest wealth quintile, whereas in West Bengal 43% of younger men and 35% of younger women were in the lowest quintile.

## 4. Income, consumption, transfers and retirement

SAGE Wave 1 India (hereafter SAGE India) collected information on respondents' economic circumstances. This chapter presents these results, including employment status and income, work history and consumption. It also covers retirement, social and economic transfers, catastrophic health spending, and types of care given and received.

### 4.1 Current activity status

All respondents were classified as either currently working, having formerly worked but currently not working, or never having worked. Individual work status was defined on the basis of jobs paid in cash or in kind, engaging in the sale of goods, having a small business, or working on the family firm or family business.

Table 4.1.1 presents state-level variation in respondents' work history, broken down by younger (aged 18-49) and older (aged 50-plus) respondents. Among the six surveyed states, Maharashtra and Karnataka recorded

the highest proportions of individuals who had ever worked or who were currently working.

At the national level, about three quarters (73%) of older respondents had ever worked; at the time of survey 43% were working and 30% were not working. 36% of the older population were currently working in Rajasthan, compared with 47% in Karnataka.

Overall, 60% of younger respondents were currently working, while 10% had previously worked but stopped; the remaining 30% had only worked in the home. The lowest proportion of younger individuals who had ever worked (59%) and who were currently working (54%) were recorded in Uttar Pradesh.

Table 4.1.2 presents the work history of respondents by selected background characteristics. Work participation rates were quite high among older persons, with many still working in agriculture and allied work (see Section 4.4). This was even true of the study's oldest respondents: a quarter of respondents aged 70-79 were still working, as were 12% of those aged 80-plus. In the 50-59 age

**Table 4.1.1** Percent distribution of respondents by work status, states and India (pooled), 2007

State	Aged 18-49					Aged 50-plus				
	Ever worked		Never worked	Total	Number	Ever worked		Never worked	Total	Number
	Currently working	Currently not working				Currently working	Currently not working			
Assam	56.1	4.7	39.2	100	517	41.6	20.6	37.9	100	677
Karnataka	67.7	12.8	19.6	100	630	46.9	31.7	21.4	100	923
Maharashtra	68.6	10.1	21.3	100	885	44.9	39.9	15.3	100	1,097
Rajasthan	59.2	15.7	25.2	100	847	35.8	41.1	23.2	100	1,378
Uttar Pradesh	53.6	5.3	41.2	100	890	45.3	21.5	33.2	100	1,311
West Bengal	60.0	11.8	28.2	100	901	39.7	27.3	33.1	100	1,173
India (pooled)	60.2	9.5	30.4	100	4,670	43.2	29.8	27.0	100	6,559



**Table 4.1.2** Percent distribution of respondents by work status according to selected background characteristics, India (pooled), 2007

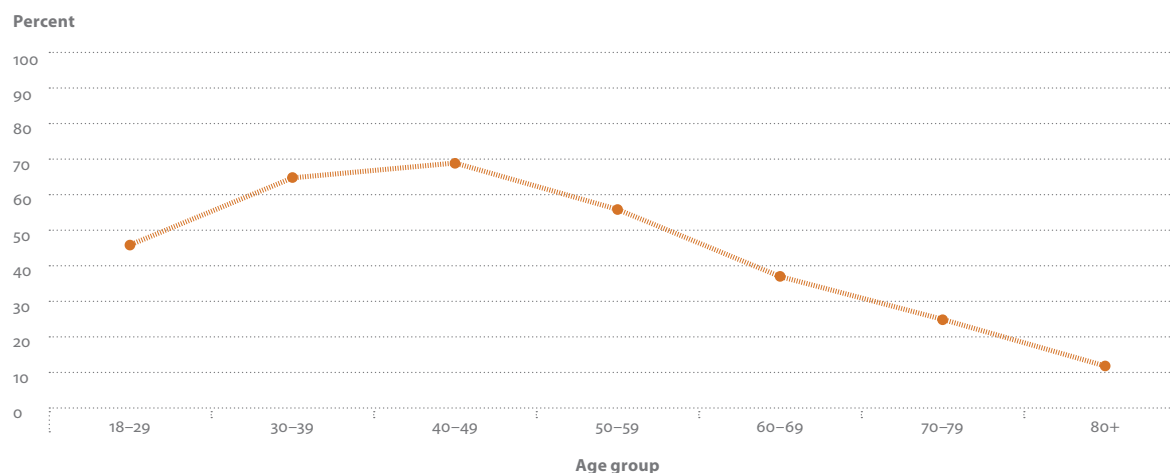
Background characteristics	Aged 18-49						Aged 50-plus				
	Ever worked¹		Never worked	Total	Number		Ever worked		Never worked	Total	Number
	Currently working	Currently not working					Currently working	Currently not working			
Age group											
18-29	46.1	9.2	44.7	100	1,606	50-59	55.8	19.2	25.1	100	2,939
30-39	65.0	9.7	25.3	100	1,657	60-69	37.2	33.8	29.0	100	2,234
40-49	68.5	9.6	22.0	100	1,407	70-79	25.3	47.6	27.2	100	1,058
						80+	11.6	54.9	33.6	100	328
Sex											
Male	88.7	6.1	5.2	100	1,045		64.9	32.3	2.7	100	3,303
Female	30.6	13.0	56.4	100	3,625		20.5	27.2	52.2	100	3,256
Marital status											
Never married	47.6	10.5	41.9	100	557		42.9	50.4	6.7	100	64
Currently married	61.6	9.2	29.2	100	3,853		49.6	27.8	22.7	100	4,861
Widowed	69.6	12.6	17.8	100	222		21.2	36.3	42.5	100	1,592
Other¹	59.7	6.5	33.8	100	38		23.4	31.9	44.7	100	42
Residence											
Urban	53.2	8.2	38.6	100	1,169		37.1	33.5	29.4	100	1,676
Rural	62.4	9.9	27.7	100	3,501		45.6	28.4	26.0	100	4,883
Caste											
Scheduled tribe	67.6	10.8	21.7	100	374		50.6	31.6	17.8	100	400
Scheduled caste	61.1	10.2	28.6	100	893		44.1	31.2	24.7	100	1,085
Other²	59.2	9.2	31.6	100	3,403		42.5	29.4	28.1	100	5,074
Religion											
Hindu	60.4	9.5	30.2	100	3,907		43.5	29.6	26.9	100	5,531
Muslim	55.3	9.8	34.8	100	593		41.9	28.9	29.3	100	791
Other³	71.8	8.9	19.7	100	170		39.7	39.7	20.6	100	237
Education											
No formal education	53.1	13.8	33.1	100	1,715		35.0	32.0	33.0	100	3,365
Less than primary	68.0	11.1	20.9	100	431		45.6	27.8	26.6	100	745
Primary school	59.8	9.5	30.7	100	788		42.4	29.8	27.8	100	929
Secondary school	63.3	6.9	29.8	100	741		56.0	26.9	17.2	100	654
High school	62.7	6.0	31.3	100	656		65.2	22.5	12.3	100	541
College and above	66.5	4.7	28.7	100	339		59.9	30.6	9.5	100	325
Wealth quintile											
Lowest	66.5	13.0	20.5	100	959		46.4	31.2	22.4	100	1,312
Second	61.5	10.5	28.0	100	933		45.1	30.6	24.3	100	1,312
Middle	60.4	9.6	30.0	100	935		44.0	30.4	25.6	100	1,313
Fourth	60.6	7.5	32.0	100	934		41.4	29.5	29.1	100	1,310
Highest	50.6	6.0	43.4	100	909		38.2	27.2	34.7	100	1,312
Total	60.2	9.5	30.4	100	4,670		43.2	29.8	27.0	100	6,559

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 4.1** Percentage of respondents currently working by age, India (pooled), 2007



group, the current work participation rate was 56%. Work participation rates differed substantially among men and women: almost all (97%) of older men had ever worked and about two thirds (65%) were currently working, while only 48% of older women had ever worked and only one-fifth (21%) were currently working (Figure 4.2).

People with no education were the most likely to report never having worked, reflecting the fact that most respondents with no education were women (Table 4.1.2). Current work participation rates in all other education categories fluctuated in the range of 42-65% for those aged 50-plus and 60-68% for those under 50. People with a college education had high rates of work participation: in the older group, only 10% of respondents with a college education had never worked.

Among younger respondents, the proportion of persons currently working increased with age, from 46% at ages 18-29 to 69% in the 40-49 age group (Figure 4.1). The lower level of work participation in younger adults reflected their involvement in education. Almost all the men (95%) had worked at some point, compared with 44% of women (Table 4.1.2). As expected, the current work participation rate for men (89%) was much higher than for women (31%) (Figure 4.2).

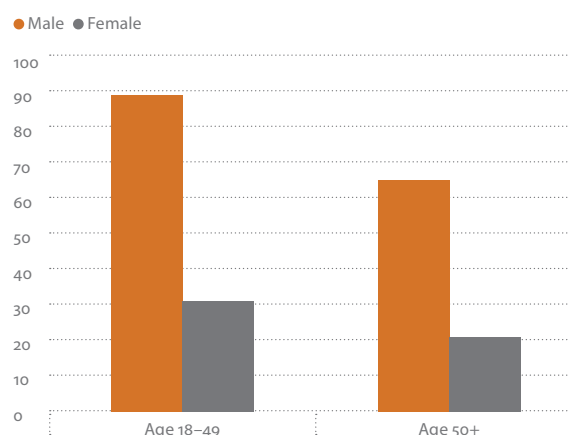
The proportion of persons who had ever worked, and of those who were currently working, decreased as income increased: in other words, poorer people worked more. Among all categories of persons by marital status, work participation rate was the highest among widowed persons, the majority of whom were widowed women who had to work to support their families in the absence of a husband. Work participation was higher in rural areas than in urban areas.

Work participation rates differed substantially among older men and women, as shown in Table 4.1.3. Almost all (97%) of older men had ever worked and about two thirds (65%) were currently working, whereas the majority (52%) of older women had never worked and only one-fifth (21%) were currently working.

The highest proportion of currently working older respondents was recorded in Karnataka (47%) and the lowest in Rajasthan (36%) (Table 4.1.1). In every state the proportion of older respondents currently working was much higher among men than women (Figure 4.3). Among older men the rate varied from 73% in Uttar Pradesh to 52% in Rajasthan; for older women, the highest proportion was recorded in Maharashtra (30%) and the lowest in Assam (13%).

As shown in Table 4.1.4, the proportion of older men currently working decreased substantially as age increased, from 83% in the 50-59 age group to 39% for those aged 70-79. About a quarter of men aged 80-plus were still

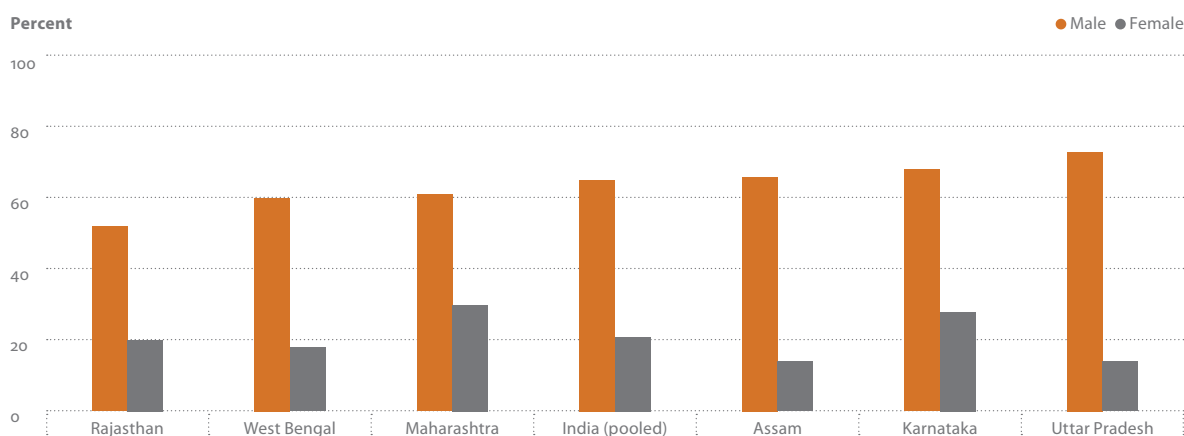
**Figure 4.2** Percentage of respondents currently working by sex and age group, India (pooled), 2007



**Table 4.1.3** Percent distribution of respondents by work status, states and India (pooled), 2007

State	Aged 50-plus								
	Male					Female			
	Ever worked		Never worked	Percent	Number	Ever worked		Never worked	Percent
	Currently working	Currently not working				Currently working	Currently not working		
Assam	66.2	25.6	8.2	100	368	13.2	14.6	72.1	100
Karnataka	67.8	25.0	7.3	100	419	27.8	37.9	34.4	100
Maharashtra	60.6	36.3	3.1	100	547	29.6	43.2	27.2	100
Rajasthan	51.7	48.0	0.3	100	677	20.0	34.3	45.7	100
Uttar Pradesh	72.5	25.6	1.9	100	703	13.8	17.0	69.2	100
West Bengal	59.9	38.0	2.1	100	589	18.0	15.8	66.2	100
<b>India (pooled)</b>	<b>64.7</b>	<b>32.3</b>	<b>2.9</b>	<b>100</b>	<b>3,303</b>	<b>20.6</b>	<b>27.2</b>	<b>52.2</b>	<b>100</b>

**Figure 4.3** Percentage of currently working respondents aged 50-plus by sex, states and India (pooled), 2007

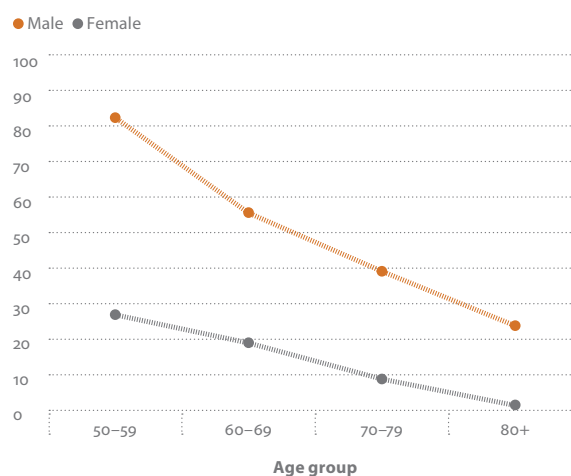


working. Men with a high school education had the highest rate of current work participation. The proportion currently working was much higher among married men (67%) compared to men who had never married (44%) and widowed men (54%) – perhaps due to the likelihood that widowed men were older than currently married men.

Among older female respondents, the proportion who had ever worked fell from 50% in the 50-59 age group to 44% at age 80-plus (Table 4.1.4). As with the men, the female current work participation rate decreased sharply with age: just over one-quarter of women were working in the 50-59 age group, falling to 9% at age 70-79 and just 2% in the 80-plus age group. Work participation rate among women varied inversely with income: the proportions who had ever worked decreased from 60% in the lowest wealth quintile to 30% in the highest. Similarly, the

proportion of women currently working decreased from 29% among in the lowest wealth quintile to 12%

**Figure 4.4** Percentage of currently working respondents aged 50-plus, by sex, India (pooled), 2007



**Table 4.1.4** Percent distribution of respondents by work status according to background characteristics, India (pooled), 2007

Background characteristics	Aged 50-plus									
	Male					Female				
	Ever worked		Never worked	Total	Number	Ever worked		Never worked	Total	Number
	Currently working	Currently not working				Currently working	Currently not working			
Age group										
50-59	82.5	16.0	1.6	100	1,388	27.1	22.6	50.3	100	1,551
60-69	55.8	40.3	3.9	100	1,155	19.2	27.3	53.5	100	1,079
70-79	39.3	57.2	3.5	100	591	9.0	36.6	54.4	100	467
80+	24.0	70.9	5.1	100	169	1.7	42.2	56.1	100	159
Marital status										
Never married	44.1	55.9	0.0	100	45	38.4	29.7	31.9	100	19
Currently married	67.0	30.5	2.5	100	2,894	22.8	23.5	53.6	100	1,967
Widowed	53.9	32.8	13.3	100	10	15.5	33.3	50.1	100	32
Other <sup>1</sup>	43.2	51.1	5.7	100	354	16.6	31.7	52.8	100	1,238
Residence										
Urban	58.7	40.5	0.9	100	791	15.6	26.5	58.0	100	888
Rural	67.4	29.1	3.5	100	2,519	22.6	27.5	49.9	100	2,368
Caste										
Scheduled tribe	67.2	28.8	4.0	100	215	33.6	34.4	32.0	100	185
Scheduled caste	63.3	33.0	3.7	100	557	23.4	29.3	47.3	100	528
Other <sup>2</sup>	65.1	32.4	2.4	100	2,531	19.0	26.3	54.7	100	2,543
Religion										
Hindu	65.7	31.6	2.8	100	2,778	20.5	27.5	52.0	100	2,753
Muslim	64.6	32.5	2.8	100	411	17.3	24.9	57.8	100	383
Other <sup>3</sup>	46.5	51.5	2.0	100	114	32.8	27.9	39.3	100	123
Education										
No formal education	61.7	34.8	3.5	100	1,084	23.3	30.7	46.0	100	2,281
Less than primary	63.9	33.6	2.5	100	453	14.9	18.2	66.9	100	292
Primary school	61.9	35.4	2.7	100	580	9.7	20.5	69.8	100	349
Secondary school	66.1	30.5	3.5	100	495	17.8	13.3	69.0	100	159
High school	74.3	24.2	1.5	100	427	12.1	13.0	74.9	100	114
College and above	66.5	32.2	1.3	100	264	20.1	20.6	59.3	100	61
Wealth quintile										
Lowest	64.4	31.8	3.9	100	654	29.3	30.6	40.1	100	658
Second	67.9	29.5	2.6	100	668	22.2	31.7	46.1	100	644
Middle	67.2	30.1	2.7	100	648	19.9	30.8	49.3	100	665
Fourth	62.4	35.2	2.4	100	683	17.2	23.0	59.9	100	627
Highest	62.5	35.5	2.0	100	650	11.6	18.1	70.3	100	662
Total	64.9	32.3	2.7	100	3,303	20.5	27.2	52.2	100	3,256

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

in the highest. Women who had never married had the highest rate of current work (38%), compared with 23% currently married women and 16% of widows. A higher proportion of women from rural areas (23%) than urban areas (16%) reported working at the time of survey.

## 4.2 Reason for discontinuing work or retirement

All participants who had ever worked but were not working at the time of survey were asked about their main reason for discontinuing work. As noted above, about 30% of older respondents had stopped working. As seen in Table 4.2.1, 73% of these older adults said they had stopped working due to health problems or retirement, 11% cited reasons related to family, 1% were laid off or could not find a job and 16% reported other reasons, such as involvement in seasonal work or not having the economic need to work. 83% of older respondents in West Bengal had discontinued work due to health, old age or retirement, compared with 64% in Assam. Among younger respondents, 21% had stopped work due to ill health or retirement; a remarkable proportion of younger adults reported unspecified other reasons. A similar pattern of reasons for discontinuation of the work was observed in all the states.

Table 4.2.2 further breaks down responses by age bracket and sex. Among older respondents, the proportion quitting work due to health reasons increased substantially with age, while the proportion citing family reasons decreased. For instance, in the oldest

age group aged 80-plus, 92% had stopped working because of health, old age or retirement, compared with only 53% among the 50-59 age group. Almost four in five older men discontinued work due to health/old age/retirement, compared with two in three of their female counterparts. Among younger respondents, notably, 9 out of 10 who had stopped working were women. Among men aged 18-49, a large proportion (36%) cited health reasons for discontinuing work, and very few reported family reasons. Among younger women, the opposite was the case: 26% gave up work for family-related reasons, and only 10% due to health problems. With increases in education and income level, the proportion of younger people who discontinued work due to family reasons rose, while those citing health reasons decreased.

As patterns of work differ substantially among men and women aged 50-plus, the reasons for discontinuing work are presented separately for men and women in Tables 4.2.3 and 4.2.4. Among both older men and older women, the most frequently cited reasons for stopping work were related to health, old age or retirement. Table 4.2.3 shows that discontinuing work due to family reasons was almost twice as common among older women (15%) as among older men (7%). Rajasthan reported the lowest (4%) and Assam the highest (32%) proportion of women who discontinued work for this reason. West Bengal had the highest percentage of older men (89%) and Karnataka older women (70%) who reported health, old age or retirement reasons; Assam reported the highest percentages of older men and women who had been laid off or could not find a job.

**Table 4.2.1** Percent distribution of respondents who have discontinued work by reasons for discontinuation, states and India (pooled), 2007

State	Aged 18-49						Aged 50-plus					
	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	Number	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	Number
Assam	22.4	19.5	2.8	55.3	100	36	14.9	64.0	4.6	16.5	100	148
Karnataka	30.3	34.3	0.8	34.7	100	106	14.5	75.0	1.5	9.0	100	323
Maharashtra	17.0	10.4	9.5	63.0	100	103	6.1	72.4	0.7	20.8	100	408
Rajasthan	4.0	13.1	8.1	74.8	100	155	2.9	71.9	1.6	23.7	100	579
Uttar Pradesh	24.3	20.8	3.0	51.9	100	57	20.5	66.2	0.4	12.9	100	283
West Bengal	18.8	31.6	5.6	44.0	100	126	7.9	82.7	0.2	9.2	100	323
India (pooled)	18.3	21.4	5.6	54.7	100	583	10.7	72.5	0.9	15.9	100	2,064

**Table 4.2.2** Percent distribution of respondents by reasons of discontinuing work, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							Aged 50-plus					
	Home-maker/ family related	Health/ old age /retired	Laid off/ cannot find job	Other	Total	No.		Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	No.
Age group													
18-29	26.0	10.2	7.0	56.8	100	178	50-59	16.5	52.5	1.5	29.5	100	550
30-39	17.3	22.1	7.0	53.6	100	213	60-69	9.3	79.6	0.8	10.2	100	797
40-49	12.4	30.7	2.9	53.9	100	192	70-79	7.5	81.2	0.5	10.8	100	524
							80+	4.5	91.5	0.4	3.7	100	193
Sex													
Male	2.7	35.9	6.1	55.3	100	65		7.0	80.3	1.0	11.7	100	1,200
Female	25.9	14.3	5.4	54.5	100	518		15.3	63.0	0.8	21.0	100	864
Marital status													
Never married	9.8	7.6	3.3	79.3	100	35		3.1	83.7	2.0	11.2	100	30
Currently married	20.0	23.3	6.2	50.6	100	510		11.9	69.8	1.0	17.3	100	1,440
Widowed	14.3	25.6	3.1	57.1	100	34		8.1	79.5	0.8	11.7	100	576
Other¹	15.8	54.4	0.0	29.8	100	4		1.5	61.7	0.7	36.1	100	18
Residence													
Urban	26.7	28.4	10.1	34.8	100	108		10.6	74.5	0.5	14.4	100	524
Rural	16.1	19.5	4.4	60.0	100	475		10.7	71.6	1.1	16.5	100	1,540
Caste													
Scheduled tribe	17.3	12.8	12.2	57.7	100	60		7.9	71.5	0.4	20.2	100	132
Scheduled caste	13.8	20.7	9.8	55.7	100	125		12.2	73.8	0.5	13.5	100	368
Other²	19.8	22.5	3.6	54.1	100	398		10.6	72.3	1.1	16.1	100	1,564
Religion													
Hindu	19.5	18.0	5.6	56.9	100	506		10.1	72.0	1.0	16.9	100	1,779
Muslim	13.1	46.8	1.4	38.8	100	56		17.9	72.2	0.2	9.8	100	217
Other³	7.1	8.9	21.7	62.4	100	21		3.3	82.9	1.6	12.1	100	68
Education													
No formal education	14.2	28.8	3.8	53.3	100	284		12.1	68.2	0.8	18.9	100	1,105
Less than primary	16.5	27.7	7.0	48.8	100	64		13.0	77.6	1.4	8.1	100	216
Primary school	21.0	20.1	5.6	53.3	100	100		9.6	74.3	0.9	15.2	100	272
Secondary school	18.2	17.3	0.9	63.7	100	66		8.1	71.8	1.6	18.5	100	195
High school	19.0	0.5	17.7	62.8	100	44		4.0	89.2	0.5	6.3	100	156
College and above	50.6	0.0	5.8	43.6	100	25		7.7	85.1	0.6	6.6	100	120
Wealth quintile													
Lowest	14.2	35.1	4.4	46.2	100	153		5.9	75.3	1.1	17.7	100	448
Second	13.0	23.5	5.7	57.9	100	120		12.2	65.0	0.7	22.1	100	405
Middle	19.9	17.8	1.0	61.3	100	125		16.4	67.9	0.9	14.7	100	409
Fourth	21.8	10.2	8.0	60.1	100	107		12.1	75.4	1.7	10.7	100	405
Highest	32.3	1.8	13.6	52.3	100	78		7.0	80.8	0.2	12.0	100	397
Total	18.3	21.4	5.6	54.7	100	583		10.7	72.5	0.9	15.9	100	2,064

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 4.2.3** Percent distribution of older respondents who have discontinued work, by reasons of discontinuation, states and India (pooled), 2007

State	Men						Women					
	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	Number	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	Number
Assam	6.7	72.6	3.2	17.6	100	106	31.6	46.8	7.3	14.3	100	42
Karnataka	10.7	82.7	1.6	5.1	100	127	16.9	70.4	1.4	11.3	100	196
Maharashtra	2.7	80.9	1.5	14.9	100	207	8.9	65.5	0.0	25.6	100	201
Rajasthan	1.9	76.6	2.2	19.2	100	327	4.2	65.3	0.8	29.9	100	252
Uttar Pradesh	15.3	75.9	0.0	8.8	100	195	29.3	49.8	1.1	19.8	100	88
West Bengal	3.5	88.5	0.3	7.8	100	238	19.3	67.9	0.0	12.8	100	85
India (pooled)	7.0	80.3	1.0	11.7	100	1,200	15.3	63.0	0.8	21.0	100	864

With increasing age, both men and women were more likely to discontinue work due to health, old age or retirement and less likely to have been laid off or to be unable to find a job. Among older women, family related matters declined in importance (Table 4.2.4). However, married older women were still more likely than married older men to cite family reasons for stopping work (22% compared to 7%). Among older people who had never married, 89% of men discontinued work due to health, old age or retirement, as compared to 43% of women. Older women who had never married were the most likely to report being laid off or unable to find a job.

### 4.3 Sector of employment

All participants who had ever worked were asked about the sector in which they had been engaged. Table 4.3.1 presents the results by state for respondents who were currently working in four categories of employment: the public sector, the private sector, self-employment, and informal employment.

Among respondents aged 50-plus, most were either self-employed (54%) or working in the informal sector (27%), with only a small proportion in public sector (10%) or private sector (9%) employment. This pattern was replicated among younger adults, the highest proportions of whom were also either self-employed (45%) or engaged in informal employment (29%) (Table 4.3.1). Among older respondents, private sector employment was highest in Karnataka and Assam and lowest in West Bengal, Rajasthan and Uttar Pradesh (Figure 4.5). For the same group, self-employment was

most common in Assam, Rajasthan, Uttar Pradesh and West Bengal: for example, 72% of older respondents were self-employed in Rajasthan compared with 18% in Karnataka. Informal employment among older adults was the highest (59%) in Karnataka and the lowest (9%) in Assam. For younger respondents, informal employment was most common in Karnataka and West Bengal.

Table 4.3.2 shows the employment categories of current workers by different background characteristics. In most categories, the pattern of distribution of workers was more or less uniform. As noted earlier, the highest proportion of older workers were self-employed, followed by those engaged in the informal sector. The highest proportion of older men were self-employed, whereas the highest proportion of older women worked in the informal sector. Increasing education and income brought a sharp reduction in the proportion of persons working in the informal sector, with consequent increase in public and private sector employment. Seven percent of rural older respondents were employed in the public sector compared with 20% in urban areas (Figure 4.6).

Table 4.3.1 presented the state-level distribution of older persons aged 50-plus by sector of employment. Table 4.3.3 shows these differentials by sex. Most older men (59%) were self-employed, whereas the highest proportion of older women (43%) worked in the informal sector. In each state, the employment pattern was similar to the national pattern, and also was similar to that among younger respondents age 18-49.

Table 4.3.4 provides a closer look at male and female respondents aged 50-plus who were working at the

**Table 4.2.4 Reason for discontinuing work, respondents aged 50-plus, India (pooled), 2007**

Background characteristics	Men						Women					
	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	No.	Home-maker/ family related	Health/ old age/ retired	Laid off/ cannot find job	Other	Total	No.
<b>Age group</b>												
50-59	6.0	62.2	2.7	29.1	100	227	24.5	45.1	0.6	29.8	100	323
60-69	4.8	89.2	0.4	5.6	100	485	15.8	65.9	1.5	16.8	100	312
70-79	10.3	81.0	0.6	8.1	100	359	2.4	81.5	0.4	15.8	100	165
80+	7.8	90.2	0.7	1.3	100	129	0.0	93.2	0.0	6.8	100	64
<b>Marital status</b>												
Never married	3.6	89.4	0.0	7.1	100	23	0.0	43.3	16.1	40.7	100	7
Currently married	6.7	80.6	1.1	11.5	100	997	22.2	48.3	0.7	28.9	100	443
Widowed	9.5	77.1	0.6	12.9	100	176	7.6	80.3	0.8	11.3	100	400
Other <sup>1</sup>	7.0	11.0	3.3	78.7	100	4	0.0	75.3	0.0	24.7	100	14
<b>Residence</b>												
Urban	6.3	82.9	0.8	10.0	100	346	17.2	61.6	0.1	21.2	100	178
Rural	7.4	78.8	1.2	12.7	100	854	14.5	63.6	1.1	20.9	100	686
<b>Caste</b>												
Scheduled tribe	4.1	81.6	0.8	13.5	100	67	11.1	62.9	0.0	26.0	100	65
Scheduled caste	6.6	80.9	0.3	12.2	100	201	19.0	65.3	0.8	15.0	100	167
Other <sup>2</sup>	7.3	80.0	1.2	11.5	100	932	14.9	62.3	0.9	21.9	100	632
<b>Religion</b>												
Hindu	6.0	80.9	1.1	12.1	100	1,012	14.9	61.5	0.9	22.7	100	767
Muslim	15.9	76.1	0.3	7.8	100	148	20.7	66.8	0.0	12.5	100	69
Other <sup>3</sup>	1.5	80.5	2.5	15.5	100	40	6.7	87.6	0.0	5.8	100	28
<b>Education</b>												
No formal education	7.9	76.9	0.9	14.2	100	410	14.2	63.7	0.8	21.3	100	695
Less than primary	12.3	78.8	1.2	7.8	100	172	15.3	74.0	1.9	8.9	100	44
Primary school	8.9	77.4	1.2	12.5	100	207	11.7	65.4	0.0	22.9	100	65
Secondary school	4.1	78.8	1.8	15.3	100	171	43.3	10.6	0.0	46.2	100	24
High school	0.6	92.4	0.1	6.8	100	136	40.0	54.6	4.9	0.5	100	20
College and above	3.9	89.3	0.7	6.2	100	104	43.4	45.3	0.0	11.3	100	16
<b>Wealth quintile</b>												
Lowest	4.3	80.2	0.4	15.2	100	230	7.6	70.4	1.8	20.3	100	218
Second	6.5	72.2	1.4	19.9	100	221	17.5	58.3	0.0	24.2	100	184
Middle	11.3	79.2	1.1	8.4	100	221	21.7	56.5	0.8	21.0	100	188
Fourth	10.0	80.5	2.1	7.5	100	258	16.0	66.5	1.1	16.4	100	147
Highest	3.6	88.3	0.3	7.9	100	270	14.3	64.9	0.0	20.8	100	127
<b>Total</b>	<b>7.0</b>	<b>80.3</b>	<b>1.0</b>	<b>11.7</b>	<b>100</b>	<b>1,200</b>	<b>15.3</b>	<b>62.9</b>	<b>0.8</b>	<b>21.0</b>	<b>100</b>	<b>864</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

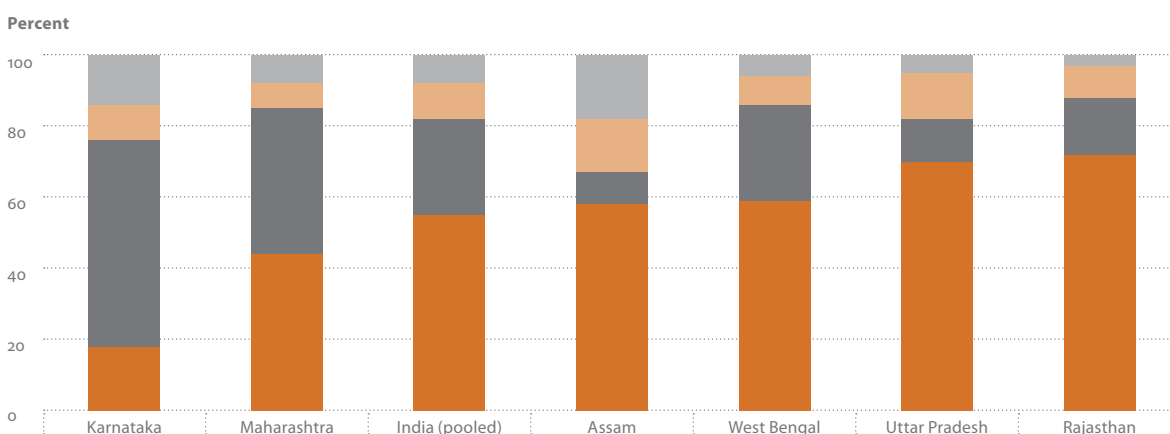
<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 4.3.1** Percent distribution of currently working respondents by sector of employment, states and India (pooled), 2007

State	Aged 18-49						Aged 50-plus					
	Public sector	Private sector	Self-employed	Informal employment	Total	No.	Public sector	Private sector	Self-employed	Informal employment	Total	No.
Assam	8.4	28.3	52.8	10.5	100	188	15.4	17.4	58.1	9.1	100	261
Karnataka	7.9	26.9	17.9	47.2	100	344	8.9	13.5	18.3	59.3	100	390
Maharashtra	6.6	10.6	43.9	39.0	100	464	7.1	8.2	43.7	40.9	100	474
Rajasthan	8.6	8.5	50.8	32.1	100	376	9.4	2.5	72.3	15.8	100	493
Uttar Pradesh	6.1	11.4	64.2	18.4	100	305	12.9	5.2	70.4	11.5	100	587
West Bengal	5.7	7.8	39.5	47.0	100	418	7.9	6.6	58.6	26.9	100	444
India (pooled)	6.8	13.3	44.8	29.4	100	2,095	10.1	8.9	53.5	27.1	100	2,649

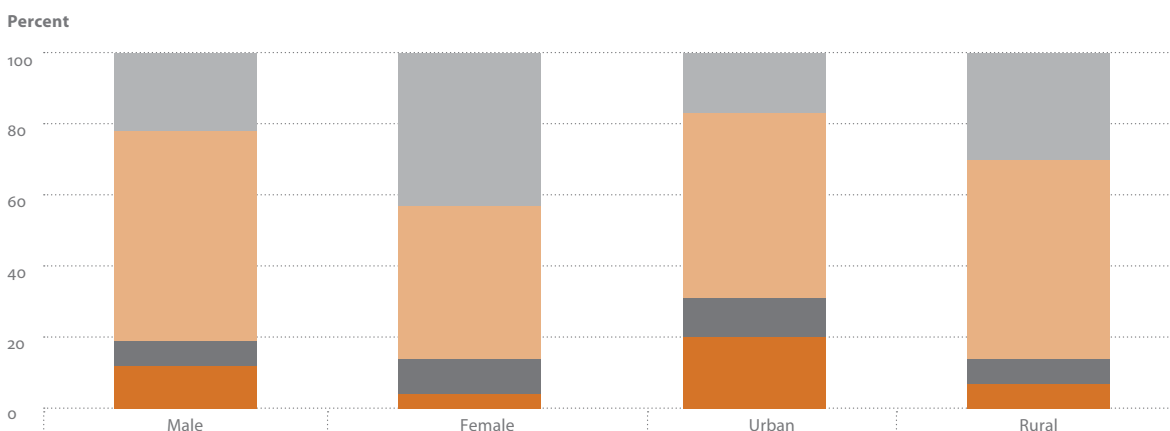
**Figure 4.5** Percentage of respondents aged 50-plus by current sector of employment, states and India (pooled), 2007

● Self-employed ● Informal employment ● Public sector ● Private sector



**Figure 4.6** Percent distribution of respondents aged 50-plus by current sector of employment, sex and residence, India (pooled), 2007

● Public sector ● Private sector ● Self-employed ● Informal employment



**Table 4.3.2** Percent distribution of currently working respondents by sector of employment according to background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							Aged 50-plus					
	Public sector	Private sector	Self-employed	Informal employment	Total	No.		Public sector	Private sector	Self-employed	Informal employment	Total	No.
Age group													
18-29	4.7	18.8	43.8	32.8	100	521	50-59	12.5	8.7	51.6	27.3	100	1,562
30-39	5.4	13.6	45.7	35.2	100	838	60-69	4.5	6.1	61.0	28.5	100	813
40-49	9.4	9.6	50.2	30.8	100	736	70-79	10.0	3.9	62.5	23.6	100	241
							80+	8.5	8.2	64.5	18.8	100	33
Sex													
Male	7.0	12.8	50.2	30.0	100	927		11.9	6.8	59.0	22.3	100	1,968
Female	6.2	14.8	37.4	41.6	100	1,168		4.0	10.0	43.0	43.8	100	681
Marital status													
Never married	7.3	23.9	49.1	19.8	100	197		7.1	9.1	72.4	11.4	100	29
Currently married	6.8	11.5	47.1	34.6	100	1,744		10.6	7.2	56.5	25.8	100	2,252
Widowed	6.7	24.0	42.5	26.8	100	133		5.9	10.6	43.6	39.9	100	358
Other¹	4.4	17.5	39.4	38.8	100	21		1.7	6.0	84.3	8.0	100	10
Residence													
Urban	8.8	24.2	46.3	20.7	100	450		19.6	10.6	52.4	17.5	100	559
Rural	6.3	10.3	47.2	36.2	100	1,645		6.9	6.5	56.2	30.3	100	2,090
Caste													
Scheduled tribe	6.4	13.4	33.1	47.1	100	199		1.8	16.3	51.2	30.7	100	197
Scheduled caste	5.7	11.2	40.3	42.8	100	430		10.1	8.1	44.7	37.1	100	466
Other²	7.2	13.9	50.4	28.6	100	1,466		10.8	6.7	57.9	24.7	100	1,986
Religion													
Hindu	7.4	13.2	47.6	31.7	100	1,795		10.5	7.4	54.4	27.8	100	2,244
Muslim	2.1	13.1	45.6	39.1	100	209		7.8	7.5	65.9	18.8	100	300
Other³	6.9	14.3	38.4	40.4	100	91		7.8	11.2	38.5	42.5	100	105
Education													
No formal education	0.7	10.5	37.8	51.1	100	780		1.9	6.9	52.7	38.5	100	1,157
Less than primary	2.4	8.9	43.7	45.0	100	222		3.2	8.3	60.0	28.6	100	308
Primary school	3.7	10.7	47.2	38.5	100	338		3.6	7.4	62.4	26.6	100	390
Secondary school	4.8	12.5	57.6	25.2	100	323		9.8	9.5	65.4	15.3	100	326
High school	15.1	16.7	54.2	14.0	100	273		28.1	5.3	55.6	11.0	100	300
College and above	21.9	24.6	43.4	10.2	100	159		48.7	10.7	29.6	11.1	100	168
Wealth quintile													
Lowest	2.1	8.6	29.1	60.1	100	518		0.8	8.1	50.2	40.8	100	595
Second	1.3	10.1	53.2	35.4	100	453		2.7	7.5	62.7	27.1	100	577
Middle	5.4	16.6	50.7	27.2	100	431		8.9	7.2	59.4	24.4	100	535
Fourth	13.1	18.3	50.7	17.9	100	394		14.4	8.8	53.4	23.4	100	512
Highest	16.5	14.8	57.0	11.7	100	299		29.7	5.8	49.4	15.2	100	430
Total	6.8	13.3	47.0	32.9	100	2,095		10.1	7.5	55.3	27.1	100	2,649

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 4.3.3** Sector of employment of respondents aged 50-plus, states and India (pooled), 2007

State	Aged 50-plus											
	Men						Women					
	Public sector	Private sector	Self-employed	Informal employment	Total	No.	Public sector	Private sector	Self-employed	Informal employment	Total	No.
Assam	16.1	15.5	61.0	7.4	100	224	11.6	28.2	41.4	18.8	100	37
Karnataka	10.8	9.9	21.2	58.1	100	245	4.5	21.6	11.9	62.0	100	145
Maharashtra	9.6	8.5	49.6	32.3	100	318	2.1	7.6	32.3	58.0	100	156
Rajasthan	11.6	3.5	69.4	15.5	100	345	4.0	0.0	79.6	16.3	100	148
Uttar Pradesh	14.4	4.6	71.3	9.6	100	494	3.8	8.7	64.8	22.8	100	93
West Bengal	8.5	6.5	62.6	22.5	100	342	6.1	7.0	44.4	42.5	100	102
India (pooled)	11.9	6.8	59.0	22.3	100	1,968	4.0	10.0	43.0	43.0	100	681

time of the study. Distribution by sector of employment was more or less the same in different age groups and across different castes and religions. As noted earlier, education and income level had a strong impact: increases in education and income brought a sharp reduction in the proportion of persons, especially men, working in the informal sector, with a commensurate increase in the public and private sectors.

#### 4.4 Occupational structure

Table 4.4.1 shows the occupational structure of older respondents by state. A large proportion of these workers were engaged either in agriculture (48%) or in elementary occupations (26%). Occupational distribution was fairly similar in all states, but Uttar Pradesh (62%) and Rajasthan (59%) had especially high rates of workers in agriculture.

The occupational distribution of older workers by selected characteristics is shown in Table 4.4.2. Fifty-one percent of older men worked in agriculture and 21% in elementary occupations, compared with 40% and 41% respectively among older women. The four occupations of senior official, professional, technician and clerk collectively accounted for 13% of older male workers, but for only 6% of older female workers. The highest proportion of older scheduled tribe respondents worked in agriculture, while those in scheduled castes were most likely to work in elementary occupations. Increases in education and wealth quintile brought decreases in the number of older respondents engaged in elementary occupations, and corresponding increases in the proportion working as senior officials, professionals, technicians and clerks.

#### 4.5 Sources of household income

The household income questionnaire asked about income received from a variety of different sources – wages or salary, trading or business, rent, pensions, interest or dividends, or any other source – as well as the amount received from each source. A question was also asked about the perception of sufficiency of income.<sup>7</sup>

Table 4.5.1 presents the results by state. Overall, the most common source of household income was wages or salaries: other than in Assam, more than two thirds (68%) of households received income from this source (in Assam, the figure was only 29%). Meanwhile, 35% of households overall received income from trade or business (64% in Rajasthan), while only a small proportion received income from interest or dividends (2%) or rent (4%). The exception was Karnataka, where rental income was more than twice as high as any other state at 11%. A large proportion of households (46% overall, although 71% in Uttar Pradesh and 65% in Assam) reported income from sources other than those mentioned above. These other sources probably include agriculture or farm income and remittances from abroad. Overall, only about one in 10 households received income from a pension.

The estimated per capita mean monthly household income was Rs. 1,121, varying from Rs. 1,362 in Maharashtra down to Rs. 996 in Assam and Rs. 976 in Uttar Pradesh. Most households – 55 % overall, and over two thirds in Karnataka and one fifth in Assam and West Bengal – did not find their income

<sup>7</sup> The exact wording of this question was: "Thinking about the income for this household, do you believe that it is enough money to cover your daily living needs and obligations?"

**Table 4.3.4 Sector of employment of respondents aged 50-plus, India (pooled), 2007**

Background characteristics	Aged 50-plus											
	Men						Women					
	Public sector	Private sector	Self-employed	Informal employment	Total	No.	Public sector	Private sector	Self-employed	Informal employment	Total	No.
<b>Age group</b>												
50-59	14.9	8.5	54.3	22.4	100	1,132	4.7	9.3	42.9	43.1	100	430
60-69	5.2	3.8	67.2	23.8	100	611	2.5	12.5	43.2	42.8	100	202
70-79	11.2	4.4	66.5	18.0	100	197	4.1	1.7	42.7	51.5	100	44
80+	9.3	4.0	66.7	20.1	100	28	0.0	54.3	40.3	5.4	100	5
<b>Marital status</b>												
Never married	0.6	7.8	82.6	9.1	100	22	35.4	14.8	28.5	21.3	100	7
Currently married	12.1	6.7	58.7	22.5	100	1,794	4.2	9.0	46.4	40.4	100	458
Widowed	11.4	7.8	60.4	20.4	100	147	2.9	12.1	34.7	50.3	100	211
Other <sup>1</sup>	0.0	12.7	87.3	0.0	100	5	3.3	0.0	81.6	15.2	100	5
<b>Residence</b>												
Urban	22.9	8.9	54.3	13.9	100	421	7.1	16.9	45.2	30.8	100	138
Rural	8.2	6.1	60.6	25.2	100	1,547	3.1	7.9	42.3	46.6	100	543
<b>Caste</b>												
Scheduled tribe	2.2	15.8	55.8	26.2	100	132	1.0	17.2	41.7	40.1	100	65
Scheduled caste	11.6	6.3	50.4	31.6	100	335	5.5	13.5	27.9	53.1	100	131
Other <sup>2</sup>	12.7	6.3	61.0	20.0	100	1,501	4.0	8.2	46.9	40.9	100	485
<b>Religion</b>												
Hindu	12.3	6.6	58.1	23.0	100	1,652	4.5	10.1	42.0	43.4	100	592
Muslim	9.5	7.3	66.9	16.3	100	246	0.7	8.5	61.7	29.1	100	54
Other <sup>3</sup>	12.0	11.9	49.2	26.9	100	70	1.8	10.2	23.3	64.7	100	35
<b>Education</b>												
No formal education	2.7	4.2	61.1	32.0	100	614	1.0	10.1	42.9	46.2	100	543
Less than primary	2.9	7.8	63.1	26.2	100	260	5.3	11.9	37.6	45.2	100	48
Primary school	3.9	7.3	63.0	25.8	100	348	0.0	8.9	55.6	35.6	100	42
Secondary school	8.6	10.1	66.1	15.2	100	308	26.1	1.1	55.6	17.2	100	18
High school	26.8	5.4	56.7	11.1	100	283	75.1	0.0	18.3	6.6	100	17
College and above	48.4	9.7	30.3	11.6	100	155	54.7	30.8	14.5	0.0	100	13
<b>Wealth quintile</b>												
Lowest	0.6	7.1	57.2	35.0	100	397	1.3	10.5	35.8	53.6	100	198
Second	3.4	6.1	68.4	22.0	100	420	0.6	11.7	45.2	42.5	100	157
Middle	9.6	7.3	63.1	20.0	100	396	6.6	7.0	46.7	39.7	100	139
Fourth	16.8	7.9	53.9	21.4	100	396	4.1	12.4	51.4	32.1	100	116
Highest	32.1	5.7	50.6	11.6	100	359	15.4	6.4	42.3	36.1	100	71
<b>Total</b>	<b>11.9</b>	<b>6.8</b>	<b>59.0</b>	<b>22.3</b>	<b>100</b>	<b>1,968</b>	<b>4.0</b>	<b>10.0</b>	<b>43.0</b>	<b>43.1</b>	<b>100</b>	<b>681</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 4.4.1 Occupational structure of the respondents aged 50-plus, states and India (pooled), 2007**

State	Aged 50-plus									
	Senior officials	Professionals	Technicians	Clerks	Service workers	Agricultural	Trade	Plant	Elementary occupation <sup>1</sup>	Number
Assam	0.8	5.3	7.3	0.8	10.8	45.3	2.0	0.3	27.3	261
Karnataka	1.5	3.7	2.6	4.5	6.0	43.2	12.6	1.4	24.5	390
Maharashtra	0.6	2.7	1.6	2.6	7.7	36.5	6.9	2.2	39.3	474
Rajasthan	0.3	6.6	0.5	1.6	7.8	58.8	8.3	2.4	13.8	492
Uttar Pradesh	1.5	3.2	5.8	0.8	4.8	61.6	4.5	0.2	17.8	587
West Bengal	1.5	7.1	4.9	0.8	7.2	35.5	11.3	1.8	29.9	443
India (pooled)	1.1	4.2	3.9	1.7	6.5	48.4	7.4	1.3	25.5	2647

<sup>1</sup> Elementary occupations usually require a minimum general level of education, plus short periods of work-related training in areas such as health and safety, food hygiene, and customer service requirements.

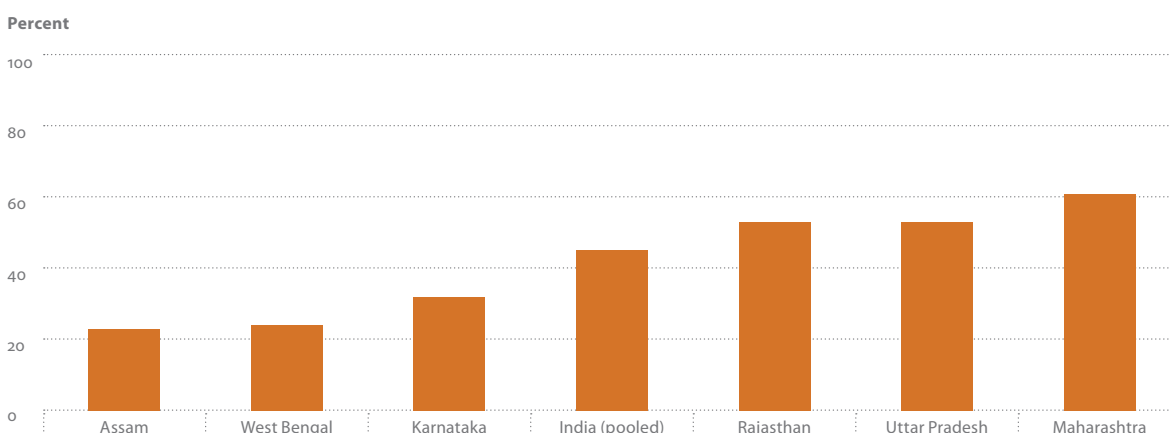
sufficient to take care of their needs. Perhaps unsurprisingly, Maharashtra, which had the highest income, also had the highest proportion (61%) of households reporting that their income was adequate to meet daily needs and obligations (Figure 4.7). Interestingly, however, most households (53%) in Uttar Pradesh also reported their income to be adequate to their daily needs, even though that state had the lowest mean income in the survey.

Information on household income, by selected characteristics of the head of household, is presented in Table 4.5.2. Patterns varied depending upon the sex and ages of the heads of household. The most commonly reported source of income for all categories of household was wages or salaries, followed by other sources such as farm income or remittances. However, far more male-headed households (36%) than female-headed households (25%) received income from trade or business. On the other hand, female-headed house-

holds (17%) were twice as likely to report income from pensions than male-headed households (9%).

The income of male-headed households was much higher than female-headed households (Rs. 1133 versus Rs. 1023 per month). Although overall, the proportions of male and female-headed households perceiving their income to be adequate did not vary widely (45% of male-headed households versus 40% of female-headed households), greater variation appeared when these groups were broken down by age: nearly 50% of households headed by older men considered their income to be adequate, compared to 36% of those headed by younger women, reflecting the sharp disparity in monthly incomes for these groups (Rs. 1184 versus Rs. 938).

Households headed by younger people were more likely to receive income from wages or salaries, whereas those headed by older adults were more likely to

**Figure 4.7 Percentage of households reporting sufficient income, states and India (pooled), 2007**

**Table 4.4.2 Occupational structure of respondents aged 50-plus, India (pooled), 2007**

Background characteristics	Aged 50-plus									
	Senior officials	Professionals	Technicians	Clerks	Service workers	Agricultural	Trade	Plant	Elementary occupation <sup>1</sup>	Number
<b>Age group</b>										
50-59	1.2	5.4	5.2	2.5	5.8	44.6	7.3	1.6	26.4	1,560
60-69	1.2	1.8	1.8	0.4	8.6	52.3	7.3	0.7	26.0	813
70-79	0.9	3.5	1.2	0.6	5.0	60.6	9.3	0.7	18.3	241
80+	0.0	0.0	2.1	0.0	12.1	61.9	1.3	0.0	22.6	33
<b>Sex</b>										
Male	1.5	4.5	4.3	2.2	7.2	50.8	7.1	1.6	20.9	1968
Female	0.0	3.0	2.4	0.3	4.5	40.4	8.5	0.2	40.7	679
<b>Marital status</b>										
Never married	0.0	4.4	7.8	2.1	0.6	59.8	4.1	0.0	21.1	29
Currently married	1.3	4.0	4.0	2.0	6.8	49.9	7.2	1.3	23.6	2,250
Widowed	0.0	5.9	2.5	0.0	5.0	35.0	8.8	0.8	42.1	358
Other <sup>2</sup>	0.0	1.7	0.0	0.0	9.0	57.4	23.9	0.0	8.0	10
<b>Residence</b>										
Urban	3.6	6.3	5.9	4.2	12.1	29.7	15.2	2.9	20.1	559
Rural	0.3	3.5	3.2	0.9	4.7	54.5	4.9	0.7	27.3	2088
<b>Caste</b>										
Scheduled tribe	0.0	0.0	1.1	0.5	5.6	47.0	7.3	1.4	37.1	196
Scheduled caste	1.2	2.4	2.6	0.6	4.5	37.3	4.6	0.7	46.1	464
Other <sup>3</sup>	1.2	4.9	4.4	2.1	7.1	50.9	8.1	1.4	20.1	1,987
<b>Religion</b>										
Hindu	1.2	4.0	3.8	1.9	6.3	49.7	7.1	1.2	24.9	2,242
Muslim	0.7	6.0	5.0	0.9	9.1	43.6	8.6	1.9	24.2	300
Other <sup>4</sup>	2.2	2.2	1.5	1.5	4.5	30.0	10.6	1.7	46.0	105
<b>Education</b>										
No formal education	0.0	0.8	1.0	0.1	3.8	51.0	5.8	0.4	37.1	1,156
Less than primary	0.9	1.7	1.5	0.7	8.9	47.3	14.2	0.3	24.8	307
Primary school	0.8	1.5	1.4	0.1	9.5	49.0	9.6	1.1	27.0	390
Secondary school	2.2	4.4	4.0	3.2	8.3	52.2	9.2	4.4	12.3	326
High school	1.2	11.2	7.0	4.1	9.5	47.2	5.1	2.6	12.2	300
College and above	6.7	19.8	23.5	9.2	4.6	28.2	3.4	0.0	4.7	168
<b>Wealth quintile</b>										
Lowest	0.1	2.2	2.1	0.0	2.9	40.0	5.7	0.4	46.7	594
Second	0.0	1.9	1.3	0.5	5.5	58.9	4.8	0.5	26.8	576
Middle	0.4	2.3	2.5	0.5	9.8	49.9	13.9	2.2	18.7	536
Fourth	0.6	5.0	4.2	3.3	7.7	49.8	8.7	2.4	18.3	511
Highest	5.6	11.4	11.2	5.7	8.0	42.8	4.6	1.3	9.6	430
<b>Total</b>	<b>1.1</b>	<b>4.2</b>	<b>3.9</b>	<b>1.7</b>	<b>6.5</b>	<b>48.4</b>	<b>7.4</b>	<b>1.3</b>	<b>25.5</b>	<b>2,647</b>

1 Elementary occupations usually require a minimum general level of education, plus short periods of work-related training in areas such as health and safety, food hygiene, and customer service requirements.

2 Includes divorced, separated or cohabiting.

3 Includes non-scheduled caste or tribe and no caste or tribe.

4 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 4.5.1 Sources of income and per capita mean monthly household income (Rs.), states and India (pooled), 2007**

	Wages/ salary	Trading/ business	Rental	Pension	Interest / dividends	Other	Per capita mean monthly household income <sup>1</sup>	Income adequate
Assam	29.2	40.5	2.9	9.8	4.3	64.8	996	23.0
Karnataka	78.7	21.0	11.4	12.5	0.7	39.7	1,162	32.2
Maharashtra	71.9	37.4	2.9	7.9	1.9	26.2	1,362	60.8
Rajasthan	75.2	63.7	5.4	9.4	2.1	3.0	1,194	52.5
Uttar Pradesh	66.8	28.4	3.0	9.0	1.5	70.8	976	52.9
West Bengal	68.7	33.4	4.0	12.2	5.0	49.3	1,026	24.2
<b>India (pooled)</b>	<b>68.3</b>	<b>35.2</b>	<b>4.3</b>	<b>9.8</b>	<b>2.4</b>	<b>45.7</b>	<b>1,121</b>	<b>45.2</b>

1. Household income outliers have been excluded from the analysis. Income outliers for each state have been determined by considering the respective state levels of maximum consumption expenditure (NSSO 64th Round, 2007-08) as the limit.

**Table 4.5.2 Sources of income and per capita mean monthly household income (Rs.), India (pooled), 2007**

Background characteristic	Wages/ salary	Trading/ business	Rental	Pension	Interest / dividends	Other	Per capita mean monthly household income <sup>1</sup>	Income adequate
<b>Age</b>								
Female 18-49	74.6	22.2	2.9	13.4	5.8	41.5	938	35.9
Female 50+	62.5	26.2	6.0	19.1	2.1	41.1	1073	43.5
Male 18-49	73.6	34.4	3.8	4.9	1.3	42.3	1085	42.5
Male 50+	63.9	38.2	4.8	13.1	3.3	49.6	1184	49.1
<b>Sex</b>								
Male	68.7	36.3	4.3	9.1	2.3	46.0	1133	45.8
Female	67.0	24.7	4.8	16.9	3.5	41.3	1023	40.7
<b>Marital status</b>								
Never married	65.3	30.8	4.8	7.1	1.7	45.2	1116	39.8
Currently married	68.8	36.4	4.3	8.6	2.2	45.5	1136	45.8
Widowed	66.7	28.0	4.7	18.0	3.6	46.1	1047	43.5
Other <sup>2</sup>	76.0	32.0	1.1	10.9	0	48.6	761	28.8
<b>Residence</b>								
Urban	69.5	35.0	6.0	14.0	5.0	23.4	1579	54.6
Rural	67.9	35.3	3.7	8.3	1.4	53.8	953	41.8
<b>Education</b>								
No formal education	75.1	32.4	2.9	6.6	0.6	46.7	865	35.4
Less than primary	71.1	35.9	4.5	6.1	1.6	42.4	975	37.9
Primary school	66.8	38.2	3.4	7.7	2.0	47.3	1112	43.3
Secondary school	62.5	38.5	4.3	10.6	2.3	46.1	1267	47.6
High school	61.9	35.6	5.5	14.8	4.3	45.6	1413	57.1
College and above	67.6	31.2	9.8	21.1	8.3	41.3	2252	72.2
<b>Wealth quintile</b>								
Lowest	79.0	23.6	1.9	4.5	0.4	46.1	715	25.9
Second	70.4	35.1	2.1	5.7	0.7	50.9	930	34.8
Middle	64.6	39.5	2.5	8.6	1.5	49.8	1126	41.8
Fourth	63.6	40.4	5.3	11.9	2.0	43.1	1462	55.5
Highest	63.0	41.7	10.2	19.9	7.9	39.0	2157	73.2
<b>Total</b>	<b>68.5</b>	<b>35.2</b>	<b>4.3</b>	<b>9.8</b>	<b>2.4</b>	<b>45.6</b>	<b>1121</b>	<b>45.2</b>

1 Household income outliers have been excluded from the analysis. Income outliers for each state have been determined by considering the respective state levels of maximum consumption expenditure (NSSO 64th Round, 2007-08) as the limit.

2 Includes divorced, separated or cohabiting.

receive income from pensions. Nevertheless, the mean monthly income of households headed by older persons was higher than for those headed by younger persons.

The mean monthly income of urban households was almost 50% higher than rural households. Most urban households perceived their income to be adequate, whereas most rural households perceived it to be inadequate. A larger proportion of rural households (54%) compared to urban (23%) received income from other sources.

As education and wealth quintile of the head of household increased, the proportion receiving income from wages and salaries decreased, while those receiving pensions, interest or dividends increased. Educational attainment of the head of household was positively related to income. The mean monthly income of a college-educated household head was almost three times the income of a household headed by person with no formal education. About 72% of the households headed by a person who was college-educated found monthly income enough to meet daily needs and obligations, compared to 35% of the households headed by a person with no formal education.

## 4.6 Financial and other transfers

Along with data on household income, SAGE India also collected data on household support networks and financial transfers. The survey asked whether any household member had received financial or non-monetary (in-kind) support during the previous 12 months, from family, the community or the government. It also asked whether any household member received assistance in doing household chores or pro-

viding care or transportation. Information was also collected on transfers and assistance provided by a household to other family members not residing in the same household and to the community.

Table 4.6.1 presents state-level data on financial and in-kind transfers into and out of households. Overall, 32% of households received monetary assistance and 12% received in-kind assistance from family members, community or the government. A relatively smaller proportion of households provided monetary (18%) or in-kind (8%) assistance to other family members or community. Only 4% of households received assistance in household chores from either family members or the community, and just 6% provided such assistance.

Most households in Karnataka (61%) and Rajasthan (53%) received monetary transfers, whereas in Assam the figure was only 13%. In the other states, 22-29% of households received monetary assistance. The proportion of households receiving in-kind transfers ranged from 23% in West Bengal down to 8% in Maharashtra. Monetary transfers out of the household were less common than inward transfers, ranging from 23% in Maharashtra and West Bengal down to 10% in Assam. About 5-11% household provided in-kind assistance.

Table 4.6.2 presents information on transfers and assistance by source of support, type of household head and wealth quintile. Families (22%) and the government (10%) were most commonly reported as sources of monetary support. Meanwhile, 7% and 5% of households received in-kind support from family or the government, respectively. Very little support came from the community. In return, households more often provided monetary and in-kind support to family than to the community.

**Table 4.6.1** Percentage of households who received and provided monetary, non-monetary and household chore assistance, states and India (pooled), 2007

State	Into household			Out from household		
	Monetary	Non-monetary	Assistance	Monetary	Non-monetary	Assistance
Assam	12.7	8.7	3.3	9.6	5.1	4.9
Karnataka	61.0	9.6	5.7	20.9	10.3	5.7
Maharashtra	28.0	8.0	5.7	23.0	8.4	11.4
Rajasthan	52.9	13.6	5.9	15.9	4.5	5.4
Uttar Pradesh	21.6	9.5	4.0	14.2	8.7	4.8
West Bengal	28.9	22.6	0.7	22.9	9.8	0.5
India (pooled)	31.7	12.0	4.1	18.4	8.3	5.6

**Table 4.6.2** Percentage of households who received and provided monetary or non-monetary support and assistance by source, household head type and wealth quintile, India (pooled), 2007

Background characteristic	Into household			Out from household		
	Monetary	Non-monetary	Assistance <sup>1</sup>	Monetary	Non-monetary	Assistance
Family	21.5	6.9	3.6	12.2	5.9	3.4
Community	6.2	1.0	0.9	8.8	3.3	3.1
Government	10.2	5.2				
<b>Household head type</b>						
Female 18-49	48.3	23.4	7.3	16.0	3.3	8.5
Female 50+	39.7	18.1	6.9	14.1	7.5	5.9
Male 18-49	29.7	12.5	4.3	17.8	7.4	6.5
Male 50+	31.4	9.9	3.3	19.7	9.7	4.4
<b>Wealth quintile</b>						
Lowest	31.8	18.2	4.3	10.7	3.9	3.4
Second	33.4	13.9	3.8	13.1	6.9	5.4
Middle	34.8	10.6	3.7	18.6	9.4	5.5
Fourth	32.3	9.8	5.1	23.0	10.4	7.9
Highest	27.1	5.5	3.6	29.2	12.7	6.2
<b>India (pooled)</b>	<b>31.7</b>	<b>12.0</b>	<b>4.1</b>	<b>18.4</b>	<b>8.3</b>	<b>5.6</b>

<sup>1</sup> Refers to physical help in the year prior to interview, including involvement in household chores or activities (meal preparation, shopping, cleaning and laundry), physical care, or transportation/help getting around outside the home.

A relatively higher proportion of female-headed households received all three types of support (monetary, non-monetary and assistance with chores): for example, 48% of households headed by younger women received monetary support and 23% received in-kind support, compared to 30% and 13% respectively for households headed by men in the same age group. Households headed by younger women were more likely to receive all three types of support than households headed by older women. Meanwhile, a lower proportion of female-headed households provided monetary or in-kind support to others.

The proportion of households who received monetary support or assistance with chores did not vary with

income. However, with increasing income the proportion receiving in-kind support decreased. Increases in income also brought a rise in all three types of transfers out of the households: 29% of households in the highest wealth quintile provided monetary support, 13% gave in-kind support and 6% provided assistance. In the lowest quintile, the corresponding figures were 11%, 4% and 3%.

SAGE India also collected data on the monetary value of support received and provided during the 12 months prior to the survey. For those who received or provided assistance with household chores, personal care or transportation, data was collected on the average number of hours per week involved. Table 4.7.1 provides

**Table 4.7.1** Mean value of monetary, non-monetary and time transfers into or out of household, states and India (pooled) 2007

State	Into household			Out from household		
	Mean monetary value (Rs./year)	Mean non-monetary value (Rs./year)	Assistance (hours/ week)	Mean monetary value (Rs./year)	Mean non-monetary value (Rs./year)	Assistance (hours/ week)
Assam	1,229	414	7.4	613	70	15.4
Karnataka	35,971	370	7.5	2,759	220	15.5
Maharashtra	6,310	926	20.4	2,123	334	39.6
Rajasthan	28,686	1,360	18.0	2,257	206	17.0
Uttar Pradesh	3,099	251	31.5	2,606	387	41.2
West Bengal	3,701	264	2.2	806	632	1.0
<b>India (pooled)</b>	<b>10,343</b>	<b>549</b>	<b>18.1</b>	<b>2,030</b>	<b>363</b>	<b>26.3</b>

**Table 4.7.2** Mean value of monetary, non-monetary and household chore assistance by source, household head type and wealth quintile, India (pooled), 2007

Background characteristic	Into household			Out from household		
	Mean monetary value (Rs./year)	Mean non-monetary value (Rs./year)	Assistance (hours/week)	Mean monetary value (Rs./year)	Mean non-monetary value (Rs./year)	Assistance (hours/week)
<b>Family</b>	4610	411	16.2	1670	221	16.0
<b>Community</b>	1470	38	1.8	1351	140	9.6
<b>Government</b>	4236	97				
<b>Household head type</b>						
Female (18-49)	9,812	460	34.7	694	40	60.2
Female (50+)	8,947	323	54.0	1,195	101	18.0
Male (18-49)	9,630	631	18.1	1,677	380	31.6
Male (50+)	11,309	506	11.9	2,593	408	19.0
<b>Wealth quintile</b>						
Lowest	3,558	303	16.0	611	29	17.9
Second	6,261	398	25.2	637	110	39.2
Middle	11,939	333	28.7	941	113	17.0
Fourth	10,699	292	13.3	1,679	655	30.8
Highest	22,047	1,423	10.5	6,447	941	23.4
<b>India (pooled)</b>	<b>10,343</b>	<b>549</b>	<b>18.1</b>	<b>2,030</b>	<b>363</b>	<b>26.3</b>

state-level data on the average monetary value of support and average hours of assistance per week received or provided.

On average, in a year a typical household received monetary support of Rs. 10,343, in-kind support worth Rs. 549, and 18 hours per week of assistance. At the same time, the average household provided others with support of Rs. 2,030, in-kind support worth Rs. 363, and assistance for 26 hours per week. Across the states, there was a large variation in the magnitude of monetary assistance received: households in Karnataka and Rajasthan received on average Rs. 35,971 and Rs. 28,686 respectively during the 12 months prior to the survey, whereas in Assam the amount received was only Rs. 1,229. Similarly, the monetary value of in-kind support ranged from Rs. 1,360 in Rajasthan down to Rs. 251 in Uttar Pradesh. In Uttar Pradesh households received assistance for an average of 32 hours per week, whereas in West Bengal the average was only 2.2 hours per week. Compared to the state-level variation in the monetary support received, the variation in the monetary support which households provided was quite small, ranging from Rs. 2759 in Karnataka down to Rs. 613 in Assam. Although households in West Bengal provided monetary support of only Rs. 806, they also provided in-kind support worth Rs. 632, the highest amount among all the states.

Table 4.7.2 presents the average monetary value of support and average hours of assistance per week received

and provided, by head of the household characteristics. Out of the monetary support of Rs. 10,343 received by the average household, Rs. 4,610 (45%) came from family, Rs. 4,236 (41%) came from the government and Rs. 1,470 (14%) came from the community. Of the Rs. 549 worth of in-kind support received by the average household, 75% came from family, 18% from the government and 7% from the community. The 18 hours per week of assistance received was made up of 16.2 hours from family and 1.8 hours from the community. Of the monetary, non-monetary and assistance with chores which households provided to others, 55-62% was provided to family members and the remaining 38-45% to community members.

Although female-headed households were more likely to receive all three types of support, the overall average monetary value of support received by female- and male-headed households was similar. However, female-headed households receive far more hours of assistance with chores. The monetary value of the support provided by female-headed households was smaller than that provided by male-headed households.

Monetary support received and provided increased in parallel with wealth quintile. For example, households from the lowest quintile received Rs. 3,558 in monetary support and provided support of Rs. 611, whereas those from the highest wealth quintile received Rs. 22,047 and provided Rs. 6,447.



## 4.7 Care giving

Older persons may become less mobile and mentally alert with increasing age, and as a result may need care and assistance. This includes daily personal care, such as help with eating, dressing, bathing and moving around the house, as well as assistance with affairs outside the home, such as transportation to see doctors, going to buy medicines, or managing finances, health care, emotional wellbeing or other personal affairs.

To gauge whether older members of households might be receiving assistance from other household members, whether from the older or younger cohorts, all respondents were asked whether they had provided any type of help to a household member who was ill and needing assistance in the 12 months prior to the survey. Table 4.8.1 provides state-level details of the help provided by older respondents to an adult or child in the household. Across all states, more of these respondents provided assistance to adults in all the different domains of care than to children; nevertheless, the number providing care was low. Overall, 4% of older respondents provided financial help, 4% provided social/emotional help, 5% provided help in health-related matters, 4% provided physical help and 4% provided help with personal care. Among the states, older respondents in Maharashtra, Rajasthan and Uttar Pradesh were more likely to extend help in various domains of care, while West Bengal had the lowest proportion of older respondents who provided care.

Table 4.8.2 shows the proportion of older respondents who provided different kinds of help according to their background characteristics. As respondents aged, they were less likely to provide help to others – presumably because they were increasingly in need of help themselves. Although a higher proportion of men than women provided financial help, a lower proportion of men provided other kinds of help. A higher proportion of rural dwellers provided help than did urban respondents.

Table 4.8.3 provides state-level details of the care provided by younger respondents. Again, only a small proportion of these respondents reported providing care; about 4-6% provided help to an adult household member and about 1-2% provided help to a child. Younger respondents in Maharashtra and Uttar Pradesh were most likely to have provided assistance.



Table 4.8.4 shows the proportion of younger adults who provided care for an adult or child in the household according to background characteristics of the respondent. As the respondents' age increased, there was slight increase in the proportion that provided help to an adult household member. Men and rural respondents tended to help more often than women or urban respondents. Wealth quintile did not hold any relationship with the help provided. A higher proportion of young widowed women provided care in all domains than other categories.

**Table 4.8.1** Percentage of respondents aged 50-plus who provided care by type of care, states and India (pooled), 2007

State	Aged 50-plus									
	Financial		Social/emotional		Health		Physical		Personal	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child
Assam	2.0	0.5	2.7	0.1	3.6	0.8	5.2	0.0	2.4	0.3
Karnataka	4.0	0.7	3.9	0.7	5.7	0.1	4.1	0.1	4.0	0.0
Maharashtra	5.4	0.8	3.6	0.4	6.4	0.8	2.3	0.4	5.3	0.6
Rajasthan	5.4	0.9	6.8	0.8	5.1	0.4	4.6	0.3	5.6	0.3
Uttar Pradesh	5.8	0.4	5.9	0.3	6.3	0.3	5.2	0.3	3.4	0.4
West Bengal	0.5	0.1	0.4	0.0	1.8	0.0	2.2	0.2	2.5	0.2
India (pooled)	4.3	0.5	4.1	0.4	5.2	0.3	3.9	0.3	3.9	0.3

**Table 4.8.2** Percentage of respondents aged 50-plus who provided care by type of care according to background characteristics, India (pooled), 2007

Background characteristic	Aged 50-plus									
	Financial		Social/emotional		Health		Physical		Personal	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child
<b>Age group</b>										
50-59	5.1	0.7	4.7	0.5	6.4	0.6	4.7	0.5	4.3	0.5
60-69	4.2	0.4	4.1	0.3	5.2	0.2	3.8	0.1	4.3	0.3
70-79	3.6	0.1	3.3	0.0	2.5	0.0	2.2	0.0	2.8	0.0
80+	0.4	0.5	1.1	0.5	1.3	0.0	0.4	0.0	0.9	0.5
<b>Sex</b>										
Male	6.0	0.6	3.9	0.4	4.8	0.5	3.6	0.2	2.5	0.1
Female	2.6	0.4	4.3	0.4	5.6	0.2	4.1	0.3	5.4	0.6
<b>Marital status</b>										
Never married	4.4	0.0	2.6	0.0	4.7	0.0	5.4	0.0	4.7	0.0
Currently married	5.0	0.5	4.7	0.4	5.9	0.4	4.3	0.3	4.2	0.3
Widowed	2.0	0.5	2.1	0.4	2.8	0.3	2.1	0.2	2.7	0.6
Other <sup>1</sup>	0.0	0.0	6.2	0.0	2.1	0.0	2.1	0.0	9.5	0.0
<b>Residence</b>										
Urban	3.7	0.5	2.6	0.5	4.5	0.5	2.5	0.2	4.5	0.3
Rural	4.6	0.5	4.7	0.3	5.5	0.3	4.4	0.3	3.7	0.4
<b>Wealth quintile</b>										
Lowest	5.0	0.6	5.0	0.3	5.7	0.9	4.3	0.7	4.3	1.8
Second	4.1	0.4	4.2	0.3	4.2	0.3	3.1	0.1	3.5	1.9
Middle	4.9	1.1	3.2	0.9	6.2	0.2	5.9	0.4	4.5	1.6
Fourth	3.5	0.4	3.7	0.2	5.1	0.0	4.0	0.2	4.7	2.2
Highest	4.0	0.1	4.3	0.2	4.9	0.2	2.8	0.2	2.8	1.0
<b>Total</b>	<b>4.4</b>	<b>0.5</b>	<b>4.1</b>	<b>0.4</b>	<b>5.2</b>	<b>0.3</b>	<b>3.9</b>	<b>0.3</b>	<b>3.9</b>	<b>1.7</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

**Table 4.8.3** Percentage of respondents aged 18-49 who provided care to adult or child by type of care, state and pooled (India), 2007

State	Aged 18-49									
	Financial		Social/emotional		Health		Physical		Personal	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child
Assam	4.1	0.9	0.6	0.5	2.7	2.9	5.4	1.0	3.7	0.7
Karnataka	3.2	0.6	2.4	0.7	4.5	0.6	2.3	1.0	4.4	0.3
Maharashtra	6.3	4.6	4.0	4.1	6.4	4.7	4.2	1.9	5.8	1.1
Rajasthan	3.2	1.1	3.6	1.0	3.1	1.4	3.1	1.3	3.2	1.1
Uttar Pradesh	7.8	1.4	8.7	1.3	10.0	1.4	7.9	1.4	4.5	1.7
West Bengal	0.7	0.4	0.3	0.1	1.6	0.3	2.0	0.3	2.2	0.7
India (pooled)	4.9	1.7	4.5	1.5	5.9	1.9	4.8	1.2	4.1	1.7

**Table 4.8.4** Percentage of respondents aged 18-49 who provided care by type of care according to background characteristics, India (pooled), 2007

Background characteristic	Aged 18-49									
	Financial		Social/emotional		Health		Physical		Personal	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child
<b>Age group</b>										
18-29	3.0	1.3	4.1	1.5	5.2	2.7	3.9	1.6	3.1	2.3
30-39	5.1	2.1	4.1	1.9	6.4	1.9	5.4	1.4	5.5	1.9
40-49	6.6	1.8	5.2	1.1	6.1	1.0	5.0	0.7	3.8	1.0
<b>Sex</b>										
Male	7.8	2.2	5.8	1.5	7.4	1.6	6.3	1.2	4.0	1.3
Female	2.0	1.2	3.1	1.4	4.3	2.1	3.2	1.3	4.3	2.1
<b>Marital status</b>										
Never married	4.4	0.8	6.3	0.8	6.7	0.8	6.5	0.8	3.3	1.1
Currently married	4.5	1.7	3.7	1.4	5.3	1.8	4.0	1.1	3.9	1.7
Widowed	16.3	5.4	15.7	5.0	15.8	6.6	16.3	5.5	12.5	5.5
Other <sup>1</sup>	5.8	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0
<b>Residence</b>										
Urban	2.7	1.7	2.2	1.7	4.1	1.4	2.7	0.9	3.4	1.3
Rural	5.5	1.7	5.2	1.4	6.5	2.0	5.4	1.3	4.4	1.8
<b>Wealth quintile</b>										
Lowest	4.5	2.2	3.6	0.9	4.9	1.7	4.3	1.1	4.2	1.8
Second	5.7	1.8	5.7	1.4	6.5	1.6	4.8	1.7	4.6	1.9
Middle	5.1	1.7	5.0	2.0	5.9	1.8	5.0	0.8	3.2	1.6
Fourth	6.1	2.0	5.5	2.1	7.9	2.6	6.4	1.7	5.8	2.3
Highest	3.4	0.8	2.6	1.1	4.5	1.8	3.5	0.9	2.9	1.0
<b>Total</b>	<b>4.9</b>	<b>1.7</b>	<b>4.5</b>	<b>1.5</b>	<b>5.9</b>	<b>1.9</b>	<b>4.8</b>	<b>1.2</b>	<b>4.1</b>	<b>1.7</b>

<sup>1</sup> Includes divorced, separated or cohabiting.



## 5. Risk factors and health behaviours

This chapter describes risks to health and measures how these risks are distributed in the population. The rationale behind the inclusion of risk factors in SAGE is that 1) they have significant impact on mortality and morbidity from non-communicable diseases, and 2) risk modification is possible through effective primary prevention and health promotion efforts. The SAGE questions were based on the WHO NCD risk factor surveillance (STEPS) guidelines (WHO, 2005).

SAGE Wave 1 India (hereafter SAGE India) collected data on five major risk factors: tobacco abuse, alcohol consumption, intake of fruit and vegetables, physical activity levels, and environmental risk factors. The use of tobacco and alcohol has considerable impact on the health of the individual. The nutritional content of food, levels of fruit and vegetable intake and levels of physical activity are directly associated with health. SAGE has added questions on food security, which is particularly important for vulnerable groups, especially in the context of globalization, inequalities, environmental damage and financial crises. Finally, environmental risk factors such as access to improved drinking water, improved sanitation facilities, type of fuel used for cooking, and ventilation of cooking areas are crucial determinants of human health. Interventions to promote safe environments offer a large potential for disease prevention and can help to reduce health inequalities.

### 5.1 Tobacco use

Tobacco use is a major preventable cause of premature death and disease, currently causing over five million deaths each year worldwide and expected to cause over eight million deaths yearly by 2030 (Reddy and Gupta, 2004). The vast majority of these deaths are projected to occur in developing countries. There is sufficient evidence to support the causal relationship

between tobacco use and its adverse health effects. The medical research links tobacco use to vascular diseases such as coronary heart diseases, stroke and subclinical atherosclerosis, respiratory diseases such as chronic obstructive pulmonary diseases and pneumonia, adverse reproductive effects and cancers of ten sites. Most cardiovascular diseases, cancers and chronic lung diseases are directly attributable to tobacco consumption. Tobacco use increases risk of tuberculosis and more than 20% of tuberculosis incidence may be attributed to smoking (WHO, 2009). In India, according to a nationally representative study of smoking and deaths, smoking was responsible for around one million deaths in 2010 (Jha *et al.*, 2008), and 40% of the Indian tuberculosis burden may be attributed to smoking (WHO, 2009).

While globally, smoking of factory-made cigarettes is the dominant form of tobacco use, in India tobacco is used in a variety of forms. The most popular way to smoke tobacco, especially among rural men and women, is through small, thin hand-rolled cigarettes known as *bidi*. It is estimated that one-third of tobacco production in India goes to *bidi* making (Reddy and Gupta, 2004). Factory-made cigarettes are the second most popular form of tobacco smoking, mainly in urban areas. Other methods of smoking tobacco popular in different parts of the country are *chutta* (coarse cheroots), *dhumti* and other cigars, *chillu* and other forms of pipes, and *hookah* water pipes. Tobacco is also chewed with *paan* (betel quid), areca nut and other flavourings to form mixtures such as *paan masala*, *gutka* and *mawa* (Reddy and Gupta, 2004). Powders containing tobacco are also widely used for application to the teeth and gums.

Information collected in SAGE India on tobacco use included ever and current use of tobacco; frequency of tobacco use (daily or occasional); daily frequency of use of different tobacco products, both smoking and smokeless; and age at the time of quitting daily tobacco use and the time elapsed since quitting.

### 5.1.1 Tobacco use among older respondents

Table 5.1.1 and Figure 5.1 present the prevalence of tobacco use among older respondents (aged 50-plus) by state. Use among 50+ older adults stood at 50%, then 47% were daily users and 3% used occasionally. About 20% smoked tobacco every day and 30% used smokeless tobacco every day. About 5% of persons had previously used tobacco but had stopped completely by the time of the survey.

Tobacco use varied significantly by state, both in frequency and in form. In Assam (66%), Uttar Pradesh (57%) and West Bengal (55%) the majority of older respondents used tobacco in some form, either daily or occasionally, whereas in the other three states current use of tobacco was 40-43%. In Rajasthan the prevalence of smoking tobacco (26%) was almost double that of smokeless tobacco (14%), while in the other five states,

smokeless tobacco was more prevalent than smoking tobacco (Figure 5.1).

Table 5.1.2 presents the prevalence of tobacco use among older respondents by selected background characteristics. Daily tobacco use fluctuated in the range of 49-52% among persons aged 50-79. Tobacco use was slightly lower among persons aged 80-plus, though even in this age group 42% were tobacco users. The percentage of persons who had quit using tobacco increased with age: slightly more than 8% of persons aged 80-plus had quit, compared to 4% of persons aged 50-59.

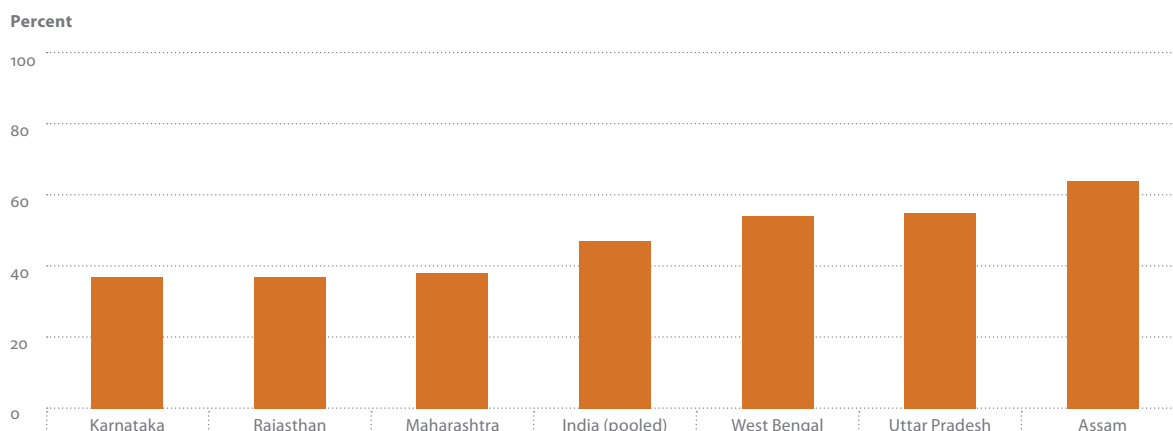
As the prevalence and pattern of tobacco use differed substantially between older men and women, tobacco use is tabulated separately by sex in Table 5.1.3. Current tobacco use was much higher among older men (67%) than older women (31%). In every state, most older men used tobacco, either daily or occasionally. In Assam, Uttar

**Table 5.1.1 Tobacco consumption among respondents aged 50-plus, states and India (pooled), 2007**

State	Tobacco consumption (all products)					Daily tobacco consumption <sup>1</sup>		Number
	Current daily user	Not daily user	Not current user	Never user	Total	Excluding smokeless tobacco	Smokeless tobacco	
Assam	63.8	2.2	4.2	29.8	100	14.2	54.4	677
Karnataka	36.5	4.1	6.4	53.0	100	16.5	22.0	923
Maharashtra	37.6	5.2	4.4	52.8	100	7.8	30.8	1,097
Rajasthan	37.3	2.4	4.7	55.5	100	26.4	13.5	1,376
Uttar Pradesh	54.7	2.0	3.4	39.9	100	24.4	34.6	1,311
West Bengal	53.5	1.5	6.3	38.8	100	26.0	30.6	1,173
India (pooled)	47.1	2.9	4.7	45.3	100	19.9	30.2	6,557

<sup>1</sup> Sum of these columns will not add up to "Current daily user" result because multiple responses allowed about forms of tobacco used.

**Figure 5.1 Percentage of respondents aged 50-plus who are current daily tobacco users, states and India (pooled), 2007**



**Table 5.1.2 Tobacco consumption among respondents aged 50-plus, India (pooled), 2007**

Background characteristic	Tobacco consumption (all products)					Daily tobacco consumption*		
	Current daily tobacco user	Tobacco user, not daily	Not current tobacco user	Never tobacco user	Total	Excluding smokeless tobacco	Smokeless tobacco	Number
Age group								
50-59	46.3	3.0	3.6	47.2	100	22.2	27.8	2,938
60-69	48.9	2.6	4.8	43.6	100	21.5	31.2	2,234
70-79	47.7	3.2	6.6	42.5	100	14.7	35.3	1,057
80+	42.2	3.1	8.3	46.5	100	12.6	30.8	328
Sex								
Male	63.1	4.2	7.2	25.6	100	34.7	34.7	3,303
Female	30.5	1.6	2.1	65.8	100	5.4	25.4	3,254
Marital status								
Never married	64.7	1.5	5.4	28.4	100	35.0	37.6	64
Currently married	48.8	3.2	5.0	43.0	100	23.2	29.5	4,861
Widowed	40.6	1.9	3.6	54.0	100	9.9	32.2	1,590
Other <sup>1</sup>	52.2	4.9	2.5	40.5	100	13.7	30.9	42
Residence								
Urban	37.3	2.9	4.6	55.3	100	15.1	23.9	1,676
Rural	51.1	2.9	4.7	41.2	100	22.5	32.7	4,881
Caste								
Scheduled tribe	60.5	2.3	4.7	32.5	100	20.1	45.8	400
Scheduled caste	54.8	2.2	5.4	37.6	100	26.9	32.8	1,084
Other <sup>2</sup>	44.6	3.1	4.5	47.8	100	18.9	28.5	5,073
Religion								
Hindu	46.3	3.0	4.8	45.9	100	19.4	30.2	5,529
Muslim	54.8	1.9	4.3	39.1	100	28.3	30.3	791
Other <sup>3</sup>	40.0	4.8	3.7	51.4	100	14.4	28.4	237
Education								
No formal education	46.1	2.5	3.6	47.8	100	18.3	30.9	3,363
Less than primary	51.7	3.7	5.5	39.1	100	25.0	30.6	745
Primary school	51.0	3.6	4.1	41.2	100	24.4	30.2	929
Secondary school	48.2	4.0	6.6	41.3	100	21.9	31.2	654
High school	49.6	1.8	7.1	41.5	100	19.7	33.0	541
College and above	31.3	3.4	7.2	58.0	100	17.5	15.7	325
Wealth quintile								
Lowest	57.0	3.4	4.9	34.8	100	25.6	35.7	1,312
Second	53.7	1.8	3.2	41.4	100	22.4	34.9	1,310
Middle	49.1	3.1	5.0	42.7	100	21.1	32.4	1,313
Fourth	40.0	3.4	5.7	50.9	100	16.4	25.2	1,310
Highest	33.2	3.0	4.7	59.0	100	15.0	20.0	1,312
Total	47.1	2.9	4.7	45.3	100	20.4	30.2	6,557

\* Sum of these columns will not add up to "Current daily user" result because multiple responses allowed about forms of tobacco used.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.





					Females							
		Daily tobacco consumption*		No.	Tobacco consumption (all products)					Daily tobacco consumption*		No.
Never tobacco user	Total	Excluding smokeless tobacco	Smokeless tobacco		Current daily tobacco user	Tobacco user, not daily	Not current tobacco user	Never tobacco user	Total	Excluding smokeless tobacco	Smokeless tobacco	
26.3	100	38.7	32.5	1,388	27.2	1.5	1.8	69.5	100	4.5	22.7	1,550
24.3	100	37.0	34.0	1,155	33.9	1.7	2.0	62.5	100	6.5	28.5	1,079
25.4	100	21.8	42.5	591	33.6	1.4	2.7	62.3	100	6.4	27.0	466
26.4	100	23.4	34.7	169	31.8	2.1	3.8	62.3	100	4.1	27.7	159
18.8	100	44.3	39.7	45	29.6	5.7	0.0	64.7	100	0.0	29.6	19
25.9	100	35.0	34.0	2,894	27.4	1.4	1.9	69.3	100	5.1	22.6	1,967
22.7	100	29.1	42.2	354	35.5	1.7	2.4	60.3	100	5.9	30.2	1,236
3.4	100	66.6	39.9	10	41.6	6.1	2.2	50.1	100	0.0	28.5	32
34.5	100	28.9	28.6	788	20.6	1.1	2.0	76.2	100	1.2	19.1	888
22.0	100	37.0	37.1	2,515	34.6	1.8	2.1	61.5	100	7.1	28.0	2,366
14.4	100	32.2	50.0	215	46.1	2.2	0.6	51.0	100	6.6	41.5	185
18.8	100	43.0	35.8	557	38.0	0.7	3.4	57.8	100	9.6	29.5	527
28.1	100	33.0	33.4	2,531	27.8	1.7	1.9	68.5	100	4.4	23.4	2,542
26.0	100	33.1	35.8	2,778	29.3	1.8	2.2	66.7	100	5.3	24.4	2,751
19.2	100	48.2	30.9	411	37.6	0.6	1.2	60.6	100	6.9	29.6	380
40.0	100	25.7	21.4	114	35.4	0.9	0.8	62.9	100	3.0	35.4	123
17.2	100	44.3	37.7	1,084	34.4	1.8	2.5	61.3	100	6.9	27.9	2,279
20.3	100	38.9	33.8	453	26.7	1.1	1.4	70.7	100	1.6	25.1	292
19.6	100	37.9	37.0	580	20.7	1.4	0.4	77.4	100	1.7	18.6	349
30.3	100	27.7	35.1	495	16.0	1.2	0.0	82.8	100	0.0	16.0	159
34.2	100	23.1	35.9	427	15.8	0.0	0.3	83.7	100	0.0	15.8	114
52.4	100	20.3	17.5	264	5.0	0.0	2.9	92.1	100	0.8	4.1	61
14.9	100	45.1	36.3	654	41.5	1.4	3.3	53.8	100	7.0	35.1	668
18.6	100	37.8	42.9	668	34.1	0.7	1.0	64.3	100	6.9	26.8	642
25.3	100	36.1	37.7	648	33.7	2.5	3.1	60.7	100	5.6	28.9	665
31.3	100	27.7	30.3	683	22.8	2.2	1.6	73.4	100	3.5	19.3	627
39.2	100	25.9	25.5	650	16.6	1.2	1.3	80.8	100	3.1	14.0	662
25.6	100	34.8	34.7	3,303	30.5	1.6	2.1	65.8	100	5.4	25.4	3,254

Pradesh and West Bengal, at least two thirds of older men used tobacco every day and about 4% used occasionally. In Karnataka, Rajasthan and West Bengal, use of smoking tobacco was higher than smokeless tobacco, whereas in Assam, Maharashtra and Uttar Pradesh the preference was reversed. Among older women, Assam was the only state where more than half (57%) used tobacco every day; the lowest prevalence was recorded in Rajasthan (12%). Rajasthan was also the only state where older women used smoking tobacco more than smokeless; in all other states the daily use of smokeless tobacco among older women exceeded that of smoking tobacco. Overall, daily use of smoking and smokeless tobacco was about the same among older men, whereas older women used smokeless tobacco far more than they smoked.

Table 5.1.4 presents the prevalence of tobacco use among older male and female respondents by selected background characteristics. Among older men the prevalence of daily tobacco use decreased with age, mainly because of the reduction in smoking. However, among older women the prevalence of daily tobacco use did not show any specific trend with increasing age. Among both older men and women, daily use of both smoking and smokeless tobacco was much higher in rural than urban areas.

Daily tobacco use declined with increasing education and wealth quintile in both sexes. Among older men, this inverse relationship was mainly because of a reduction in daily use of smoking tobacco, whereas use of smokeless tobacco changed little. However, among older women it is the use of smokeless tobacco that decreased with education and income, since even in

the lowest education and income brackets very few older women smoked.

## 5.1.2 Tobacco use among younger respondents

Table 5.1.5 shows the prevalence of tobacco use among younger respondents (aged 18-49) by state. Some 40% of younger respondents used tobacco in some form, 37.5% every day and 2.5% occasionally. Meanwhile, 58.5% of younger respondents had never used tobacco at all; a small proportion (1.5%) had previously used tobacco, but had stopped.

As the figures above indicate, 38% of younger current tobacco users used tobacco on a daily basis. Daily tobacco use ranged from 44% in Assam and Uttar Pradesh down to 27% Maharashtra, with levels in Rajasthan almost the same as the national level of 37% In all states except Assam, 1-3% younger persons used tobacco occasionally; in Assam it was 6%.

Smokeless tobacco was more commonly used than smoking tobacco: about one-quarter (24%) of younger adults were using smokeless tobacco daily, compared to 16% who smoked daily. In Assam, Maharashtra and Uttar Pradesh the prevalence of smokeless tobacco strongly exceeded that of the smoking form, whereas in Rajasthan it was the reverse. In Karnataka and West Bengal, daily use of both smoking and smokeless tobacco was almost same.

Table 5.1.6 gives the prevalence of tobacco use among younger respondents by selected background characteristics. The use of both smoking and smokeless tobacco

**Table 5.1.5 Tobacco consumption among respondents aged 18-49, states and India (pooled), 2007**

State	Tobacco consumption (all products)					Daily tobacco consumption <sup>1</sup>		Number
	Current daily user	Not daily user	Not current user	Never used	Total	Excluding smokeless tobacco	Smokeless tobacco	
Assam	43.7	6.1	1.5	48.7	100	9.3	37.6	517
Karnataka	29.2	2.7	1.9	66.2	100	16.0	14.4	630
Maharashtra	26.6	2.7	0.9	69.8	100	5.3	22.5	882
Rajasthan	37.0	2.1	1.3	59.6	100	23.4	16.2	846
Uttar Pradesh	43.6	2.5	1.1	52.8	100	17.9	30.3	890
West Bengal	42.2	1.4	2.6	53.9	100	22.6	21.3	901
India (pooled)	37.5	2.5	1.5	58.5	100	16.1	24.1	4,667

<sup>1</sup> Sum of these columns will not add up to "Current daily user" result because multiple responses allowed about forms of tobacco used.

**Table 5.1.6 Tobacco consumption among respondents aged 18-49, India (pooled), 2007**

Background characteristic	Tobacco consumption (all products)					Daily tobacco consumption*		Number
	Current daily tobacco user	Tobacco user, not daily	Not current tobacco user	Never tobacco user	Total	Excluding smokeless tobacco	Smokeless tobacco	
Age group								
18-29	21.1	3.0	0.9	75.0	100	6.0	15.8	1,604
30-39	38.7	2.5	1.8	57.1	100	15.6	26.0	1,655
40-49	51.5	2.2	1.7	44.6	100	27.7	29.3	1,407
Sex								
Male	59.5	3.7	2.1	34.6	100	30.6	35.4	1,042
Female	14.8	1.3	0.8	83.1	100	2.5	12.4	3,624
Marital status								
Never married	22.9	2.9	1.9	72.2	100	9.4	14.2	556
Currently married	39.6	2.6	1.4	56.4	100	17.9	25.5	3,851
Widowed	39.7	0.4	0.5	59.4	100	17.0	25.3	222
Other¹	30.9	7.3	0.0	61.8	100	5.5	25.4	38
Residence								
Urban	26.8	2.0	1.6	69.7	100	12.1	15.9	1,168
Rural	40.9	2.7	1.4	54.9	100	17.4	26.7	3,499
Caste								
Scheduled tribe	45.3	1.5	0.5	52.7	100	17.0	33.1	374
Scheduled caste	43.9	2.9	1.3	51.8	100	20.0	27.2	893
Other²	35.0	2.5	1.6	60.9	100	15.8	22.4	3,400
Religion								
Hindu	36.9	2.4	1.6	59.1	100	16.4	24.1	3,904
Muslim	43.8	3.0	0.7	52.6	100	22.4	24.0	593
Other³	29.0	4.4	1.9	64.7	100	5.3	23.7	170
Education								
No formal education	41.7	2.1	1.3	55.0	100	20.2	24.7	1,715
Less than primary	49.1	2.7	1.1	47.0	100	19.5	31.9	430
Primary school	37.4	3.2	1.7	57.7	100	17.7	23.4	788
Secondary school	36.9	2.1	0.9	60.2	100	15.5	25.8	741
High school	34.8	2.7	2.1	60.5	100	15.8	23.3	654
College and above	19.5	3.5	2.0	75.0	100	5.1	14.3	339
Wealth quintile								
Lowest	48.4	2.7	1.7	47.1	100	20.1	31.7	959
Second	47.2	2.4	1.4	49.0	100	21.5	28.0	933
Middle	36.1	2.4	1.8	59.7	100	15.8	25.5	934
Fourth	33.7	2.6	1.4	62.4	100	16.5	20.3	933
Highest	18.7	2.5	0.9	77.8	100	8.5	12.6	908
Total	37.5	2.5	1.5	58.5	100	16.7	24.1	4,667

\* Sum of these columns will not add up to "Current daily user" result because multiple responses allowed about forms of tobacco used.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

increased sharply with age: 24% of persons aged 18-29 currently used tobacco in some form, rising to 54% in persons aged 40-49. This increase was larger for smoking tobacco than for the smokeless variety. Tobacco use was much higher among younger men (66%) than among younger women (15%). Men used both smoking and smokeless tobacco more or less equally, while most women used smokeless tobacco: less than 3% of women reported smoking compared to 31% of men, while 12% of younger women reported using smokeless tobacco compared to 35% of younger men. Most younger female tobacco users used smokeless tobacco, whereas younger men used both types of tobaccos more or less equally.

The use of tobacco generally decreased as levels of education rose. However, tobacco use was higher among persons with less than a primary education than among those with no education at all, due to higher use of smokeless tobacco. The sharpest drop in tobacco use came with education at the college level and above: about one-fifth of college-educated persons used tobacco, compared to 39% of those with high school education.

Use of both of smoking and smokeless tobacco was much lower among younger people who had never married than in married or widowed persons, possibly due to the low prevalence of tobacco in the younger age group, who were less likely to be married. Tobacco use, both smoking and smokeless, was inversely related to income, decreasing from 52% in the lowest and second wealth quintiles to 21% among in the highest quintile. Tobacco use was higher in rural areas than urban areas, especially in relation to smokeless tobacco use.

One prominent observation was that there was uniformly low prevalence of occasional tobacco use (less than 3%) among younger users and only a small proportion of younger people had quit using tobacco (less than 2%).

## 5.2 Alcohol consumption

Alcohol is a toxic substance that can affect every organ in the body. The organs principally affected by excessive alcohol intake are the stomach, liver, brain and heart. Alcohol consumption slows down functioning of the liver and interferes with digestion. It irritates the lining of the food pipe and stomach, causing gastritis and ulcers. It also increases the incidence of cancer of stomach. Alcohol consumption can lead to fatty liver, alcoholic hepatitis and permanent liver damage/cirrhosis. It slows down the functioning of brain, causes loss of

**Table 5.2.1 Alcohol consumption among respondents aged 50-plus, states and India (pooled), 2007**

State	Persons						Males						Females					
	Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number		Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number		Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number	
Assam	77.8	11.1	7.2	4.0	677		68.8	16.1	9.3	5.9	368		88.0	5.3	4.8	1.9	309	
Karnataka	84.1	9.8	3.2	2.9	923		68.6	19.2	6.3	5.9	419		98.3	1.2	0.3	0.2	504	
Maharashtra	80.0	17.4	1.6	1.0	1,097		60.7	34.4	3.1	1.8	547		98.6	1.2	0.2	0.2	550	
Rajasthan	90.2	7.7	0.9	1.1	1,377		80.8	15.1	1.9	2.3	677		99.5	0.5	0.0	0.0	700	
Uttar Pradesh	87.5	9.1	2.3	1.1	1,311		77.0	16.8	4.1	2.1	703		99.5	0.4	0.2	0.0	608	
West Bengal	81.4	12.6	2.8	3.2	1,773		69.4	20.0	5.2	5.4	589		94.1	4.7	0.4	0.8	584	
India (pooled)	84.2	11.5	2.4	1.8	6,558		71.3	21.0	4.4	3.3	3,303		97.7	1.6	0.4	0.3	3,255	

Note: Lifetime abstainers = never consumed alcoholic beverages; non-heavy drinkers (social drinkers) = no days in last year/less than once a month/1-3 days per month with fewer than five standard drinks in the last seven days; infrequent heavy drinker = 1-3 days per week with fewer than five standard drinks in the last seven days; frequent heavy drinker = five or more days per week with five or more standard drinks in the last seven days.

inhibitions and affects judgment and coordination. It can lead to depression, poor memory and concentration. Alcohol consumption also interferes with normal heart rhythm, and excessive alcohol use can damage blood vessels, weaken heart muscles and enlarge the heart.

Information on alcohol consumption collected by SAGE India included ever and current use, along with estimate of daily volume of standard drinks consumed. Information was collected on the frequency of drinking and average number of drinks per day during the previous 12 months. To measure current alcohol consumption, the survey collected information on the amount of alcohol consumed by an individual on each day of a one week period prior to interview. To improve estimates of prevalence of alcohol consumption, interviewers used pictures of typical servings in different glasses and asked respondents to indicate which size of glass they had used for each type of alcohol consumed. Categories of drinking are defined in Table 5.2.1, including lifetime abstainers, non-heavy drinkers, infrequent heavy drinkers, and frequent heavy drinkers.

### 5.2.1 Alcohol consumption among older respondents

Table 5.2.1 presents the prevalence of alcohol use by state among older respondents. About 16% of these respondents reported alcohol consumption. The highest prevalence was reported in Assam (22%) and the lowest in Rajasthan (10%).

Alcohol consumption among older respondents differed significantly by sex, with older women significantly less likely to drink at all (2%) than older men (29%). Among

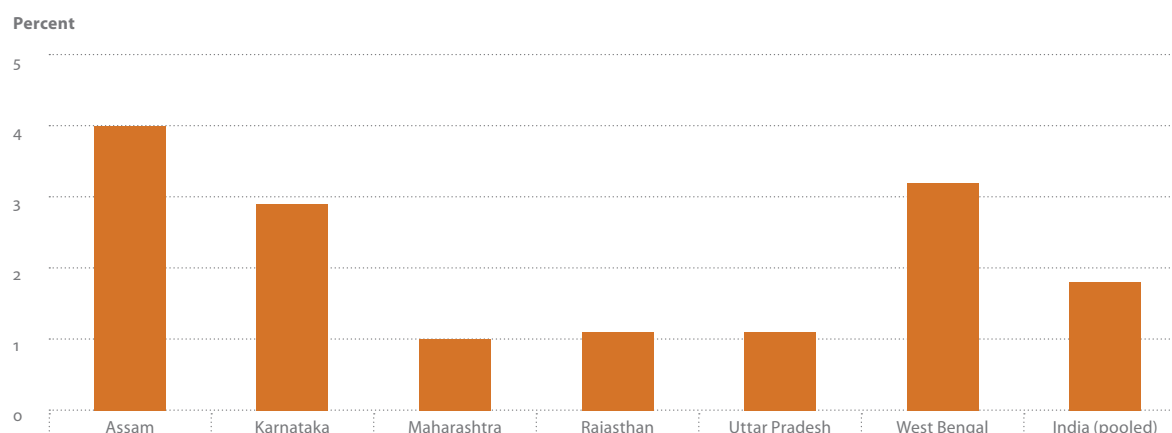
older men, the prevalence of alcohol consumption ranged from 39% in Maharashtra to 19% in Rajasthan. By contrast, only 0.5% of older women consumed alcohol Rajasthan and Uttar Pradesh and less than 2% in Karnataka and Maharashtra – although a surprising 12% did so in Assam.

The prevalence of heavy drinking, both frequent and infrequent, was low overall (1.8% and 2.4% respectively). The prevalence of frequent heavy drinking was highest in Assam (4%), followed by West Bengal (3%) and lowest in Maharashtra (1%) (Figure 5.2). Interestingly, among older adults who drank at all, older women were actually more likely to be heavy drinkers (either frequent or infrequent) than older men: just under a third of older women who drank were either frequent or infrequent heavy drinkers, compared to around a quarter of older male drinkers.

Table 5.2.2 presents the prevalence of alcohol use among older respondents by background characteristics. The proportion of heavy drinkers was much higher in Assam and West Bengal than in Maharashtra and Rajasthan. Among older men, prevalence of alcohol consumption did not vary consistently with age, though among women it decreased with age. Older women showed relatively lower prevalence of alcohol use in urban areas, among castes other than scheduled tribes/castes, and among Muslims. The prevalence both of alcohol use overall and of heavy drinking decreased as education and income increased.

As elsewhere in the world, alcohol use among older SAGE India respondents was higher among some historically socially disadvantaged groups: 18% of older members of scheduled tribes were frequent or infrequent

**Figure 5.2** Percentage of respondents aged 50-plus who are frequent heavy drinkers, states and India (pooled), 2007





**Table 5.2.2 Alcohol consumption among respondent aged 50-plus, India (pooled), 2007**

Background characteristic	All respondents					Males				
	Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number	Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number
<b>Age group</b>										
50-59	84.1	10.7	2.9	2.3	2,939	71.7	19.1	5.2	4.0	1,388
60-69	84.8	11.5	2.4	1.3	2,234	72.0	20.9	4.5	2.4	1,155
70-79	81.6	15.5	1.7	1.2	1,057	67.2	27.8	2.8	2.2	591
80+	90.9	6.9	0.1	2.1	328	79.5	15.6	0.2	4.8	169
<b>Marital status</b>										
Never married	81.5	12.8	4.4	1.3	64	76.6	16.2	5.6	1.6	45
Currently married	81.7	13.4	2.8	2.2	4,861	71.3	21.1	4.3	3.4	2,894
Widowed	93.0	15.2	1.3	0.6	1,591	71.8	20.8	5.4	2.4	354
Other <sup>1</sup>	97.4	0.2	1.4	1.0	42	98.9	1.1	0.0	0.0	10
<b>Residence</b>										
Urban	88.5	9.2	1.5	0.8	1,676	77.1	18.3	3.0	1.6	788
Rural	82.5	12.5	2.8	2.2	4,882	69.1	22.1	4.9	3.9	2,515
<b>Caste</b>										
Scheduled tribe	55	26.9	6.8	11.3	400	33.8	37.7	10.1	18.5	215
Scheduled caste	77.7	15.1	5.9	1.3	1,085	60.4	26.6	10.5	2.4	557
Other <sup>2</sup>	87.7	9.7	1.4	1.3	5,073	76.3	18.6	2.6	2.4	2,531
<b>Religion</b>										
Hindu	82.6	12.6	2.8	2.0	5,530	68.4	22.9	5.0	3.6	2,788
Muslim	97.5	1.8	0.1	0.6	791	95.4	3.3	0.2	1.1	411
Other <sup>3</sup>	75.8	20.9	1.8	1.4	237	54.9	40.0	2.4	2.8	114
<b>Education</b>										
No formal education	86.9	9.1	2.4	1.6	3,364	63.4	25.4	6.8	4.4	1,084
Less than primary	77.1	17.7	2.8	2.4	745	64.3	27.9	3.9	3.9	453
Primary school	81.4	13.2	3.2	2.2	929	70.7	20.9	4.9	3.5	580
Secondary school	81.6	14.4	1.8	2.2	654	77.3	17.9	2.2	2.7	495
High school	83.8	13.5	1.4	1.3	541	81.1	15.8	1.6	1.6	427
College and above	86.2	9.2	3.2	1.5	325	84.3	10.3	3.7	1.7	264
<b>Wealth quintile</b>										
Lowest	80.1	13.1	4.4	2.5	1,312	63.0	24.5	8.3	4.1	654
Second	83.2	12.7	1.8	2.3	1,311	70.0	22.4	3.3	4.4	668
Middle	84.5	11.3	2.2	2.0	1,313	71.8	20.9	3.6	3.7	648
Fourth	87.5	9.1	2.2	1.1	1,310	77.1	16.8	4.0	2.1	683
Highest	86.8	10.8	1.3	1.0	1,312	75.6	20.1	2.5	1.8	650
<b>Total</b>	<b>84.2</b>	<b>11.5</b>	<b>2.4</b>	<b>1.8</b>	<b>6,558</b>	<b>71.3</b>	<b>21.0</b>	<b>4.4</b>	<b>3.3</b>	<b>3,303</b>

Note: Lifetime abstainers = never consumed alcoholic beverages; non-heavy drinkers (social drinkers) = no days in last year/less than once a month/1-3 days per month with fewer than five standard drinks in the last seven days; infrequent heavy drinker = 1-3 days per week with fewer than five standard drinks in the last seven days; frequent heavy drinker = five or more days per week with five or more standard drinks in the last seven days.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Females				
Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number
97.5	1.6	0.4	0.5	1,551
97.2	2.1	0.5	0.2	1,079
98.2	1.2	0.5	0.1	466
100	0.0	0.0	0.0	159
100	0.0	0.0	0.0	19
97.8	1.5	0.4	0.4	1,967
97.4	2.0	0.5	0.2	1,237
97.0	0.0	1.7	1.3	32
99.9	0.2	0.0	0.0	888
96.7	2.3	0.6	0.4	2,367
76.8	15.9	3.5	3.9	185
96.4	2.7	1.0	0.0	528
99.4	0.4	0.1	0.1	2,542
97.4	1.9	0.5	0.3	2,752
99.9	0.2	0.0	0.0	380
97.0	1.8	1.3	0.0	123
97.1	2.0	0.5	0.4	2,280
98.6	0.7	0.8	0.0	292
99.4	0.4	0.2	0.0	349
98.6	0.9	0.0	0.5	159
100	0.0	0.0	0.0	114
97.3	2.7	0.0	0.0	61
96.4	2.2	0.6	0.9	658
96.6	3.0	0.3	0.1	643
97.6	1.4	0.9	0.2	665
99.3	0.4	0.3	0.0	627
99.1	0.7	0.1	0.1	662
97.7	1.6	0.4	0.3	3,255

heavy drinkers (11% frequent), compared with the national average of 4%. However, the rate of heavy drinking among older respondents from scheduled castes was significantly lower at just over 1%. As overall, rates differed between men and women, with 29% of older male members of scheduled tribes reporting frequent or infrequent heavy drinking compared to 7% of older women.

## 5.2.2 Alcohol consumption among respondents age 18-49

About 18% of younger respondents consumed alcohol, while the other 83% were lifetime abstainers (Table 5.2.3). Among the 18% who were drinkers, 2% were frequent heavy drinkers, 4% infrequent heavy drinkers and the remaining 12% were non-heavy drinkers. The prevalence of alcohol consumption was highest in Assam and Karnataka (23% drinkers) and lowest in Rajasthan (11%).

Prevalence of alcohol consumption as well as heavy drinking increased with age (Table 5.2.4). Alcohol consumption was much less common among women: fewer than 2% reported drinking alcohol, compared to 33% of men. Prevalence was lower among respondents from urban areas, among those from groups other than scheduled tribes/castes, and among Muslims. Alcohol consumption decreased as education and income rose for younger respondents. Perhaps encouragingly, the prevalence of frequent or infrequent heavy drinking was lower among younger members of scheduled tribes than among older members (14%, compared to 18%), including among frequent heavy drinkers (7%, compared to 11%).

## 5.3 Diet

Information on dietary habits and their changing patterns are important for planning and improving nutrition-related health policies and programmes. Following the WHO NCD risk factors surveillance strategy (WHOSTEPS), SAGE India collected data on the number of servings of fruit and vegetables eaten by respondents on a typical day (WHO, 2005). WHO considers fewer than five (WHO, 2003) servings of fruit and vegetables per day to be insufficient to reduce the risk of diet contributing to cardiovascular disease and other health conditions.

**Table 5.2.3 Alcohol consumption among respondents aged 18-49 , states and India (pooled), 2007**

State	Aged 18-49				
	Lifetime abstainers	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number
Assam	77.2	11.4	6.6	4.8	517
Karnataka	77.4	11.9	9.0	1.6	630
Maharashtra	82.8	13.0	2.1	2.1	882
Rajasthan	88.7	7.9	2.8	0.6	846
Uttar Pradesh	83.5	11.4	3.6	1.5	890
West Bengal	81.3	13.8	2.3	2.7	901
<b>India (pooled)</b>	<b>82.5</b>	<b>11.7</b>	<b>3.8</b>	<b>1.9</b>	<b>4,666</b>

Note: Lifetime abstainers = never consumed alcoholic beverages; non-heavy drinkers (social drinkers) = no days in last year/less than once a month/1-3 days per month with fewer than five standard drinks in the last seven days; infrequent heavy drinker = 1-3 days per week with fewer than five standard drinks in the last seven days; frequent heavy drinker = five or more days per week with five or more standard drinks in the last seven days.

**Table 5.2.4 Alcohol consumption among respondents aged 18-49, India (pooled), 2007**

Background characteristic	Aged 18-49				
	Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number
<b>Age group</b>					
18-29	91.6	7.2	0.7	0.5	1,604
30-39	79.3	14.0	4.7	1.9	1,655
40-49	77.3	13.7	5.8	3.2	1,407
<b>Sex</b>					
Male	66.9	22.3	7.2	3.6	1042
Female	98.6	0.9	0.3	0.2	3624
<b>Marital status</b>					
Never married	88.2	9.9	1.6	0.3	556
Currently married	81.5	12.1	4.3	2.2	3,850
Widowed	87	11.1	0.7	1.2	222
Other <sup>1</sup>	88	6.0	6.0	0.0	37
<b>Residence</b>					
Urban	87.3	8.5	2.8	1.4	1,168
Rural	81.0	12.8	4.2	2.1	3,498
<b>Caste</b>					
Scheduled tribe	70.2	15.5	7.2	7.1	374
Scheduled caste	75.4	16.5	6.0	2.2	893
Other <sup>2</sup>	85.6	10.1	2.9	1.4	3,399
<b>Religion</b>					
Hindu	81.1	12.6	4.2	2.1	3,903
Muslim	93.1	5.2	0.9	0.8	593
Other <sup>3</sup>	80.3	12.9	4.2	2.7	170

Background characteristic	Aged 18-49				
	Life time abstainer	Non-heavy drinkers	Infrequent heavy drinkers	Frequent heavy drinkers	Number
<b>Education</b>					
No formal education	83.6	9.8	4.4	2.3	1,714
Less than primary	79.2	11.4	4.0	5.5	430
Primary school	81.1	15.4	2.4	1.2	788
Secondary school	82.9	10.3	4.7	2.1	741
High school	83.6	11.4	3.8	1.2	654
College and above	82.3	14.9	2.8	0.0	339
<b>Wealth quintile</b>					
Lowest	79.7	13.0	3.5	3.8	959
Second	82.1	13.5	3.3	1.0	932
Middle	81.4	10.4	5.8	2.4	934
Fourth	82.6	11.3	4.7	1.3	933
Highest	87.4	10.0	1.8	0.7	908
<b>Total</b>	<b>82.5</b>	<b>11.7</b>	<b>3.8</b>	<b>1.9</b>	<b>4,666</b>

Note: Lifetime abstainers = never consumed alcoholic beverages; non-heavy drinkers (social drinkers) = no days in last year/less than once a month/1-3 days per month with fewer than five standard drinks in the last seven days; infrequent heavy drinker = 1-3 days per week with fewer than five standard drinks in the last seven days; frequent heavy drinker = five or more days per week with five or more standard drinks in the last seven days.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

### 5.3.1 Diet among respondents aged 50-plus

Fruit and vegetable intake of older men and women is presented in Table 5.3.1. In this population, the intake of fruit/vegetables was grossly insufficient: fewer than 10% of older respondents met the minimum standard. The situation was worst in West Bengal, where only 5% of older men and less than 1% of older women

reported sufficient intake of fruit/vegetables. The best diet was in Karnataka, where one-quarter of men and about one-fifth of women had sufficient fruit/vegetable intake.

Table 5.3.2 presents the dietary intake for older respondents by background characteristics. Sufficient intake of fruit/vegetables among older adults decreased with age. The proportion of respondents with sufficient

**Table 5.3.1** Percent distribution of respondents aged 50-plus by sufficiency of fruit/vegetable intake, states and India (pooled), 2007

State	All respondents			Males			Females			Total
	Insufficient	Sufficient	Number	Insufficient	Sufficient	Number	Insufficient	Sufficient	Number	
Assam	84.8	15.2	677	83.5	16.4	368	86.3	13.7	309	100
Karnataka	78.1	21.9	923	75.0	25.0	419	80.9	19.0	504	100
Maharashtra	89.0	11.0	1,098	85.3	14.7	548	92.5	7.5	550	100
Rajasthan	92.1	7.9	1,378	87.5	12.5	677	96.5	3.5	701	100
Uttar Pradesh	93.3	6.8	1,311	90.9	9.1	703	95.9	4.1	608	100
West Bengal	97.2	2.8	1,173	94.9	5.1	589	99.7	0.3	584	100
<b>India (pooled)</b>	<b>90.6</b>	<b>9.4</b>	<b>6,560</b>	<b>87.9</b>	<b>12.1</b>	<b>3,304</b>	<b>93.5</b>	<b>6.5</b>	<b>3,256</b>	<b>100</b>

Note: Sufficient nutrition implies five or more servings of fruit/vegetables in a typical day on average in the last seven days.

**Table 5.3.2** Percent distribution of respondents aged 50-plus by sufficiency of fruit/vegetable intake according to selected background characteristics, India (pooled), 2007

Background characteristic	All respondents			Males			Females			Total
	Insufficient	Sufficient	Number	Insufficient	Sufficient	Number	Insufficient	Sufficient	Number	
<b>Age group</b>										
50-59	89.4	10.6	2,939	87.6	12.4	1,388	91.3	8.7	1,551	100
60-69	90.8	9.2	2,235	86.7	13.4	1,156	95.0	5.0	1,079	100
70-79	93.5	6.5	1,058	90.9	9.1	591	96.4	3.6	467	100
80+	92.7	7.3	328	89.5	10.5	169	95.3	4.7	159	100
<b>Marital status</b>										
Never married	94.3	5.7	64	94.1	5.9	45	95.2	4.8	19	100
Currently married	89.5	10.5	4,862	87.8	12.2	2,895	92.3	7.8	1,967	100
Widowed	94.3	5.7	1,592	89.1	10.9	354	95.4	4.6	1,238	100
Other <sup>1</sup>	93.9	6.1	42	83.0	17.0	10	96.7	3.3	32	100
<b>Residence</b>										
Urban	88.3	11.8	1,676	84.6	15.4	788	91.9	8.2	888	100
Rural	91.6	8.4	4,884	89.2	10.8	2,516	94.1	5.9	2,364	100
<b>Caste</b>										
Scheduled tribe	92.5	7.5	400	92.4	7.6	215	92.5	7.5	185	100
Scheduled caste	96.4	3.6	1,085	95.5	4.5	559	97.3	2.7	528	100
Other <sup>2</sup>	89.3	10.7	5,075	86.0	14.0	2,537	92.1	7.3	2,534	100
<b>Religion</b>										
Hindu	90.6	9.4	5,532	87.7	12.3	2,787	93.5	6.5	2,753	100
Muslim	90.5	9.5	791	88.7	11.3	408	92.4	7.5	380	100
Other <sup>3</sup>	92.4	7.6	237	90.0	10.0	116	95.1	5.0	123	100
<b>Education</b>										
No formal education	94.0	6.0	3,365	92.3	7.6	1,088	94.7	5.3	2,281	100
Less than primary	88.7	11.3	746	89.5	10.5	454	87.3	12.7	292	100
Primary school	89.8	10.2	929	86.6	13.4	580	95.0	5.0	349	100
Secondary school	89.6	10.4	654	89.1	10.9	495	91.7	8.3	159	100
High school	83.8	16.2	541	84.0	16.0	427	82.9	17.2	114	100
College and above	77.2	22.8	325	77.0	23.0	264	78.0	22.1	61	100
<b>Wealth quintile</b>										
Lowest	95.8	4.2	1,312	93.6	6.4	654	97.9	2.1	658	100
Second	93.3	6.7	1,312	91.3	8.7	644	95.4	4.7	644	100
Middle	92.3	7.8	1,313	90.5	9.5	665	93.9	6.1	665	100
Fourth	87.5	12.5	1,311	84.6	15.4	627	90.8	9.2	627	100
Highest	83.1	16.9	1,312	78.7	21.3	662	87.9	12.4	662	100
<b>Total</b>	<b>90.6</b>	<b>9.4</b>	<b>6560</b>	<b>87.9</b>	<b>12.1</b>	<b>3,304</b>	<b>93.5</b>	<b>6.5</b>	<b>3,256</b>	<b>100</b>

Note: Sufficient intake implies five or more servings of fruit/vegetables in a typical day on average in the last seven days.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 5.3.3** Percentage of respondents aged 18-49 by sufficiency of fruit/vegetable intake, states and India (pooled), 2007

State	Aged 18-49			
	Insufficient	Sufficient	Total	Number
Assam	90.3	9.7	100	517
Karnataka	79.8	20.2	100	630
Maharashtra	84.9	15.1	100	885
Rajasthan	84.6	15.4	100	847
Uttar Pradesh	91.8	8.2	100	890
West Bengal	97.9	2.2	100	901
<b>India (pooled)</b>	<b>89.1</b>	<b>10.9</b>	<b>100</b>	<b>4670</b>

Note: Sufficient nutrition implies five or more servings of fruit/vegetables in a typical day on average in the last seven days.

intake of fruit/vegetables was slightly higher in urban areas, among those from castes other than scheduled castes/tribes, the better educated and those with higher incomes. For all background characteristics, compared with men, a lower proportion of female older adults were eating enough fruit/vegetables.

### 5.3.2 Diet among younger respondents

Table 5.3.3 shows the state-level variation in intake of fruits and vegetables among younger respondents. Most (89%) younger respondents did not eat enough fruit/vegetables; only 11% had sufficient intake.

Similarly to older respondents, the proportion with sufficient intake was highest in Karnataka; even there, however, only 20% had sufficient intake. The lowest rate of younger adults with sufficient intake of fruit/vegetables was in West Bengal, at just 2%.

Table 5.3.4 presents data on younger respondents by selected background characteristics. The proportion of younger respondents with sufficient intake of fruit/vegetables did not vary by age group. Men did a little better than women, but even among men only 14% had sufficient intake. Residents of urban areas (15%) ate slightly better than those in rural areas (10%).

The proportion of respondents with sufficient intake of fruit/vegetables increased with education and income. Even so, sufficient intake was reported by only 28% of younger people with a college education, and by only 20% of those in the highest wealth quintile.

**Table 5.3.4** Fruit and vegetable intake of respondents aged 18-49, by socio-demographic characteristics, India (pooled), 2007

Background characteristic	Aged 18-49			
	Insufficient	Sufficient	Total	Number
<b>Age group</b>				
18-29	88.1	11.9	100	1,606
30-39	90.0	10.0	100	1,657
40-49	89.1	10.9	100	1,407
<b>Sex</b>				
Male	85.9	14.1	100	1,045
Female	92.4	7.6	100	3,625
<b>Marital status</b>				
Never married	83.7	16.3	100	557
Currently married	89.5	10.5	100	3,853
Widowed/widower	96.6	3.4	100	222
Other <sup>1</sup>	98.3	1.7	100	38
<b>Residence</b>				
Urban	85.3	14.7	100	1,169
Rural	90.3	9.7	100	3,501
<b>Caste</b>				
Scheduled tribe	92.0	8.0	100	374
Scheduled caste	92.4	7.6	100	893
Other <sup>2</sup>	87.9	12.1	100	3,403
<b>Religion</b>				
Hindu	89.0	11.0	100	3,907
Muslim	90.7	9.3	100	593
Other <sup>3</sup>	84.4	15.6	100	170
<b>Education</b>				
No formal education	95.4	4.7	100	1,715
Less than primary	91.0	9.0	100	431
Primary school	93.2	6.8	100	788
Secondary school	87.7	12.3	100	741
High school	83.1	16.9	100	656
College and above	72.4	27.6	100	339
<b>Wealth quintile</b>				
Lowest	96.4	3.6	100	959
Second	93.2	6.8	100	933
Middle	87.8	12.3	100	935
Fourth	85.8	14.2	100	934
Highest	80.3	19.7	100	909
<b>Total</b>	<b>89.1</b>	<b>10.9</b>	<b>100</b>	<b>4,670</b>

Note: Sufficient intake implies five or more servings of fruit/vegetables in a typical day on average in the last seven days.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 5.4.1** Percent distribution of respondents aged 50-plus by physical activity, states and India (pooled), 2007

State	All respondents						Males						Females						Total
	Vigorous activity	Moderate activity	Light activity	No activity	Number		Vigorous activity	Moderate activity	Light activity	No activity	Number		Vigorous activity	Moderate activity	Light activity	No activity	Number		
Assam	28.8	34.0	6.2	31.0	676		40.8	27.6	6.6	25.3	368		14.9	41.5	5.8	37.9	308	100	
Karnataka	22.8	33.5	11.8	31.9	921		28.2	19.9	18.4	33.5	417		18.0	45.9	5.7	30.4	504	100	
Maharashtra	19.5	37.8	12.1	30.6	1,097		23.4	29.1	15.2	32.3	547		15.8	46.1	9.0	29.0	550	100	
Rajasthan	28.8	37.8	14.6	18.9	1,377		30.7	33.2	18.5	17.6	677		26.9	42.2	10.7	20.3	700	100	
Uttar Pradesh	25.9	35.0	14.9	24.2	1,311		33.3	23.7	20.2	22.9	703		17.2	47.8	8.9	25.6	608	100	
West Bengal	19.9	51.7	7.0	21.5	1,172		29.3	40.3	9.9	20.6	588		9.9	63.8	3.9	22.4	584	100	
India (pooled)	23.6	38.6	12.1	25.8	6,554		30.1	28.5	16.3	25.2	3,300		16.9	49.0	7.7	26.4	3,254	100	

Note: Sufficient physical activity was defined as spending more than 150 minutes per week (in the last seven days) on light, moderate or vigorous activity.

**Table 5.4.2** Physical activity levels among respondent aged 50-plus, India (pooled), 2007

Background characteristic	All respondents				
	Vigorous activity	Moderate activity	Light activity	No activity	Number
<b>Age group</b>					
50-59	32.2	40.0	10.5	17.3	2,936
60-69	19.9	40.9	13.5	25.7	2,233
70-79	10.1	32.6	14.5	42.9	1,057
80+	4.8	28.3	10.2	56.7	328
<b>Marital status</b>					
Never married	24.1	42.1	18.4	15.5	64
Currently married	26.5	37.7	12.9	22.9	4,857
Widowed	13.2	41.4	9.3	36.1	1,591
Other <sup>1</sup>	26.2	44.9	1.3	27.6	42
<b>Residence</b>					
Urban	13.9	40.5	12.9	32.8	1,674
Rural	27.6	37.8	11.7	22.9	4,880
<b>Caste</b>					
Scheduled tribe	25.4	44.3	10.0	20.3	400
Scheduled caste	28.2	38.0	10.3	23.4	1,084
Other <sup>2</sup>	22.5	38.3	12.6	26.7	5,070
<b>Religion</b>					
Hindu	24.1	38.4	12.6	24.9	5,527
Muslim	19.5	39.3	8.8	32.4	790
Other <sup>3</sup>	25.6	39.3	11.3	23.8	237
<b>Education</b>					
No formal education	23.2	39.9	10.0	26.9	3,363
Less than primary	25.4	32.7	9.2	32.6	745
Primary school	23.2	43.0	11.6	22.2	929
Secondary school	27.7	35.6	15.1	21.5	653
High school	24.6	33.8	16.9	24.7	540
College and above	15.6	37.3	25.5	21.6	324
<b>Wealth quintile</b>					
Lowest	27.4	39.0	9.5	24.1	1,311
Second	27.3	38.5	10.4	23.8	1,311
Middle	23.9	40.4	9.0	26.7	1,313
Fourth	21.8	33.7	14.4	30.0	1,309
Highest	16.4	40.8	17.8	25.1	1,310
<b>Total</b>	<b>23.6</b>	<b>38.6</b>	<b>12.1</b>	<b>25.8</b>	<b>6,554</b>

Note: Sufficient physical activity was defined as spending more than 150 minutes per week (in the last seven days) on light, moderate or vigorous activity.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Males					Females					Total
Vigorous activity	Moderate activity	Light activity	No activity	Number	Vigorous activity	Moderate activity	Light activity	No activity	Number	
40.4	27.9	14.2	17.5	1,385	23.3	53.0	6.6	17.1	1,551	100
25.2	32.2	18.6	24.0	1,155	14.7	49.3	8.6	27.4	1,078	100
13.2	24.6	18.8	43.7	591	6.4	41.9	9.5	42.2	466	100
9.2	24.9	13.4	52.5	169	1.2	31.0	7.7	60.1	159	100
25.0	43.3	17.9	13.8	45	20.6	37.3	20.3	21.7	19	100
30.6	28.4	15.9	25.0	2,891	20.2	51.8	8.2	19.7	1,966	100
22.2	27.7	20.5	29.2	357	11.3	44.2	6.9	37.6	1,237	100
70.0	12.0	1.1	16.9	10	14.8	53.4	1.4	30.4	32	100
16.6	28.4	17.2	37.7	789	11.1	52.5	8.6	27.9	888	100
35.3	28.6	15.9	20.3	2,514	19.3	47.5	7.4	25.8	2,366	100
31.0	37.4	13.3	18.3	215	19.7	51.4	6.6	22.4	185	100
37.1	28.2	12.5	22.1	557	18.7	48.5	7.8	24.8	527	100
28.5	28.0	17.2	26.3	2,528	16.3	48.9	7.8	27.0	2,542	100
30.9	28.0	16.6	24.5	2,776	17.1	49.1	8.4	25.3	2,751	100
27.6	28.7	13.8	29.9	410	10.9	50.7	3.4	35.0	380	100
18.4	39.9	16.5	25.2	114	31.7	38.2	7.1	22.9	123	100
34.0	24.2	15.6	26.0	1,084	18.3	46.8	7.5	27.3	2,279	100
29.9	24.4	12.2	33.6	453	18.0	46.7	4.3	31.0	292	100
32.0	34.8	11.2	21.9	580	8.4	56.6	12.4	22.9	349	100
30.0	29.9	17.7	22.4	494	19.0	57.6	5.2	18.6	159	100
26.3	30.5	18.6	24.6	426	14.8	52.9	7.3	25.3	114	100
17.5	30.8	28.4	23.3	263	4.3	75.8	8.4	11.4	61	100
36.3	27.3	12.3	24.0	654	18.9	50.1	6.9	24.2	657	100
38.2	27.2	13.3	21.3	668	16.3	49.9	7.6	26.3	643	100
29.6	30.2	12.7	27.5	648	18.0	51.0	5.1	25.8	665	100
26.1	23.6	18.4	31.9	682	17.0	45.3	9.9	27.9	627	100
18.8	34.2	25.1	21.9	648	13.8	47.9	9.8	28.5	662	100
30.1	28.5	16.3	25.2	3,300	16.9	49.0	7.7	26.4	3,254	100

## 5.4 Physical activity

Physical activity refers to activity undertaken at work, around the home and garden, to get to and from places, and for recreation, fitness and sport. Regular physical activity has a significant positive effect in preventing ischemic heart diseases, ischemic stroke, type two diabetes mellitus, and breast and colon cancers. Physical activity is also important in preserving the residual fraction once peripheral arterial disease and chronic airways disease have developed (Shephard, 1998). It also increases sensitivity to insulin, raises HDL cholesterol levels and reduces blood pressure. In addition, recreational physical activity has been shown to reduce minor anxiety, depression and weight (Salmon, 2001).

Questions in SAGE on physical activity will allow for direct comparisons with the Global Physical Activity Questionnaire (GPAQ) surveys (Armstrong 2006). The physical activity questions assessed the frequency (days), intensity (low, moderate, high) and duration (minutes and/or hours) of activity over the preceding seven days. SAGE India included questions on three types of activities:

- 1) vigorous-intensity activity, such as lifting heavy weights, digging or chopping wood;
- 2) moderate-intensity activity, such as brisk walking, carrying light loads, cleaning, cooking, or washing clothes; and
- 3) light-intensity activity, such as walking or riding a bicycle.

Respondents were asked whether they had performed such activity continuously for at least 10 minutes, the number of days they performed the activity in a typical week, and the average time spent per day for the activity.

### 5.4.1 Physical activity by older respondents

Table 5.4.1 (see p. 86) presents the activity levels of older respondents, divided into four categories:

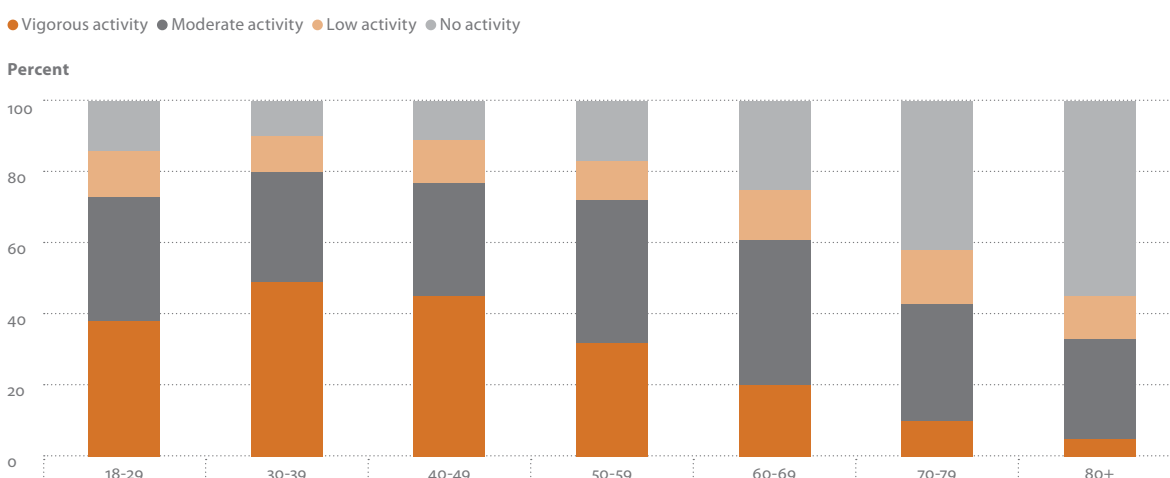
- 1) those who engaged in vigorous activity;
- 2) those who engaged in moderate activity;
- 3) those who engaged in light activity; and
- 4) those who engaged in no activity of any kind.

For this study, any activity – vigorous, moderate or light – for more than 150 minutes over the seven days preceding the interview was considered sufficient.

Overall, the study's older respondents were quite active: only just over one-quarter (26%) reported no activity. This level was similar for men and women, though a higher proportion of older men than older women engaged in vigorous activity. Older respondents in Assam, Karnataka and Maharashtra were less likely to be adequately active than those in Rajasthan, Uttar Pradesh and West Bengal.

The activity levels of older respondents according to background characteristics are presented in Table 5.4.2 (see pp. 86–87). Among both sexes, the proportion of persons with insufficient activity increased with age: among the oldest age group (80-plus), 53% of men and 60% of women were not active. Notably, however, more than one-third of the oldest men and women engaged in vigorous or moderate physical activity. A higher proportion of both men and women from rural areas undertook sufficient physical activity, and also vigorous activity, than their urban counterparts. The proportion of men and women who were insufficiently active bore little relationship with either educational attainment or income.

**Figure 5.3 Physical activity levels by age, India (pooled), 2007**



## 5.4.2 Physical activity by younger respondents aged 18-49

Table 5.4.3 gives state-level data on younger respondents. This group was also quite active: only 12% did not engage in physical activity, while 33% were moderately active and 44% engaged in vigorous activity. The most active younger respondents were in West Bengal, where 90% engaged in vigorous or moderate activity and only 10% did not engage in physical activity. The least active younger respondents were in Karnataka and Maharashtra, where about 70% engaged in vigorous or moderate activity and 17-20% were inactive.

The activity levels of younger adults according to background characteristics are presented in Table 5.4.4. Younger men were more likely than younger women to be active, as were respondents from rural areas compared with their urban counterparts. The proportion of younger respondents who engaged in sufficient physical activity bore an inverse relationship with educational attainment and income: wealthier people were more likely to be insufficiently active. There was little variation by age groupings.

## 5.5 Environmental risk factors

Access to safe drinking water and adequate sanitation are essential elements for the improvement of the quality of life of millions of individuals. They are also a basic human right. An important share of the total burden of disease worldwide – about 10% – could be prevented by improvements related to drinking water, sanitation, hygiene and water resource management (Prüss-Üstün *et al.*, 2008). Adverse health outcomes are associated with unsafe water, lack of access to water for

hygiene purposes, poor sanitation, and inadequate management of water resources and systems, especially in agriculture. Major water-borne diseases include infectious diarrhoea, malaria, schistosomiasis and trachoma. Questions in this section are based on the WHO/UNICEF Joint Monitoring Programme core questions (WHO/UNICEF 2006).

### 5.5.1 Access to improved water sources

SAGE India collected data on main source of drinking water in dwellings. From households that used bottled water for drinking, information was also collected on the main source of water used for other purposes, such as hand washing. For all households that did not have a water source within the household, information on the time required for one round trip to fetch water and the person who usually fetches water was also collected.

Figure 5.4 presents state-level variations in access to improved sources of drinking water. An improved source of drinking water was defined as:

- 1) water piped into the dwelling, yard or plot;
- 2) water available from a public tap or standpipe;
- 3) a tube well or borehole;
- 4) a protected dug well or a protected spring; or
- 5) rainwater.

Households that drank bottled water were included in this category only if the water used for cooking and/or hand-washing was from an improved source. In total, 88% of households used improved sources for drinking water. The lowest rate was 76% in Rajasthan; the highest rate was 96% in Uttar Pradesh.

**Table 5.4.3 Physical activity of respondents aged 18-49, states and India (pooled), 2007**

State	Age 18-49					
	Vigorous activity	Moderate activity	Light activity	No activity	Total	Number
Assam	45.0	38.3	5.8	10.8	100	517
Karnataka	41.1	28.6	13.2	17.1	100	630
Maharashtra	36.5	31.6	12.2	19.7	100	885
Rajasthan	51.4	25.6	13.3	9.7	100	847
Uttar Pradesh	44.2	31.8	14.5	9.6	100	890
West Bengal	47.1	42.6	2.9	9.5	100	901
<b>India (pooled)</b>	<b>43.7</b>	<b>32.8</b>	<b>11.2</b>	<b>12.2</b>	<b>100</b>	<b>4,670</b>

Note: Sufficient physical activity was defined as spending more than 150 minutes per week (in the last seven days) on light, moderate or vigorous activity.

**Table 5.4.4** Physical activity of respondents aged 18-49, by socio-demographic characteristics, India (pooled), 2007

Background characteristic	Age 18-49					
	Vigorous activity	Moderate activity	Light activity	No activity	Total	Number
<b>Age group</b>						
18-29	37.9	34.8	12.1	15.2	100	1,606
30-39	48.4	31.6	9.6	10.5	100	1,657
40-49	44.6	32.2	12.1	11.2	100	1,407
<b>Sex</b>						
Male	54.8	18.8	16.9	9.5	100	1,046
Female	32.2	47.3	5.4	15.0	100	3,624
<b>Marital status</b>						
Never married	33.2	34.7	18.8	13.2	100	557
Currently married	45.0	32.6	10.2	12.1	100	3,853
Widowed	47.9	32.7	9.8	9.7	100	222
Other <sup>1</sup>	48.2	21.1	11.0	19.6	100	37
<b>Residence</b>						
Urban	31.2	42.2	9.3	17.3	100	1,169
Rural	47.7	29.8	11.9	10.6	100	3,501
<b>Caste</b>						
Scheduled tribe	53.8	23.2	13.5	9.5	100	374
Scheduled caste	49.9	32.0	10.6	7.5	100	893
Other <sup>2</sup>	41.1	33.9	11.2	13.8	100	3,403
<b>Religion</b>						
Hindu	44.3	32.5	11.0	12.2	100	3,907
Muslim	42.0	32.9	11.9	13.3	100	593
Other <sup>3</sup>	37.0	40.9	14.1	8.0	100	170
<b>Education</b>						
No formal education	47.0	33.8	8.5	10.7	100	1,715
Less than primary	53.4	31.5	8.4	6.7	100	431
Primary school	45.1	33.1	10.0	11.8	100	788
Secondary school	43.9	30.9	14.0	11.2	100	741
High school	40.9	31.8	12.9	14.4	100	656
College and above	26.5	35.7	17.0	20.7	100	339
<b>Wealth quintile</b>						
Lowest	50.2	29.6	11.5	8.8	100	959
Second	52.8	32.7	7.2	7.4	100	933
Middle	46.5	29.7	12.7	11.2	100	935
Fourth	38.4	34.4	11.4	15.8	100	934
Highest	27.8	38.7	13.9	19.6	100	909
<b>Total</b>	<b>43.7</b>	<b>32.8</b>	<b>11.2</b>	<b>12.2</b>	<b>100</b>	<b>4,670</b>

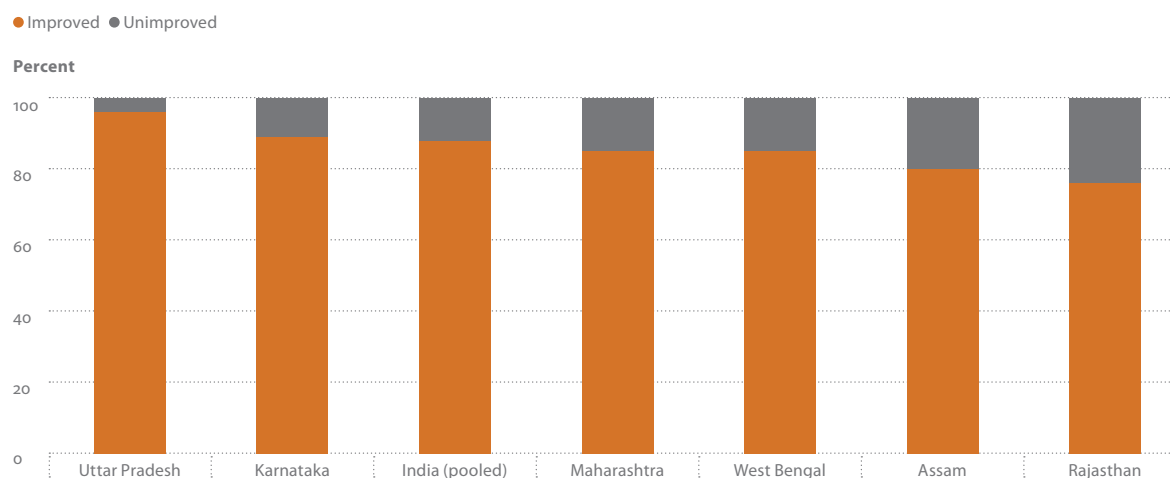
Note: Sufficient physical activity was defined as spending more than 150 minutes per week (in the last seven days) on light, moderate or vigorous activity.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 5.4** Household access to improved drinking water, states and India (pooled), 2007



Availability of improved sources of drinking water increased with income: 95% of households in the highest wealth quintile had access to improved sources of drinking water, as compared to 80% in the lowest quintile (Table 5.5.1). Almost all households in urban areas (97%) had access to improved drinking water. Access did not vary substantially by age or sex of household head.

#### (a) Time spent to collect drinking water

Only one-third of the households surveyed had drinking water sources on the premises (Table 5.5.2). Meanwhile, 53% of households did not have drinking water sources on the premises, but had to spend less than 30 minutes making one trip to collect water; the remaining 13% of households had to spend 30 minutes or longer obtaining drinking water.

**Table 5.5.1** Percent distribution of households by source of drinking water, India (pooled), 2007

Background characteristic	Improved	Unimproved	Total	Number of households
<b>Wealth quintile</b>				
Lowest	80.3	19.7	100	2,085
Second	86.4	13.6	100	2,085
Middle	85.7	14.3	100	1,266
Fourth	91.7	8.3	100	2,085
Highest	94.5	5.5	100	2,084
<b>Residence</b>				
Urban	96.7	3.4	100	2,479
Rural	84.1	15.9	100	7,126
<b>Household head</b>				
Female 18-49	88.9	11.1	100	336
Female 50+	89.4	10.6	100	546
Male 18-49	87.2	12.8	100	4,301
Male 50+	87.4	12.6	100	4,364
Other person	88.7	11.3	100	58
<b>Total</b>	<b>87.5</b>	<b>12.5</b>	<b>100</b>	<b>9,605</b>

Note: Improved water means water piped into the household or from a protected source.



**Table 5.5.2 Time to collect drinking water (round trip), India (pooled), 2007**

Background characteristic	Time to collect drinking water (round trip)				
	Water on premises	Less than 30 minutes	More than 30 minutes	Total	Number of households
<b>Wealth quintile</b>					
Lowest	18.2	65.6	16.3	100	1,944
Second	31.2	53.8	15.0	100	1,827
Middle	34.8	53.5	11.7	100	1,036
Fourth	41.3	48.8	9.9	100	1,275
Highest	61.7	32.1	6.2	100	1,053
<b>Residence</b>					
Urban	30.5	63.4	6.1	100	1,003
Rural	34.4	51.4	14.2	100	6,132
<b>Household head</b>					
Female 18-49	33.3	48.8	17.9	100	256
Female 50+	29.1	56.7	14.3	100	384
Male 18-49	31.3	54.1	14.5	100	3,238
Male 50+	36.2	53.0	10.8	100	3,200
Other person	81.7	18.3	0.0	100	57
<b>Total</b>	<b>33.7</b>	<b>53.4</b>	<b>12.9</b>	<b>100</b>	<b>7,135</b>

**Table 5.5.3 Person who usually collects drinking water, India (pooled), 2007**

Background characteristic	Men	Women	Male child (under 15)	Female child (under 15)	Other	Total	Number of households
<b>Wealth quintile</b>							
Lowest	10.2	84.7	1.2	3.7	0.2	100	1,546
Second	9.8	84.0	1.7	4.4	0.2	100	1,280
Middle	11.7	82.8	2.8	2.5	0.2	100	666
Fourth	12.6	83.9	1.7	1.8	0.0	100	755
Highest	18.5	76.6	0.8	3.0	1.1	100	459
<b>Residence</b>							
Urban	14.3	81.3	1.0	3.2	0.2	100	635
Rural	10.7	84.0	1.7	3.4	0.2	100	4,071
<b>Household head</b>							
Female 18-49	4.7	89.8	2.2	3.1	0.0	100	169
Female 50+	6.6	92.9	0.2	0.0	0.3	100	265
Male 18-49	10.1	83.8	2.0	3.8	0.2	100	2,226
Male 50+	13.8	81.2	1.2	3.5	0.3	100	2,036
Other person	18.5	76.6	0.8	3.0	1.1	100	458
<b>Total</b>	<b>11.3</b>	<b>83.4</b>	<b>1.6</b>	<b>3.4</b>	<b>0.2</b>	<b>100</b>	<b>4,696</b>

The proportion of households with drinking water on the premises increased substantially with increased income. In the lowest wealth quintile, only 18% of households had sources of drinking water on the premises and 16% had to spend more than 30 minutes for one round trip to water sources. By contrast, in the wealthiest households, 62% of households had water sources on the premises and only 6% had to spend more than 30 minutes for one round trip to water sources. Almost equal proportions of households from urban (31%) and rural areas (34%) had water sources on the premises, but a higher proportion of rural (14%) than urban households (6%) had to travel more than 30 minutes to collect water.

#### (b) Person who usually collects drinking water

For households which did not have water sources within the household premises, information was collected on the person who usually collected water. Table 5.5.3 shows that in most households, females (83% adults and 3% girls under 15) did the work of collecting water;

in about 11% of households, adult men collected the water. This pattern prevailed in households from all wealth quintiles, in urban and rural areas, and in households having different types of household head. Only in households from the highest wealth quintile did a higher proportion of adult men (19%) share the responsibility of fetching water.

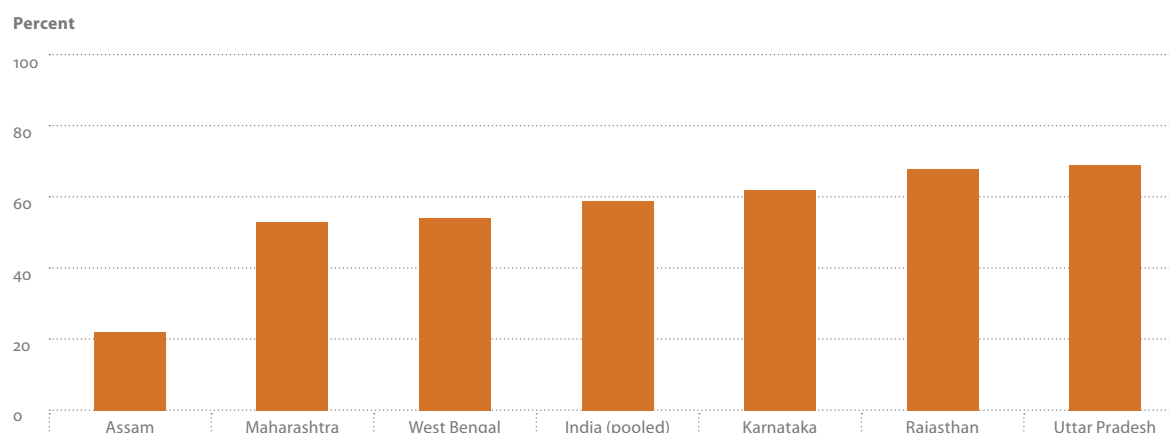
### 5.5.2 Access to improved sanitation

Table 5.5.4 shows state-level variation in the type of sanitation facility usually used by households. Most households (59%) did not have any sanitation facility; 31% had an improved facility, and the remaining 10% used an unimproved facility. Improved sanitation facilities include toilet facilities with a flush or a pour flush that was connected to a sewer system, septic tank or pit latrine; a ventilated improved pit (VIP) latrine, biogas latrine or pit latrine with slab; or a twin pit composting toilet. If a household had any of these types of toilet facilities but shared them with other households, the household was not considered to have an improved sanitation facility.

**Table 5.5.4 Access to improved sanitation facility, states and India (pooled), 2007**

State	Improved	Unimproved	No toilet	Total	Number of households
Assam	67.7	10.6	21.7	100	1,072
Karnataka	32.5	5.8	61.7	100	1,207
Maharashtra	34.7	12.2	53.1	100	1,849
Rajasthan	26.1	6.3	67.6	100	1,895
Uttar Pradesh	20.6	10.7	68.6	100	1,896
West Bengal	34.9	11.0	54.1	100	1,686
India (pooled)	31.0	10.1	59.0	100	9,605

**Figure 5.5 Percentage of households without any toilet facility, states and India (pooled), 2007**



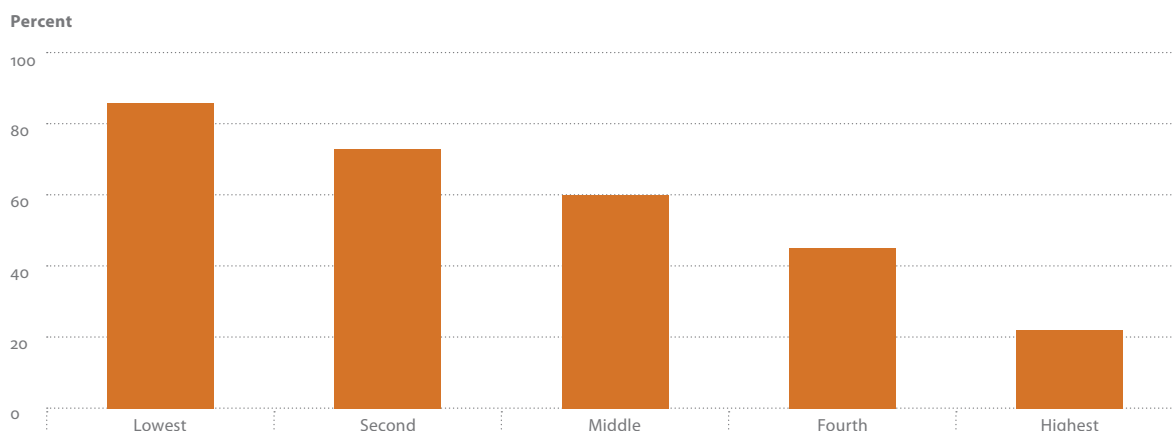
Among the six surveyed states, only in Assam did the majority (78%) of households have any sanitation facilities, compared with less than half the households in the remaining states. In Assam, two thirds of households had improved toilet facilities, whereas in the remaining states the proportion of households with improved facilities ranged from 21-35%. Around a fifth (22%) of the households in Assam did not have any toilet facility, compared with two thirds in Karnataka, Rajasthan, and Uttar Pradesh (Figure 5.5).

Table 5.5.5 shows the availability of sanitation facilities generally, and improved facilities specifically, in relation to selected characteristics. Only 14% of the poorest households had sanitation facilities, compared to 78% of households from the highest wealth quintile (see also Figure 5.6). About three quarters (73%) of urban households had sanitation facilities, including 52% with improved facilities, compared to only 29% and 23% respectively in rural areas. Households headed by older men were more likely to have improved sanitation,

**Table 5.5.5 Access to improved sanitation facility, India (pooled), 2007**

Background characteristic	Improved	Unimproved	No toilet	Total	Number of household
<b>Wealth quintile</b>					
Lowest	9.4	4.2	86.4	100	2,085
Second	16.3	10.5	73.2	100	2,085
Middle	28.0	12.1	59.9	100	1,266
Fourth	41.8	13.0	45.2	100	2,085
Highest	65.6	12.4	22.0	100	2,084
<b>Residence</b>					
Urban	52.4	20.5	27.1	100	2,479
Rural	23.1	6.2	70.7	100	7,126
<b>Household head</b>					
Female 18-49	29.4	8.3	62.3	100	336
Female 50+	29.3	9.5	61.2	100	546
Male 18-49	26.6	11.0	62.4	100	4,301
Male 50+	35.3	9.3	55.5	100	4,364
Other person	51.6	24.1	24.3	100	58
<b>Total</b>	<b>31.0</b>	<b>10.1</b>	<b>59.0</b>	<b>100</b>	<b>9,605</b>

**Figure 5.6 Percentage of households without any toilet facility by wealth quintile, India (pooled), 2007**





and less likely to have no toilet at all, than those headed by younger men or by women of any age.

### 5.5.3 Solid fuel use

Solid fuel use is defined as the household combustion of coal or biomass such as dung, charcoal, wood, or crop residues. Worldwide, some 50% of all households and 90% of rural households use solid fuels for cooking or heating (Desai *et al.*, 2004). Solid fuels are commonly burned in inefficient simple stoves and in poorly ventilated conditions. In such situations, burning solid fuel generates substantial emissions of many health-damaging pollutants, including respirable particulates and carbon monoxide, and results in exposure to indoor air pollution often far exceeding national standards and international guidelines (Desai *et al.*, 2004). The disease burden from solid fuel use is most significant in developing countries, particularly in poor households in rural areas. Women and their youngest children are most exposed because of their household roles. Solid fuel use is most firmly associated with acute lower respiratory infections (including pneumonia) in young children and with chronic obstructive pulmonary disease and lung cancer in women (and to a lesser degree in men). Each of these three health outcomes is a major disease category in most societies; household solid fuel use thus is likely to be a major cause of disease burden in communities where it is prevalent.

SAGE India collected data on the main type of fuel used by households for cooking, based on a harmonized WHO/UN approach to environmental risks. All households that used solid fuel were asked whether food was cooked on an open fire, or on an open or closed stove; whether the fire/stove had a chimney or hood; and whether the cooking was done in a separate building, a dedicated kitchen, or a room also used for living or sleeping.

Table 5.5.6 shows the distribution of households by type of cooking fuel used. Nearly 80% of households used solid fuel; 20% used clean fuel (LPG, electricity) and 1% used kerosene. With the exception of Maharashtra, where only 58% of households used solid fuel, in all remaining states the proportion of households using solid fuel was in the range of 76–88%.

Almost all (99%) of the households in the lowest wealth quintile used solid fuel, whereas in the highest quintile the majority (59%) used clean fuel (Table 5.5.7). Solid fuel was twice as common in rural (91%) as in urban areas (45%).

Among the households that used solid fuel, 16% had a chimney or hood (Table 5.5.8). Among the household that used solid fuel and cooked in a room used for living or sleeping 28% had a chimney or hood, 24% of household cooked in a separate room that used as kitchen had chimney or hood. About 5% of households that cooked outdoor or separate building as kitchen had chimney or hood.

**Table 5.5.6** Percent distribution of households by type of cooking fuel used, states and India (pooled), 2007

State	Cooking fuel used				
	Clean fuel	Kerosene/paraffin	Solid fuel	Total	Number of households
Assam	15.2	0	84.8	100	1,072
Karnataka	22.4	1.8	75.8	100	1,207
Maharashtra	39.8	2.2	58.0	100	1,849
Rajasthan	17.2	0.6	82.2	100	1,895
Uttar Pradesh	11.8	0.1	88.1	100	1,896
West Bengal	14.7	1.0	84.3	100	1,686
India (pooled)	20.3	1.0	78.7	100	9,605

**Table 5.5.7** Percent distribution of households by type of cooking fuel used according to household type and wealth quintile, India (pooled), 2007

Background characteristic	Cooking fuel used				
	Clean fuel	Kerosene/paraffin	Solid fuel	Total	Number of households
<b>Wealth quintile</b>					
Lowest	0.4	0.7	98.9	100	2,085
Second	4.7	1.4	93.9	100	2,085
Middle	9.6	1.8	88.6	100	1,266
Fourth	31.2	0.9	67.9	100	2,085
Highest	58.8	0.4	40.8	100	2,084
<b>Residence</b>					
Urban	52.4	2.7	44.9	100	2,479
Rural	8.6	0.3	91.1	100	7,126
<b>Total</b>	<b>20.3</b>	<b>1.0</b>	<b>78.7</b>	<b>100</b>	<b>9,605</b>

**Table 5.5.8** Percent distribution of households using chimney or hood by place of cooking in the household, India (pooled), 2007

	Fire/stove covered or not			
	Chimney/hood	Neither	Total	Number of households
<b>Where cooking usually done</b>				
In room used for living or sleeping	28.7	71.3	100	924
In separate room used as kitchen	24.3	75.7	100	3,206
In separate building used as kitchen	5.4	94.6	100	576
Outdoor	5.0	95.0	100	2,238
Other place	2.9	97.1	100	242
<b>Total</b>	<b>15.7</b>	<b>84.3</b>	<b>100</b>	<b>7,186</b>



## 6. Health state

The main objective of WHO SAGE is to obtain reliable, valid and comparable data on levels of health in a range of key domains for adult populations aged 50-plus. The WHO defined health in its 1978 Alma-Ata Declaration as "... a state of complete physical, mental and social well-being, not just the absence of disease or infirmity." This definition moved the boundaries of health beyond biology to also include social, psychological, spiritual, environmental and other factors. However, this definition does not provide objective indicators of health. There is no uniform scale to measure health, and it often differs according to sex, occupation, families, communities, and socioeconomic groups. Nevertheless, in an effort to standardise approaches to the measurement of health, WHO's health survey team has proposed a number of operational indicators (WHO, 2003).

Individual health status is assessed in SAGE through a single overall general self-reported health question as well as through self-evaluation of eight health domains: mobility, self-care, pain and discomfort, cognition, interpersonal activity, sleep and energy, affect, and vision. A major advantage of SAGE, compared to other health surveys, is the multi-domain approach to measuring health combined with the anchoring vignette methods to improve our understanding of the ways different people and populations respond to the same health questions. Using multiple domains allows one to generate a single composite score, or alternately to examine the various components that determine the whole. The vignette methodology establishes a latent scale used by populations, and when applied to the health score, can be used to improve comparability health levels across different populations.

The survey also includes assessments of functioning using 12 questions from the WHO Disability Assessment Schedule-II (WHODAS-2) (Ustun *et al.*, 2010). WHODAS-2

focuses on six areas of activity and produces an overall disability score that can be used to identify health needs, determine needed interventions, identify changes in physical function over time, and evaluate the clinical effects of treatment. A fuller set of activities of daily living and instrumental activities of daily life are also included because they are widely used in surveys and studies of older populations (see Section 6.2).

This chapter discusses respondents' self-reported health and functioning and presents some more objective health measures, specifically on cognition.

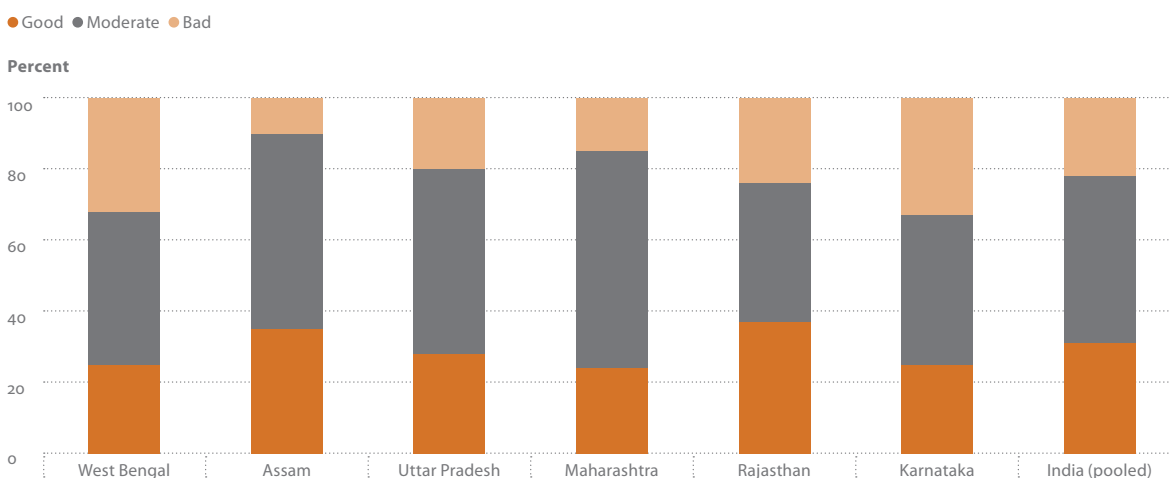
### 6.1 Self-reported overall general health and activity

#### 6.1.1. Self-reported overall general health

Self-reported general health status in epidemiological surveys has been well studied and applied, and has been shown to be an important indicator for many health and health-related issues. SAGE Wave 1 India (hereafter SAGE India) included a single overall general health question, "In general, how would you rate your health today?" Respondents could choose from five options: very good, good, moderate, bad and very bad. The five possible responses categories were collapsed into three groups for presentation of results: good (including respondent choices 'very good' and 'good'), moderate, and bad (including 'very bad' and 'bad').

Among older respondents (aged 50-plus), less than a third (31%) reported their health status as good, although nearly half (47%) considered their health to be moderate (Figure 6.1). A higher percentage residing in Assam (35%) and Rajasthan (37%) reported good health than in the other regions, while Karnataka also had the lowest percentage of those reporting bad health

**Figure 6.1** Self-reported health status of respondents aged 50-plus, states and India (pooled), 2007



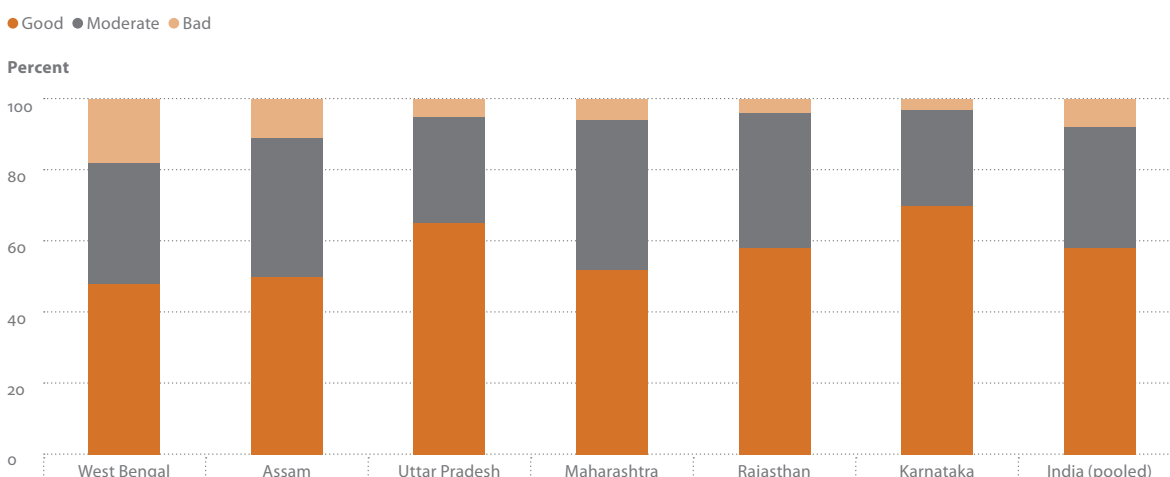
(10%). Older respondents in Rajasthan reported the lowest percentage of good health (24%), but also lower levels of bad health (15%). Those in Karnataka, on average, reported better health than those in the states of West Bengal and Assam.

Perhaps unsurprisingly, younger respondents (aged 18-49) rated their health higher than older respondents across the board, with only 8% considering their health to be bad (Figure 6.2) and the majority (58%) reporting good health. As with older respondents, among the six states, the health of younger respondents was best in Karnataka, where 70% reported their health as good and only 3% reported it as bad. However, among younger respondents, the worst results came from West Bengal, where only 48% reported their health as good and 18% reported it as bad, and Assam (11% bad, 50% good).

The self-reported health of women was lower than that of men across both age groups, although it was more noticeable in the older cohort. Three quarters (75%) of older women reported their current health as moderate or bad, as compared to 64% of older men. Meanwhile, 36% of younger women reported their health as moderate and 9% as bad, as compared to 32% and 7% of younger men respectively (Table 6.1).

Comparison between the results of the composite health and disability variables (mean health and WHODAS mean scores) with the single health question demonstrate the face validity, with higher health scores for good health and lower for bad health, and worse disability for those reporting bad health – and differences between the broad age groups.

**Figure 6.2** Self-reported health of respondents aged 18-49, states and India (pooled), 2007





**Table 6.1 Self-reported health, India (pooled), 2007**

Background characteristic	Aged 18-49						Aged 50-plus				
	Good	Moderate	Bad	Total	Number		Good	Moderate	Bad	Total	Number
Age group											
18-29	71.1	24.7	4.2	100	1,604	50-59	37.3	46.2	16.5	100	2,939
30-39	58.0	33.7	8.4	100	1,657	60-69	28.3	49.1	22.7	100	2,234
40-49	46.7	43.3	10.1	100	1,407	70-79	19.5	47.6	32.9	100	1,058
						80+	11.5	41.2	47.2	100	328
Sex											
Male	61.3	32.0	6.8	100	1,045		35.8	44.5	19.7	100	3,303
Female	55.1	36.3	8.5	100	3,623		25.0	49.7	25.3	100	3,256
Marital status											
Never married	74.0	23.1	2.9	100	557		20.7	50.0	29.3	100	64
Currently married	56.7	35.3	8.1	100	3,851		32.9	47.3	19.8	100	4,861
Widowed	46.3	39.2	14.5	100	222		22.7	46.3	31.0	100	1,592
Other¹	34.9	64.8	0.3	100	38		25.3	34.6	40.1	100	42
Residence											
Urban	61.2	33.6	5.2	100	1,169		37.8	42.5	19.7	100	1,676
Rural	57.3	34.3	8.4	100	3,499		27.6	48.9	23.5	100	4,883
Caste											
Scheduled tribe	56.8	35.5	7.8	100	374		23.2	41.0	35.8	100	400
Scheduled caste	59.2	32.8	8.1	100	892		27.6	47.4	25.0	100	1,085
Other²	58.2	34.4	7.5	100	3,402		31.7	47.4	20.9	100	5,074
Religion											
Hindu	59.9	33.6	6.5	100	3,905		31.5	47.1	21.4	100	5,531
Muslim	47.9	35.6	16.5	100	593		26.2	46.1	27.7	100	791
Other³	55.2	41.4	3.4	100	170		22.5	48.6	28.9	100	237
Education											
No formal education	52.2	38.6	9.2	100	1,713		23.6	49.9	26.6	100	3,365
Less than primary	50.5	38.2	11.3	100	431		32.2	46.9	20.9	100	745
Primary school	50.7	39.1	10.2	100	788		29.8	47.4	22.8	100	929
Secondary school	61.1	31.4	7.5	100	741		38.9	44.8	16.4	100	654
High school	70.9	25.6	3.5	100	656		43.7	42.1	14.2	100	541
College and above	71.6	26.5	1.9	100	339		59.9	31.4	8.7	100	325
Wealth quintile											
Lowest	51.1	37.8	11.1	100	959		22.6	46.5	31.0	100	1,312
Second	55.6	34.0	10.5	100	932		25.6	48.2	26.2	100	1,312
Middle	59.0	32.8	8.3	100	935		32.2	45.2	22.7	100	1,313
Fourth	58.6	37.2	4.2	100	933		33.5	50.3	16.2	100	1,310
Highest	68.7	28.5	2.8	100	909		40.7	45.4	14.0	100	1,312
Total	58.3	34.1	7.6	100	4,668		30.5	47.1	22.4	100	6,559
Mean health score	74.8	61.6	50.3	68.4			64.5	52.7	40.5	53.6	
WHODAS mean score	8.3	15.4	29.1	12.3			16.4	26.9	46.0	28.0	

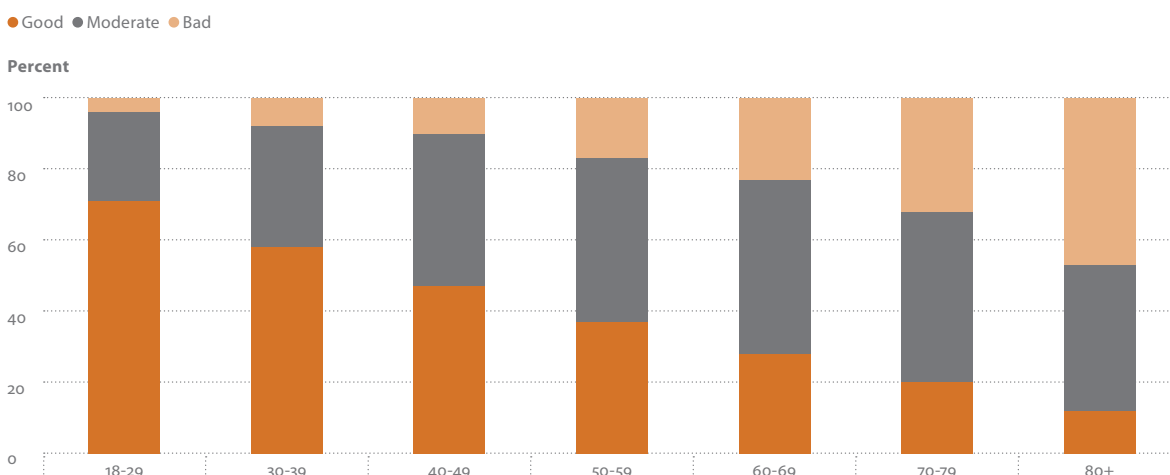
Note: The mean health score is a composite variable based on responses to questions in eight health domains, ranging from 0 (worst health) to 100 (best health). The mean WHODAS score is an estimation of functioning or disability; it is a composite variable based on 12 questions. A score of 0 indicates no disability and 100 the highest level of disability.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 6.3** Self-reported health of respondents by age group, India (pooled), 2007



Urban living was associated with better health among both older and younger respondents. For example, in the older age group, 83% of respondents in urban areas said their health was good, compared to 82% of their rural counterparts.

Most older respondents were either married or widowed. In the younger cohort, health was best among those who had never been married, followed by currently married and then widowed. This may be because unmarried respondents were younger than their married counterparts, who were in turn younger than the widowed. In contrast married older respondents had better health than their unmarried or widowed counterparts.

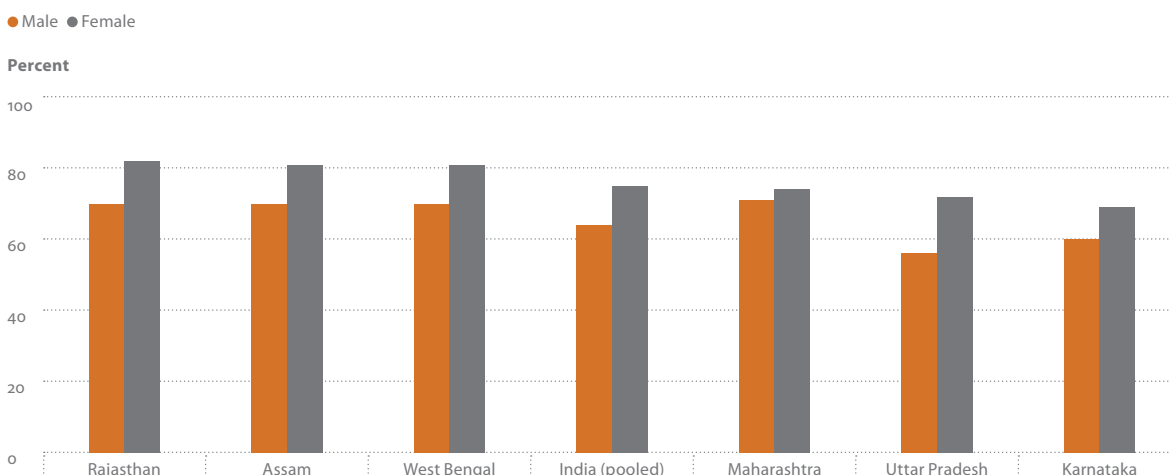
As elsewhere in the world, social disadvantage translated to worse health outcomes among older respondents. Among older respondents, people from scheduled tribes reported the worst health, followed by scheduled

castes and then other castes. Hindus reported relatively better health than respondents of other religions. Perhaps encouragingly, in the younger group, there was little variation in health status by tribe or caste.

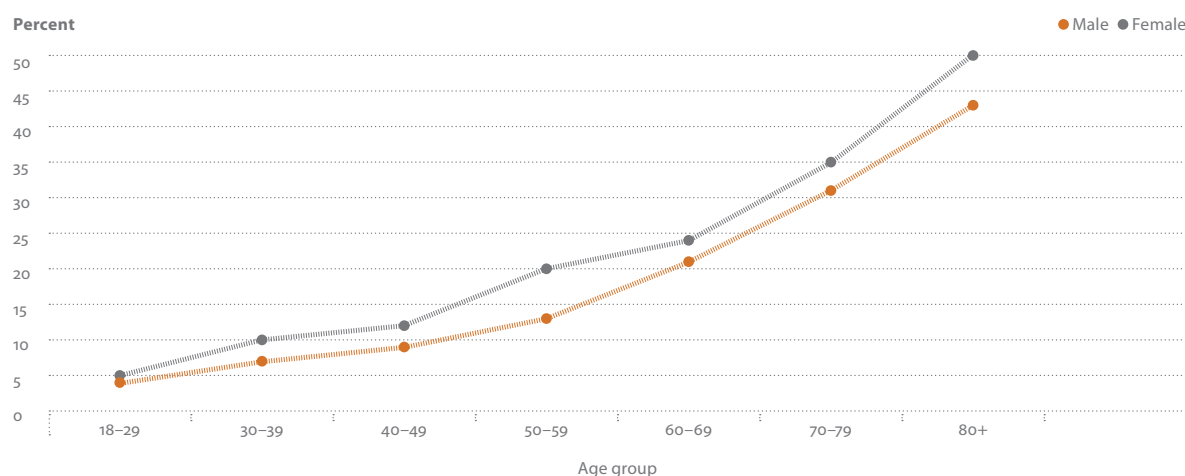
Unsurprisingly, self-reported health deteriorated progressively with age (Figure 6.3). Whereas 71% of the youngest respondents (aged 18-29) said their health was good, this dropped to 12% in the 80-plus age group. Correspondingly, the proportion who said their health was bad rose from 4% at age 18-29 to 47% at 80-plus.

Age, gender and state differences are made graphically evident in Figures 6.4 and 6.5. In all states and across each age group, female health was worse than that of men: among the respondents aged 50-plus, 36% of men compared with 25% of women reported good health, while 20% of men compared to 25% of women

**Figure 6.4** Proportion of men and women aged 50-plus who reported health as moderate or bad, states and India (pooled), 2007



**Figure 6.5** Proportion of persons who reported health as bad, by age and sex, India (pooled), 2007



reported bad health. The gender differential was most striking in Uttar Pradesh, where 72% of older women said their health was moderate or bad, compared with 56% of men (Figure 6.4). The difference was smallest (just 3%) in Maharashtra. The gender differential in self-reported health was evident in almost every category of background characteristics: residence, caste, religion, education and income.

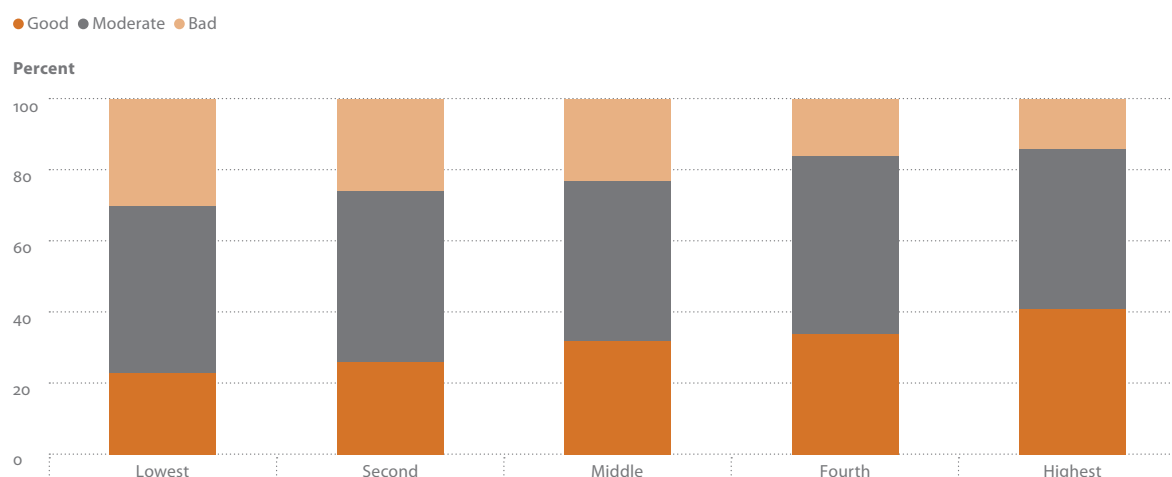
For both sexes and younger and older age groups, self-reported health generally improved with educational attainment. For example, among older women, 27% of those with no formal education said their health was bad, compared to 9% for those with college education. The relationship between income and health was also positive. Among both sexes and age groups, reports of good health increased while reports of bad health decreased with rising wealth (see also

Figure 6.6). In the older group, good health increased from 23% (25% of men and 20% of women) in the lowest wealth quintile to 41% (49% of men and 32% of women) in the highest.

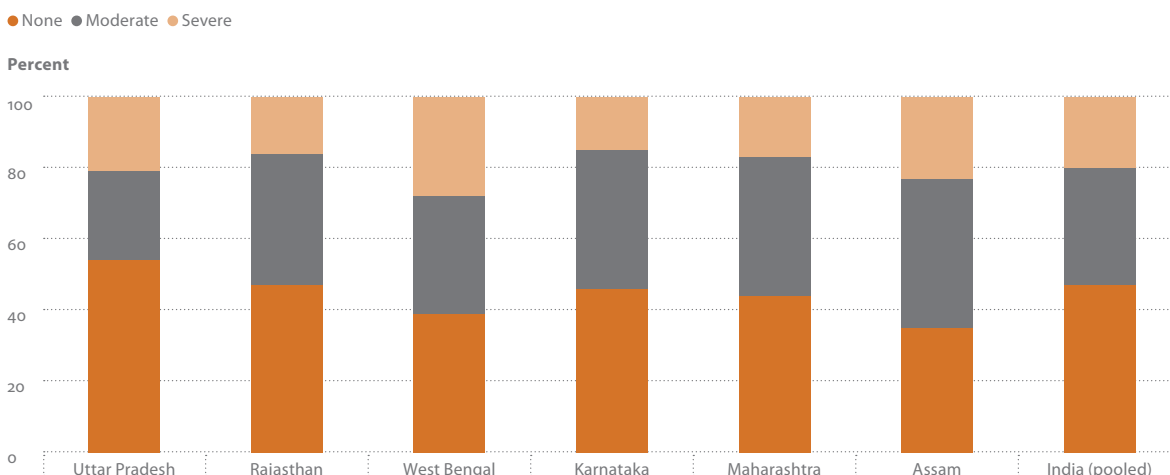
### 6.1.2. Difficulties with work or household activities

Another dimension of general health is the extent to which a person can carry out typical, routine household or work activities. To identify any particular health issues limiting respondents' regular activities, SAGE India included the question, "Overall in the last 30 days, how much difficulty did you have with work or household activities?" Respondents could choose among five response options: none, mild, moderate, severe, and extreme/cannot do. The five possible responses

**Figure 6.6** Self-reported health status of respondents aged 50-plus by wealth quintile, India (pooled), 2007



**Figure 6.7** Self-reported difficulty with work or household activities for respondents aged 50-plus, states and for India (pooled), 2007



were divided into three groups for presentation of results: none (including 'none' and 'mild'), moderate, and severe (including 'severe' and 'extreme').

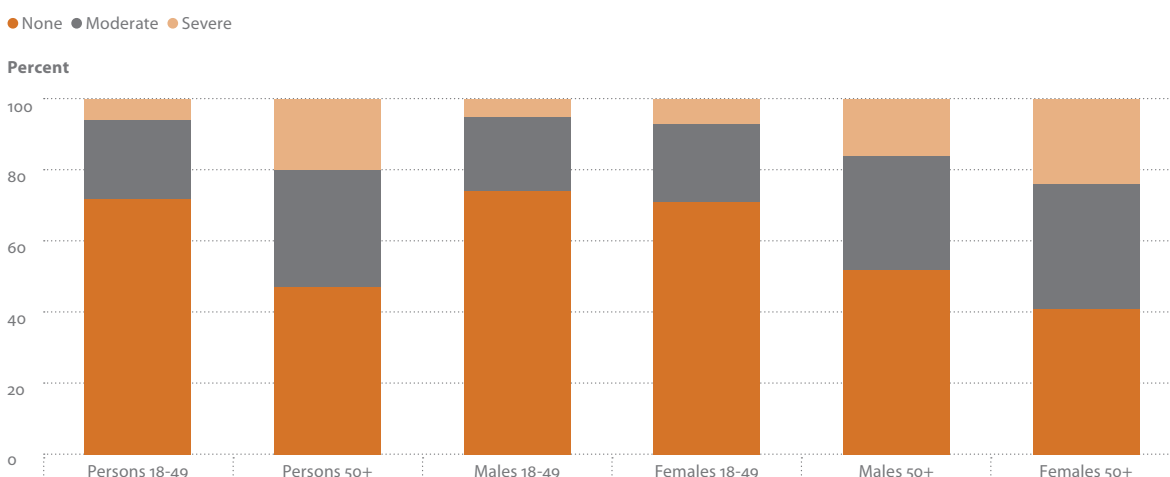
A considerable proportion of older respondents reported difficulty in work or household activities. Among the surveyed states, the proportion of older respondents who reported some difficulty, either moderate or severe, was highest in Assam and lowest in Uttar Pradesh (Figure 6.7). Older adults in Assam were more likely, and those in Uttar Pradesh least likely, to report difficulty with work or household activities. The severity of limitation was greatest in West Bengal and least in Karnataka (Results not shown).

Older men in Assam were the most likely to report difficulty, and those from Rajasthan and Uttar Pradesh the least likely. Among older women, the proportion who reported some difficulty, either moderate or severe, was highest in Maharashtra and lowest in Uttar Pradesh.

The highest proportions of both sexes (10-12%) reporting severe difficulty in carrying out work or household activities were found in Karnataka. Almost two thirds (65%) of older respondents in Assam reported difficulty, either moderate or severe, compared to less than half (46%) in Uttar Pradesh. In each state, a higher proportion of older women than older men reported severe difficulty with work. The difference was especially large in Assam, where 31% of older women reported severe difficulty, compared to 16% of older men.

Age was a clear contributor to difficulties with work or household activity: 72% of younger respondents reported no difficulty, compared to only 47% of older respondents (Figure 6.8). Severe difficulties were reported by 20% of the older group, compared to just 6% of younger respondents. Older women were more likely than older men to have difficulty: 24% of older women reported severe difficulty, compared to 16% of men.

**Figure 6.8** Self-reported difficulty with work or household activities, by age group and sex, India (pooled), 2007



A clear age gradient was seen in the proportion of respondents reporting difficulty with work or household activities. Among the oldest group, aged 80-plus, 20% reported no difficulty, compared to 81% among the younger adults age 18-29. Meanwhile the proportion who reported severe difficulty decreased from 54% in the oldest, to 3% in the youngest respondent groups. In each age group, a higher proportion of women than men reported severe difficulty with work: 61% of women aged 80-plus faced severe difficulties, compared to 44% of men (Figure 6.9). The gender differential prevailed across categories of residence, caste, religion, education and income, with women consistently reporting severe difficulty with work more often than men (Table 6.2). In terms of marital status, widowed respondents had more difficulty than married people, who in turn had more difficulty than younger women who had never been married. This is likely a reflection of the older age among married and especially widowed people.

One-third of widowed older women reported severe difficulty with work or household activities, compared to a fifth of currently married older women.

Both men and women living in rural areas were somewhat more likely to report difficulty in carrying out work or household activities than those from urban areas. A more pronounced difference was evident among different castes: among older men, members of scheduled tribes had more difficulty than members of scheduled castes, and yet more difficulty than respondents from other castes. Younger Muslims were more likely to report severe difficulty with work than younger Hindus are persons from other religions.

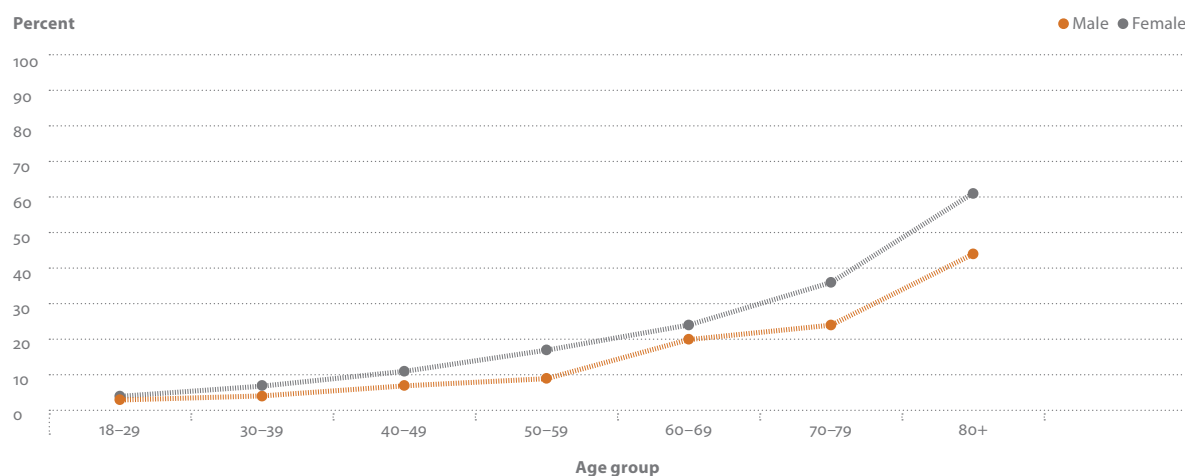
Difficulty with work or household activities bore an inverse relationship with education as well as wealth

quintile, especially among older respondents (Table 6.2). In the 50-plus age group, 41% of men without formal education had no difficulty, rising to 71% for men with college education. Similarly, 22% of men with no formal education reported severe difficulty, decreasing to 8% among men with college education. However, as mentioned earlier, the relationship between education and difficulty with work may reflect the higher representation of younger respondents in the higher education category. With increases in wealth, there was a progressive increase in the proportion of persons reporting no difficulty with work and a corresponding decrease in the proportion with severe difficulty. For example, among older respondents who reported no difficulty with work or household activity increased from 37% in the lowest wealth quintile to 59% in the highest (Figure 6.10).

## 6.2 Health state and functioning

The ability to disaggregate health into distinct domains helps to better understand the determinants of health, and the possible differences between perceived and true levels of health. For this reason, SAGE India used WHO's approach to measuring health state, based on a multi-dimensional construct which can be viewed as a point of comparison with the single overall self-reported general health question. Respondents were asked their situation in the past 30 days with regard to 16 survey items in eight domains of health, including mobility, self-care, pain and discomfort, cognition, interpersonal activities, sleep and energy, affect, and vision. An individual's health state score was then generated using item response theory (Baker, 2001). The health score ranged from 0 (indicating worst health) to 100 (best health).

**Figure 6.9** Proportion of persons who reported severe difficulty with work or household activities, by age group and sex, India (pooled), 2007



**Table 6.2 Difficulties with work/household activities, India (pooled), 2007**

Background characteristic	Aged 18-49						Aged 50-plus				
	None	Moderate	Severe	Total	Number		None	Moderate	Severe	Total	Number
Age group											
18-29	80.7	15.9	3.4	100	1,605	50-59	55.0	32.1	12.9	100	2,939
30-39	71.4	23.3	5.3	100	1,657	60-69	41.9	36.4	21.7	100	2,234
40-49	65.9	25.2	8.9	100	1,407	70-79	37.0	33.4	29.6	100	1,058
						80+	20.3	25.2	54.4	100	328
Sex											
Male	73.8	21.2	5.0	100	1,045		51.7	32.1	16.2	100	3,303
Female	71.1	22.1	6.9	100	3,624		41.1	34.5	24.4	100	3,256
Marital status											
Never married	83.6	14.3	2.2	100	557		38.7	35.2	26.2	100	64
Currently married	71.7	22.0	6.3	100	3,852		49.7	33.1	17.2	100	4,861
Widowed	57.1	32.4	10.5	100	222		35.5	34.2	30.4	100	1,592
Other¹	51.7	47.5	0.9	100	38		58.8	22.8	18.4	100	42
Residence											
Urban	74.1	20.3	5.6	100	1,169		52.6	31.1	16.3	100	1,676
Rural	72.0	22.0	6.0	100	3,500		44.1	34.2	21.8	100	4,883
Caste											
Scheduled tribe	72.5	21.3	6.2	100	374		37.4	37.7	25.0	100	400
Scheduled caste	74.2	21.1	4.7	100	893		41.1	36.8	22.1	100	1,085
Other²	72.0	21.8	6.2	100	3,402		48.3	32.3	19.4	100	5,074
Religion											
Hindu	74.1	20.8	5.1	100	3,906		47.3	33.0	19.8	100	5,531
Muslim	63.8	24.9	11.4	100	593		42.9	35.2	22.0	100	791
Other³	64.9	29.7	5.4	100	170		41.1	35.2	23.7	100	237
Education											
No formal education	66.8	25.9	7.3	100	1,714		39.4	36.2	24.4	100	3,365
Less than primary	65.4	26.8	7.8	100	431		46.3	36.5	17.2	100	745
Primary school	68.6	24.7	6.7	100	788		50.7	29.3	20.0	100	929
Secondary school	74.5	19.9	5.6	100	741		53.0	29.6	17.4	100	654
High school	80.4	15.5	4.1	100	656		60.0	30.7	9.3	100	541
College and above	86.9	11.1	2.0	100	339		70.5	21.1	8.4	100	325
Wealth quintile											
Lowest	68.6	24.8	6.6	100	959		37.4	36.6	26.0	100	1,312
Second	69.9	22.9	7.2	100	932		42.6	32.9	24.4	100	1,312
Middle	69.7	22.6	7.6	100	935		46.6	34.1	19.3	100	1,313
Fourth	73.6	22.3	4.1	100	934		49.3	35.6	15.1	100	1,310
Highest	82.0	14.7	3.3	100	909		58.7	27.0	14.3	100	1,312
Total	72.5	21.6	5.9	100	4,669		46.5	33.3	20.2	100	6,559
Mean health score	72.8	59.9	46.3	68.4			61.8	50.6	39.5	53.6	
WHODAS mean score	9.0	17.9	32.5	12.3			18.1	30.0	47.4	28.0	

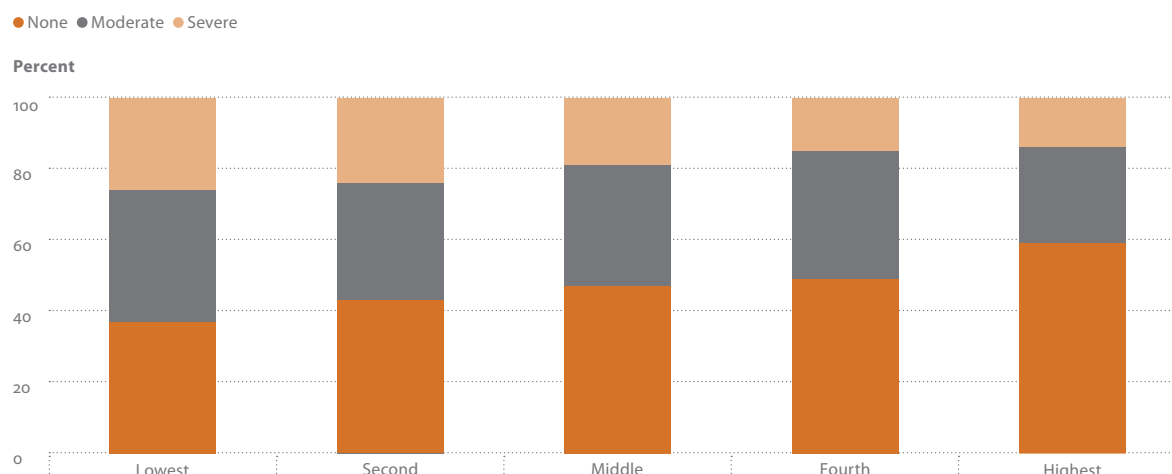
Note: The mean health score is a composite variable based on responses to questions in eight health domains, ranging from 0 (worst health) to 100 (best health). The mean WHODAS score is an estimation of functioning or disability; it is a composite variable based on 12 questions. A score of 0 indicates no disability and 100 the highest level of disability.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 6.10** Percent distribution of respondents aged 50-plus by level of difficulty with work or household activities and wealth quintile, India (pooled), 2007



To begin to better understand subjective health states, SAGE India also used anchoring vignettes as a method of improving comparability of self-reported measures. A vignette is a description of a hypothetical person of the same age and characteristics of the respondent doing a particular activity, and respondents were asked to rate the condition and experience of the person in the vignette story. Five vignettes were available for each of the eight health domains. Additionally, SAGE India used performance tests, such as a timed walk and vision tests, for cross-validation of the anchoring vignette strategy and as independent tests for improving understanding of self-reported health. The objective tests used in SAGE India are presented in Chapter 8.

Functional assessment is also an important aspect of overall health evaluation. To assess functioning, SAGE

India used the 12-item WHO Disability Assessment Schedule (WHODAS) version 2, as well as a broader set of typical activities of daily living and instrumental activities of daily living. Activities of daily living (ADL) refer to daily self-care activities, typically within an individual's place of residence, and include more basic activities such as eating, bathing and toileting. Service or care-giving issues are typically triggered when a person has two or more ADL deficiencies. Instrumental activities of daily living (IADLs) include more complex activities, such as heavy or light housework, laundry, preparing meals, shopping for daily necessities, getting around outside, travelling, managing money and using a telephone. WHODAS provides a well validated assessment of overall functioning or disability (Ustun *et al.*, 2010). A respondent is asked about the level of difficulty experienced with daily activities; a single score is then generated by adding up the responses to

**Table 6.3** Mean health score and WHODAS score, by states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Mean health score	Number	Mean WHODAS score*	Number	Mean health score	Number	Mean WHODAS score	Number
Assam	68.1	517	12.4	517	52.6	677	26.3	677
Karnataka	69.5	630	11.6	630	55.0	923	25.5	923
Maharashtra	69.8	885	12.4	885	54.4	1,097	28.2	1,098
Rajasthan	69.1	846	13.6	847	53.0	1,378	31.1	1,378
Uttar Pradesh	68.9	890	11.3	890	54.5	1,311	26.5	1,311
West Bengal	64.9	901	13.6	901	50.4	1,173	30.7	1,173
<b>India (pooled)</b>	<b>68.4</b>	<b>4,669</b>	<b>12.3</b>	<b>4,670</b>	<b>53.6</b>	<b>6,559</b>	<b>28.0</b>	<b>6,560</b>

Note: The mean health score is a composite variable based on responses to questions in eight health domains, ranging from 0 (worst health) to 100 (best health). The mean WHODAS score is an estimation of functioning or disability; it is a composite variable based on 12 questions. A score of 0 indicates no disability and 100 the highest level of disability.



the 12 questions and standardizing the raw score to a 0-100 scale, with a higher WHODAS score reflecting higher disability (worse overall functioning).

Mean health scores for older and younger adults are presented by state in Table 6.3. Although the variation in mean health scores by state was small, older adults in West Bengal had the lowest health score (50), as did younger adults (65). The highest health score for older adults was in Karnataka and Uttar Pradesh, while it was highest for younger adults in Maharashtra.

Issues with functioning are more typically seen at older ages, with higher levels of disability more likely with increasing age. The WHODAS results by state reflect this scenario, with the highest levels of disability in older adults seen in Rajasthan, followed by West Bengal. In younger adults, problems with functioning were lower, but were also highest in Rajasthan and West Bengal. The ranking of health state scores by state was relatively consistent for older and younger adults.

Overall, health scores were lower for older (54) than younger (68) adults, with a clear age gradient (Table 6.3). The health score decreased from 76 for the youngest age group respondents to 42 among the oldest (Table 6.4). Men consistently reported better health (higher health scores) than women. The scores indicated relatively better health status in never-married younger persons and worse status in older widowed persons. Scores were somewhat better among urban than rural dwellers. Health status did not vary greatly by caste group, but Muslims scored slightly worse than other religions. Health status improved with both education and income. Among older people, the health score rose from 50 for persons with no education to 65 for those with college education. Similarly, the health score increased from 49 in the lowest wealth quintile to 59 in the highest.

Disability followed an inverse pattern, with WHODAS increasing with age (higher disability at older ages). Higher disability was seen in women, widowed, rural dwellers, lower education and lower wealth quintiles.

Table 6.5 presents another way to look at functioning, in this case through the number of ADL and IADL deficiencies. With increasing age, there was a sharp increase in the proportion of persons with ADL and IADL deficiencies. Most respondents aged 50-plus (52%) had at least one ADL deficiency and 40% had two or more. A lower proportion (28%) of older persons reported IADL deficiencies. Deficiencies were far more common among older women than older men: about 63% and 34% of older women had at least one ADL and IADL deficiency respectively, compared with 42% and 21% of older men (Table 6.5).

Among the states, West Bengal had the highest proportion of older people with ADL and IADL deficiencies – nearly two thirds (63%) and one-third, respectively. The state with the lowest disability rates was Maharashtra: less than half the older persons had two or more ADL deficiencies and a seventh had two or more IADL deficiencies. The gender gap was especially large in West Bengal, where only 21% of older women had no ADL deficiency compared with 52% of men, and 62% of women compared with 38% of men had two or more.

The mean health score decreased (i.e. health worsened) and mean WHODAS score decreased (i.e. disability increased) with increases in the number of ADL and IADL deficiencies. Compared to other states, a larger proportion of respondents from West Bengal had ADL and IADL deficiencies, while Maharashtra had comparatively lower disability.

ADL and IADL deficiencies were more common in rural than urban areas. Respondents who were widowed were most likely to have at least one ADL and IADL deficiency; among widowed older women, 59% had two or more ADL deficiencies, and 26% had two or more IADL deficiencies. Higher education was associated with lower disability levels. Thirty-nine percent of older adults with no formal education had no ADL deficiencies, while 76% of older adults with a college education or more reported no disability (Table not shown). The proportion of people with no IADL deficiencies also increased with education. Meanwhile, the gender gap was very evident in each educational category; for example, 44% of college-educated older women had at least one ADL deficiency and 35% had two or more, compared to 20% and 14% respectively for college-educated men.

As with higher education, better economic status brought improvement in carrying out daily activities. The proportion of persons with no ADL deficiencies rose from 40% in the lowest wealth quintile to 56% in the highest. The gender gap was again evident: in each wealth quintile, the proportion of women with ADL and IADL deficiencies was higher than men

About four in every five (81%) respondents age 18-49 had no ADL deficiency, 8% had only one deficiency and 11% had two or more. Most (91%) of these young adults did not have any IADL deficiency, 6% had one 3% had two or more deficiencies. While these levels in younger adults warrant close consideration and attention by the local health and social systems, a larger impact is seen in the older adult population, with corresponding needs for informal and formal support.

**Table 6.4 Mean health scores and WHODAS scores, India (pooled), 2007**

Background characteristic	Aged 18-49					Aged 50-plus			
	Mean health score	Number	Mean WHODAS score	Number		Mean health score	Number	Mean WHODAS score	Number
Age group									
18-29	75.9	1,605	8.0	1,606	50-59	57.1	3188	23.1	3,189
30-39	67.7	1,657	12.8	1,657	60-69	52.6	2026	29.0	2,026
40-49	62.3	1,407	15.8	1,407	70-79	48.1	1048	35.4	1,048
					80+	41.7	297	47.5	297
Sex									
Male	71.4	1,045	10.2	1,045		57.0	3344	24.0	3,345
Female	65.4	3,624	14.4	3,625		50.0	3215	32.2	3,215
Marital status									
Never married	78.3	557	6.6	557		52.8	48	28.4	48
Currently married	67.5	3,852	12.8	3,853		55.3	5,046	25.6	5,046
Widowed	57.9	222	17.9	222		47.5	1,434	36.4	1,434
Other¹	59.3	38	16.2	38		49.5	32	34.1	32
Residence									
Urban	71.4	1,169	10.4	1,169		56.4	1896	25.3	1,896
Rural	67.5	3,500	12.9	3,501		52.4	4663	29.1	4,664
Caste									
Scheduled tribe	68.3	374	12.9	374		52.3	400	29.4	400
Scheduled caste	67.3	893	12.5	893		51.9	1,085	29.3	1,085
Other²	68.8	3,402	12.2	3,403		54.0	5,074	27.6	5,075
Religion									
Hindu	69.0	3,906	11.8	3,907		53.8	5,531	27.6	5,532
Muslim	64.2	593	15.8	593		52.1	791	30.4	791
Other³	69.2	170	12.4	170		53.9	237	28.2	237
Education									
No formal education	63.2	1,714	16.5	1,715		49.8	3361	32.9	3,361
Less than primary	64.8	431	14.7	431		53.9	658	28.0	659
Primary school	67.0	788	13.0	788		55.2	971	26.0	971
Secondary school	70.5	741	9.9	741		58.2	667	21.3	667
High school	74.0	656	8.4	656		60.4	564	18.9	564
College and above	78.0	339	6.1	339		65.2	337	13.2	337
Wealth quintile									
Lowest	64.1	959	15.7	959		49.1	1185	33.3	1,190
Second	64.7	932	14.2	933		51.8	1272	30.6	1,276
Middle	69.4	935	11.7	935		53.8	1225	27.5	1,230
Fourth	70.6	934	10.7	934		55.5	1280	25.9	1,285
Highest	74.8	909	8.3	909		58.6	1558	21.5	1,564
Total	68.4	4,669	12.3	4,670		53.6	6,559	28.0	6,545

Note: The mean health score is a composite variable based on responses to questions in eight health domains, ranging from 0 (worst health) to 100 (best health). The mean WHODAS score is an estimation of functioning or disability; it is a composite variable based on 12 questions. A score of 0 indicates no disability and 100 the highest level of disability.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 6.5 Activities of daily living (ADL) and Instrumental activities of daily living (IADL), India (pooled), 2007**

Background characteristic	Male aged 50-plus				Male aged 50-plus				No.	Female aged 50-plus				Female aged 50-plus				No.
	ADL				IADL					ADL				IADL				
	o	1	2+	Total	o	1	2+	Total		o	1	2+	Total	o	1	2+	Total	
Age group																		
50-59	68.5	10.9	20.6	100	86.8	7.6	5.6	100	1,388	44.1	16.0	40.0	100	74.4	13.6	12.0	100	1,551
60-69	53.6	15.4	31.0	100	77.8	8.5	13.7	100	1,151	34.9	11.9	53.2	100	63.4	17.2	19.4	100	1,079
70-79	45.4	9.5	45.1	100	63.2	18.4	18.4	100	591	28.1	7.5	64.4	100	56.4	16.2	27.4	100	467
80+	23.2	9.7	67.1	100	45.0	14.2	39.9	100	169	7.7	7.4	84.8	100	32.8	16.7	50.6	100	159
Marital status																		
Never married	51.7	3.1	45.3	100	65.2	13.4	21.4	100	45	47.1	33.3	19.5	100	82.8	6.7	10.5	100	19
Currently married	59.8	11.7	28.5	100	79.8	9.7	10.5	100	2,894	41.1	13.7	45.3	100	71.1	14.6	14.3	100	1,967
Widowed	41.5	17.0	41.5	100	65.2	12.2	22.5	100	354	29.4	11.7	58.9	100	57.6	16.0	26.3	100	1,238
Other¹	63.0	6.8	30.2	100	79.7	0	20.3	100	10	44.3	10.6	45.1	100	60.0	35.3	4.7	100	32
Residence																		
Urban	64.3	11.7	24.0	100	83.4	6.0	10.6	100	788	43.0	8.8	48.2	100	73.4	13.0	13.6	100	885
Rural	56.1	12.1	31.8	100	76.6	11.9	12.2	100	2,515	34.2	14.7	51.0	100	63.0	16.2	20.9	100	2,368
Caste																		
Scheduled tribe	60.5	6.0	33.5	100	71.4	16.0	12.6	100	215	32.4	19.0	48.6	100	64.7	18.4	16.9	100	185
Scheduled caste	56.5	14.2	29.4	100	77.3	8.8	13.9	100	557	39.3	14.0	46.8	100	67.2	14.0	18.9	100	528
Other²	58.7	11.9	29.4	100	79.3	9.8	11.0	100	2,531	36.6	12.4	51.0	100	65.9	15.3	18.8	100	2,543
Religion																		
Hindu	59.4	11.8	28.8	100	79.5	9.5	11.0	100	2,778	38.4	12.6	49.0	100	66.9	14.6	18.4	100	2,753
Muslim	54.3	14.7	31.0	100	76.7	11.2	12.1	100	411	24.6	12.7	62.7	100	58.8	18.9	22.3	100	380
Other³	47.8	6.8	45.4	100	62.0	14.6	22.4	100	114	40.4	24.6	35.1	100	69.8	17.7	12.5	100	123
Education																		
No formal education	51.9	13.2	34.9	100	70.2	14.1	15.7	100	1,084	33.5	13.5	53.0	100	64.0	16.2	19.8	100	2,281
Less than primary	57.0	8.2	34.8	100	71.9	16.1	12.1	100	453	37.4	12.7	49.9	100	67.9	14.4	17.7	100	292
Primary school	54.1	14.7	31.3	100	78.7	7.0	14.1	100	580	43.7	9.4	47.0	100	68.1	11.9	20.0	100	349
Secondary school	63.2	13.5	23.3	100	86.1	5.1	8.9	100	495	59.0	8.4	32.2	100	74.9	14.2	10.9	100	159
High school	61.0	11.2	28.0	100	85.1	9.3	5.7	100	427	49.7	22.4	26.9	100	81.2	10.3	8.5	100	114
College and above	79.6	6.1	14.3	100	93.0	2.3	4.7	100	264	56.3	9.2	34.5	100	86.1	10.8	3.1	100	61
Wealth quintile																		
Lowest	48.4	15.0	36.6	100	70.3	14.1	15.6	100	654	31.7	13.7	54.6	100	64.8	15.8	19.4	100	658
Second	56.9	9.0	33.8	100	76.0	10.5	13.6	100	668	37.2	11.2	51.6	100	67.0	14.1	18.9	100	644
Middle	59.1	10.7	30.2	100	77.1	11.2	11.7	100	648	32.2	12.4	55.4	100	61.3	16.0	22.8	100	665
Fourth	59.8	15.0	25.1	100	82.7	7.2	10.1	100	683	42.1	13.8	44.1	100	68.1	14.0	17.9	100	627
Highest	68.7	9.8	21.5	100	87.6	6.2	6.2	100	650	42.5	14.1	43.4	100	69.4	16.5	14.1	100	662
Total	58.4	12.0	29.6	100	78.6	9.9	11.5	100	3,303	36.8	13.0	50.2	100	66.2	15.3	18.7	100	3,256
Mean health score	64.1	53.0	44.5	57.0	60.8	47.7	39.3	57.0		59.3	51.2	42.8	50.0	54.7	45.5	37.1	50.0	
WHODAS mean score	14.1	25.7	42.7	24.0	17.7	36.6	55.0	24.0		17.7	27.0	44.2	32.2	23.9	38.1	56.9	32.2	

Note: The mean health score is a composite variable based on responses to questions in eight health domains, ranging from 0 (worst health) to 100 (best health). The mean WHODAS score is an estimation of functioning or disability; it is a composite variable based on 12 questions. A score of 0 indicates no disability and 100 the highest level of disability.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



## 7. Morbidity and interventions

Globally, the burden of disease is shifting from infectious diseases to non-communicable diseases. In most countries, the contribution of chronic conditions to the overall burden of disease is increasing, with chronic conditions such as heart disease and stroke now the chief causes of death. Population ageing and changes in the distribution of risk factors have accelerated the incidence of non-communicable diseases.

In India, according to the World Health Survey, about 20% of the population has at least one chronic disease and over 10% have more than one (Patel *et al.*, 2011). This burden is disproportionately felt by the older population: more than half of the burden of non-communicable disease occurs in the 45-plus age group, a figure that will rise to over 45% by 2030. For the year 2004, WHO estimated that depressive disorders and chronic obstructive lung disease were among the top ten causes of disease burden in India. By 2030, depressive disorders, heart disease, chronic obstructive lung disease and road traffic injuries will be the four leading causes of disease burden in India. The contributing factors are many and varied, including global, societal and individual factors.

SAGE gathered evidence on a range of chronic conditions prevalent among older adults which account for a large portion of the burden of non-communicable diseases in this age group. This chapter presents the results for a set of chronic conditions and how well health needs associated with these conditions were met. It also discusses co-morbidities – i.e. the co-occurrence of chronic conditions, injuries, oral health and cataracts – as well as screening for cervical and breast cancer.

### 7.1 Single chronic conditions

SAGE calculated prevalence rates for eight selected chronic conditions: arthritis, stroke, angina pectoris,

diabetes mellitus, asthma, depression, hypertension and chronic lung disease. For each condition, two sets of questions were posed. The first set asked whether the respondent had ever been diagnosed with the disease, i.e. told by a health care professional that they had the given health condition. For those who had been diagnosed with the disease, a second set of questions was asked relating to treatment. For four conditions – angina, arthritis, asthma and depression – respondents were also asked about a set of specific symptoms related to the health condition that, when combined with validated diagnostic algorithms, predicted the given health condition with adequate sensitivity and specificity to improve the prevalence rate estimates.

Those who reported affirmatively for a given chronic condition were asked about current treatments in the last two weeks (medication or other treatment) and chronic ongoing therapy over the last 12 months. Respondents who had taken medication or treatment in the previous two weeks were categorised as currently treated. Those who had taken medication or treatment in the previous 12 months were categorised as on chronic therapy irrespective of their current treatment status. All respondents were asked if during the previous 12 months they had experienced symptoms of the specific chronic condition.

#### 7.1.1 Arthritis

SAGE asked the question, “Have you ever been diagnosed with/told you have arthritis (a disease of the joints, or by another name, osteoarthritis)?” A set of symptomatic questions were also asked, regardless of the answer about being diagnosed. Table 7.1.1 shows the prevalence of arthritis among older and younger respondents by selected background characteristics. The self-reported prevalence of arthritis increased with age, from 3% at age 18–29 to 17% at age 50–59.

**Table 7.1.1** Self-reported and symptom-based prevalence of arthritis and percentage receiving current or chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Arthritis self-reported	Number	Arthritis symptom- based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
18-29	2.6	1,604	4.0	1,604	19.5	71	53.8	71
30-39	7.3	1,655	9.8	1,655	21.2	186	49.2	186
40-49	9.7	1,406	13.8	1,406	24.7	249	49.4	249
<b>Sex</b>								
Male	5.8	1,042	7.1	1,042	24.0	76	51.4	76
Female	7.5	3,623	11.8	3,623	22.0	430	49.0	430
<b>Marital status</b>								
Never married	2.7	556	2.8	556	13.8	14	52.2	14
Currently married	7.0	3,850	10.1	3,850	23.1	447	49.7	447
Widowed	9.7	222	13.4	222	24.9	39	53.8	39
Other <sup>1</sup>	8.1	37	10.9	37	1.9	6	33.6	6
<b>Residence</b>								
Urban	5.3	1,168	7.4	1,168	25.3	90	48.7	90
Rural	7.0	3,497	10.0	3,497	22.1	416	50.2	416
<b>Caste</b>								
Scheduled tribe	8.5	373	9.2	373	36.2	39	65.5	39
Scheduled caste	4.0	893	8.3	893	21.6	87	40.4	87
Other <sup>2</sup>	7.1	3,399	9.7	3,399	21.8	380	50.8	380
<b>Religion</b>								
Hindu	6.5	3,902	9.2	3,902	22.7	419	51.3	419
Muslim	8.2	593	10.4	593	24.9	69	47.0	69
Other <sup>3</sup>	4.6	170	10.4	170	15.7	18	31.4	18
<b>Education</b>								
No formal education	7.3	1,714	12.0	1,714	19.6	230	44.3	230
Less than primary	7.6	430	12.1	430	11.0	53	36.1	53
Primary school	8.1	788	11.0	788	21.5	102	61.7	102
Secondary school	7.9	741	8.6	741	33.7	67	61.5	67
High school	4.0	654	5.5	654	27.2	42	38.5	42
College and above	2.9	338	3.6	338	38.2	12	65.7	12
<b>Wealth quintile</b>								
Lowest	7.1	959	11.7	959	23.1	141	42.1	141
Second	6.5	932	9.9	932	9.2	110	46.6	110
Middle	7.3	934	10.0	934	27.6	102	57.9	102
Fourth	6.9	933	7.7	933	31.4	79	58.8	79
Highest	4.9	907	6.9	907	27.8	74	49.1	74
<b>Total</b>	<b>6.6</b>	<b>4,665</b>	<b>9.4</b>	<b>4,665</b>	<b>22.7</b>	<b>506</b>	<b>49.9</b>	<b>506</b>

Note: Prevalence of arthritis is the proportion of population affected by arthritis at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus							
	Arthritis self-reported	Number	Arthritis symptom- based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
50-59	16.6	2,938	22.7	2,937	29.7	629	53.3	629
60-69	19.2	2,234	24.1	2,234	26.7	548	52.8	548
70-79	21.2	1,057	25.3	1,057	35.1	269	60.1	269
80+	18.4	328	22.7	328	38.4	81	54.8	81
<b>Sex</b>								
Male	15.5	3,303	20.1	3,303	32.3	638	52.6	638
Female	21.0	3,254	27.2	3,253	28.3	889	55.7	889
<b>Marital status</b>								
Never married	5.1	64	14.6	64	6.1	5	6.1	5
Currently married	17.7	4,861	23.1	4,861	30.4	1115	54.4	1115
Widowed	20.7	1,590	25.5	1,589	29.8	399	55.6	399
Other <sup>1</sup>	6.3	42	16.6	42	4.5	8	37.6	8
<b>Residence</b>								
Urban	18.1	1,676	22.4	1,675	33.6	383	57.9	383
Rural	18.3	4,881	24.0	4,881	28.7	1144	53.0	1144
<b>Caste</b>								
Scheduled tribe	15.5	400	21.5	400	22.8	69	41.1	69
Scheduled caste	15.4	1,085	22.1	1,085	18.6	228	41.2	228
Other <sup>2</sup>	19.0	5,072	24.0	5,071	32.7	1230	57.8	1230
<b>Religion</b>								
Hindu	17.9	5,529	23.3	5,529	29.9	1283	53.7	1283
Muslim	20.5	791	24.5	790	32.8	191	64.0	191
Other <sup>3</sup>	18.1	237	26.1	237	23.9	53	35.2	53
<b>Education</b>								
No formal education	19.1	3,363	26.2	3,363	24.3	843	50.2	843
Less than primary	22.4	745	25.7	744	33.5	200	64.2	200
Primary school	17.5	929	21.2	929	32.5	211	53.1	211
Secondary school	12.6	654	17.5	654	26.1	120	50.5	120
High school	17.9	541	20.8	541	56.5	97	66.2	97
College and above	14.7	325	16.4	325	54.0	56	79.4	56
<b>Wealth quintile</b>								
Lowest	18.0	1,312	24.3	1,312	22.8	317	45.1	317
Second	20.9	1,311	27.2	1,311	28.5	316	54.9	316
Middle	16.1	1,312	20.5	1,311	33.2	296	57.7	296
Fourth	19.2	1,310	24.7	1,310	31.0	317	57.3	317
Highest	16.8	1,312	20.4	1,312	38.0	281	59.5	281
<b>Total</b>	<b>18.2</b>	<b>6,557</b>	<b>23.5</b>	<b>6,556</b>	<b>30.0</b>	<b>1527</b>	<b>54.4</b>	<b>1527</b>

Among younger adults, 7% reported being diagnosed with arthritis; the symptom-based prevalence of arthritis was 9%, indicating that some of the respondents who had been diagnosed with arthritis had not experienced any symptoms during the previous 12 months. Although there was a large variation between states in the self-reported prevalence of arthritis (from 2% to 14%), the symptom-based prevalence had a much narrower range (from 7% in Rajasthan to 12% in Karnataka). Among younger respondents, the highest self-reported arthritis prevalence was in Karnataka (14%) along with the highest percentage based on symptom reporting as well (12%). In Maharashtra and West Bengal, 9% of the younger respondents were diagnosed with arthritis. In Rajasthan, only 2% reported being diagnosed with arthritis, but 7% had arthritis based on symptom reporting. The state-level variation in the self-reported prevalence was similar to that observed in older adults.

State	Aged 18-49								Aged 50-plus							
	Arthritis self-reported	Number	Arthritis symptom-based	Currently treated	Number	Chronic therapy	Number	Arthritis self-reported	Number	Arthritis symptom-based	Currently treated	Number	Chronic therapy	Number		
Assam	4.7	517	7.7	4.0	40	38.2	40	13.3	676	16.0	676	18.5	101	65.8	101	
Karnataka	13.8	630	12.3	28.9	82	78.1	82	33.5	923	32.2	923	39.0	295	78.1	295	
Maharashtra	8.6	882	11.3	22.5	104	57.7	104	21.3	1,097	22.8	1,096	34.4	272	59.8	272	
Rajasthan	1.8	846	6.9	9.3	55	16.6	55	6.1	1,377	19.1	1,377	18.4	259	22.8	259	
Uttar Pradesh	3.7	890	7.1	18.3	84	28.1	84	12.0	1,311	20.2	1,311	26.7	264	41.6	264	
West Bengal	9.2	900	11.9	34.1	141	63.4	141	24.8	1,173	29.5	1,173	30.0	336	59.0	336	
India (pooled)	6.6	4,665	9.4	22.7	506	49.9	506	18.2	6,557	23.5	6,556	30.0	1,527	54.4	1,527	

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.



Among older adults who had arthritis, 54% had received treatment in the previous 12 months, while just 30% had received treatment in the previous two weeks. Rates of treatment in previous 12 months was higher in Karnataka than Rajasthan. This fact could contribute to the variability in symptom reporting, as adequately treated arthritis would result in reduced or no symptoms.

Of the young respondents with arthritis, half had received medication or treatment during the previous 12 months (on chronic treatment). By contrast, only 23% had received treatment in the previous two weeks (currently treated). In Karnataka, Maharashtra and West Bengal, 78%, 58% and 63% of respondents had received treatment in the past 12 months, but only 29%, 23% and 34% respectively had received any treatment in the past two weeks.

For each category of age, gender, residence, education and wealth quintile, at least half of those reporting a diagnosis of arthritis were on chronic treatment (over the past 12 months). However, only one-quarter were currently (within the past two weeks) receiving medication or treatment.

## 7.1.2 Stroke

SAGE included the question, “Have you ever been told by a health professional that you have had a stroke?” All respondents were also asked whether they had ever experienced symptoms of stroke. Table 7.1.3 presents the prevalence of stroke by state based on self-reporting of diagnosis. For older adults, the prevalence of self-reported stroke was 2%. Among the six states, the lowest self-reported prevalence was in Assam (1%). The prevalence of self-reported diagnosed stroke among older adults ranged from 1% in Assam to 4% in West Bengal.

Less than 1% of younger respondents reported being diagnosed with stroke.

Slightly more than one-half (51%) of older adults who were diagnosed with stroke had received medical treatment over the past 12 months, while 37% were

**Table 7.1.3 Self-reported prevalence of stroke, percentage receiving current therapy and recent therapy, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Stroke self-reported	Number	Currently treated	Number	Chronic therapy	Number	Stroke self-reported	Number	Currently treated	Number	Chronic therapy	Number
Assam	0.1	517	0.0	2	85.9	2	1.2	677	50.3	10	76.1	10
Karnataka	0.0	630	NA	NA	NA	NA	2.0	923	50.7	15	64.0	15
Maharashtra	0.3	882	73.4	2	100	2	1.5	1,097	63.2	20	67.3	20
Rajasthan	0.6	846	0.0	3	0.0	3	1.7	1,377	66.9	25	74.0	25
Uttar Pradesh	1.7	890	9.3	12	0.7	12	1.6	1,310	19.9	19	38.8	19
West Bengal	0.2	900	0.0	5	19.4	5	3.8	1,173	23.9	58	39.3	58
India (pooled)	0.7	4,665	12.6	24	9.9	24	2.0	6,557	37.3	147	51.0	147

Note: Prevalence of stroke is the proportion of population affected by stroke at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

**Table 7.1.4** Self-reported prevalence of stroke and percentage receiving current and chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					
	Stroke self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
18-29	0.7	1,604	0.8	4	0.0	4
30-39	0.8	1,655	9.3	9	7.0	9
40-49	0.7	1,406	27.3	11	22.6	11
<b>Sex</b>						
Male	0.9	1,042	0.4	7	0.0	7
Female	0.6	3,623	30.5	17	24.6	17
<b>Marital status</b>						
Never married	0.8	554	1.9	2	0.0	2
Currently married	0.8	3,850	14.4	21	10.4	21
Widowed	0.2	222	0.0	1	100.0	1
Other <sup>1</sup>	0.0	37	NA	NA	NA	NA
<b>Residence</b>						
Urban	0.9	1,168	18.3	6	21.1	6
Rural	0.7	3,497	10.1	18	5.3	18
<b>Caste</b>						
Scheduled tribe	0.3	373	0.0	2	0.0	2
Scheduled caste	1.0	893	32.0	6	19.4	6
Other <sup>2</sup>	0.7	3,399	5.3	16	6.6	16
<b>Religion</b>						
Hindu	0.8	3,902	14.2	20	10.3	20
Muslim	0.7	593	0.0	3	4.6	3
Other <sup>3</sup>	0.1	170	0.0	1	100.0	1
<b>Education</b>						
No formal education	0.4	1,714	51.8	6	42.8	6
Less than primary	0.9	430	0.0	5	4.9	5
Primary school	1.7	788	8.6	7	0.5	7
Secondary school	0.8	741	0.0	3	1.6	3
High school	0.6	654	0.0	2	0.0	2
College and above	0.0	338	100	1	0.0	1
<b>Wealth quintile</b>						
Lowest	0.4	959	0.0	4	0.0	4
Second	0.9	932	12.6	7	9.1	7
Middle	0.6	934	0.0	4	11.6	4
Fourth	0.4	933	36.6	2	0.0	2
Highest	1.4	907	15.5	7	15.7	7
<b>Total</b>	<b>0.7</b>	<b>4,665</b>	<b>12.6</b>	<b>24</b>	<b>9.9</b>	<b>24</b>

Note: Prevalence of stroke is the proportion of population affected by stroke at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus					
	Stroke self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
50-59	1.5	2,939	45.5	44	62.8	44
60-69	2.3	2,233	26.2	59	39.3	59
70-79	2.5	1,057	51.5	35	60.3	35
80+	3.5	328	12.8	9	25.7	9
<b>Sex</b>						
Male	2.2	3,302	44.1	90	53.8	90
Female	1.7	3,255	28.0	57	47.2	57
<b>Marital status</b>						
Never married	0.0	64	0.0	NA	NA	NA
Currently married	2.0	4,860	39.6	113	54.5	113
Widowed	2.1	1,591	29.6	34	39.4	34
Other <sup>1</sup>	0.0	42	NA	NA	NA	NA
<b>Residence</b>						
Urban	2.6	1,676	40.0	48	49.7	48
Rural	1.8	4,881	35.6	99	51.8	99
<b>Caste</b>						
Scheduled tribe	2.8	400	0.0	7	5.2	7
Scheduled caste	2.1	1,085	32.2	29	41.6	29
Other <sup>2</sup>	1.9	5,072	42.3	111	57.9	111
<b>Religion</b>						
Hindu	2.1	5,529	36.8	124	50.9	124
Muslim	1.2	791	30.4	16	40.0	16
Other <sup>3</sup>	1.5	237	77.1	7	87.2	7
<b>Education</b>						
No formal education	2.0	3,364	23.5	63	40.1	63
Less than primary	0.7	745	56.6	10	58.3	10
Primary school	2.4	929	30.2	32	46.1	32
Secondary school	2.0	653	78.2	17	78.7	17
High school	2.6	541	52.2	12	58.2	12
College and above	2.4	325	63.1	13	90.4	13
<b>Wealth quintile</b>						
Lowest	1.1	1,311	15.6	17	10.2	17
Second	2.1	1,311	38.0	35	53.8	35
Middle	2.6	1,313	34.4	30	50.4	30
Fourth	1.5	1,310	12.8	28	39.7	28
Highest	2.8	1,312	60.5	37	73.0	37
<b>Total</b>	<b>2.0</b>	<b>6,557</b>	<b>37.3</b>	<b>147</b>	<b>51.0</b>	<b>147</b>

currently in treatment. In Uttar Pradesh and West Bengal, only 39% of older respondents who were diagnosed with stroke had received recent treatment, whereas in the remaining four states, 64-76% of respondents had done so.

The prevalence of stroke by selected respondent characteristics is presented in Table 7.1.4. Self-reported prevalence of stroke diagnosis increased from 1% at age 18-49 to 2% at age 50-59, rising to 4% in the oldest age group.

Among older adults the prevalence of self-reported stroke was somewhat higher among men than women. Urban respondents were more likely to have a stroke diagnosis than rural respondents. Self-reported prevalence varied consistently with education levels or wealth quintile. Meanwhile, the proportion of respondents on chronic or current treatment showed no consistent pattern by age, residence, sex, education or wealth quintile.

### 7.1.3 Angina pectoris

Table 7.1.5 presents the prevalence of angina pectoris based on self-reported diagnosis as well as through symptom reporting (based on the Rose Questionnaire) by state. Among older respondents, the symptom-based prevalence of angina (20%) was almost three times higher than the self-reported prevalence of diagnosis (6%). Comparing states, self-reported prevalence varied from 2% in Assam and Rajasthan to 9% in Karnataka, while the symptom-based prevalence ranged from a low of 15.8% in Karnataka to 33% in Maharashtra.

Among younger adults, more than 2% reported being diagnosed with angina, while almost 10% had a symptom based diagnosis. The variation by state in angina diagnosis ranged from 1% in Rajasthan to 4% in Karnataka. The difference between self-reported diagnosis and symptom-based prevalence was greatest in Maharashtra, where the self-reported prevalence of angina was only around 2%, compared with over 15% for symptom-based diagnosis. In the other states, the symptom based-prevalence of angina ranged from 6% to nearly 10%.

**Table 7.1.5 Self-reported and symptom-based prevalence of angina and percentage receiving current or chronic therapy, states and India (pooled), 2007**

State	Aged 18-49								Aged 50-plus							
	Angina self-reported	Number	Angina symptom-based	Number	Currently treated	Number	Chronic therapy	Number	Angina self-reported	Number	Angina symptom-based	Number	Currently treated	Number	Chronic therapy	Number
Assam	1.7	517	7.5	431	4.3	31	17.7	31	2.3	677	17.9	533	7.7	97	13.4	97
Karnataka	3.9	630	9.8	596	14.9	51	34.9	51	9.4	923	15.8	841	34.3	145	51.9	145
Maharashtra	1.6	882	15.3	671	4.3	122	7.3	122	7.5	1,097	32.8	844	10.1	260	21.5	260
Rajasthan	0.8	846	6.2	760	3.8	51	9.2	51	2.3	1,377	17.1	1,111	11.0	197	12.9	197
Uttar Pradesh	3.0	890	8.8	755	6.8	73	20.3	73	4.9	1,311	16.5	1,064	6.8	180	15.4	180
West Bengal	2.1	900	9.1	761	11.5	78	17.2	78	4.6	1,173	14.6	937	13.8	161	27.4	161
India (pooled)	2.3	4,665	9.8	3,974	7.5	406	16.8	406	5.5	6,558	19.6	5,330	12.4	1040	22.7	1040

Note: Prevalence of angina is the proportion of population affected by angina at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

**Table 7.1.6** Self-reported and symptom-based prevalence of angina and percentage receiving current or chronic therapy, by background characteristics of the respondents, India (pooled), 2007

Background characteristics	Aged 18-49							
	Angina self-reported	Number	Angina symptom-based	Number	Currently treated	Number	Chronic therapy*	Number
<b>Age group</b>								
18-29	0.5	1,604	5.9	1,403	0.7	68	5.5	68
30-39	3.6	1,655	10.4	1,409	6.8	167	22.9	167
40-49	2.8	1,406	13.1	1,162	11.0	171	16.9	171
<b>Sex</b>								
Male	2.1	1,042	8.2	938	6.7	76	14.8	76
Female	2.5	3,623	11.5	3,036	8.0	330	18.3	330
<b>Marital status</b>								
Never married	0.5	556	3.1	491	9.0	9	9.0	9
Currently married	2.5	3,850	10.6	3,273	6.9	368	16.7	368
Widowed	3.8	222	10.7	180	20.1	22	33.9	22
Other <sup>1</sup>	2.0	37	35.1	30	6.9	7	6.9	7
<b>Residence</b>								
Urban	2.5	1,168	8.5	969	11.7	70	26.9	70
Rural	2.3	3,497	10.2	3,005	6.3	336	14.0	336
<b>Caste</b>								
Scheduled tribe	1.4	373	7.4	321	7.3	32	8.4	32
Scheduled caste	2.7	893	11.9	773	10.0	88	19.5	88
Other <sup>2</sup>	2.3	3,399	9.5	2,880	6.6	286	16.4	286
<b>Religion</b>								
Hindu	2.4	3,902	9.7	3,334	7.2	324	16.6	324
Muslim	1.9	593	9.3	492	7.4	61	17.2	61
Other <sup>3</sup>	3.0	170	13.8	148	12.1	21	18.7	21
<b>Education</b>								
No formal education	2.3	1,714	13.7	1,449	6.5	199	14.2	199
Less than primary	2.0	430	10.4	348	1.5	42	16.8	42
Primary school	1.7	788	9.2	673	4.7	72	12.2	72
Secondary school	3.8	741	9.1	622	6.0	54	16.2	54
High school	2.4	654	6.2	580	26.8	30	36.8	30
College and above	0.7	338	5.8	302	0.0	9	13.5	9
<b>Wealth quintile</b>								
Lowest	2.7	959	12.9	817	5.1	112	11.9	112
Second	2.6	932	11.9	788	3.2	97	14.7	97
Middle	2.6	934	9.8	791	11.0	81	16.0	81
Fourth	2.4	933	9.1	792	12.9	71	27.9	71
Highest	1.1	907	4.5	786	9.8	45	20.5	45
<b>Total</b>	<b>2.3</b>	<b>4,665</b>	<b>9.8</b>	<b>3,974</b>	<b>7.5</b>	<b>406</b>	<b>16.8</b>	<b>406</b>

Note: Prevalence of angina is the proportion of population affected by angina at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

\* Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 7.1.6

Continued

Background characteristics	Aged 50-plus							
	Angina self-reported	Number	Angina symptom-based	Number	Currently treated	Number	Chronic therapy*	Number
<b>Age group</b>								
50-59	5.0	2,939	16.1	2,396	12.3	388	20.2	388
60-69	4.9	2,234	21.3	1,814	10.7	372	19.2	372
70-79	8.6	1,057	26.3	861	16.0	227	33.6	227
80+	4.9	328	22.3	259	8.0	53	20.2	53
<b>Sex</b>								
Male	6.9	3,303	16.1	2,720	19.3	455	33.1	455
Female	4.2	3,255	23.3	2,610	7.2	585	14.9	585
<b>Marital status</b>								
Never married	1.7	64	9.8	52	0.0	8	0.0	8
Currently married	5.9	4,861	18.6	3,954	14.4	743	24.5	743
Widowed	4.4	1,591	23.2	1,288	6.8	280	18.0	280
Other <sup>1</sup>	5.3	42	21.2	36	12.2	9	23.5	9
<b>Residence</b>								
Urban	8.0	1,896	19.5	1,383	16.1	255	29.5	255
Rural	4.5	4,662	19.6	3,947	10.8	785	19.9	785
<b>Caste</b>								
Scheduled tribe	3.1	400	24.6	319	3.7	63	13.2	63
Scheduled caste	3.6	1,085	16.3	894	11.9	161	15.1	161
Other <sup>2</sup>	6.1	5,073	20.0	4,117	13.2	816	24.9	816
<b>Religion</b>								
Hindu	5.4	5,530	18.8	4,517	13.3	854	22.8	854
Muslim	4.9	791	22.2	626	7.5	155	22.0	155
Other <sup>3</sup>	11.8	237	30.4	187	9.3	31	24.6	31
<b>Education</b>								
No formal education	4.0	3,364	22.3	2,707	7.1	599	15.3	599
Less than primary	9.2	745	22.7	601	12.8	135	37.8	135
Primary school	6.0	929	19.6	723	15.3	136	32.2	136
Secondary school	7.0	654	17.7	550	19.0	89	24.3	89
High school	5.7	541	11.5	463	31.2	50	27.7	50
College and above	9.3	325	6.5	286	60.3	31	60.5	31
<b>Wealth quintile</b>								
Lowest	4.0	1,312	24.4	1,059	6.2	254	16.0	254
Second	4.3	1,311	19.0	1,050	5.4	196	18.6	196
Middle	6.1	1,313	23.0	1,065	10.5	220	22.1	220
Fourth	5.7	1,310	16.3	1,070	24.9	200	33.2	200
Highest	8.1	1,312	14.4	1,086	23.7	170	31.3	170
<b>Total</b>	<b>5.5</b>	<b>6,558</b>	<b>19.6</b>	<b>5,330</b>	<b>12.4</b>	<b>1040</b>	<b>22.7</b>	<b>1040</b>

Note: Prevalence of angina is the proportion of population affected by angina at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

\* Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Among both younger and older adults, in five of the six states, the proportion of those who were receiving current treatment for angina was comparatively low, ranging from 4.3% to 11.5% among younger adults, and from 6.8 to 13.8% among older adults. Figures for chronic therapy were only somewhat better, ranging from 7.3% to 20.3% for younger adults and 13.4% to 27.4% for older adults. The sharp outlier was Karnataka, where 14.9% of younger adults and 34.3% of older were receiving current therapy, and 34.9% of younger adults and 51.9% of older had been treated in the last year.

Table 7.1.6 presents the prevalence of angina by selected background characteristics. Among older respondents, the self-reported prevalence was higher among men (7%) than women (4%), but the symptom-based prevalence was higher among women (23%) than men (16%). The self-reported prevalence was higher in urban areas (8%) than rural areas (5%), but the symptom-based prevalence was same in both rural areas and urban areas (almost 20%).

The self-reported prevalence of angina increased with age, from 1% at age 18-29 to 9% among respondents aged 70-79. Likewise, the symptom-based prevalence increased consistently with age, from 6% at age 18-29 to 26% at age 70-79. Following the pattern for most of the chronic diseases, the prevalence of angina showed a marginal decline in the oldest age group of 80 and above.

The symptom-based prevalence of angina showed a negative relationship with education levels. Neither self-reported nor symptom-based prevalence of angina showed any relationship with wealth quintile.

Only a fifth of persons diagnosed with angina had received medication or treatment in the past 12 months. However, fewer than 15% were currently receiving treatment, and this pattern was common across age, sex, residence, education and wealth quintile.

## 7.1.4 Diabetes mellitus

Unlike the previous chronic conditions, the prevalence of diabetes was based only on self-reported diagnosis and was not based on symptom reporting. Table 7.1.7 presents the self-reported prevalence of diabetes by states. The prevalence of diabetes among older adults was 7% at the national level. Across states, the prevalence among older adults ranged from 4% in Rajasthan to 13% in Karnataka. In this age group, almost three-quarters of those who reported being diagnosed with

**Table 7.1.7 Self-reported prevalence of diabetes and percentage receiving current or chronic therapy, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Diabetes self-reported	Number	Currently treated	Number	Chronic therapy	Number	Diabetes self-reported	Number	Currently treated	Number	Chronic therapy	Number
Assam	0.7	517	56.0	6	53.0	6	4.4	677	33.3	38	55.8	38
Karnataka	1.6	630	42.5	8	93.3	8	13.3	923	66.7	123	77.0	123
Maharashtra	1.4	882	64.6	14	64.1	14	9.3	1,097	54.8	136	75.9	136
Rajasthan	1.1	846	53.4	7	53.4	7	4.0	1,377	78.2	46	82.3	46
Uttar Pradesh	2.7	890	60.2	16	71.3	16	4.4	1,311	29.0	57	56.4	57
West Bengal	2.4	900	35.7	21	63.1	21	6.9	1,173	32.5	78	71.9	78
India (pooled)	1.9	4,665	53.4	72	68.9	72	6.9	6,558	49.2	478	71.2	478

Note: Prevalence of diabetes is the proportion of population affected by diabetes at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.



**Table 7.1.8** Self-reported prevalence of diabetes, percentage receiving current therapy and recent therapy according to selected background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					
	Diabetes self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
18-29	0.7	1,604	67.2	9	82.2	9
30-39	0.8	1,655	53.8	20	31.2	20
40-49	4.2	1,406	51.1	43	73.3	43
<b>Sex</b>						
Male	2.9	1,042	51.0	27	70.2	27
Female	1.0	3,623	61.0	45	64.8	45
<b>Marital status</b>						
Never married	1.6	556	80.5	5	98.9	5
Currently married	2.0	3,850	49.8	64	65.2	64
Widowed	0.9	222	80.8	3	84.0	3
Other <sup>1</sup>	0.0	37	NA	NA	NA	NA
<b>Residence</b>						
Urban	1.8	1,168	83.0	20	83.8	20
Rural	2.0	3,497	44.7	52	64.5	52
<b>Caste</b>						
Scheduled tribe	1.8	373	9.2	4	89.5	4
Scheduled caste	0.8	893	67.7	5	100.0	5
Other <sup>2</sup>	2.3	3,399	55.3	63	64.3	63
<b>Religion</b>						
Hindu	1.8	3,902	56.7	52	68.7	52
Muslim	3.0	593	47.5	17	78.6	17
Other <sup>3</sup>	1.5	170	0.0	3	4.5	3
<b>Education</b>						
No formal education	1.5	1,714	47.7	22	76.0	22
Less than primary	1.0	430	26.6	7	54.5	7
Primary school	2.0	788	31.4	16	66.5	16
Secondary school	2.2	741	62.3	11	97.7	11
High school	2.6	654	50.8	11	38.9	11
College and above	2.4	338	98.1	5	71.2	5
<b>Wealth quintile</b>						
Lowest	1.5	959	67.4	11	66.1	11
Second	0.7	932	42.7	10	92.3	10
Middle	2.9	934	29.2	19	62.1	19
Fourth	2.9	933	67.6	20	59.1	20
Highest	1.9	907	66.2	12	86.7	12
<b>Total</b>	<b>1.9</b>	<b>4,665</b>	<b>53.4</b>	<b>72</b>	<b>68.9</b>	<b>72</b>

Note: Prevalence of diabetes is the proportion of population affected by diabetes at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## Continued

Background characteristics	Aged 50-plus					
	Diabetes self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
50-59	7.3	2,939	47.5	192	66.7	192
60-69	6.1	2,234	55.4	168	72.9	168
70-79	8.0	1,057	50.2	96	82.3	96
80+	5.0	328	18.0	22	64.2	22
<b>Sex</b>						
Male	8.2	3,303	49.8	261	68.0	261
Female	5.6	3,255	48.3	217	76.0	217
<b>Marital status</b>						
Never married	0.5	64	18.3	3	38.4	3
Currently married	7.3	4,861	49.6	357	70.9	357
Widowed	6.0	1,591	47.1	117	72.4	117
Other <sup>1</sup>	2.1	42	100.0	1	100.0	1
<b>Residence</b>						
Urban	11.6	1,676	54.0	242	72.9	242
Rural	5.0	4,882	44.7	236	69.5	236
<b>Caste</b>						
Scheduled tribe	3.3	400	63.4	11	97.7	11
Scheduled caste	2.0	1,085	31.7	36	74.5	36
Other <sup>2</sup>	8.2	5,073	49.7	431	70.3	431
<b>Religion</b>						
Hindu	6.9	5,530	51.4	400	72.1	400
Muslim	7.4	791	33.4	54	65.6	54
Other <sup>3</sup>	5.4	237	58.1	24	68.3	24
<b>Education</b>						
No formal education	4.2	3,364	39.6	141	70.0	141
Less than primary	5.3	745	42.2	49	67.7	49
Primary school	6.8	929	55.8	88	79.4	88
Secondary school	10.6	654	24.3	63	57.0	63
High school	14.0	541	74.0	63	80.3	63
College and above	18.9	325	18.4	35	48.8	35
<b>Wealth quintile</b>						
Lowest	2.5	1,312	18.4	35	48.8	35
Second	5.4	1,311	26.2	48	60.3	48
Middle	5.6	1,313	56.7	99	71.6	99
Fourth	8.7	1,310	64.7	126	80.5	126
Highest	13.3	1,312	53.5	170	75.1	170
<b>Total</b>	<b>6.9</b>	<b>6,558</b>	<b>49.2</b>	<b>478</b>	<b>71.2</b>	<b>478</b>

diabetes had received treatment over the past 12 months, and 50% were currently receiving treatment. Almost 2% of younger respondents said they had been diagnosed with diabetes. Across the six states, the prevalence ranged from less than 1% in Assam to 3% in Uttar Pradesh for younger adults.

Table 7.1.8 presents the self-reported prevalence of diabetes by selected background characteristics. Although the prevalence of diabetes among older adults was much higher than for younger adults, within the 50-plus age group it did not increase appreciably with age. Among older adults, diabetes was more prevalent among men (8%) than women (6%) and in urban areas (12%) compared with rural areas (5%). In this older age group, the prevalence of diabetes increased with education levels and wealth quintile; for example, the prevalence increased from 3% in the lowest wealth quintile to 13% for older adults in the highest quintile. Similarly, it increased from 4% among those with no formal education to 19% for those with college and above education. The proportion of older respondents who had received treatment in the previous 12 months increased with education level and wealth quintile.

### 7.1.5 Asthma

Table 7.1.9 presents the prevalence of asthma, based on self-reporting of diagnosis as well as symptom reporting, by state. At a national level, the prevalence of asthma among older adults, self-reported and symptom-based, was 7.2% and 11%, respectively. Among older respondents the self-reported prevalence was highest, 9%, in Maharashtra. In each state, the self-reported prevalence was lower than the symptom-based prevalence by 1-4%.

Nearly half (45.9%) of older respondents who were diagnosed with asthma had received treatment within the previous 12 months, with proportions ranging from 37% in Maharashtra to 54% in Karnataka. However, a smaller proportion of older respondents (32%) were currently receiving treatment.

The self-reported prevalence of asthma among younger respondents in different states varied by a narrow range of 2-3%. In each state, the symptom-based prevalence was higher than self-reported prevalence by 1-3%. A third (33.4%) of younger respondents reporting a diagnosis of asthma had received treatment in the previous 12 months; only 20% were currently receiving treatment, however.

**Table 7.1.9 Self-reported and symptom-based prevalence of asthma and percentage receiving current or chronic therapy, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Asthma self-reported	Number	Asthma symptom-based	Number	Currently treated	Number	Asthma self-reported	Number	Asthma symptom-based	Number	Currently treated	Number
Assam	2.2	517	3.4	517	19.5	15	5.9	677	8.4	677	21.1	58
Karnataka	3.1	630	4.4	630	47.5	23	5.6	923	9.7	923	32.4	117
Maharashtra	1.9	882	5.2	882	12.3	44	8.8	1,097	12.4	1,095	28.7	131
Rajasthan	2.7	846	4.7	846	26.5	28	6.7	1,377	11.3	1,377	30.7	155
Uttar Pradesh	2.3	890	3.9	890	17.6	28	8.1	1,311	11.8	1,311	32.7	162
West Bengal	2.4	900	3.3	900	3.2	35	5.6	1,173	8.9	1,173	39.0	114
India (pooled)	2.4	4,665	4.2	4,665	19.5	173	7.2	6,558	11.0	6,556	32.0	737

Note: Prevalence of asthma is the proportion of the population affected by asthma at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

**Table 7.1.10** Self-reported and symptom-based prevalence of asthma and percentage receiving current or chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Asthma self-reported	Number	Asthma symptom-based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
18-29	1.2	1,604	1.7	1,604	22.6	21	61.9	21
30-39	1.9	1,655	3.7	1,655	15.2	65	26.7	65
40-49	3.9	1,406	7.0	1,406	20.8	87	30.6	87
<b>Sex</b>								
Male	2.6	1,042	4.9	1,042	14.5	56	26.6	56
Female	2.1	3,623	3.4	3,623	26.7	117	43.4	117
<b>Marital status</b>								
Never married	1.9	556	1.9	556	41.8	4	83.6	4
Currently married	2.6	3,850	4.7	3,850	18.1	164	30.6	164
Widowed	0.2	222	1.4	222	15.6	5	15.6	5
Other <sup>1</sup>	0.0	37	0.0	37	NA	NA	NA	NA
<b>Residence</b>								
Urban	2.6	1,168	3.3	1,168	43.3	35	58.6	35
Rural	2.3	3,497	4.5	3,497	13.8	138	27.5	138
<b>Caste</b>								
Scheduled tribe	0.9	373	1.6	373	28.4	9	57.2	9
Scheduled caste	2.0	893	4.1	893	10.8	39	18.8	39
Other <sup>2</sup>	2.6	3,399	4.4	3,399	21.3	125	36.3	125
<b>Religion</b>								
Hindu	2.2	3,902	4.2	3,902	17.8	139	30.6	139
Muslim	3.7	593	4.7	593	32.5	30	50.8	30
Other <sup>3</sup>	2.1	170	2.8	170	0.0	4	31.8	4
<b>Education</b>								
No formal education	2.6	1,714	4.6	1,714	19.0	79	39.0	79
Less than primary	2.7	430	5.0	430	30.9	16	31.9	16
Primary school	1.4	788	3.8	788	10.6	38	27.0	38
Secondary school	1.7	741	3.0	741	6.5	18	17.7	18
High school	2.9	654	5.7	654	22.6	19	26.2	19
College and above	3.2	338	2.4	338	42.0	3	84.1	3
<b>Wealth quintile</b>								
Lowest	2.6	959	4.7	959	12.4	54	31.0	54
Second	1.9	932	4.2	932	12.0	36	20.7	36
Middle	1.8	934	4.3	934	22.7	28	29.9	28
Fourth	2.1	933	3.7	933	37.6	25	44.6	25
Highest	3.6	907	4.0	907	18.6	30	46.2	30
<b>Total</b>	<b>2.4</b>	<b>4,665</b>	<b>4.2</b>	<b>4,665</b>	<b>19.4</b>	<b>173</b>	<b>33.4</b>	<b>173</b>

Note: Prevalence of asthma is the proportion of the population affected by asthma at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 7.1.10

Continued

Background characteristics	Aged 50-plus							
	Asthma self-reported	Number	Asthma symptom-based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
50-59	5.3	2,939	8.6	2,938	25.0	251	39.4	251
60-69	8.5	2,234	12.6	2,234	33.4	266	48.6	266
70-79	10.5	1,057	14.4	1,056	43.3	172	51.5	172
80+	7.8	328	12.7	328	26.8	48	52.8	48
<b>Sex</b>								
Male	9.0	3,303	13.1	3,301	33.2	432	48.7	432
Female	5.4	3,255	8.7	3,255	29.9	305	41.6	305
<b>Marital status</b>								
Never married	5.6	64	27.7	64	17.2	14	20.3	14
Currently married	6.9	4,861	10.4	4,859	29.9	519	44.7	519
Widowed	8.2	1,591	12.2	1,591	39.3	198	50.8	198
Other <sup>1</sup>	13.9	42	13.6	42	27.2	6	69.7	6
<b>Residence</b>								
Urban	8.2	1,676	9.0	1,676	39.9	159	54.5	159
Rural	6.8	4,882	11.8	4,880	29.5	578	43.2	578
<b>Caste</b>								
Scheduled tribe	5.6	400	11.3	400	29.9	56	43.3	56
Scheduled caste	8.7	1,085	11.7	1,085	30.6	125	48.9	125
Other <sup>2</sup>	7.0	5,073	10.8	5,071	32.4	556	45.4	556
<b>Religion</b>								
Hindu	7.2	5,530	11.0	5,528	31.5	617	44.8	617
Muslim	7.7	791	11.4	791	38.4	103	58.3	103
Other <sup>3</sup>	6.3	237	9.3	237	17.2	17	21.9	17
<b>Education</b>								
No formal education	6.9	3,364	11.8	3,364	29.2	407	44.3	407
Less than primary	8.7	745	12.4	744	41.1	99	58.0	99
Primary school	8.0	929	12.7	929	30.5	112	40.5	112
Secondary school	6.9	654	9.5	654	43.7	64	57.7	64
High school	8.4	541	7.0	541	22.7	40	25.9	40
College and above	3.9	325	4.6	324	42.2	15	69.9	15
<b>Wealth quintile</b>								
Lowest	9.6	1,312	14.5	1,311	28.3	193	44.2	193
Second	7.3	1,311	12.6	1,310	26.9	180	33.5	180
Middle	6.9	1,313	10.0	1,313	40.1	135	59.5	135
Fourth	6.4	1,310	9.8	1,310	35.0	127	52.2	127
Highest	5.5	1,312	7.0	1,312	35.1	102	47.0	102
<b>Total</b>	<b>7.2</b>	<b>6,558</b>	<b>11.0</b>	<b>6,556</b>	<b>32.0</b>	<b>737</b>	<b>45.9</b>	<b>737</b>

Note: Prevalence of asthma is the proportion of the population affected by asthma at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

The self-reported and symptom-based prevalence of asthma by selected background characteristics are presented in Table 7.1.10. Both the self-reported and symptom-based prevalence of asthma increased with age. The prevalence of self-reported asthma increased from 1% in the 18-29 age group to 11% in the 70-79 age group, then declined to 8% among the oldest adults aged 80-plus.

Among older respondents, the prevalence of asthma was higher among men than among women: one in seven men reported having symptoms of asthma, compared with one in 11 women. The prevalence of self-reported asthma diagnosis was slightly higher in urban (8%) than rural areas (7%); however the percentage of those experiencing symptoms was higher in rural (12%) than urban areas (9%). The symptom-based prevalence decreased with educational level and wealth quintile; however, the self-reported prevalence bore a negative relationship with wealth quintile only.

### 7.1.6 Depression

Respondents were asked whether they had ever been diagnosed with depression, and whether they had experienced symptoms of depression in the past 12 months. The diagnosis of depression derived from the reporting of symptoms was based on the International Classification of Diseases, 10<sup>th</sup> Edition, Diagnostic Criteria for Research (ICD-10-DCR).

The self-reported and symptom-based prevalence of depression is presented by state in table 7.1.11. The survey found a self-reported prevalence of depression of 3% among younger adults and 4% among those aged 50-plus. In both age groups, the symptom-based prevalence was much higher than the self-reported prevalence: among younger and older adults, 9% and 19% respectively met the criteria for a diagnosis of depression. By state, for older respondents, Karnataka had the highest (14%) prevalence of self-reported depression and Rajasthan (1%) the lowest. However, in terms of symptom-based prevalence among older respondents, Uttar Pradesh (31%) and Karnataka (27%) strongly outstripped other states. The self-reported prevalence of depression among younger adults aged 18-49 ranged from 0.4% in Rajasthan to 14% in Karnataka. The symptom-based prevalence was also highest in Karnataka (16%). In Uttar Pradesh, only 1% of respondents were diagnosed with depression; however, 13% met the diagnostic criteria based on symptom reporting.

**Table 7.1.11 Self-reported and symptom-based prevalence of depression and percentage receiving current or chronic therapy, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Depression self-reported	Number	Depression symptom-based	Number	Currently treated	Number	Depression self-reported	Number	Depression symptom-based	Number	Currently treated	Number
Assam	4.2	517	3.3	516	20.5	13	6.4	677	6.4	677	24.2	40
Karnataka	13.9	630	15.8	630	5.7	110	14.0	923	26.9	923	4.4	266
Maharashtra	2.4	882	5.8	882	3.9	54	4.4	1,097	9.2	1,097	9.3	85
Rajasthan	0.4	846	6.8	846	0.0	56	1.2	1,377	17.7	1,377	4.2	245
Uttar Pradesh	1.1	890	12.7	889	4.6	119	1.8	1,311	30.9	1,311	2.4	386
West Bengal	2.4	900	7.1	899	3.7	77	2.3	1,173	9.1	1,172	6.7	120
India (pooled)	3.2	4,665	9.4	4,662	4.5	429	4.1	6,558	19.3	6,557	4.3	1,142

Note: Prevalence of depression is the proportion of population affected by depression at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

**Table 7.1.12** Self-reported and symptom-based prevalence of depression and percentage receiving current and chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Depression self-reported	Number	Depression symptom-based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
18-29	1.3	1,604	4.8	1,603	3.6	72	7.0	72
30-39	3.7	1,655	9.9	1,654	5.5	166	8.9	166
40-49	4.5	1,406	13.2	1,405	4.1	191	7.7	191
<b>Sex</b>								
Male	4.4	1,042	8.0	1,042	3.5	76	8.2	76
Female	2.0	3,623	10.9	3,620	5.3	353	7.9	353
<b>Marital status</b>								
Never married	1.4	556	4.5	555	0.0	16	15.3	16
Currently married	3.3	3,850	9.3	3,848	4.9	355	7.7	355
Widowed	7.6	222	24.8	222	4.7	49	7.2	49
Other <sup>1</sup>	1.8	37	36.2	37	3.0	9	3.0	9
<b>Residence</b>								
Urban	3.1	1,168	9.4	1,168	2.5	91	4.3	91
Rural	3.2	3,497	9.4	3,494	5.2	338	9.2	338
<b>Caste</b>								
Scheduled tribe	4.3	373	4.0	373	5.5	22	9.7	22
Scheduled caste	2.3	893	9.0	893	6.8	77	10.0	77
Other <sup>2</sup>	3.3	3,399	10.0	3,396	3.9	330	7.5	330
<b>Religion</b>								
Hindu	3.3	3,902	9.0	3,901	5.3	343	8.1	343
Muslim	2.8	593	13.8	592	0.5	75	7.3	75
Other <sup>3</sup>	1.2	170	4.3	169	10.6	11	10.6	11
<b>Education</b>								
No formal education	2.4	1,714	12.2	1,712	2.9	202	4.5	202
Less than primary	4.3	430	9.1	430	6.4	44	10.0	44
Primary school	3.3	788	8.8	788	10.0	76	11.3	76
Secondary school	2.7	741	10.0	741	2.9	55	13.8	55
High school	3.5	654	7.1	655	4.6	36	4.6	36
College and above	4.9	338	4.9	338	2.7	16	9.8	16
<b>Wealth quintile</b>								
Lowest	2.1	959	10.7	958	6.3	112	10.9	112
Second	2.6	932	10.2	930	2.2	86	2.2	86
Middle	3.9	934	9.8	934	4.5	86	6.3	86
Fourth	5.2	933	10.1	933	4.4	78	10.1	78
Highest	2.5	907	6.0	907	5.6	67	13.2	67
<b>Total</b>	<b>3.2</b>	<b>4,665</b>	<b>9.4</b>	<b>4,662</b>	<b>4.5</b>	<b>429</b>	<b>8.0</b>	<b>429</b>

Note: Prevalence of depression is the proportion of population affected by depression at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



## Continued

Background characteristics	Aged 50-plus							
	Depression self-reported	Number	Depression symptom-based	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
50-59	4.0	2,939	17.3	2,939	4.4	428	6.8	428
60-69	4.2	2,234	19.8	2,233	2.1	400	3.6	400
70-79	4.4	1,057	22.3	1,057	7.6	239	8.8	239
80+	3.3	328	26.4	328	5.3	75	5.3	75
<b>Sex</b>								
Male	4.2	3,303	17.7	3,302	4.5	516	6.0	516
Female	4.0	3,253	21.0	3,255	4.2	626	6.0	626
<b>Marital status</b>								
Never married	4.3	64	15.0	63	0.0	11	0.0	11
Currently married	4.1	4,861	18.4	4,861	4.1	795	5.9	795
Widowed	4.1	1,591	22.4	1,591	5.3	331	6.7	331
Other <sup>1</sup>	0.0	42	23.0	42	NA	5	0.0	5
<b>Residence</b>								
Urban	3.4	1,676	18.4	1,675	2.7	225	4.0	225
Rural	4.4	4,882	19.6	4,882	4.9	917	6.8	917
<b>Caste</b>								
Scheduled tribe	4.6	400	9.9	400	1.4	50	2.8	50
Scheduled caste	3.4	1,085	20.2	1,085	3.1	196	3.3	196
Other <sup>2</sup>	4.2	5,073	19.7	5,072	4.7	896	6.7	896
<b>Religion</b>								
Hindu	4.1	5,530	18.8	5,529	4.1	950	5.9	950
Muslim	3.5	791	21.9	791	5.1	163	6.7	163
Other <sup>3</sup>	6.1	237	21.4	237	6.5	29	7.5	29
<b>Education</b>								
No formal education	4.2	3,364	22.5	3,364	3.3	719	4.5	719
Less than primary	4.3	745	20.1	745	3.9	147	8.7	147
Primary school	5.0	929	16.0	928	7.0	118	7.3	118
Secondary school	4.0	654	14.0	654	11.7	71	13.9	71
High school	3.9	541	16.4	541	3.1	62	4.8	62
College and above	2.3	325	10.0	325	0.1	25	5.3	25
<b>Wealth quintile</b>								
Lowest	4.2	1,312	22.2	1,312	2.7	290	3.4	290
Second	4.6	1,311	25.1	1,311	6.0	298	7.2	298
Middle	3.3	1,313	18.1	1,313	2.8	226	4.9	226
Fourth	4.7	1,310	17.0	1,309	6.2	193	9.9	193
Highest	3.6	1,312	12.7	1,312	3.4	135	5.6	135
<b>Total</b>	<b>4.1</b>	<b>6,558</b>	<b>19.3</b>	<b>6,557</b>	<b>4.3</b>	<b>1142</b>	<b>6.0</b>	<b>1142</b>



**Table 7.1.14** Prevalence of self-reported hypertension and prevalence based on measurement of blood pressure and percentage receiving current and chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Hypertension self-reported	Number	Hypertension measured	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
18-29	2.8	1,603	11.2	1,583	2.8	50	9.5	50
30-39	5.9	1,655	19.7	1,636	4.5	112	13.7	112
40-49	11.7	1,406	26.1	1,395	16.2	186	30.3	186
<b>Sex</b>								
Male	5.2	1,042	19.2	1,032	8.0	53	15.3	53
Female	8.7	3,622	19.3	3,582	11.5	295	26.3	295
<b>Marital status</b>								
Never married	2.3	555	12	549	1.7	11	8.2	11
Currently married	7.4	3,850	20.2	3,809	10.4	304	21.3	304
Widowed	12.3	222	19.6	219	12.4	30	35.9	30
Other <sup>1</sup>	2.4	37	33.1	37	0.0	3	5.2	3
<b>Residence</b>								
Urban	8.3	1,168	23.3	1,148	12.7	109	22.6	109
Rural	6.5	3,496	17.9	3,466	8.5	239	19.9	239
<b>Caste</b>								
Scheduled tribe	6.7	373	24.1	369	8.3	23	11.5	23
Scheduled caste	4.5	893	18.5	886	4.0	55	16.8	55
Other <sup>2</sup>	7.6	3,398	19.0	3,359	11.4	270	22.9	270
<b>Religion</b>								
Hindu	6.8	3,902	19.1	3,856	9.4	276	20.1	276
Muslim	8.3	592	18.8	589	12.2	59	26.5	59
Other <sup>3</sup>	4.7	170	22.7	169	8.0	13	15.6	13
<b>Education</b>								
No formal education	7.1	1,714	20.3	1,693	8.9	127	18.6	127
Less than primary	5.3	430	17.2	427	8.6	32	22.0	32
Primary school	6.0	788	21.9	783	5.8	60	15.3	60
Secondary school	6.4	741	15.6	734	15.7	52	25	52
High school	8.4	653	17.5	649	8.4	50	28.7	50
College and above	7.9	338	22.3	328	14.2	27	19.4	27
<b>Wealth quintile</b>								
Lowest	4.5	959	17.8	951	5.0	54	11.7	54
Second	5.3	931	17.6	922	7.7	52	15.9	52
Middle	7.8	934	19.5	926	12.4	67	24.9	67
Fourth	7.3	933	19.6	923	11.8	78	19.7	78
Highest	10.2	907	22.2	892	11.7	97	30.6	97
<b>Total</b>	<b>6.9</b>	<b>4,664</b>	<b>19.2</b>	<b>4,614</b>	<b>9.7</b>	<b>348</b>	<b>20.7</b>	<b>348</b>

Note: Hypertension: systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mm Hg.

Prevalence of hypertension is the proportion of population affected by hypertension at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 7.1.14

Continued

Background characteristics	Aged 50-plus							
	Hypertension self-reported	Number	Hypertension measured	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>								
50-59	15.7	2,938	32.6	2,905	20.5	995	32.7	995
60-69	16.2	2,234	36.2	2,201	20.4	839	35.4	839
70-79	22.6	1,057	41.3	1,048	33.4	448	46.2	448
80+	15.6	328	42.0	318	23.0	153	31.6	153
<b>Sex</b>								
Male	14.0	3,303	32.3	3,263	22.4	1154	32.3	1154
Female	20.1	3,254	39.0	3,209	23.6	1281	39.1	1281
<b>Marital status</b>								
Never married	10.8	64	37.3	62	7.3	27	10.1	27
Currently married	16.4	4,861	34.2	4,799	22.6	1 719	35.6	1 719
Widowed	19.3	1,590	40.5	1,569	24.6	675	37.5	675
Other <sup>1</sup>	13.2	42	27.8	42	29.3	14	45.4	14
<b>Residence</b>								
Urban	24.7	1,676	40.3	1,645	33.7	758	47.2	758
Rural	13.8	4,881	33.6	4,827	18.0	1677	30.6	1677
<b>Caste</b>								
Scheduled tribe	11.8	400	34.0	395	5.5	155	22.5	155
Scheduled caste	11.3	1,085	30.9	1,074	15.1	344	27.2	344
Other <sup>2</sup>	18.5	5,072	36.6	5,003	25.6	1936	38.4	1936
<b>Religion</b>								
Hindu	16.8	5,530	35.6	5,460	22.7	2041	35.2	2041
Muslim	18.2	790	33.9	779	22.7	286	42.6	286
Other <sup>3</sup>	17.4	237	39.6	233	32.0	108	32.7	108
<b>Education</b>								
No formal education	14.6	3,363	34.5	3,312	17.0	1204	30.3	1204
Less than primary	14.8	745	35.6	740	20.2	281	29.7	281
Primary school	15.2	929	36.0	917	24.2	335	35.2	335
Secondary school	20.8	654	35.2	650	26.0	247	45.6	247
High school	25.3	541	36.7	534	36.1	222	48.3	222
College and above	28.4	325	43.5	319	48.9	146	59.7	146
<b>Wealth quintile</b>								
Lowest	7.6	1,311	28.2	1,292	8.1	413	19.3	413
Second	15.4	1,311	34.9	1,295	17.2	453	29.3	453
Middle	16.7	1,313	35.5	1,292	17.5	494	32.3	494
Fourth	18.5	1,310	34.1	1,295	28.1	500	41.0	500
Highest	28.3	1,312	46.0	1,298	39.0	575	52.5	575
<b>Total</b>	<b>17.0</b>	<b>6,557</b>	<b>35.5</b>	<b>6,472</b>	<b>23.0</b>	<b>2435</b>	<b>36.0</b>	<b>2435</b>

Note: Hypertension: systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mm Hg.

Prevalence of hypertension is the proportion of population affected by hypertension at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

of hypertension was lowest in Uttar Pradesh (13%). Furthermore, in the remaining five states, at least 18% of respondents in this group had blood pressure exceeding normal levels. Based on measured blood pressure, the highest level of hypertension was recorded in Maharashtra (29%).

About one-fifth of younger respondents and one-third of older respondents who reported being diagnosed with hypertension had received treatment in the last 12 months. Only 10% and 23%, respectively, were currently receiving treatment.

Table 7.1.14 presents the prevalence of hypertension by selected background characteristics of respondents. The prevalence of hypertension increased with age, based on both self-reported and measurement-based findings. The self-reported prevalence rose from 3% at age 18-29 to 12% at age 40-49, and further to 23% in 70-79 age group. A higher proportion of females than males reported having hypertension among the older respondents. However, based on direct measurement of blood pressure, males aged 18-49 were likely to have hypertension as equal as females in the same age group. The prevalence of self-reported hypertension, especially among older respondents, bore a positive relationship with both education levels and wealth; for example, more than a quarter of older respondents with either a college education (28%) or from the highest wealth quintile (28%) reported being diagnosed with hypertension. However, based on measured blood pressure, respondents from every educational level and wealth quintile were almost equally likely to be hypertensive.

21% of younger respondents and 36% of older respondents who reported being diagnosed with hypertension had received treatment in the previous 12 months.

### 7.1.8 Chronic lung disease

SAGE estimated the prevalence of chronic lung disease on the basis of self-reported diagnosis. The prevalence of lung disease is presented by state in Table 7.1.15. At a national level, the self-reported prevalence of lung diseases among older respondents was estimated at 4.5%, with the lowest levels in Assam (3%) and the highest in Uttar Pradesh (6%). Among younger respondents, 2% reported a diagnosis of lung disease, with prevalence again the lowest in Assam (0.4%) and highest in Uttar Pradesh (3.5%).

**Table 7.1.15 Self-reported prevalence of lung diseases and percentage receiving current and chronic therapy, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Lung diseases self-reported	Number	Currently treated	Number	Chronic therapy	Number	Lung diseases self-reported	Number	Currently treated	Number	Chronic therapy	Number
Assam	0.4	517	0.0	1	0.0	1	2.7	677	42.3	19	83.4	19
Karnataka	2.6	630	63.9	10	68.6	10	4.1	923	55.8	41	68.4	41
Maharashtra	1.0	882	48.9	9	66.5	9	4.6	1,097	37.6	25	65.7	25
Rajasthan	2.7	846	38.1	15	33.6	15	3.7	1,377	49.4	50	57.7	50
Uttar Pradesh	3.5	890	11.7	21	34.9	21	5.9	1,311	27.2	88	44.5	88
West Bengal	1.8	900	0.0	10	12.9	10	3.1	1,173	26.7	44	49.4	44
India (pooled)	2.3	4,665	23.9	66	38.6	66	4.5	6,558	35.0	267	54.7	267

Note: Prevalence of lung dysfunction is the proportion of population affected by lung dysfunction at a specific time. Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks. Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

**Table 7.1.16** Self-reported prevalence of lung dysfunction and percentage receiving current and chronic therapy, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					
	Lung diseases self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
18-29	1.1	1,604	20.8	11	79.3	11
30-39	1.8	1,655	28.9	19	40.8	19
40-49	4.0	1,406	22.5	36	27.6	36
<b>Sex</b>						
Male	3.6	1,042	19.9	35	33.7	35
Female	1.1	3,623	37.8	31	55.7	31
<b>Marital status</b>						
Never married	1.3	556	41.5	5	73.6	5
Currently married	2.5	3,850	23.0	58	36.5	58
Widowed	2.1	222	12.9	3	24.8	3
Other <sup>1</sup>	0.0	37	NA	NA	NA	NA
<b>Residence</b>						
Urban	1.3	1,168	26.4	13	27.9	13
Rural	2.7	3,497	23.5	53	40.2	53
<b>Caste</b>						
Scheduled tribe	2.4	373	57.6	6	57.6	6
Scheduled caste	2.2	893	8.4	12	42.7	12
Other <sup>2</sup>	2.4	3,399	24.7	48	35.9	48
<b>Religion</b>						
Hindu	2.5	3,902	24.8	56	38.3	56
Muslim	1.8	593	4.3	8	32.6	8
Other <sup>3</sup>	1.1	170	94.0	2	94.0	2
<b>Education</b>						
No formal education	2.1	1,714	40.9	26	52.7	26
Less than primary	2.4	430	60.4	7	72.4	7
Primary school	2.2	788	4.8	11	9.7	11
Secondary school	3.2	741	10.6	11	15.4	11
High school	2.4	654	16.5	8	42.1	8
College and above	1.8	338	20.1	3	76.8	3
<b>Wealth quintile</b>						
Lowest	3.6	959	20.8	20	29.0	20
Second	2.6	932	20.4	17	44.5	17
Middle	2.0	934	36.9	10	32.8	10
Fourth	2.6	933	19.4	11	46.8	11
Highest	0.8	907	31.0	8	59.3	8
<b>Total</b>	<b>2.3</b>	<b>4,665</b>	<b>23.9</b>	<b>66</b>	<b>38.6</b>	<b>66</b>

Note: Prevalence of diabetes is the proportion of population affected by diabetes at a specific time.

Current therapy/treatment refers to respondents who received medication/treatment in the previous two weeks.

Chronic therapy/treatment refers to respondents who received medication or treatment over the previous 12 months.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## Continued

Background characteristics	Aged 50-plus					
	Lung diseases self-reported	Number	Currently treated	Number	Chronic therapy	Number
<b>Age group</b>						
50-59	3.5	2,939	32.3	102	57.9	102
60-69	4.5	2,234	34.0	100	53.9	100
70-79	7.6	1,057	35.3	50	49.3	50
80+	4.0	328	66.8	15	66.1	15
<b>Sex</b>						
Male	6.3	3,303	37.3	182	55.3	182
Female	2.6	3,255	29.4	85	53.1	85
<b>Marital status</b>						
Never married	5.5	64	30.9	4	47.0	4
Currently married	4.9	4,861	34.0	212	51.6	212
Widowed	3.0	1,591	41.0	49	71.3	49
Other <sup>1</sup>	3.5	42	35.0	2	100.0	2
<b>Residence</b>						
Urban	4.4	1,676	30.8	55	58.4	55
Rural	4.6	4,882	36.7	212	53.2	212
<b>Caste</b>						
Scheduled tribe	4.0	400	32.3	20	63.3	20
Scheduled caste	4.2	1,085	31.4	48	65.3	48
Other <sup>2</sup>	4.6	5,073	35.9	199	52.1	199
<b>Religion</b>						
Hindu	4.4	5,530	39.0	224	54.1	224
Muslim	4.8	791	14.1	36	42.5	36
Other <sup>3</sup>	6.1	237	24.1	7	100.0	7
<b>Education</b>						
No formal education	3.7	3,364	29.1	125	49.1	125
Less than primary	6.0	745	27.4	34	49.3	34
Primary school	5.0	929	33.3	43	70.4	43
Secondary school	5.6	654	44.0	35	41.9	35
High school	6.2	541	65.3	20	80.1	20
College and above	3.1	325	9.0	10	27.7	10
<b>Wealth quintile</b>						
Lowest	4.9	1,312	28.6	66	53.4	66
Second	5.1	1,311	27.9	60	65.2	60
Middle	5.5	1,313	33.4	54	49.2	54
Fourth	3.0	1,310	39.6	42	47.2	42
Highest	4.4	1,312	50.6	45	55.9	45
<b>Total</b>	<b>4.5</b>	<b>6,558</b>	<b>35.0</b>	<b>267</b>	<b>54.7</b>	<b>267</b>



Table 7.1.16 shows the prevalence of lung diseases by selected background characteristics. Self-reported prevalence of lung diseases increased with age. The prevalence of lung diseases based on self-reporting was higher among men than women. It was also higher in rural areas than in urban areas. Self-reported prevalence of lung diseases did not show any relationship with wealth.

### 7.1.9 Chronic conditions among persons aged 50-plus

In earlier sections, prevalence rates by self-report and also by symptom reporting were discussed separately for arthritis, stroke, angina pectoris, diabetes mellitus, asthma, depression, hypertension and chronic lung disease. This section summarises the discussion on the prevalence of these diseases among older respondents.

Figure 7.1 presents self-reported prevalence of these eight chronic diseases among older respondents. Arthritis was the most prevalent chronic disease, affecting 18% of respondents, followed by hypertension (17%). Asthma and diabetes affected one in 14 respondents (7%). The prevalence of angina was more than 5%, while that of chronic lung disease, depression and stroke was less than 5%.

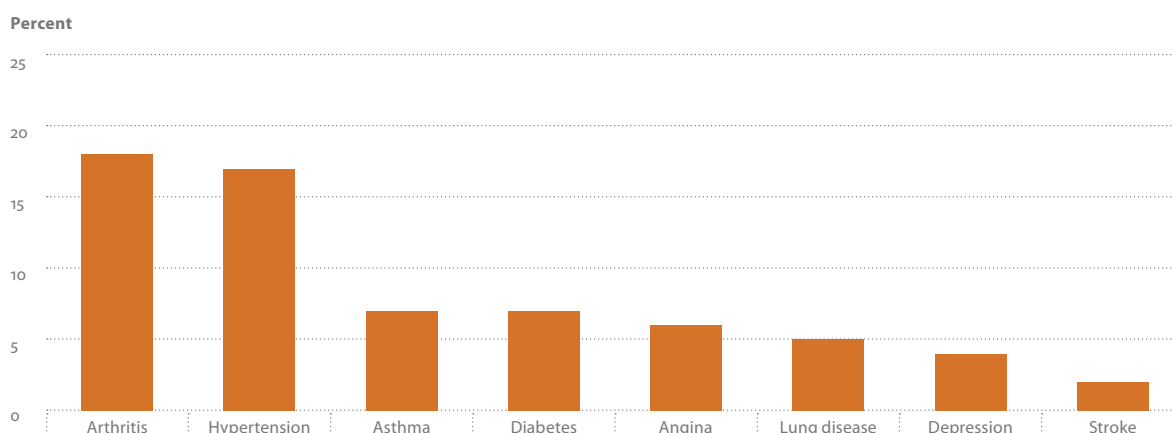
Many adults may not seek medical care for adverse health conditions, and thus may not be diagnosed;

therefore, calculating symptom-based prevalence can improve prevalence estimates. Figure 7.2 compares self-reported and symptom-based prevalence of diseases, excluding diabetes and hypertension. The symptom-based prevalence of arthritis and asthma was lower by 2-3% than the self-reported prevalence. In contrast, the symptom-based prevalence of angina, lung disease and depression was substantially higher than the self-reported prevalence of these diseases. Only 4% of older respondents were diagnosed with depression, but 19% reported experiencing symptoms of depression. The symptom-based prevalence of stroke (4%) was also twice the self-reported prevalence.

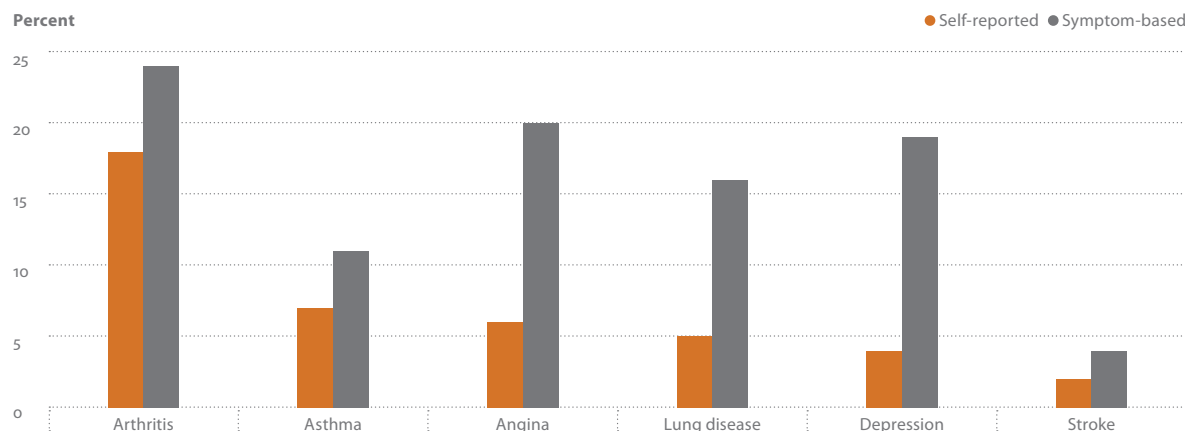
There was wide variation in the prevalence of these diseases across the states. Figure 7.3 shows the self-reported prevalence of these diseases in different states. As mentioned earlier, arthritis and hypertension were the most prevalent diseases among older respondents, and lung disease, depression and stroke were the least prevalent. In Karnataka, West Bengal, Maharashtra arthritis was the most prevalent, followed by hypertension. In Assam, Uttar Pradesh and Rajasthan hypertension was the most prevalent. In Rajasthan, asthma was more prevalent than arthritis. Lung disease, depression and stroke were the least prevalent diseases in most states; in Karnataka, however, depression was the third most prevalent, and in Uttar Pradesh chronic lung disease was the fourth most common disease.

Figure 7.4 compares self-reported prevalence of chronic diseases among men and women. A higher proportion of women than men were diagnosed with arthritis and hypertension, while the prevalence of the remaining six diseases was higher among men than women (although the differences between male and female prevalence were not large).

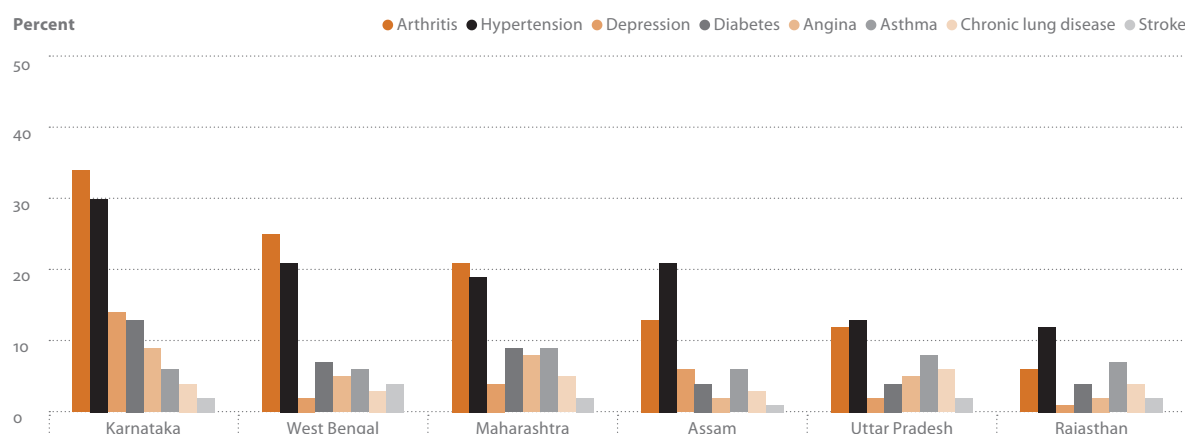
**Figure 7.1** Self-reported prevalence of chronic diseases among respondents aged 50-plus, India (pooled), 2007



**Figure 7.2** Self-reported and symptom-based prevalence of chronic diseases among respondents aged 50-plus, India (pooled), 2007



**Figure 7.3** Self-reported prevalence of chronic diseases among respondents aged 50-plus by state, 2007



**Figure 7.4** Self-reported prevalence of chronic diseases among men and women aged 50-plus, India (pooled), 2007

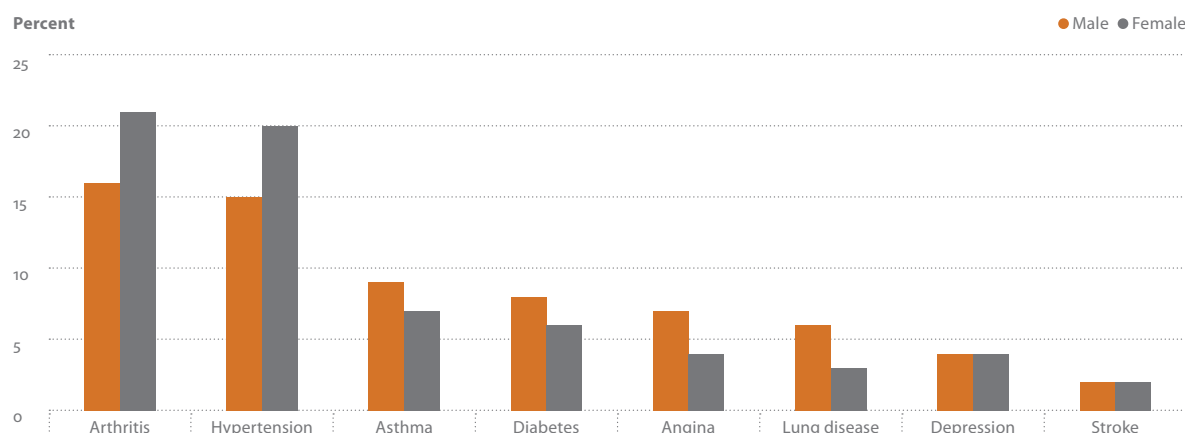
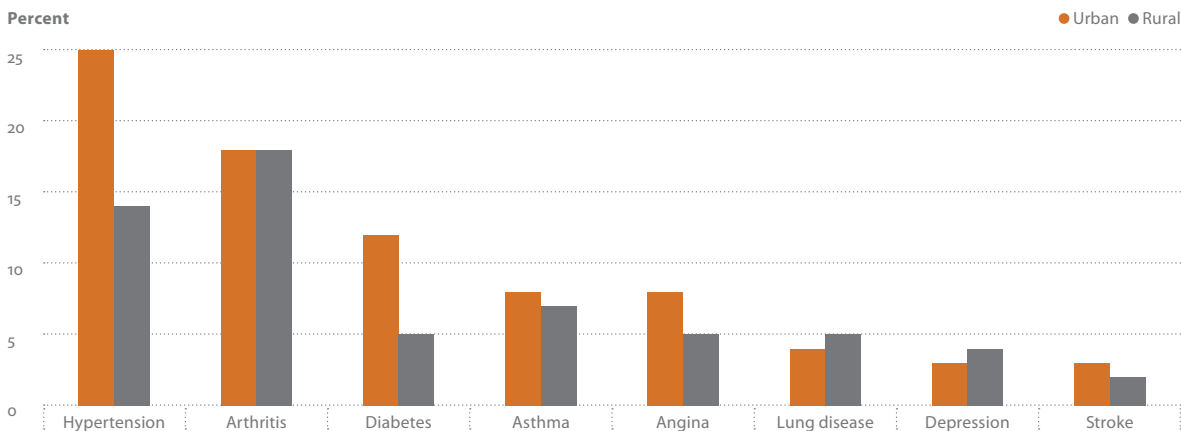


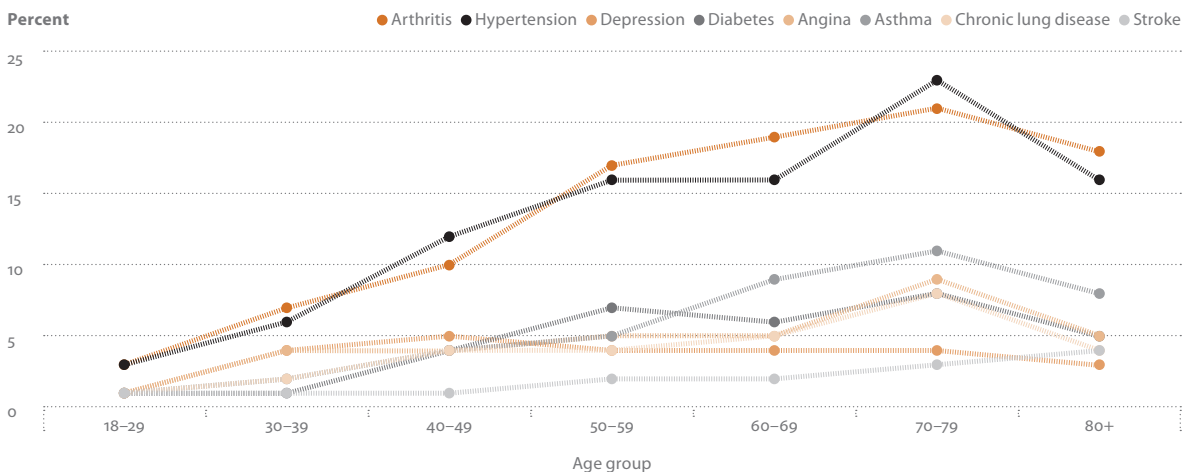
Figure 7.5 depicts the prevalence of chronic diseases in urban and rural areas. The self-reported prevalence of arthritis and chronic lung disease was almost same in urban and rural areas. Older adults in rural areas were more likely to be diagnosed with depression than their urban counterparts, though the prevalence of depres-

sion in both areas was quite low. The prevalence of the other five diseases was higher in urban areas than in rural areas; for instance, the prevalence of hypertension in urban areas exceeded that in rural areas by 11%. Similarly, 12% of older respondents in urban areas were diagnosed with diabetes, compared with 5% of rural

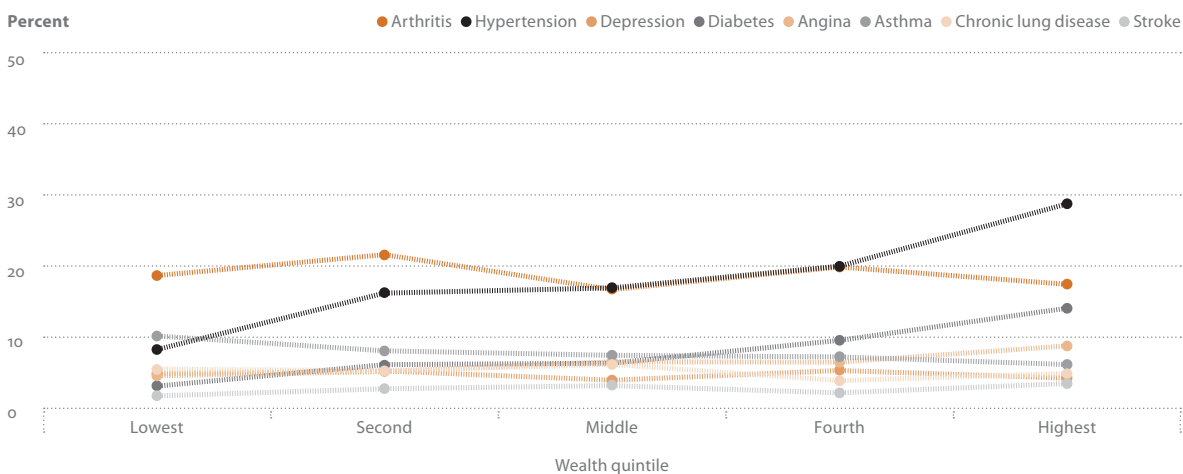
**Figure 7.5** Self-reported prevalence of chronic diseases among respondents aged 50-plus in urban and rural areas, India (pooled), 2007



**Figure 7.6** Self-reported prevalence of chronic diseases by age, India (pooled), 2007



**Figure 7.7** Prevalence of chronic diseases among respondents aged 50-plus by wealth quintile



residents. On the whole, the extent of morbidity, as measured by the proportion diagnosed with one or more chronic diseases, was higher in urban areas than rural areas.

Morbidity rates also varied substantially with age. Figure 7.6 shows the self-reported prevalence of the eight chronic diseases surveyed. Among adults aged 18-29, the prevalence of all eight diseases was below 5%. After that, the prevalence of different diseases increased with age at different speeds; among older adults age 70-79, for instance, prevalence varied from 3% for stroke to 21-23% for hypertension. The one exception was depression, which did not vary consistently with age. The increasing prevalence of all diseases continued until age 70-79; after that, the prevalence of all diseases except stroke decreased. The increasing prevalence with age was particularly sharp for arthritis and hypertension, which rose from 2% in the 18-29 age group to 22-23% in the 70-79 age group.

Figure 7.7 shows the variation in the self-reported prevalence of chronic diseases among older respondents by wealth quintiles. The prevalence of at least three chronic diseases – angina, diabetes and hypertension – increased with wealth. For example, the increases in prevalence of hypertension and diabetes from the lowest wealth quintile to the highest were around 11 and 21 percentage points respectively. On the other hand, the prevalence of asthma dropped with increasing wealth, although the difference in the prevalence of asthma from the lowest to the highest wealth quintile was only four percentage points. The prevalence of arthritis, depression, chronic lung diseases and stroke was almost same across wealth quintiles.

### 7.1.10 Unmet Need

In order to assess the health care needs of the population, unmet need was estimated for each chronic condition separately. Unmet need was defined as the proportion of respondents who were diagnosed with a condition but had not received any medication or treatment for it in the previous 12 months. Table 7.1.17 presents by state the levels of unmet need for each condition.

Among older respondents, the highest unmet need was for depression (64%). Unmet need was under 50% for the other seven chronic diseases, including 47% for stroke and 41% for chronic lung disease, compared with

**Table 7.1.17 Percentage of respondents with unmet need for medication or treatment for chronic diseases, states and India (pooled), 2007**

State	Aged 18-49								Aged 50-plus							
	Arthritis	Stroke	Angina	Diabetes	Asthma	Depression	Hypertension	Chronic lung disease	Arthritis	Stroke	Angina	Diabetes	Asthma	Depression	Hypertension	Chronic lung disease
Assam	34.0	14.1	32.6	26.7	3.3	67.7	45.7	100.0	19.4	23.9	10.1	44.2	30.4	64.1	19.6	10.5
Karnataka	20.3	NA	14.5	6.7	15.0	86.2	14.0	15.8	16.9	31.9	11.9	15.3	4.8	81.3	13.8	23.8
Maharashtra	19.6	0.0	37.2	9.7	8.1	90.3	42.0	26.2	26.8	22.7	21.0	24.0	45.3	62.8	26.1	23.9
Rajasthan	33.3	100.0	32.9	46.6	22.2	100.0	43.2	56.7	26.5	26.0	23.0	9.6	29.9	22.6	25.9	42.3
Uttar Pradesh	45.2	90.0	33.4	14.7	52.6	35.8	39.0	62.9	23.5	61.2	45.9	40.7	22.3	28.7	32.3	54.3
West Bengal	16.6	80.6	35.1	37.0	38.6	57.4	35.6	87.1	29.2	60.7	31.0	28.1	13.0	56.6	19.4	49.7
India (pooled)	24.8	82.9	30.4	20.4	30.1	76.3	37.3	56.3	24.1	46.9	27.7	25.9	26.6	63.9	24.0	41.4

Note: Unmet need refers to the percentage of respondents who had not received medication or treatment in the previous 12 months, despite being diagnosed with the condition.

**Table 7.1.18** Percentage of respondents with unmet need for medication or treatment for chronic diseases, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Arthritis	Stroke	Angina	Diabetes	Asthma	Depression	Hypertension	Chronic lung disease
<b>Age group</b>								
18-29	13.5	99.2	44.7	17.8	13.9	73.7	55.6	20.7
30-39	26.9	83.7	30.7	35.4	33.9	75.9	42.3	47.4
40-49	26.1	66.9	27.5	18.2	32.9	77.3	30.8	69.0
<b>Sex</b>								
Male	32.4	99.6	38.8	18.9	35.4	85.0	38.6	61.9
Female	18.8	58.3	23.1	25.0	23.4	56.8	36.5	36.6
<b>Marital status</b>								
Never married	45.1	98.1	44.1	1.1	14.0	52.0	58.0	26.4
Currently married	23.4	81.6	30.5	22.7	31.9	78.0	36.0	57.8
Widowed	25.7	0.0	25.5	16.0	0.0	76.6	43.4	75.2
Other <sup>1</sup>	56.4	NA	0.0	NA	NA	40.9	0.0	NA
<b>Residence</b>								
Urban	29.9	78.9	20.3	16.2	11.8	86.7	31.5	72.1
Rural	23.6	84.6	34.0	21.6	36.7	73.2	39.7	53.8
<b>Caste</b>								
Scheduled tribe	18.5	100.0	58.9	10.5	0.0	91.0	47.9	42.4
Scheduled caste	15.8	68.0	23.3	0.0	44.5	59.9	26.2	57.3
Other <sup>2</sup>	26.9	88.2	31.0	23.2	28.1	77.6	38.2	57.2
<b>Religion</b>								
Hindu	23.1	81.7	32.2	18.2	35.2	78.0	38.0	55.9
Muslim	33.7	95.4	28.1	18.9	14.5	63.9	35.5	67.4
Other <sup>3</sup>	25.8	0.0	0.0	95.5	0.0	63.0	25.1	6.0
<b>Education</b>								
No formal education	21.9	36.8	20.9	15.4	22.9	77.5	38.3	34.7
Less than primary	42.4	95.1	27.6	45.5	19.7	79.0	28.4	27.7
Primary school	12.6	86.9	41.8	33.5	27.5	69.5	39.1	86.4
Secondary school	28.2	98.4	51.5	0.0	37.2	49.1	36.4	80.1
High school	39.3	100.0	9.7	38.6	40.4	90.9	33.1	57.9
College and above	18.8	0.0	0.0	1.9	35.8	90.2	46.4	23.2
<b>Wealth quintile</b>								
Lowest	29.4	100.0	50.6	29.5	21.3	43.8	49.6	67.9
Second	27.1	78.3	20.4	7.7	54.3	91.2	43.1	49.5
Middle	17.7	88.4	45.4	16.0	1.3	84.3	31.6	51.9
Fourth	27.6	63.4	5.5	28.8	11.4	80.5	39.4	53.2
Highest	21.4	83.6	12.0	13.3	48.5	68.8	30.8	40.7
<b>Total</b>	<b>24.8</b>	<b>82.9</b>	<b>30.4</b>	<b>20.4</b>	<b>30.1</b>	<b>76.3</b>	<b>37.3</b>	<b>56.3</b>

Note: Unmet need refers to the percentage of respondents who had not received medication or treatment in the previous 12 months, despite being diagnosed with the condition.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus							
	Arthritis	Stroke	Angina	Diabetes	Asthma	Depression	Hypertension	Chronic lung disease
<b>Age group</b>								
50-59	21.2	37.0	35.6	29.7	34.6	63.1	29.7	37.3
60-69	27.6	56.3	27.5	24.5	22.1	72.3	22.3	44.2
70-79	24.4	37.2	14.5	15.5	24.3	52.0	16.2	46.0
80+	26.8	74.3	24.8	35.8	11.6	57.2	13.9	27.9
<b>Sex</b>								
Male	23.9	45.2	26.5	27.9	25.8	69.2	25.4	40.7
Female	24.3	49.2	29.8	22.6	27.8	58.1	22.9	43.1
<b>Marital status</b>								
Never married	82.7	NA	100.0	61.6	0.0	40.7	65.8	53.0
Currently married	23.8	45.0	29.2	25.7	28.2	64.6	25.7	44.1
Widowed	25.0	54.0	19.9	26.6	22.0	62.2	18.4	26.2
Other <sup>1</sup>	0.0	NA	16.9	0.0	31.2	NA	4.3	0.0
<b>Residence</b>								
Urban	23.0	48.8	28.3	23.2	39.2	63.6	23.0	40.7
Rural	24.6	45.8	27.3	28.3	20.4	64.0	24.6	41.7
<b>Caste</b>								
Scheduled tribe	36.6	94.8	14.3	2.3	9.9	94.0	31.0	34.5
Scheduled caste	32.7	58.4	34.2	24.0	27.3	76.0	19.5	34.7
Other <sup>2</sup>	22.0	39.2	27.4	26.6	27.3	59.5	24.2	43.1
<b>Religion</b>								
Hindu	23.9	47.3	27.5	24.6	27.4	64.1	25.1	41.1
Muslim	21.1	53.5	23.2	34.4	12.1	58.2	19.7	57.5
Other <sup>3</sup>	41.9	12.8	37.2	22.6	67.9	73.4	11.9	0.0
<b>Education</b>								
No formal education	25.1	58.4	27.0	27.6	20.5	70.6	27.4	47.0
Less than primary	23.5	19.1	22.8	32.3	14.5	59.1	24.7	48.3
Primary school	30.6	53.9	16.9	18.9	32.4	55.7	17.5	29.6
Secondary school	25.5	15.8	46.8	17.7	19.9	44.7	23.4	47.1
High school	13.2	41.8	39.1	40.1	70.6	62.1	28.8	14.9
College and above	11.5	9.6	20.3	17.1	17.1	77.1	9.2	72.3
<b>Wealth quintile</b>								
Lowest	33.2	83.5	19.8	51.2	29.6	76.2	29.4	43.8
Second	26.0	42.9	33.5	39.3	37.8	59.6	31.4	33.4
Middle	23.2	47.3	21.9	23.5	12.5	71.9	30.1	45.9
Fourth	14.1	60.3	16.8	18.9	12.4	56.3	24.1	41.6
Highest	22.1	27.0	40.3	19.6	37.3	55.6	13.9	41.7
<b>Total</b>	<b>24.1</b>	<b>46.9</b>	<b>27.7</b>	<b>25.9</b>	<b>26.6</b>	<b>63.9</b>	<b>24.0</b>	<b>41.4</b>

24-28% for arthritis, angina, diabetes, asthma or hypertension. Among adults aged 18-49, the condition with the highest level of unmet need for medication and treatment nationally was stroke (83%). Most younger respondents diagnosed with depression (76%) or chronic lung diseases (56%) also had unmet need. The lowest unmet need in this group was reported for diabetes (20%).

## 7.2 Co-morbidities

Table 7.2.1 presents the distribution of chronic conditions and co-morbidity by age group and state. Among younger respondents, 80% reported no chronic disease, 16% reported one disease, and 4% reported two or more diseases. The prevalence of chronic disease and particularly multiple morbidities among younger respondents was highest in Karnataka, with 23% reporting a single health condition and 9% reporting multiple morbidities. In Rajasthan, by contrast, only 10% reported a single health condition and 2% reported multiple morbidities.

**Table 7.2.1** Percent distribution of respondents by number of health conditions, states and India (pooled), 2007

Note: Co-morbidity refers to the presence of one or more diseases or disorders.



**Table 7.2.2** Percent distribution of respondents by number of single health conditions by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					Aged 50-plus			
	No morbidity	Single health condition	Two or more health conditions	Number		No morbidity	Single health condition	Two or more health conditions	Number
<b>Age group</b>									
18-29	90.5	8.4	1.1	1,603	50-59	62.1	24.2	13.7	2,937
30-39	79.2	16.8	4.0	1,655	60-69	56.8	27.2	16.0	2,233
40-49	70.4	21.7	7.9	1,406	70-79	49.7	28.2	22.2	1,057
					80+	56.7	28.8	14.6	328
<b>Sex</b>									
Male	79.7	15.9	4.4	1,042		59.1	24.8	16.2	3,302
Female	79.8	15.8	4.4	3,622		57.3	27.3	15.4	3,253
<b>Marital status</b>									
Never married	89.1	10.0	0.9	555		73.9	22.9	3.2	64
Currently married	78.7	16.4	4.8	3,850		58.6	25.5	15.9	4,860
Widowed	71.7	21.2	7.1	222		55.9	27.9	16.2	1,589
Other <sup>1</sup>	86.4	12.5	1.1	36		73.0	20.3	6.7	42
<b>Residence</b>									
Urban	79.6	16.6	3.9	1,168		51.5	28.4	20.1	1,676
Rural	79.9	15.5	4.6	3,496		61.0	25.0	14.1	4,879
<b>Caste</b>									
Scheduled tribe	80.8	14.0	5.1	373		68.1	18.0	13.9	400
Scheduled caste	84.7	12.0	3.4	893		64.3	24.0	11.7	1,085
Other <sup>2</sup>	78.4	17.0	4.6	3,398		56.3	26.9	16.8	5,070
<b>Religion</b>									
Hindu	79.8	15.8	4.4	3,902		58.4	25.9	15.7	5,528
Muslim	78.2	16.3	5.6	592		57.1	26.4	16.5	790
Other <sup>3</sup>	85.0	13.3	1.8	170		57.5	26.1	16.4	237
<b>Education</b>									
No formal education	79.6	16.1	4.4	1,714		61.5	24.0	14.5	3,362
Less than primary	80.5	14.4	5.2	430		57.4	25.2	17.5	745
Primary school	79.1	16.4	4.6	788		55.8	29.9	14.4	929
Secondary school	80.6	14.7	4.7	741		54.7	29.0	16.3	653
High school	78.9	16.9	4.1	653		53.2	25.4	21.4	541
College and above	81.3	15.2	3.5	338		49.5	30.4	20.1	325
<b>Wealth quintile</b>									
Lowest	81.7	14.1	4.3	959		64.3	24.8	10.9	1,310
Second	81.6	15.0	3.3	931		60.7	24.3	14.9	1,311
Middle	78.6	16.0	5.5	934		59.1	24.7	16.2	1,312
Fourth	77.3	17.9	4.8	933		56.4	26.4	17.2	1,310
Highest	79.2	16.5	4.3	907		49.4	30.0	20.7	1,312
<b>Total</b>	<b>79.8</b>	<b>15.8</b>	<b>4.4</b>	<b>4,664</b>		<b>58.2</b>	<b>26.0</b>	<b>15.8</b>	<b>6,555</b>

Note: Co-morbidity refers to the presence of one or more diseases or disorders.

<sup>1</sup> Includes divorced, separated or cohabiting.

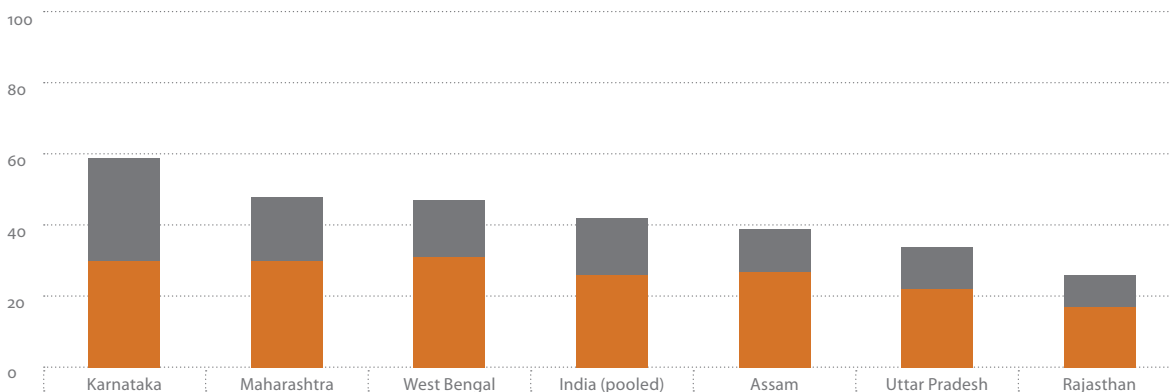
<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 7.8** Prevalence of morbidity among adults aged 50-plus, states and India (pooled), 2007

● Single health condition ● Two or more health conditions

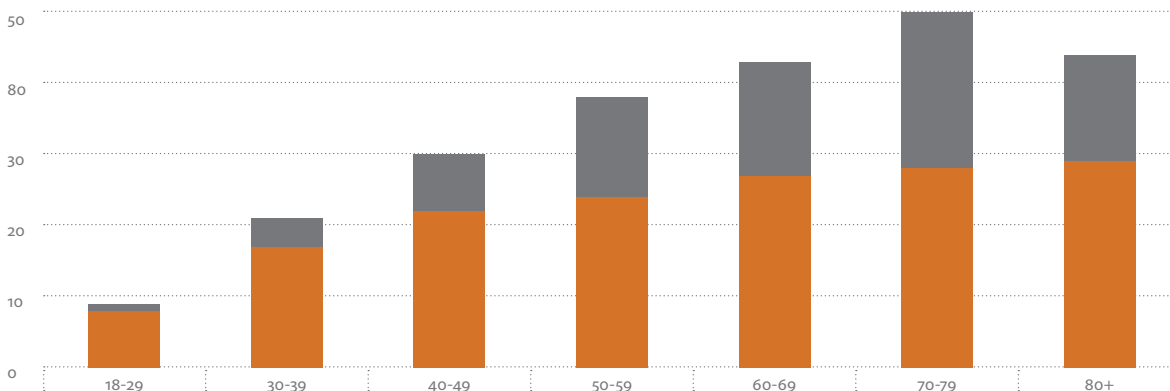
Percent



**Figure 7.9** Prevalence of co-morbidity by age, India (pooled), 2007

● Single health condition ● Two or more health conditions

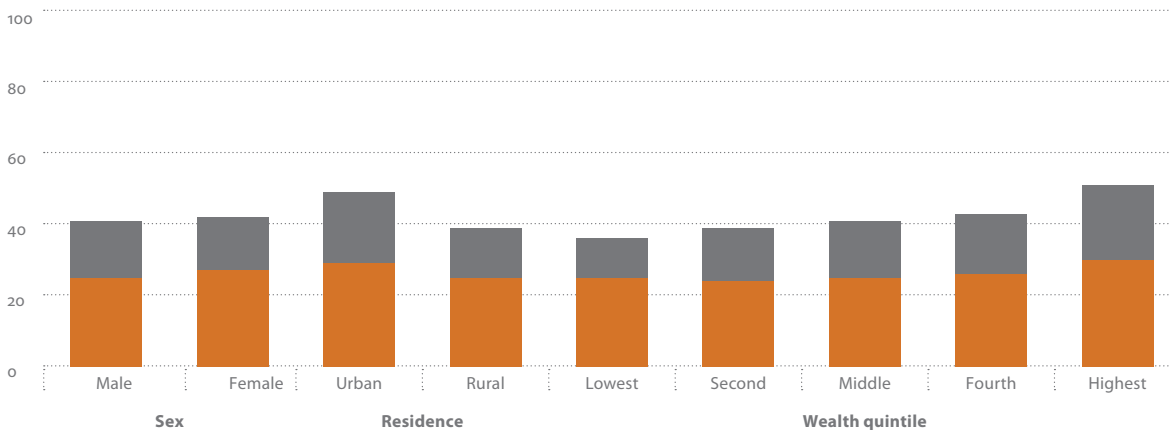
Percent



**Figure 7.10** Prevalence of co-morbidity among persons aged 50-plus by sex, residence and wealth quintile,

● Single health condition ● Two or more health conditions

Percent



had only one health condition and 29% had multiple morbidities; only 41% were disease-free. By contrast, in Rajasthan almost three quarters of older respondents had no morbidity, 17% reported a single health condition and 9% reported multiple morbidities (Figure 7.8).

Table 7.2.2 presents the distribution of respondents by background characteristics according to number of morbidities. The prevalence of morbidity rose sharply with age (Figure 7.9). The proportion of persons with single morbidity increased from 8% at age 18-29 to 29% for the oldest group aged 80 and above. The proportion with multiple morbidities also increased from just 1% at age 18-29 to 22% at age 70-79.

Older respondents in urban areas were more likely than their rural counterparts to have multiple morbidities (Figure 7.10). In urban areas, almost half (48%) of respondents aged 50-plus were diagnosed with at least one chronic disease, compared with 39% in rural areas, while 20% in urban areas were diagnosed with two or more health conditions, compared with 14% in rural areas.

Though many individual diseases did not show a consistent relationship with wealth, the proportion of persons diagnosed with at least one chronic disease, and also the proportion diagnosed with two or more chronic diseases, increased with wealth quintile. The proportion diagnosed with single disease increased from 25% in the lowest wealth quintile to 30% in the highest. Similarly, the proportion diagnosed with two or more diseases rose from 11% in the lowest wealth quintile to 21% in the highest.

### 7.3 Injuries (road traffic and all other)

Injuries are a growing burden for most countries. The SAGE India questions on the prevalence of injury followed WHO's suggested injury surveillance guidelines. Questions were asked about injuries incurred during the 12 months prior to the survey, including about their source (road traffic or other) and their impact on a person's ability.

Table 7.3.1 presents by state the prevalence of road traffic accidents and other injuries during the 12 months prior to the survey, and the proportion of persons who developed disabilities as a result. Among the six surveyed states, respondents in West Bengal reported the highest prevalence of injuries due to both types of incidents in both the age groups. Among older respondents, 2% and 9% had been injured in road traffic and other incidents

**Table 7.3.1 Self-reported prevalence of injuries and any resulting physical disability, states and India (pooled) 2007**

State	Aged 18-49												Aged 50-plus					
	Road-traffic accidents						All other incidents						Road-traffic accidents			All other incidents		
	Percentage road injury	No.	Percentage with disability	No.	Other injury	No.	Percentage with disability	No.	Percentage road injury	No.	Percentage with disability	No.	Percentage road injury	No.	Percentage with disability	Other injury	No.	Percentage with disability
Assam	2.4	516	41.6	10	3.9	517	66	21	3.7	677	53.0	25	4.9	677	53.4	35		
Karnataka	2.5	630	43.4	11	7.1	630	49.8	40	1.5	923	59.8	15	10.1	923	38.2	94		
Maharashtra	1.6	882	4.7	10	5.6	882	2.7	33	1.2	1,097	13.5	13	5.5	1,097	7.8	58		
Rajasthan	2.6	846	5.7	13	6.7	846	22.1	46	1.4	1,377	43.5	23	7.2	1,376	35.2	87		
Uttar Pradesh	3.9	890	4.0	24	7.9	890	13.3	68	2.2	1,311	17.5	36	9.5	1,311	8.2	129		
West Bengal	4.5	900	29.9	36	13.9	900	32.1	129	5.1	1,173	41.7	43	14.6	1,173	32.0	184		
India (pooled)	3.1	4,664	16.2	104	8.0	4,665	23.7	337	2.4	6,558	33.6	155	9.1	6,557	22.5	587		

**Table 7.3.2** Self-reported prevalence of injuries and resulting physical disability by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49							
	Road-traffic accidents				All other accidents			
	Percentage road injury	Number	Percentage with disability	Number	Percentage road injury	Number	Percentage with disability	Number
<b>Age group</b>								
18-29	2.4	1,604	16.7	25	7.7	1,604	20.9	101
30-39	2.9	1,655	13.5	30	7.3	1,655	20.7	118
40-49	3.9	1,405	17.9	49	8.9	1,406	28.3	118
<b>Sex</b>								
Male	4.9	1,042	13.6	54	9.3	1,042	14.1	99
Female	1.3	3,622	26.0	50	6.6	3,623	36.1	238
<b>Marital status</b>								
Never married	3.6	556	20.1	10	8.6	556	26.2	39
Currently married	3.1	3,849	14.7	89	8.0	3,850	22.7	279
Widowed	1.2	222	0.0	0.0	4.3	222	57.7	15
Other <sup>1</sup>	0.0	37	65.6	5	9.7	37	0.0	4
<b>Residence</b>								
Urban	3.6	1,167	20.9	26	7.3	1,168	17.6	65
Rural	3.0	3,497	14.3	78	8.2	3,497	25.5	272
<b>Caste</b>								
Scheduled tribe	2.9	373	44.8	8	6.0	373	50.5	25
Scheduled caste	2.2	893	16.7	16	7.9	893	22.8	63
Other <sup>2</sup>	3.4	3,398	13.8	80	8.2	3,399	22.1	249
<b>Religion</b>								
Hindu	2.8	3,901	14.5	78	8.0	3,902	23.4	273
Muslim	5.4	593	20.0	20	8.5	593	29.3	56
Other <sup>3</sup>	3.3	170	28.4	6	6.5	170	6.4	8
<b>Education</b>								
No formal education	2.9	1,714	10.9	30	7.7	1,714	28.1	128
Less than primary	1.8	430	32.6	13	8.5	430	26.5	39
Primary school	2.8	788	23.7	19	8.9	788	32.5	68
Secondary school	3.5	741	18.5	18	6.7	741	31.9	44
High school	4.4	653	15.6	18	10.2	654	6.0	42
College and above	2.5	338	6.3	6	5.2	338	11.8	16
<b>Wealth quintile</b>								
Lowest	2.8	959	10.7	27	9.3	959	26.9	93
Second	3.0	932	18.1	20	8.3	932	30.9	77
Middle	4.1	934	26.5	20	9.0	934	16.7	63
Fourth	4.9	932	7.1	26	5.8	933	21.3	54
Highest	0.9	907	24.5	11	6.9	907	20.6	50
<b>Total</b>	<b>3.1</b>	<b>4,664</b>	<b>16.2</b>	<b>104</b>	<b>8.0</b>	<b>4,665</b>	<b>23.7</b>	<b>337</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## Continued

Background characteristics	Aged 50-plus							
	Road-traffic accidents				All other accidents			
	Percentage road injury	Number	Percentage with disability	Number	Percentage road injury	Number	Percentage with disability	Number
<b>Age group</b>								
50-59	2.7	2,939	30.6	81	9.4	2,939	20.7	263
60-69	2.2	2,234	29.2	45	8.6	2,233	26.0	184
70-79	1.5	1,057	32.3	19	9.2	1,057	20.2	106
80+	4.1	328	72.3	10	9.0	328	28.1	34
<b>Sex</b>								
Male	2.6	3,303	30.1	88	7.3	3,303	16.6	258
Female	2.2	3,255	37.9	67	11.0	3,254	26.5	329
<b>Marital status</b>								
Never married	0.0	64	0.0	0.0	10.6	64	0.0	8
Currently married	2.3	4,861	32.2	112	8.5	4,861	21.6	414
Widowed	3.0	1,591	38.6	42	11.0	1,590	26.0	160
Other <sup>1</sup>	4.9	42	0.0	1	22.2	42	11.0	5
<b>Residence</b>								
Urban	1.6	1,676	20.4	32	8.8	1,676	17.7	121
Rural	2.8	4,882	36.6	123	9.3	4,881	24.3	466
<b>Caste</b>								
Scheduled tribe	2.6	400	71.4	7	6.0	400	21.7	27
Scheduled caste	2.9	1,085	19.2	30	10.8	1,085	27.8	108
Other <sup>2</sup>	2.3	5,073	34.4	118	9.0	5,072	21.1	452
<b>Religion</b>								
Hindu	2.3	5,530	33.9	125	9.2	5,529	21.2	489
Muslim	4.0	791	33.1	27	9.6	791	32.4	87
Other <sup>3</sup>	0.7	237	12.4	3	5.8	237	13.6	11
<b>Education</b>								
No formal education	2.6	3,364	38.8	66	10.0	3,363	24.2	312
Less than primary	2.4	745	34.1	19	9.4	745	25.6	79
Primary school	3.0	929	44.3	30	9.3	929	18.0	92
Secondary school	2.1	654	25.5	15	7.5	654	16.7	49
High school	2.5	541	23.8	16	5.4	541	24.4	32
College and above	3.9	325	0.0	9	8.8	325	17.8	23
<b>Wealth quintile</b>								
Lowest	2.9	1,312	49.1	36	10.8	1,312	21.6	145
Second	2.6	1,311	33.4	30	9.0	1,311	24.6	121
Middle	2.0	1,313	31.3	26	8.7	1,313	21.4	117
Fourth	2.3	1,310	20.6	30	8.9	1,310	19.4	112
Highest	2.2	1,312	26.2	33	7.6	1,311	25.4	92
<b>Total</b>	<b>2.4</b>	<b>6,558</b>	<b>33.6</b>	<b>155</b>	<b>9.1</b>	<b>6,557</b>	<b>22.5</b>	<b>587</b>

respectively; a full third (34%) of the former had developed a disability, and just under a quarter (22%) of the latter. Respondents aged 18-49 reported higher injury levels overall. Among younger respondents, 3% have been injured in road traffic accidents, and 16 % of these developed a disability; 8% had been injured in other incidents, and 23.7% of these had developed a disability. Assam and Maharashtra had the lowest prevalence of injuries in the younger age group.

The prevalence of injuries by background characteristics of the respondents is presented in table 7.3.2. The prevalence of injury due to either road-traffic accidents or other incidents does not show consistent differentials by age, gender, residence, education or wealth index, nor does the proportion of respondents who developed disabilities.

## 7.4 Oral health and cataracts

Sensory deficits are likely to increase at older ages. Questions about the mouth, teeth and eyes were included in SAGE to get a broad indication of selected sensory problems, which can help improve the burden of disease estimates, and also to determine levels of health coverage through indicator conditions like cataracts.

Table 7.4.1 presents state-level prevalence of edentulism (oral health problems) during the 12 months prior to the survey and of cataracts in the five years prior to the survey. Of the study's younger respondents, 4% reported problems with their teeth/mouth and 2.2% reported having at least one cataract. The prevalence of both of these problems was much higher among older respondents: about one in every seven older persons reported problems with their teeth/mouth, and one in six reported a cataract.

**Table 7.4.1 Self-reported prevalence of edentulism and cataracts, states and India (pooled) , 2007**

State	Aged 18-49				Aged 50-plus			
	Edentulism	Number	Cataract	Number	Edentulism	Number	Cataract	Number
Assam	2.4	517	5.9	517	11.5	677	17.7	677
Karnataka	10.3	630	4.2	630	22.6	923	22.8	923
Maharashtra	2.9	882	1.9	882	14.4	1,097	15.4	1,097
Rajasthan	2.0	846	2.1	847	14.5	1,377	14.7	1,378
Uttar Pradesh	3.4	890	1.7	890	16.6	1,311	20.4	1,311
West Bengal	1.3	900	1.1	901	9.5	1,173	13.3	1,173
India (pooled)	3.5	4,665	2.2	4,667	15.1	6,558	17.7	6,559

Table 7.4.2 presents prevalence of edentulism and of cataracts by different background characteristics. Both edentulism and cataracts show an increase with age, especially above the age of 50, with the prevalence of both edentulism and cataracts almost double after age 70 and above as compared to in the 60-69 age bracket. The prevalence of edentulism was higher among younger men than younger women, but this trend was reversed among the older age group. However, the prevalence of cataracts was almost same for both younger men and younger women, whereas it was slightly high for older women. Edentulism was highest among the never-married in the younger age group, but among those widowed in the older age group. The prevalence of both edentulism and cataracts was higher in urban areas than rural ones, except in the older age group, where cataracts occurred at almost the same rate in both areas. Both edentulism and cataracts varied according to education and wealth among both younger and older respondents.

## 7.5 Cervical and breast cancer screening

SAGE included two questions for all female respondents to estimate the prevalence of mammography and pap smears, the screening tests for breast cancer and cervical cancer respectively. The extent to which women undergo these screening tests can be a pointer to gaps in women's health prevention strategies.

Table 7.5.1 presents by state the proportion of female respondents who went for breast and cervical cancer screening in the 12 months prior to the survey. Only a small proportion of women – around 1% in both age groups – had gone for breast cancer screening in the previous year. Rates of cervical cancer screening were

**Table 7.4.2** Self-reported prevalence of edentulism and cataracts by selected background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					Aged 50-plus			
	Edentulism	Number	Cataract	Number		Edentulism	Number	Cataract	Number
<b>Age group</b>									
18-29	3.1	1,604	0.8	1,605	50-59	9.5	2,939	10.0	2,939
30-39	2.9	1,655	1.6	1,655	60-69	14.6	2,234	19.6	2,234
40-49	4.5	1,406	4.1	1,407	70-79	29.2	1,057	32.0	1,058
					80+	30.2	328	33.9	328
<b>Sex</b>									
Male	4.2	1,042	2.4	1,042		13.9	3,303	16.3	3,303
Female	2.8	3,623	2.0	3,625		16.4	3,256	18.8	3,256
<b>Marital status</b>									
Never married	4.2	556	1.3	556		9.6	64	21.1	64
Currently married	3.4	3,850	2.3	3,851		13.1	4,861	15.2	4,861
Widowed	3.2	222	3.1	222		23.0	1,591	25.8	1,592
Other <sup>1</sup>	2.0	37	0.0	38		2.8	42	15.7	42
<b>Residence</b>									
Urban	5.1	1,168	2.6	1,168		18.2	1,676	17.5	1,676
Rural	3.0	3,497	2.1	3,499		13.9	4,882	17.5	4,883
<b>Caste</b>									
Scheduled tribe	1.9	373	2.5	374		8.0	400	15.1	400
Scheduled caste	2.0	893	1.8	893		11.9	1,085	15.2	1,085
Other <sup>2</sup>	4.1	3,399	2.3	3,400		16.3	5,073	18.2	5,074
<b>Religion</b>									
Hindu	3.0	3,902	2.3	3,904		15.6	5,530	17.8	5,531
Muslim	7.3	593	1.5	593		13.8	791	14.5	791
Other <sup>3</sup>	1.4	170	2.0	170		8.1	237	20.4	237
<b>Education</b>									
No formal education	2.6	1,714	2.1	1,751		16.4	3,364	17.6	3,365
Less than primary	3.5	430	2.4	430		19.1	745	20.4	745
Primary school	3.9	788	1.4	788		13.4	929	17.9	929
Secondary school	5.1	741	2.2	741		10.3	654	15.8	654
High school	1.5	654	3.2	654		14.4	541	18.8	541
College and above	6.6	338	2.2	339		10.8	325	11.9	325
<b>Wealth quintile</b>									
Lowest	3.5	959	2.2	959		15.5	1,312	15.3	1,312
Second	3.5	932	2.0	933		14.1	1,311	17.4	1,312
Middle	4.2	934	2.5	934		14.0	1,313	15.5	1,313
Fourth	2.8	933	2.4	933		17.2	1,310	19.8	1,310
Highest	3.5	907	2.0	908		15.3	1,312	20.1	1,312
<b>Total</b>	<b>3.5</b>	<b>4,665</b>	<b>2.2</b>	<b>4,667</b>		<b>15.1</b>	<b>6,558</b>	<b>17.5</b>	<b>6,559</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 7.5.1** Percentage of women covered by breast and cervical cancer screening, states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Breast cancer screening	Number	Cervical cancer screening	Number	Breast cancer screening	Number	Cervical cancer screening	Number
Assam	0.3	403	0.3	403	1.3	309	0.7	312
Karnataka	1.0	500	3.4	500	3.7	504	4.0	504
Maharashtra	3.8	683	3.3	683	0.7	550	1.4	549
Rajasthan	1.1	654	2.3	654	0.7	701	1.1	699
Uttar Pradesh	0.7	677	2.2	677	0.4	608	1.2	601
West Bengal	0.8	707	0.7	707	1.3	584	0.7	584
India (pooled)	1.4	3,624	2.2	3,624	1.1	3,256	1.5	3,249

similarly low: 2% in the 18-49 age group and 1% in the 50-plus age group. Karnataka and Maharashtra had the highest rates of screening for breast and cervical cancer, although even in these states the proportions did not exceed 4%.

The proportion of women screened for breast and cervical cancer by selected background characteristics is presented in Table 7.5.2. The proportion of female respondents who had gone for cancer screening did not vary consistently by age. However, women from

urban areas and from higher wealth quintiles were more likely to have been screened for one or both cancers in both age groups; in both age groups, the proportion of women who had been screened for breast cancer or cervical cancer also showed a weak positive relationship with educational attainment.

Only 1% of older women seem to have had undergone breast or cervical cancer screening in the previous year. These results point to the practical non-existence of cancer screening programmes for women in India.



**Table 7.5.2** Percentage of women covered by breast and cervical cancer screening, by selected background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					Aged 50-plus			
	Breast cancer screening	Number	Cervical cancer screening	Number		Breast cancer screening	Number	Cervical cancer screening	Number
<b>Age group</b>									
18-29	0.9	1,334	1.2	1,334	50-59	1.2	1,551	1.7	1,551
30-39	2.4	1,298	2.0	1,297	60-69	1.0	1,079	1.3	1,073
40-49	1.0	993	3.7	993	70-79	1.6	467	1.4	467
					80+	0.0	159	0.7	158
<b>Marital status</b>									
Never married	0.1	410	0.0	410		0.0	19	0.0	19
Currently married	1.4	2,979	2.4	2,979		0.9	1,967	1.6	1,963
Widowed	2.9	202	3.7	202		1.5	1,234	1.4	1,235
Other <sup>1</sup>	11.6	32	0.0	33		0.3	32	0.0	32
<b>Residence</b>									
Urban	2.7	929	2.5	929		1.4	884	2.1	885
Rural	1.0	2,695	2.1	2,695		1.0	2,368	1.2	2,364
<b>Caste</b>									
Scheduled tribe	0.1	289	1.1	290		0.6	183	1.1	185
Scheduled caste	1.9	683	1.8	683		0.7	524	0.3	526
Other <sup>2</sup>	1.4	2,652	2.4	2,651		1.3	2,516	1.8	2,538
<b>Religion</b>									
Hindu	1.3	3,045	2.4	3,046		1.0	2,753	1.7	2,745
Muslim	1.5	458	0.7	457		1.7	380	0.3	383
Other <sup>3</sup>	6.2	121	3.4	121		1.6	123	0.0	121
<b>Education</b>									
No formal education	0.9	1,504	1.5	1,504		0.9	2,281	0.9	2,277
Less than primary	0.5	324	2.7	324		3.1	292	4.4	292
Primary school	0.9	605	3.5	605		1.0	349	1.2	349
Secondary school	2.2	547	3.3	547		1.7	156	6.8	156
High school	3.3	445	1.4	445		3.3	113	0.7	113
College and above	2.1	198	1.4	199		0.0	61	1.7	62
<b>Wealth quintile</b>									
Lowest	0.8	739	1.3	738		0.4	658	0.4	655
Second	1.1	711	1.5	711		1.7	644	0.5	644
Middle	1.6	713	2.8	713		0.5	665	1.2	663
Fourth	1.6	740	2.8	740		1.1	627	2.0	628
Highest	2.3	721	2.9	722		2.0	662	3.9	659
<b>Total</b>	<b>1.4</b>	<b>3,624</b>	<b>2.2</b>	<b>3,624</b>		<b>1.1</b>	<b>3,256</b>	<b>1.5</b>	<b>3,249</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



## 8. Health examination and biomarkers

Ageing is the time-altered transformation of an individual's health-related capacities. To complement self-reporting of health status, and to improve corrections for reporting biases, biomarkers – measures of individual or combined biological functions – can be used to measure age-altered biological or physiological processes. Biomarkers not only provide objective measures by which to assess the current health of an individual, but also can provide early warning of future adverse health outcomes. For example, blood pressure and pulse rate can provide information about potential or existing heart disease; similarly, the body mass index (BMI) and waist-hip ratios are indicators of obesity, chronic metabolic disorders and fat distribution in the body.

SAGE was the first study in India to include a range of biomarker information to complement self-reported health. Social science research often focuses on anthropometric measures and measures of physical and cognitive functions, as these are relatively easy to implement in large household health surveys. However, recent technological advances have led to rapid, relatively inexpensive and logistically feasible diagnostic tests that make it convenient to incorporate biomedical information as part of large-scale surveys of population health in developing countries. SAGE incorporated separate health examination and biomarkers module, including measures of anthropometry (measured weight, height, waist and hip circumferences), physiology (blood pressure, heart rate and lung function), physical function (grip strength, timed walk, and vision tests) and cognition (learning, memory, concentration, and attention). Prior to taking measurements and testing, the participants were asked to sign an additional informed consent document.

The incorporation of biomarkers in SAGE complements the WHO approach to measuring health across

multiple domains, as biomarkers often measure distinct components of an individual's health state. For example, a self-report of mobility can be assessed against performance on a timed walk and grip strength, or self-reported vision can be compared to results of a tumbling E eye test. Along with information gained from responses to the vignettes, corrections can be made to self-reported health to better estimate true levels of health and differences across individuals and populations.

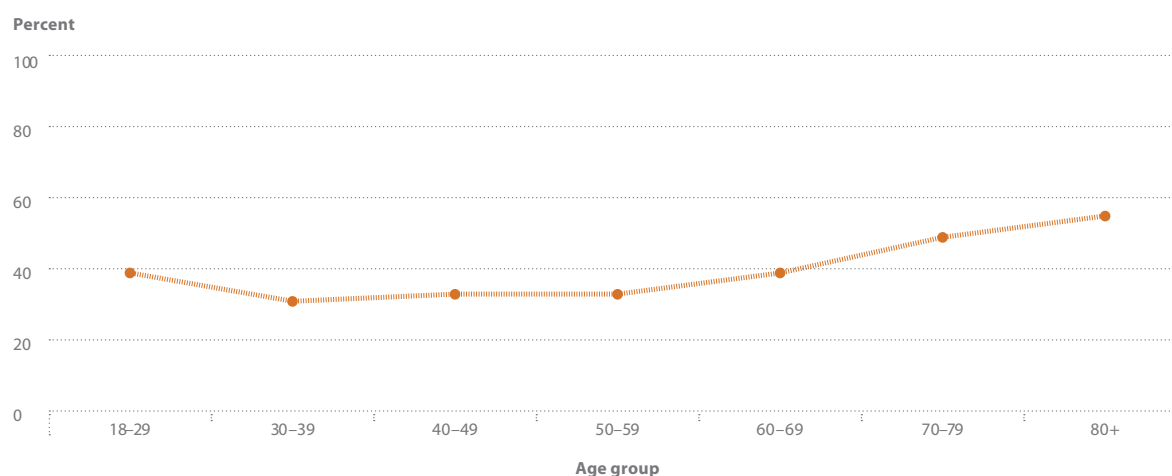
### 8.1 Anthropometry

#### 8.1.1 Body mass index

Body mass index (BMI) is an important indicator of an individual's nutritional status. BMI is calculated by dividing an individual's weight (in kilograms) by the square of their height (in metres). Raised BMI is a factor in a number of diseases; it also reflects physiological changes in stature and body composition with ageing. Epidemiological studies have consistently shown that obesity is associated with increasing risk of cardiovascular diseases and diabetes. The risks of being underweight are also considerable, and include impairments in the immune system, impaired fertility and micronutrient deficiencies, in addition to inadequate energy for daily mental and physical activities. In this section, we present results on mean BMI and the prevalence of underweight, overweight and obesity by age, sex and state.

Body mass index results are based on measured height and weight. Table 8.1.1 includes the prevalence of underweight, normal weight, overweight and obesity among younger and older adults by selected background characteristics. The levels of underweight increased with increasing age (see Figure 8.1.1).

**Figure 8.1.1** Percentage of underweight persons by age group, India (pooled), 2007



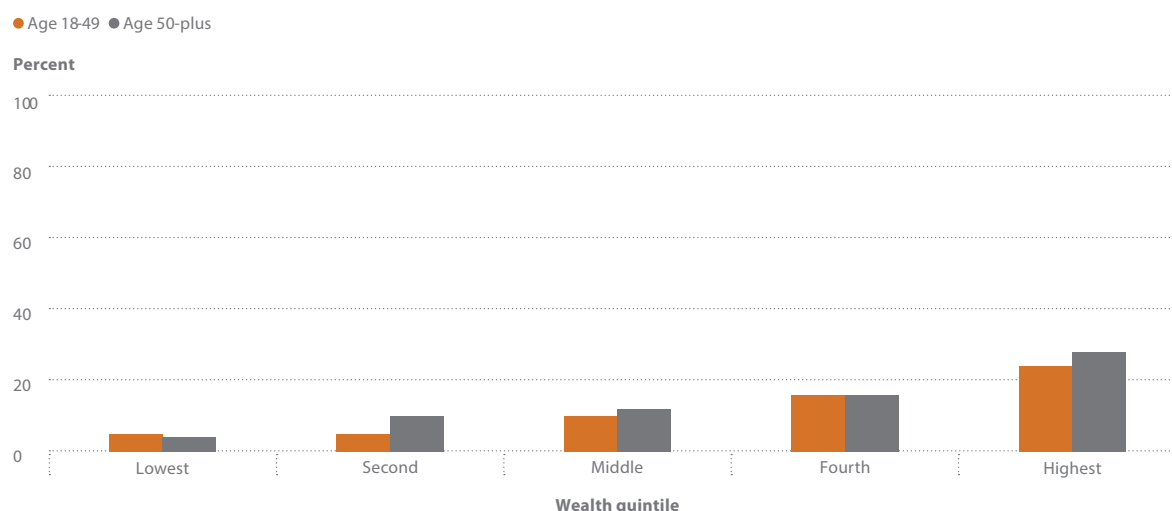
Overall, as a risk for chronic health issues, the burden of underweight was disproportionately concentrated among respondents from rural backgrounds, scheduled caste/tribes, those with no formal education and in the lowest wealth quintile. For example, 55% of older adults from the lowest wealth quintile were underweight, compared with just 20% in the highest quintile. In contrast, the burden of overweight/obesity was disproportionately concentrated among respondents from urban backgrounds, other castes, higher education categories and higher wealth quintile households. However, mean BMI did not vary much by age, sex, religion or marital status.

The proportion of overweight and obesity increased from 7% at age 18-29 to 16% at age 50-59. However, the prevalence of overweight and obesity declined for older

adults aged 60-plus. The prevalence of overweight/obesity was much higher for women (16 %) than men (9 %) at 50-plus years. As one might anticipate from the underweight figures, only 4 % of older respondents from the lowest wealth quintile were overweight or obese, compared with 28 % from the highest quintile.

In urban areas, more than twice as many older adults (22%) were overweight or obese compared with their rural counterparts (9 %). By caste, the prevalence of underweight was extremely high for scheduled caste and scheduled tribe respondents among both older adults (49 % and 51 % respectively) and younger adults (39 % and 41 % respectively). By income levels, the percentage of overweight and obesity rose with increasing wealth, with some differences between younger and older adults (Figure 8.1.2).

**Figure 8.1.2** Prevalence of overweight/obesity by age group and wealth quintile, India (pooled), 2007



**Table 8.1.1** Mean body mass index (BMI, kg/m<sup>2</sup>) and risk category (%) by background characteristics, India (pooled), 2007

Background characteristics	Mean BMI	Aged 18-49					
		Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	Number
Age group							
18-29	20.2	38.6	54.2	4.8	2.4	100	1,527
30-39	21.1	31.0	55.9	10.6	2.4	100	1,628
40-49	20.9	33.2	53.1	10.9	2.8	100	1,388
Sex							
Male	20.7	34.1	55.8	8.3	1.7	100	1030
Female	20.8	34.2	52.9	9.5	3.4	100	3513
Marital status							
Never married	20.2	37.2	57.8	3.5	1.5	100	547
Currently married	20.9	33.6	54	9.7	2.7	100	3741
Widowed	20.5	36.6	50.8	9.5	3.1	100	218
Other <sup>1</sup>	20.9	36.7	55.3	6.3	1.7	100	36
Residence							
Urban	21.5	24.1	58.6	13.9	3.4	100	1,136
Rural	20.5	37.4	53.0	7.3	2.3	100	3,407
Caste							
Scheduled tribe	19.6	40.7	55.2	3.2	0.9	100	367
Scheduled caste	20.1	39.3	50.5	8.0	2.2	100	872
Other <sup>2</sup>	21.1	32.1	55.4	9.7	2.8	100	3,304
Religion							
Hindu	20.8	33.9	54.3	9.3	2.5	100	3,797
Muslim	20.6	33.9	55.6	7.4	3.1	100	576
Other <sup>3</sup>	20.0	40.8	52.8	4.7	1.7	100	170
Education							
No formal education	20.1	37.4	55.9	4.4	2.3	100	1,669
Less than primary	19.7	43.8	47.1	8.3	0.7	100	418
Primary school	20.4	37.3	50.5	9.0	3.2	100	770
Secondary school	21.5	36.5	51.5	9.0	3.1	100	720
High school	21.2	26.8	56.0	14.7	2.5	100	644
College and above	22.7	18.0	65.9	13.3	2.8	100	322
Wealth quintile							
Lowest	19.2	49.2	46.2	2.8	1.9	100	933
Second	19.9	38.3	56.7	3.1	1.8	100	898
Middle	21.1	32.9	56.7	8.3	2.0	100	918
Fourth	21.3	26.9	56.8	13.0	3.3	100	914
Highest	22.6	19.8	56.6	19.5	4.2	100	880
Total	20.8	34.2	54.4	8.9	2.6	100	4,543

Note: BMI has been calculated by dividing weight (kg) by height (metres squared)(kg/m<sup>2</sup>).

BMI levels have been classified according to WHO classifications: underweight = <18.4; normal = 18.5 - 24.9; overweight = 25.0 - 29.9; obese = ≥30.0.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## Continued

Background characteristics	Mean BMI	Aged 50-plus					
		Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	Number
Age group							
50-59	20.9	33.6	50.8	13.1	2.5	100	2887
60-69	20.4	39.5	49.7	8.9	1.9	100	2175
70-79	19.7	49.8	40.8	7.8	1.5	100	1017
80+	19.3	56.8	36.8	4.6	1.8	100	293
Sex							
Male	20.2	40.0	50.6	8.1	1.3	100	3227
Female	20.8	37.8	45.9	13.3	3.0	100	3145
Marital status							
Never married	20.4	56.0	35.1	2.7	6.2	100	61
Currently married	20.6	36.9	50.0	10.8	2.2	100	4754
Widowed	20.2	45.4	42.6	10.3	1.7	100	1518
Other <sup>1</sup>	19.5	48.7	40.5	10.8	0.0	100	39
Residence							
Urban	21.6	28.7	49.3	18.5	3.5	100	1,615
Rural	20.1	43.0	47.9	7.5	1.6	100	4,757
Caste							
Scheduled tribe	19.3	50.9	40.2	7.2	1.7	100	390
Scheduled caste	19.7	48.8	44.9	4.4	1.9	100	1,061
Other <sup>2</sup>	20.8	35.1	49.6	12.2	3.0	100	4,921
Religion							
Hindu	20.5	38.2	48.4	10.5	2.9	100	5,381
Muslim	20.3	40.4	47.1	11.0	1.6	100	761
Other <sup>3</sup>	21.2	31.5	51.7	12.4	4.4	100	230
Education							
No formal education	19.8	45.5	45.5	6.8	2.3	100	3258
Less than primary	20.7	39.4	45.9	12.0	2.7	100	722
Primary school	20.7	36.0	49.3	12.3	2.4	100	908
Secondary school	20.9	28.4	53.7	16.0	2.0	100	637
High school	21.7	23.2	53.5	18.7	4.6	100	531
College and above	23.0	17.0	59.2	16.8	7.0	100	316
Wealth quintile							
Lowest	18.9	54.9	41.4	2.7	1.0	100	1,272
Second	20.0	44.6	45.7	8.4	1.4	100	1,269
Middle	20.2	40.3	47.4	10.4	1.8	100	1,270
Fourth	21.0	27.9	56.7	12.3	3.1	100	1,287
Highest	22.8	20.4	52.1	20.7	6.8	100	1,274
Total	20.5	38.3	48.3	10.6	2.8	100	6,372

**Table 8.1.2** Mean body mass index (BMI, kg/m<sup>2</sup>) and risk categories (%) for older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 50-plus						
	Men						Number
	Mean BMI	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	
Age group							
50-59	20.5	34.4	53.3	10.3	2.1	100	1365
60-69	20.2	39.6	52.7	6.1	1.6	100	1135
70-79	19.2	50.3	42.2	6.1	1.4	100	572
80+	19.5	55.3	35.9	5.9	2.9	100	155
Marital status							
Never married	19.7	57.1	33.9	0.4	8.7	100	42
Currently married	20.2	38.5	51.2	8.5	1.8	100	2834
Widowed	19.3	47.4	45.5	5.5	1.6	100	341
Other <sup>1</sup>	20.1	32.2	52.3	15.6	0.0	100	10
Residence							
Urban	20.9	31.3	52.3	14.1	2.4	100	765
Rural	19.9	42.4	50.0	5.9	1.6	100	2462
Caste							
Scheduled tribe	19.3	49.2	45.0	4.1	1.8	100	209
Scheduled caste	19.6	48.2	46.8	3.5	1.5	100	548
Other <sup>2</sup>	20.3	36.7	51.9	9.5	1.9	100	3,304
Religion							
Hindu	20.2	38.5	51.4	8.1	2.0	100	2718
Muslim	19.8	46.0	44.8	8.5	0.8	100	396
Other <sup>3</sup>	20.5	35.3	54.3	7.3	3.2	100	113
Education							
No formal education	19.4	52.4	42.6	3.5	1.5	100	1053
Less than primary	19.2	47.0	46.7	6.2	0.2	100	442
Primary school	19.9	40.0	52.7	5.7	1.6	100	569
Secondary school	20.4	32.4	55.2	11.4	1.1	100	486
High school	21.2	25.5	56.0	15.4	3.1	100	422
College and above	22.6	17.7	62.4	14.4	5.4	100	255
Wealth quintile							
Lowest	18.7	56.3	41.2	2.1	0.7	100	637
Second	20.0	45.4	47.2	5.6	1.9	100	649
Middle	19.4	43.8	49.3	5.3	0.6	100	631
Fourth	20.7	28.4	57.7	12.1	1.8	100	673
Highest	22.2	20.5	58.9	16.2	4.4	100	637
Total	20.2	39.4	50.6	8.2	1.8	100	3227

Note: BMI has been calculated by dividing weight (kg) by height (metres squared)(kg/m<sup>2</sup>).

BMI levels have been classified according to WHO classifications: underweight = <18.4; normal = 18.5 - 24.9; overweight = 25.0 - 29.9; obese = ≥30.0.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



Continued

Background characteristics	Aged 50-plus						
	Women						
	Mean BMI	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	Number
<b>Age group</b>							
50-59	21.5	31.7	48.3	16.2	3.8	100	1522
60-69	20.6	38.3	46.3	11.6	3.8	100	1040
70-79	20.3	46.5	40.3	10.2	3.0	100	445
80+	19.1	55.5	36.9	3.4	4.3	100	138
<b>Marital status</b>							
Never married	23.2	33.6	40.2	10.4	15.8	100	19
Currently married	21.1	33.2	48.4	14.3	4.1	100	1920
Widowed	20.4	43.7	41.8	11.4	3.1	100	1177
Other <sup>1</sup>	19.3	49.0	41.5	9.5	0.0	100	29
<b>Residence</b>							
Urban	22.2	25.4	46.7	22.9	5.1	100	850
Rural	20.3	42.0	45.6	9.2	3.2	100	2295
<b>Caste</b>							
Scheduled tribe	19.4	52.6	35.3	10.5	1.6	100	181
Scheduled caste	19.7	49.4	42.9	5.4	2.3	100	513
Other <sup>2</sup>	21.2	33.5	47.3	15.0	4.2	100	2451
<b>Religion</b>							
Hindu	20.8	37.9	45.3	13.0	3.8	100	2663
Muslim	20.8	34.4	49.6	13.7	2.4	100	365
Other <sup>3</sup>	21.7	27.8	49.3	17.3	5.6	100	117
<b>Education</b>							
No formal education	20.1	42.5	46.7	8.2	2.6	100	2205
Less than primary	22.6	26.3	44.5	22.1	7.1	100	280
Primary school	22.1	29.3	43.5	23.4	3.8	100	339
Secondary school	22.8	13.5	47.8	33.4	5.4	100	151
High school	24.8	9.1	38.6	38.8	13.5	100	109
College and above	25.7	12.8	39.5	31.3	16.5	100	61
<b>Wealth quintile</b>							
Lowest	19.0	53.5	41.8	3.2	1.4	100	635
Second	20.0	43.8	44.2	11.4	0.9	100	620
Middle	21.0	35.6	45.5	15.8	3.1	100	639
Fourth	21.4	27.3	55.5	12.6	4.6	100	614
Highest	23.4	20.3	44.5	25.7	9.6	100	637
<b>Total</b>	<b>20.8</b>	<b>37.1</b>	<b>45.9</b>	<b>13.2</b>	<b>3.7</b>	<b>100</b>	<b>3145</b>

Table 8.1.2 presents the percentage distribution of mean BMI for older men and women by selected background characteristics. It shows a steady and steep rise in the proportion of respondents who were underweight as age increased in both sexes. Among men, the proportion of underweight respondents rose from 34% (age 50-59) to 55% (age 80-plus). For women, the proportion rose from 32% in younger adults to 56% in older adults. At the same time, overweight and obesity prevalence declined with age among older men and women.

The positive association of education and wealth with the prevalence of overweight and obesity was much stronger among older women than older men. Almost half (48%) of women with a college level education or more were overweight or obese, compared with 11% of women with no education. Similarly, more than a third (35%) of women aged 50-plus in the highest wealth quintile were overweight or obese, compared with 5% in the lowest quintile. The burden of overweight/obesity was heavily concentrated among urban women, particularly among those with higher education and higher incomes. Correspondingly, the prevalence of underweight women was disproportionately concentrated among those living in rural areas, with no formal education and in the poorest wealth quintile.

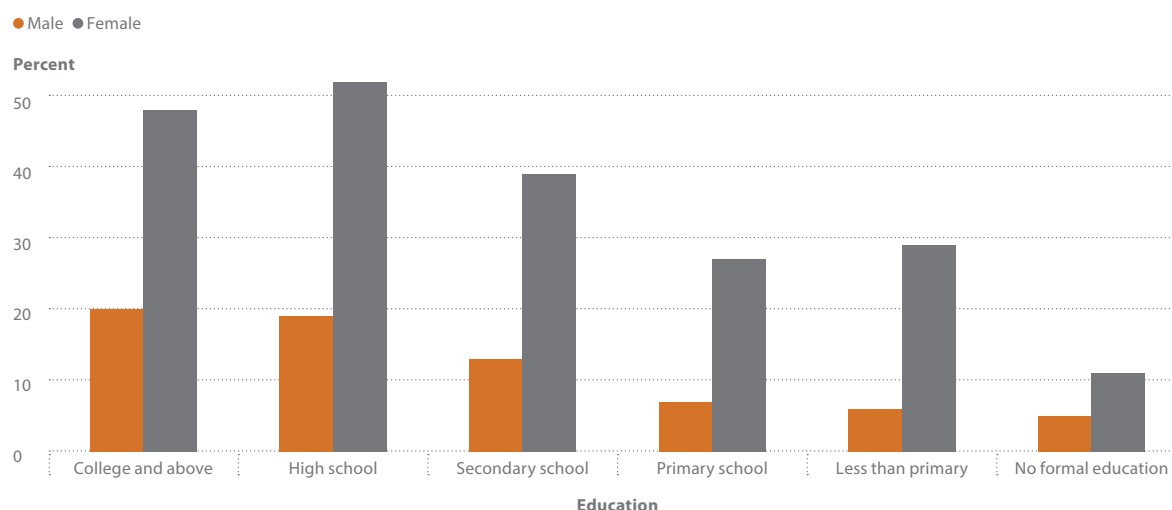
Table 8.1.3 presents mean BMI values and percentage distribution by BMI risk categories among younger and older adults, by state and for India overall. Overall, the prevalence of overweight and obesity was higher among older adults (13%) compared with younger adults (12%). By state, the prevalence of overweight and obesity in both younger and older adults was highest in Karnataka (17-21%) and lowest in Assam (6-8%). Consistent with this, the mean BMI values for both younger and older adults were highest in Karnataka (22 in both age groups) and lowest in Assam (20 in both age groups). On the other hand, more than a third of both age groups were underweight. This pattern confirms the double burden of a high prevalence of underweight combined with a rising prevalence of overweight and obesity. The prevalence of overweight/obesity was almost twice as high among older women as it was among older men and was more than four times higher for respondents with a high school education or above compared with those with no education (figure 8.1.3). While the prevalence of overweight/obesity was much higher in Karnataka, the prevalence of underweight was much higher in Uttar Pradesh and West Bengal (figure 8.1.4).

**Table 8.1.3 Mean body mass index (kg/m<sup>2</sup>) and risk categories (%) for younger and older adults, states and India (pooled), 2007**

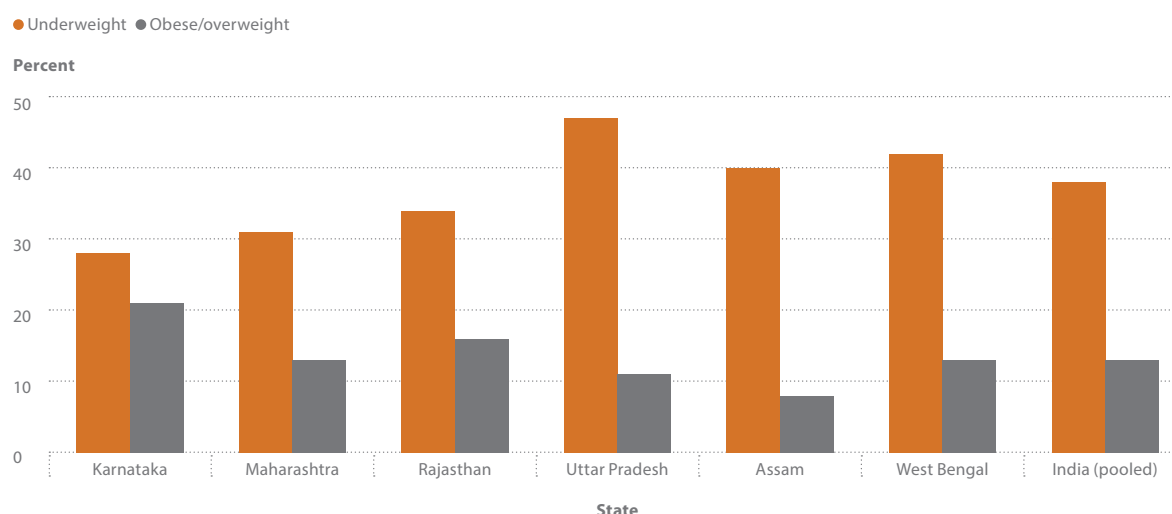
State	Aged 18-49							Aged 50-plus						
	Mean BMI	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	Number	Mean BMI	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	Number
Assam	20.1	34.4	59.1	5.6	0.8	100	505	19.9	40.4	51.3	6.5	1.8	100	655
Karnataka	21.8	26.1	57.1	14.2	2.6	100	600	21.5	27.9	51.4	16.4	4.3	100	884
Maharashtra	21.3	34.4	51.4	11.0	3.2	100	869	20.7	30.8	56.2	11.3	1.8	100	1,072
Rajasthan	20.3	34.4	56.4	7.6	1.6	100	833	21.0	33.5	50.2	12.6	3.7	100	1,358
Uttar Pradesh	20.7	36.0	53.6	7.2	3.2	100	854	20.0	46.6	42.4	8.5	2.6	100	1,268
West Bengal	20.2	35.5	54.3	8.2	2.0	100	882	20.4	41.6	45.8	9.6	3.0	100	1,135
India (pooled)	20.8	34.2	54.4	8.9	2.6	100	4,543	20.5	38.3	48.3	10.6	2.8	100	6,372

Note: BMI has been calculated by dividing weight (kg) by height (metres squared) (kg/m<sup>2</sup>). BMI levels have been classified according to WHO classifications: underweight = <18.4; normal = 18.5 - 24.9; overweight = 25.0 - 29.9; obese = ≥30.0.

**Figure 8.1.3** Prevalence of overweight/obesity among adults aged 50-plus by education level, India (pooled), 2007



**Figure 8.1.4** Percentage of underweight and overweight /obese adults aged 50-plus, states and India (pooled), 2007



## 8.1.2 Waist circumference

Waist circumference is a key indicator of abdominal fat. A high waist circumference caused by abdominal fat concentration is associated with the risk of type 2 diabetes, high cholesterol, high blood pressure and heart disease. Waist circumference can be used in conjunction with BMI to correct for the limitations of the latter in assessing weight-related health risks in persons with either high muscle mass or of advanced age.

Table 8.1.4 compares mean waist circumference and percentage distribution of respondents with high- and low-risk waist circumference for younger and older respondents by background characteristics. The prevalence of high-risk waist circumference decreased with age for respondents aged 50-plus, but increased

with age for younger adults. Pronounced gender differentials were observed in high-risk waist circumference: about 20% of younger women and 27% of older women were found to have high-risk waist circumference, compared with just 1% and 4% respectively for their male counterparts. High-risk waist circumference was more prevalent among urban older adults (24%) than rural dwellers (12%).

The prevalence of high-risk waist circumference increased with wealth among younger and older adults alike. Among those aged 50-plus, high-risk waist circumference increased from 6% for respondents in the poorest wealth quintile to 27% in the highest quintile. Marital status, caste, religion and education produced less pronounced differences in the prevalence of high-risk waist circumference.

**Table 8.1.4** Mean waist circumference (cm) and risk categories (%) for younger and older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)	Number
<b>Age group</b>					
18-29	76.3	93.7	6.3	100	1527
30-39	79.5	88.6	11.5	100	1628
40-49	79.9	86.7	13.3	100	1388
<b>Sex</b>					
Male	78.7	98.6	1.4	100	1030
Female	78.5	80.0	20.0	100	3513
<b>Marital status</b>					
Never married	75.5	96.5	3.5	100	547
Currently married	79.1	88.8	11.2	100	3741
Widowed	79.0	82.0	18.0	100	218
Other <sup>1</sup>	76.8	89.3	10.7	100	36
<b>Residence</b>					
Urban	81.2	82.5	17.5	100	1136
Rural	77.8	91.8	8.2	100	3407
<b>Caste</b>					
Scheduled tribe	75.4	94.1	5.9	100	367
Scheduled caste	77.3	92.1	7.9	100	872
Other <sup>2</sup>	79.3	88.4	11.6	100	3304
<b>Religion</b>					
Hindu	78.6	89.2	10.8	100	3797
Muslim	79.1	91.0	9.0	100	576
Other <sup>3</sup>	78.4	91.3	8.7	100	170
<b>Education</b>					
No formal education	77.2	88.7	11.3	100	1669
Less than primary	77.1	91.0	9.0	100	418
Primary school	78.0	89.4	10.6	100	770
Secondary school	78.9	90.9	9.1	100	720
High school	79.8	89.0	11.0	100	644
College and above	83.1	89.5	10.5	100	322
<b>Wealth quintile</b>					
Lowest	74.5	96.5	3.5	100	933
Second	77.2	92.3	7.7	100	898
Middle	78.7	89.7	10.3	100	918
Fourth	80.9	86.8	13.2	100	914
Highest	83.0	80.6	19.4	100	880
<b>Total</b>	<b>78.6</b>	<b>89.5</b>	<b>10.5</b>	<b>100</b>	<b>4543</b>

Note: WHO standard waist measure:

Metabolic complication and critical limit for male waist circumference =  $\geq 102$  cm;

metabolic complication and critical limit for female waist circumference =  $\geq 88$  cm

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

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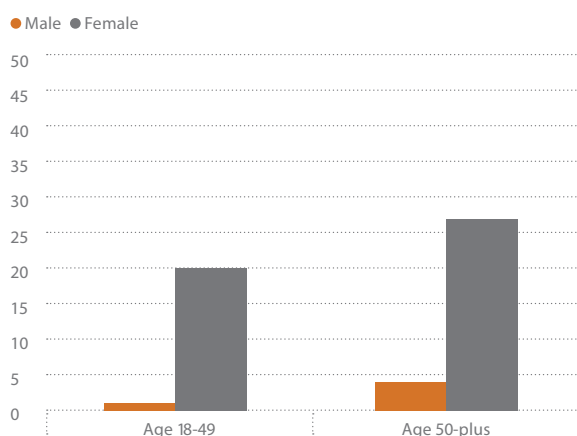
Background characteristics	Aged 50-plus				
	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)	Number
<b>Age group</b>					
50-59	81.9	82.7	17.3	100	2887
60-69	81.1	85.2	14.8	100	2175
70-79	79.4	89.1	10.9	100	1017
80+	77.1	88.4	11.7	100	293
<b>Sex</b>					
Male	81.2	96.1	3.9	100	3227
Female	80.9	72.8	27.2	100	3145
<b>Marital status</b>					
Never married	78.4	92.3	7.7	100	61
Currently married	81.5	85.9	14.1	100	4754
Widowed	79.4	80.3	19.7	100	1518
Other <sup>1</sup>	80.8	85.4	14.6	100	39
<b>Residence</b>					
Urban	84.8	75.9	24.1	100	1615
Rural	79.6	88.2	11.8	100	4757
<b>Caste</b>					
Scheduled tribe	76.4	90.5	9.5	100	390
Scheduled caste	77.0	94.3	5.7	100	1061
Other <sup>2</sup>	82.2	82.3	17.7	100	4921
<b>Religion</b>					
Hindu	81.0	85.4	14.6	100	5381
Muslim	80.9	81.0	19.0	100	761
Other <sup>3</sup>	82.5	81.4	18.6	100	230
<b>Education</b>					
No formal education	78.6	85.3	14.8	100	3258
Less than primary	81.5	83.3	16.8	100	722
Primary school	81.9	84.2	15.8	100	908
Secondary school	83.3	87.0	13.3	100	637
High school	86.0	82.1	18.0	100	531
College and above	88.2	84.8	15.2	100	316
<b>Wealth quintile</b>					
Lowest	76.2	93.8	6.2	100	1272
Second	78.7	87.9	12.1	100	1269
Middle	81.1	84.8	15.2	100	1270
Fourth	83.0	82.2	17.8	100	1287
Highest	87.3	73.2	26.8	100	1274
<b>Total</b>	<b>81.0</b>	<b>84.8</b>	<b>15.2</b>	<b>100</b>	<b>6372</b>

Table 8.1.5 presents the prevalence of high-risk waist circumference in older men and women by background characteristics. Age, location, marital status, education and wealth quintile showed highly pronounced variations. Overall, the prevalence of high-risk waist circumference was heavily concentrated among urban, educated and upper wealth quintile older women. Almost a third of (31%) of women aged 50-59 years had a high-risk waist circumference, compared with about a sixth (18%) of women aged 80-plus. The prevalence of high risk waist-circumference was higher among older women than among older men (Figure 8.1.5). Almost two in five older women in urban areas had high-risk waist circumferences, compared with one in five from rural areas. The prevalence of high-risk waist circumference in older women was also much

higher among respondents from other castes (31%) compared with those from scheduled castes (11%) and scheduled tribes (18%). By education level, more than two thirds (68%) of older women with a college education had high-risk waist circumferences compared with about 21% among those with no formal education. Almost half of older women (47%) in the upper wealth quintile were observed to have high-risk waist circumferences, compared with 12% in the poorest quintile.

Table 8.1.6 presents mean waist circumference and the percentage distribution of low- and high-risk waist circumference by state and for India overall. The prevalence of high-risk waist circumference was higher among older adults (15%) than among younger adults (11%). The risk also increased with increasing wealth for both older men and women, albeit at much higher risk levels in women (Figure 8.1.6). Twenty-six percent of older adults in Karnataka had high-risk waist circumferences, whereas Assam had the lowest proportion at just 6%. The percentage of older adults with high risk waist circumference was much higher in Karnataka, Maharashtra and Rajasthan than in Assam and West Bengal (Figure 8.1.7).

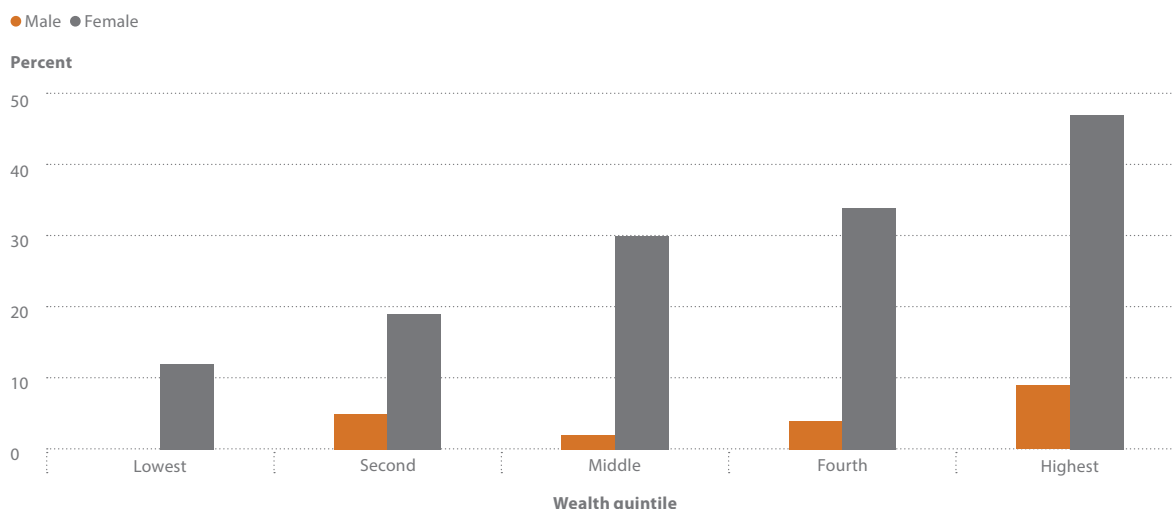
**Figure 8.1.5** Percentage of respondents with high-risk waist circumference by sex and age group, India (pooled), 2007



### 8.1.3 Waist-hip ratio

Central body obesity measured by waist-hip ratio (WHR) is considered to be a predictor of cardiovascular risks and metabolic alteration, contributing to higher risk for hypertension and diabetes. WHO standard limits for categorising waist-hip ratio are: low risk ( $\leq 0.95$  for males

**Figure 8.1.6** Percentage of high-risk waist circumference among adults aged 50-plus, by sex and wealth quintile, India (pooled), 2007



**Table 8.1.5** Mean waist circumference (cm) and risk categories (%) for older men and women, by background characteristics, India (pooled), 2007

Background characteristics	Aged 50-plus							
	Men				Women			
	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)
<b>Age group</b>								
50-59	81.9	95.2	4.8	100	81.9	69.1	30.9	100
60-69	81.3	96.8	3.2	100	80.9	73.8	26.2	100
70-79	79.4	97.5	2.6	100	79.6	79.5	20.5	100
80+	79.9	96.3	3.7	100	74.9	81.9	18.1	100
<b>Marital status</b>								
Never married	77.4	97.4	2.6	100	82.3	73.8	26.2	100
Currently married	81.4	96.0	4.0	100	81.7	70.4	29.6	100
Widowed	79.6	96.9	3.1	100	79.3	76.8	23.3	100
Other <sup>1</sup>	79.6	100	0.0	100	81.3	81.2	18.8	100
<b>Residence</b>								
Urban	84.7	91.2	8.8	100	84.9	60.6	39.3	100
Rural	79.9	98.0	2.0	100	79.2	77.7	22.3	100
<b>Caste</b>								
Scheduled tribe	76.5	98.5	1.5	100	76.4	82.3	17.7	100
Scheduled caste	77.8	99.3	0.7	100	76.2	88.8	11.2	100
Other <sup>2</sup>	82.3	95.2	4.8	100	82.2	68.8	31.2	100
<b>Religion</b>								
Hindu	81.2	96.4	3.6	100	80.8	73.9	26.1	100
Muslim	80.3	94.8	5.2	100	81.7	65.8	34.3	100
Other <sup>3</sup>	84.2	93.7	6.3	100	80.1	69.1	30.9	100
<b>Education</b>								
No formal education	77.9	98.8	1.2	100	79.1	79.3	20.7	100
Less than primary	79.9	99.0	1.0	100	84.8	56.6	43.4	100
Primary school	80.6	97.5	2.5	100	83.4	62.1	37.9	100
Secondary school	82.6	94.5	5.5	100	86.7	57.4	42.6	100
High school	85.2	89.8	10.2	100	91.2	35.4	64.6	100
College and above	88.1	93.4	6.6	100	94.0	31.8	68.2	100
<b>Wealth quintile</b>								
Lowest	76.2	99.6	0.4	100	76.2	88.3	11.7	100
Second	79.1	95.2	4.8	100	78.2	80.6	19.4	100
Middle	80.6	98.5	1.5	100	81.6	70.3	29.7	100
Fourth	82.8	95.8	4.2	100	83.3	66.4	33.6	100
Highest	87.8	91.3	8.7	100	86.6	53.3	46.7	100
<b>Total</b>	<b>81.2</b>	<b>96.1</b>	<b>3.9</b>	<b>100</b>	<b>80.9</b>	<b>72.8</b>	<b>27.2</b>	<b>100</b>

WHO Standard waist measure:

Metabolic complication and critical limit for male waist circumference =  $\geq 102$  cm;

Metabolic complication and critical limit for female waist circumference =  $\geq 88$  cm

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 8.1.6 Mean waist circumference (cm) and risk categories (%) for younger and older adults, states and India (pooled), 2007**

State	Aged 18-49					Aged 50-plus				
	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)	Number	Mean waist circumference (cm)	Low risk (%)	High risk (%)	Total (%)	Number
Assam	77.1	93.6	6.4	100	508	78.1	93.6	6.4	100	660
Karnataka	81.3	85.3	14.7	100	601	85.6	73.7	26.3	100	890
Maharashtra	80.1	87.3	12.7	100	866	82.6	84.5	15.5	100	1,072
Rajasthan	79.2	89.9	10.1	100	835	83.2	81.7	18.3	100	1,358
Uttar Pradesh	78.0	90.4	9.6	100	854	79.7	86.5	13.5	100	1,272
West Bengal	76.6	91.4	8.6	100	882	78.0	88.9	11.1	100	1,142
<b>India (pooled)</b>	<b>78.6</b>	<b>89.5</b>	<b>10.5</b>	<b>100</b>	<b>4,546</b>	<b>81.0</b>	<b>84.8</b>	<b>15.2</b>	<b>100</b>	<b>6,394</b>

WHO standard waist measure:

Metabolic complication risk critical limit for male  $\geq 102$  cmMetabolic complication risk critical limit for female  $\geq 88$  cm**Table 8.1.7 Percent distribution of metabolic risk levels (using waist-hip ratio) for younger and older respondents, states and India (pooled), 2007**

State	Aged 18-49					Aged 50-plus				
	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	Number	Low risk (%)	Moderate risk (%)	High risk (%)	Total (%)	Number
Assam	45.3	10.8	43.9	100	508	38.8	19.8	41.4	100	660
Karnataka	41.8	20.8	37.5	100	601	28.8	21.6	49.6	100	890
Maharashtra	48.3	15.2	36.5	100	866	39.8	19.8	40.4	100	1,072
Rajasthan	52.4	15.4	32.2	100	835	36.1	20.8	43.1	100	1,358
Uttar Pradesh	51.5	12.6	35.9	100	854	40.3	16.5	43.2	100	1,272
West Bengal	45.1	10.1	44.8	100	882	35.2	17.7	47.1	100	1,142
<b>India (pooled)</b>	<b>48.4</b>	<b>13.9</b>	<b>37.7</b>	<b>100</b>	<b>4,546</b>	<b>37.5</b>	<b>18.7</b>	<b>43.9</b>	<b>100</b>	<b>6,394</b>

Note: WHO standard waist-hip ratio chart

Male      Female      Risk level

0.95       $\leq 0.80$       Low

0.96-1.0      0.81-0.85      Moderate

1.0+      0.85+      High

and  $\leq 0.80$  for females); moderate risk (0.96-1.0 for men and 0.81-0.85 for women); and high risk ( $\geq 1.0$  for men and  $\geq 0.85$  for women).

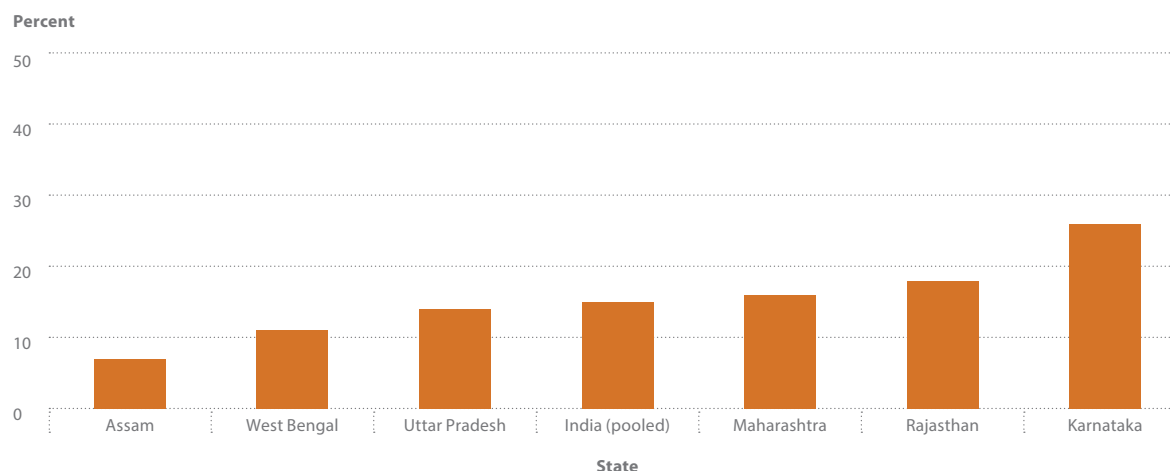
Overall, 19% of older respondents had a moderate-risk WHR and 44% had a high-risk WHR (Table 8.1.7). By comparison, 14% of younger adults had a moderate-risk WHR and 38% had a high-risk WHR. Overall, more than two thirds (63%) of older adults and more than half (52%) of younger adults were assessed with moderate-to-high-risk WHR. Among older adults, Karnataka had the highest proportion of respondents (50%) with high-risk WHR. Rajasthan had the lowest proportion of younger adults with high-risk WHR (32%) and West Bengal had the highest (45%).

Table 8.1.8 presents the percentage distribution of respondents with low-, moderate- and high-risk WHR by background characteristics. As age increased, the

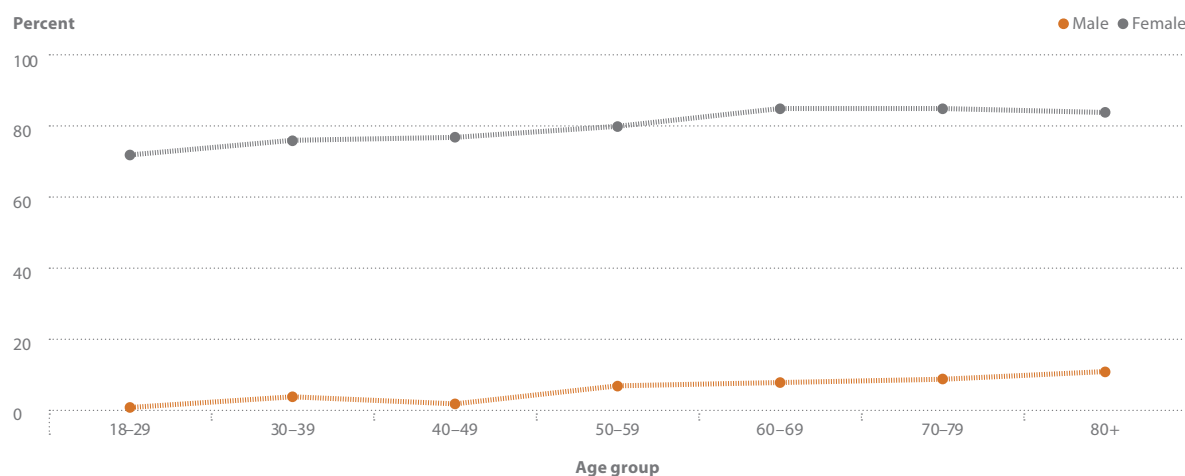
percentage of respondents with moderate-risk WHR increased as well, for instance, from 12% (18-29 years) to 19 % (50-59 years). Highly pronounced differences by sex were observed in the prevalence of high-risk WHR (see Figure 8.1.8). In the 50-plus group, more than four in five (83 %) women had high-risk WHR, compared with only 7% of men; for younger women, the figure was 75 % compared with only 3 % of men.

Irrespective of age, the prevalence of high-risk WHR declined markedly with education. Among older respondents, the prevalence of high risk WHR declined from 58% for those with no education to 19% for those with college education and above, while among younger respondents the corresponding decline was from 51% to 23%. This pattern is in marked contrast to the strong positive gradient of education and wealth quintile for the prevalence of overweight and obesity.

**Figure 8.1.7** Percentage of adults aged 50-plus with high-risk waist circumference, states and India (pooled), 2007



**Figure 8.1.8** Prevalence of high risk waist-hip ratio by sex and age group, India (pooled), 2007



**Table 8.1.8** Percent distribution of metabolic risk levels (using waist-hip ratio) for younger and older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	Low risk	Moderate risk	High risk	Total	Number
<b>Age group</b>					
18-29	48.0	11.6	40.4	100	1527
30-39	46.2	13.5	40.4	100	1628
40-49	51.0	16.3	32.8	100	1388
<b>Sex</b>					
Male	84.3	13.1	2.6	100	1030
Female	10.7	14.7	74.7	100	3513
<b>Marital status</b>					
Never married	58.3	11.3	30.4	100	547
Currently married	47.8	14.3	38.0	100	3741
Widowed	33.7	11.0	55.4	100	218
Other <sup>1</sup>	27.9	28.4	43.7	100	36
<b>Residence</b>					
Urban	40.0	16.6	43.4	100	1136
Rural	51.1	13.0	35.9	100	3407
<b>Caste</b>					
Scheduled tribe	50.1	10.2	39.7	100	367
Scheduled caste	48.8	15.2	36.0	100	872
Other <sup>2</sup>	48.1	13.9	38.0	100	3304
<b>Religion</b>					
Hindu	48.7	13.8	37.5	100	3797
Muslim	45.8	14.2	39.9	100	576
Other <sup>3</sup>	51.1	14.7	34.3	100	170
<b>Education</b>					
No formal education	35.5	13.8	50.7	100	1669
Less than primary	50.2	14.0	35.9	100	418
Primary school	48.5	12.7	38.8	100	770
Secondary school	51.5	15.6	32.9	100	720
High school	58.6	14.4	27.0	100	644
College and above	65.2	11.9	22.9	100	322
<b>Wealth quintile</b>					
Lowest	53.3	11.2	35.5	100	933
Second	46.6	14.8	38.6	100	898
Middle	51.5	11.5	37.1	100	918
Fourth	45.1	16.6	38.4	100	914
Highest	44.6	16.0	39.4	100	880
<b>Total</b>	<b>48.4</b>	<b>13.9</b>	<b>37.7</b>	<b>100</b>	<b>4543</b>

Note: WHO standard waist-hip ratio chart

Male	Female	Risk level
0.95	≤0.80	Low
0.96-1.0	0.81-0.85	Moderate
1.0+	0.85+	High

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## Continued

Background characteristics	Aged 50-plus				
	Low risk	Moderate risk	High risk	Total	Number
<b>Age group</b>					
50-59	38.7	19.2	42.1	100	2887
60-69	34.4	18.6	47.0	100	2175
70-79	40.6	17.5	41.9	100	1,017
80+	30.5	18.4	51.2	100	293
<b>Sex</b>					
Male	66.1	26.6	7.3	100	3227
Female	7.2	10.4	82.5	100	3145
<b>Marital status</b>					
Never married	51.3	25.6	23.1	100	61
Currently married	42.6	20.7	36.7	100	4754
Widowed	18.7	11.5	69.8	100	1518
Other <sup>1</sup>	16.9	9.1	74.0	100	39
<b>Residence</b>					
Urban	31.0	22.1	46.9	100	1615
Rural	39.8	17.4	42.9	100	4757
<b>Caste</b>					
Scheduled tribe	41.9	14.0	44.1	100	390
Scheduled caste	41.6	17.2	41.3	100	1061
Other <sup>2</sup>	36.1	19.4	44.6	100	4921
<b>Religion</b>					
Hindu	37.8	18.1	44.1	100	5381
Muslim	35.1	21.1	43.8	100	761
Other <sup>3</sup>	33.2	25.4	41.4	100	230
<b>Education</b>					
No formal education	27.9	14.5	57.6	100	3258
Less than primary	44.3	20.8	35.0	100	722
Primary school	45.1	18.7	36.2	100	908
Secondary school	50.5	26.1	23.4	100	637
High school	51.1	21.8	27.1	100	531
College and above	44.8	35.8	19.4	100	316
<b>Wealth quintile</b>					
Lowest	40.1	16.5	43.5	100	1272
Second	39.1	15.3	45.6	100	1269
Middle	39.4	18.8	41.8	100	1270
Fourth	36.8	19.6	43.6	100	1287
Highest	30.7	23.9	45.4	100	1274
<b>Total</b>	<b>37.7</b>	<b>18.7</b>	<b>43.9</b>	<b>100</b>	<b>6372</b>

## 8.2 Grip strength

Healthy ageing implies the maintenance of good functioning as a person gets older. Muscle strength affects functional ability and the physiological processes of body organs. Grip strength is a good measure of muscle strength and a predictor of functional limitation and disability among older populations. Grip strength was measured in both hands, with the mean of the best result in each hand used as the final result in kilograms.

Table 8.2.1 shows the mean grip strength values by state and in India (pooled). For older respondents, the mean grip strength was 20 kg (left hand) and 22 kg (right hand). For younger adults, the mean was 26 kg (left hand) and 29 kg (right hand). Mean grip strength was lowest in Uttar Pradesh in both younger and older respondents.

Table 8.2.2 presents measured grip strength by age group and sex. The mean grip strength of both hands declined consistently with the age of respondents, with a particularly heavy decline among respondents aged 70-plus. Mean grip strength was higher for respondents from rural areas compared with their urban counterparts. However, mean grip strength also increased with education, for both younger and older respondents. Wealth correlated positively with mean grip strength; however, marital status, caste, religion and education indicated no consistent pattern.

## 8.3 Mean time to walk four metres

A simple speed test measuring the time taken to walk four metres is a useful indicator of overall functional limitation in adults. In older adults particularly, walking speed can be a predictor of adverse results such as

hospitalisation, falls, dependence and mortality. Recently, there has been a growing interest examining the relationship between walking speed and decline in cognitive functioning, as slow gait often precedes cognitive decline. SAGE measured normal and rapid walking time (in seconds) to cover a four metre distance for all respondents.

Table 8.3.1 (see p. 169) presents the average time taken to walk four meters. The national average time taken for older adults was 5.1 seconds at normal walking pace and 3.6 seconds at a rapid pace. For younger adults, the average was 4.3 seconds at normal walking pace and 2.9 seconds at rapid pace. The longest average time taken for normal as well as rapid walking pace was in West Bengal and the shortest in Uttar Pradesh, for both younger and older adults.

Table 8.3.2 (see p. 170) shows the mean time taken for a four metre walk at both normal and rapid walking pace for younger and older adults. The mean time increased with age, from 4.1 seconds to 7.3 seconds at a normal pace and from 2.7 seconds to 5.1 seconds at a rapid walking pace. For respondents aged 50-plus, education showed noticeable negative impact. Gender, marital status, residence and religion, however, did not indicate strong gradients with the timed walk (see Figure 8.3.1 on p. 169).

## 8.4 Measured blood pressure

Blood pressure is the pressure of blood in the arteries (blood vessels), which is measured in millimetres of mercury (mmHg). Systolic blood pressure (SBP) is a measure of blood pressure while the heart is beating; diastolic blood pressure (DBP) is a measure of blood pressure while the heart is relaxed, between heartbeats.

**Table 8.2.1** Mean grip strength (kg) for younger and older respondents, states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Left hand	Number	Right hand	Number	Left hand	Number	Right hand	Number
Assam	25.6	502	27.9	501	20.8	635	22.3	639
Karnataka	28.0	605	30.9	603	22.0	868	24.1	869
Maharashtra	25.8	860	28.9	862	20.5	1,027	23.2	1,033
Rajasthan	27.5	837	30.0	837	22.1	1,332	24.2	1,338
Uttar Pradesh	24.6	873	26.8	880	17.8	1,256	19.7	1,253
West Bengal	26.4	858	29.9	851	21.1	1,095	24.2	1,079
India (pooled)	25.9	4,535	28.7	4,534	20.1	6,213	22.4	6,211

**Table 8.2.2 Mean grip strength (kg), by sex and age group, India (pooled), 2007**

Background characteristics	Aged 18-49			
	Men		Women	
	Left hand	Right hand	Left hand	Right hand
<b>Age group</b>				
18-29	33.5	36.3	20.7	23.3
30-39	31.5	34.7	20.4	22.9
40-49	30.2	33.3	18.9	21.1
<b>Marital status</b>				
Never married	33.1	35.0	21.2	24.2
Currently married	31.4	34.6	20.0	22.4
Widowed	26.7	29.7	19.3	21.9
Other <sup>1</sup>	26.3	24.6	22.0	23.3
<b>Residence</b>				
Urban	30.9	34.5	19.5	22.2
Rural	31.7	34.6	20.3	22.7
<b>Caste</b>				
Scheduled tribe	32.1	35.3	21.1	24.0
Scheduled caste	31.3	34.1	19.2	21.7
Other <sup>2</sup>	31.6	34.6	20.2	22.7
<b>Religion</b>				
Hindu	31.4	34.6	20.1	22.5
Muslim	32.8	34.3	19.9	22.6
Other <sup>3</sup>	30.5	33.6	20.8	23.1
<b>Education</b>				
No formal education	31.0	33.0	19.4	21.7
Less than primary	30.3	32.9	20.9	23.3
Primary school	32.2	35.9	20.9	23.4
Secondary school	30.5	32.7	19.8	22.5
High school	32.4	36.8	20.8	23.0
College and above	32.6	35.7	21.7	24.3
<b>Wealth quintile</b>				
Lowest	29.9	32.0	19.5	21.8
Second	30.8	33.7	19.8	22.7
Middle	31.7	35.0	20.2	22.6
Fourth	32.8	36.6	19.9	22.4
Highest	33.1	36.3	21.2	23.5
<b>Total</b>	<b>31.5</b>	<b>34.6</b>	<b>20.1</b>	<b>22.6</b>

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 8.2.2 Continued

Background characteristics	Aged 50-plus			
	Men		Women	
	Left hand	Right hand	Left hand	Right hand
<b>Age group</b>				
50-59	26.1	28.9	17.1	19.2
60-69	24.0	26.7	15.0	16.7
70-79	20.6	23.1	14.3	15.8
80+	17.7	18.9	10.8	12.8
<b>Marital status</b>				
Never married	23.1	26.3	13.8	16.6
Currently married	24.4	27.1	16.3	18.3
Widowed	22.5	24.4	14.7	16.4
Other <sup>1</sup>	29.1	32.8	18.1	16.4
<b>Residence</b>				
Urban	22.9	26.0	14.7	16.7
Rural	24.8	27.2	16.1	17.9
<b>Caste</b>				
Scheduled tribe	23.2	25.5	17.5	19.8
Scheduled caste	23.2	25.8	15.7	17.4
Other <sup>2</sup>	24.6	27.2	15.6	17.4
<b>Religion</b>				
Hindu	24.4	27.1	15.6	17.5
Muslim	23.9	26.1	15.8	17.2
Other <sup>3</sup>	22.9	25.7	18.0	20.5
<b>Education</b>				
No formal education	22.4	24.7	15.6	17.3
Less than primary	23.3	25.2	16.7	18.9
Primary school	24.9	27.8	16.1	18.2
Secondary school	26.4	29.4	15.1	17.4
High school	24.4	27.4	16.8	19.4
College and above	26.7	29.7	14.7	17.3
<b>Wealth quintile</b>				
Lowest	22.7	24.8	15.5	17.0
Second	23.2	26.2	14.8	16.8
Middle	23.5	26.1	15.6	17.5
Fourth	25.5	27.6	16.4	18.4
Highest	26.6	30.0	16.5	18.5
<b>Total</b>	<b>24.3</b>	<b>26.9</b>	<b>15.7</b>	<b>17.6</b>

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

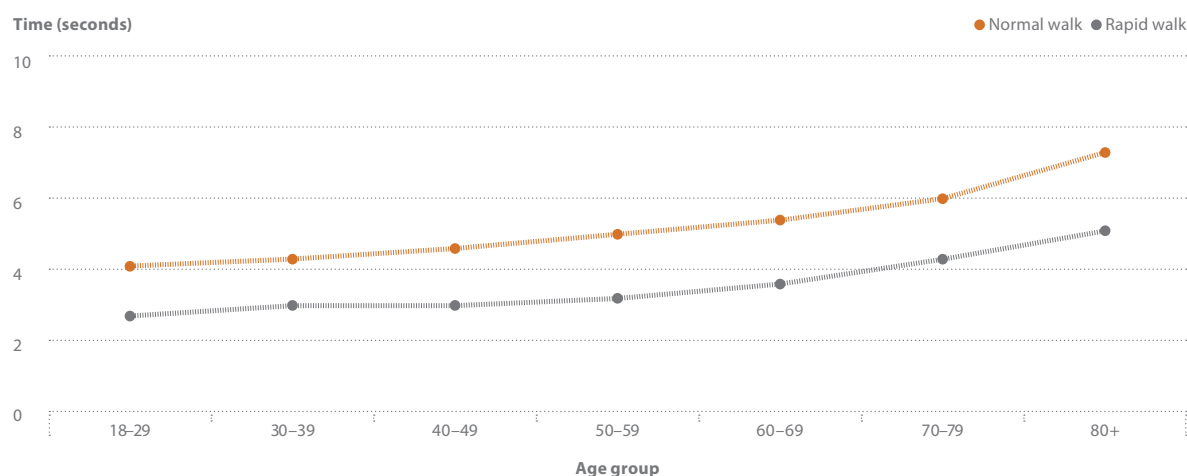
3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 8.3.1** Mean time (seconds) taken for 4m walk at normal and rapid pace for younger and older adults, states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Normal walk		Rapid walk		Normal walk		Rapid walk	
	Mean (seconds)	Number	Mean (seconds)	Number	Mean (seconds)	Number	Mean (seconds)	Number
Assam	4.5	505	3.0	505	5.3	656	3.6	650
Karnataka	4.4	605	3.0	605	5.2	852	3.7	851
Maharashtra	4.4	867	3.0	867	5.1	1,043	3.6	1,041
Rajasthan	4.3	839	2.9	840	5.3	1,346	3.7	1,345
Uttar Pradesh	4.1	872	2.6	870	4.9	1,257	3.2	1,254
West Bengal	4.5	883	3.2	883	5.4	1,129	3.9	1,129
India (pooled)	4.3	4,571	2.9	4,570	5.1	6,283	3.6	6,270

**Figure 8.3.1** Mean time taken for 4m walk (seconds), by age group, India (pooled), 2007



Globally, high blood pressure or hypertension – defined as SBP equal to or above 140 mmHg and/or DBP equal to or above 90 mmHg – causes 13% of total deaths and accounts for 4.5% of the burden of disease. High blood pressure is a major risk factor for future chronic diseases such as heart disease (angina, heart attack and heart failure), stroke (brain attack), peripheral vascular disease, eye disease (including blindness) and kidney damage. SBP in the pre-hypertension range of 120-140 mmHg may cause ischemic heart disease through many intermediate risk factors. Additionally, elevated pulse rate may be an independent risk factor for cardiovascular disease.

### 8.4.1 Prevalence of hypertension

For SAGE, three blood pressure measurements were collected from each respondent and the average of the second and third readings was used in the analysis.

The prevalence of hypertension was assessed using standard critical limits classification as recommended by WHO in 2003. The WHO classification system for blood pressure is:

- Normal: systolic <120 mmHg; diastolic <80 mmHg
- Pre-hypertension: systolic 120-139 mmHg; diastolic 80-89 mmHg
- Hypertension: systolic ≥140mmHg; diastolic ≥90 mmHg.

Table 8.4.1 shows that 29% of older respondents and 17% of adults aged 18-49 had hypertension on measurement. Almost two thirds (63%) of older adults and half (49%) of younger adults had high blood pressure (including both pre-hypertension and hypertension). By state, the prevalence of hypertension in older adults was highest in Assam (36%) followed by Karnataka and

**Table 8.3.2** Mean time (seconds) taken for 4m walk at normal and rapid pace for younger and older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49			
	Normal walk		Rapid walk	
	Mean (seconds)	Number	Mean (seconds)	Number
<b>Age group</b>				
18-29	4.1	1,566	2.7	1,565
30-39	4.3	1,626	3.0	1,627
40-49	4.6	1,379	3.0	1,378
<b>Sex</b>				
Male	4.1	1,026	2.6	1,026
Female	4.6	3,545	3.2	3,544
<b>Marital status</b>				
Never married	4.0	545	2.7	545
Currently married	4.4	3,774	2.9	3,774
Widowed	4.6	216	3.2	215
Other <sup>1</sup>	6.3	36	3.3	36
<b>Residence</b>				
Urban	4.3	1,141	2.9	1,141
Rural	4.4	3,430	2.9	3,429
<b>Caste</b>				
Scheduled tribe	4.4	367	3.0	367
Scheduled caste	4.3	875	2.8	875
Other <sup>2</sup>	4.4	3,329	2.9	3,328
<b>Religion</b>				
Hindu	4.3	3,819	2.9	3,818
Muslim	4.7	582	3.0	582
Other <sup>3</sup>	4.4	170	3.0	170
<b>Education</b>				
No formal education	4.5	1,678	3.1	1,678
Less than primary	4.4	424	3.0	424
Primary school	4.5	775	3.1	775
Secondary school	4.2	723	2.8	722
High school	4.1	643	2.7	643
College and above	4.1	328	2.7	328
<b>Wealth quintile</b>				
Lowest	4.4	938	3.0	938
Second	4.4	914	3.0	913
Middle	4.4	920	2.9	921
Fourth	4.3	913	2.8	912
Highest	4.2	886	2.8	886
<b>Total</b>	<b>4.3</b>	<b>4,571</b>	<b>2.9</b>	<b>4,570</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus			
	Normal walk		Rapid walk	
	Mean (seconds)	Number	Mean (seconds)	Number
<b>Age group</b>				
50-59	5.0	2,870	3.2	2,866
60-69	5.4	2,148	3.6	2,142
70-79	6.0	985	4.3	984
80+	7.3	280	5.1	278
<b>Sex</b>				
Male	5.0	3,171	3.2	3,166
Female	5.7	3,112	4.0	3,104
<b>Marital status</b>				
Never married	4.9	60	3.3	59
Currently married	5.2	4,702	3.5	4,694
Widowed	5.9	1,485	4.2	1,481
Other <sup>1</sup>	5.8	36	4.5	36
<b>Residence</b>				
Urban	5.3	1,582	3.7	1,580
Rural	5.4	4,701	3.6	4,690
<b>Caste</b>				
Scheduled tribe	5.1	389	3.5	387
Scheduled caste	5.2	1,052	3.6	1,047
Other <sup>2</sup>	5.4	4,842	3.6	4,386
<b>Religion</b>				
Hindu	5.3	5,311	3.6	5,299
Muslim	5.3	744	3.6	743
Other <sup>3</sup>	5.2	228	3.8	228
<b>Education</b>				
No formal education	5.6	3,206	3.9	3,197
Less than primary	5.4	714	3.5	713
Primary school	5.0	890	3.5	889
Secondary school	5.2	633	3.4	633
High school	4.9	527	3.1	525
College and above	4.6	313	3.2	313
<b>Wealth quintile</b>				
Lowest	5.7	1,255	3.7	1,250
Second	5.4	1,254	3.7	1,252
Middle	5.1	1,251	3.5	1,247
Fourth	5.3	1,271	3.6	1,270
Highest	5.2	1,252	3.6	1,251
<b>Total</b>	<b>5.1</b>	<b>6,283</b>	<b>3.6</b>	<b>6,270</b>

**Table 8.4.1** Percent distribution of younger and older respondents by measured hypertensive status (systolic and/or diastolic blood pressure), states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Normal	Pre-hypertension	Hypertension	Number	Normal	Pre-hypertension	Hypertension	Number
Assam	50.8	32.7	16.4	512	32.0	31.9	36.2	671
Karnataka	49.1	30.8	20.0	610	32.8	32.9	34.3	893
Maharashtra	41.2	31.0	27.9	874	32.0	35.9	32.2	1,074
Rajasthan	46.7	36.5	16.8	844	34.9	36.1	29.0	1,374
Uttar Pradesh	60.7	30.0	9.4	879	45.6	33.0	21.5	1,285
West Bengal	48.5	34.8	16.7	895	35.3	30.4	34.3	1,161
India (pooled)	51.0	32.1	16.9	4,614	37.4	33.4	29.2	6,458

Note: Systolic and diastolic blood pressure have been classified as per WHO norms: normal = systolic <120 mmHg and diastolic <80 mmHg; pre-hypertension = systolic 120-139 mmHg and/or diastolic 80-89 mmHg; hypertension = systolic ≥140 mmHg and/or diastolic ≥90 mmHg.

West Bengal (34%) and lowest in Uttar Pradesh (22%). The prevalence of hypertension among young adults was highest in Maharashtra (28%) and lowest in Uttar Pradesh (9%).

Table 8.4.2 presents the overall prevalence of hypertension among older and younger adults by background characteristics. The prevalence of hypertension among both older and younger adults increased with age. The prevalence of hypertension was higher among older women (31 %) than older men (28 %). More than three quarters (77 %) of divorced/ separated/cohabiting older adults had either pre- hypertension or hypertension. In contrast, the overall prevalence of hypertension was comparatively low among older women who had never married. The prevalence of hypertension was higher among both

younger and older adults in urban areas compared with rural areas. By caste, differences in the prevalence of hypertension among older adults were less pronounced.

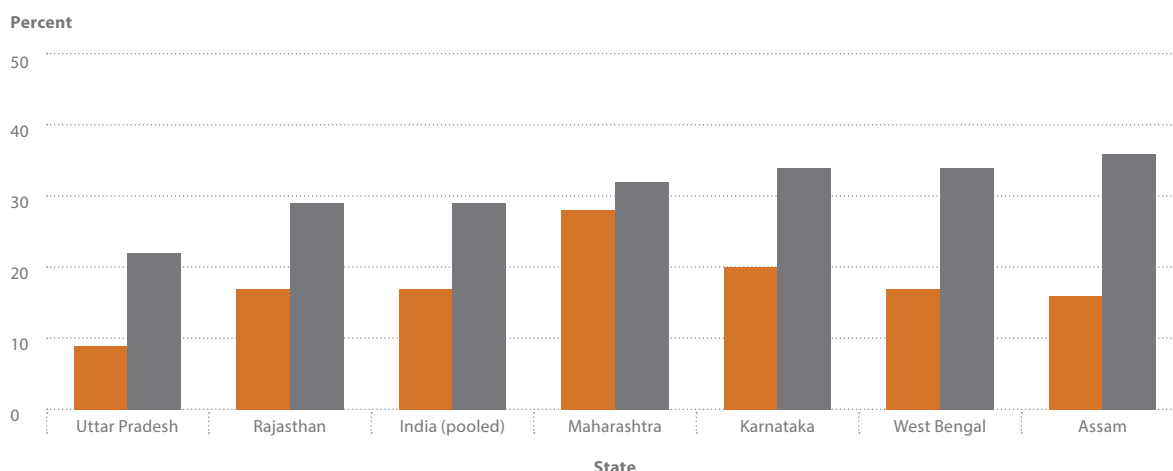
## 8.4.2 Prevalence of critical hypertension

A further examination of respondents with critical hypertension, defined as SBP of 160 or above and/or DBP of 100 or above, was also conducted. The European Society of Cardiology and European Society of Hypertension has categorised systolic and diastolic blood pressure into three groups:

- Normal: Those with optimal (systolic < 120 and/or diastolic < 80) and normal (systolic 120-129 and/or diastolic 80-84) blood pressure

**Figure 8.4.1** Prevalence of hypertension for younger and older respondents, states and India (pooled), 2007

● 18-49 age group ● 50-plus age group



**Table 8.4.2** Percent distribution of younger and older respondents by hypertensive status and background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49			
	Normal	Pre-hypertension	Hypertension	Number
<b>Age group</b>				
18-29	61.7	27.5	10.7	1527
30-39	45.3	36.7	18.1	1628
40-49	46.8	31.8	21.4	1388
<b>Sex</b>				
Male	49.7	32.5	17.8	1030
Female	52.4	31.6	16.0	3513
<b>Marital status</b>				
Never married	58.5	30.4	11.1	547
Currently married	49.8	32.5	17.7	3741
Widowed	54.2	31.1	14.7	218
Other <sup>1</sup>	52.1	17.6	30.3	36
<b>Residence</b>				
Urban	46.3	32.8	20.9	1136
Rural	52.5	31.8	15.6	3407
<b>Caste</b>				
Scheduled tribe	42.6	34.4	23.1	367
Scheduled caste	55.2	28.1	16.6	872
Other <sup>2</sup>	50.7	33.0	16.4	3304
<b>Religion</b>				
Hindu	51.1	31.9	16.9	3797
Muslim	49.7	35.1	15.2	576
Other <sup>3</sup>	53.3	25.1	21.6	170
<b>Education</b>				
No formal education	46.7	35.6	17.7	1669
Less than primary	51.6	33.7	14.8	418
Primary school	50.1	29.2	20.7	770
Secondary school	53.3	33.3	13.4	720
High school	58.1	27.0	14.9	644
College and above	50.0	30.9	19.1	322
<b>Wealth quintile</b>				
Lowest	50.0	33.8	16.2	933
Second	50.4	33.5	16.1	898
Middle	52.7	30.8	16.6	918
Fourth	53.1	29.5	17.4	914
Highest	49.3	32.2	18.5	880
<b>Total</b>	<b>51.0</b>	<b>32.1</b>	<b>16.9</b>	<b>4543</b>

Note: Systolic and diastolic blood pressure have been classified as per WHO norms: normal = systolic <120 mmHg and diastolic <80 mmHg; pre-hypertension = systolic 120-139 mmHg and/or diastolic 80-89 mmHg; hypertension = systolic ≥140 mmHg and/or diastolic ≥90 mmHg.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 8.4.2

Continued

Background characteristics	Aged 50-plus			
	Normal	Pre-hypertension	Hypertension	Number
<b>Age group</b>				
50-59	40.7	32.4	26.9	2887
60-69	36.0	33.8	30.2	2175
70-79	32.1	35.8	32.0	1,017
80+	30.9	33.0	36.2	293
<b>Sex</b>				
Male	42.5	29.9	27.6	3227
Female	32.2	37.0	30.7	3145
<b>Marital status</b>				
Never married	40.0	25.2	34.8	61
Currently married	39.6	32.7	27.7	4754
Widowed	30.3	35.8	34.0	1518
Other <sup>1</sup>	23.3	47.3	29.5	39
<b>Residence</b>				
Urban	33.5	35.7	30.7	1615
Rural	39.0	32.5	28.5	4757
<b>Caste</b>				
Scheduled tribe	33.0	38.9	28.0	390
Scheduled caste	40.8	30.2	29.1	1061
Other <sup>2</sup>	37.0	33.7	29.2	4921
<b>Religion</b>				
Hindu	37.0	33.5	29.5	5381
Muslim	40.8	33.0	26.2	761
Other <sup>3</sup>	36.4	33.1	30.5	230
<b>Education</b>				
No formal education	37.6	33.3	29.1	3258
Less than primary	33.7	36.0	30.4	722
Primary school	36.5	33.1	30.4	908
Secondary school	43.6	30.2	26.2	637
High school	36.1	35.8	28.2	531
College and above	36.0	32.7	31.3	316
<b>Wealth quintile</b>				
Lowest	43.7	29.5	26.9	1272
Second	38.7	30.6	30.8	1269
Middle	36.6	34.4	29.0	1270
Fourth	35.0	38.6	26.4	1287
Highest	32.1	35.2	32.7	1274
<b>Total</b>	<b>37.4</b>	<b>33.4</b>	<b>29.2</b>	<b>6372</b>

Note: Systolic and diastolic blood pressure have been classified as per WHO norms: normal = systolic <120 mmHg and diastolic <80 mmHg; pre-hypertension = systolic 120-139 mmHg and/or diastolic 80-89 mmHg; hypertension = systolic ≥140 mmHg and/or diastolic ≥90 mmHg.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

- Needing medical attention: Those with high normal blood pressure (systolic 130-139 and/or diastolic 85-89) or Grade 1 hypertension (systolic 140-159 and/or diastolic 90-99)
- Needing urgent medical attention (critical): Those with Grade 2 (systolic 160-179 and/or diastolic 100-109) or Grade 3 hypertension (systolic  $\geq 180$  and/or diastolic  $\geq 110$ ) (Mancia 2007).

Table 8.4.3 presents the percentage distribution of respondents by the following classifications: optimal, normal, and high normal blood pressure and Grade 1, Grade 2 and Grade 3 hypertension. Overall, 11.2% of older respondents and 5.2% of younger respondents were in the critical range, while more than a third of older respondents and a quarter of younger respondents had elevated blood pressure. Among older adults, Uttar Pradesh was the only state where less than 10 % of older respondents required urgent medical attention; in Assam, 18 % of older adults had critical hypertension (see Figure 8.4.3). Maharashtra had the highest proportion (31 %) of young adults needing medical attention; it also had the highest proportion (11 %) of younger adults with critical hypertension.

Figure 8.4.3 presents the percentage distribution of respondents by need for medical attention and by age. The proportion of respondents with normal blood pressure decreased with age, with this trend more consistent for females. Similarly, the percentage of respondents needing medical attention for high blood pressure did not change much with increasing age in men, whereas the proportion of women needing attention increased consistently with age. The percentage of respondents with critically high blood pressure, however, increased with age for both sexes (Figure 8.4.4).

### 8.4.3 Systolic and diastolic blood pressure

For older respondents, mean SBP and DBP blood pressure levels were both highest in Assam and lowest in Uttar Pradesh (Table 8.4.4). Average SBP in younger respondents was 115 mmHg (below the ideal of 120 mmHg), while DBP was 79 mmHg (almost equal to a normal reading of 80 mmHg). Among older respondents the mean pulse rate was highest (83) in Uttar Pradesh and lowest in Karnataka (80). Overall, for older respondents the mean SBP was 124 mmHg and the mean DBP was

**Table 8.4.3 Percent distribution of younger and older respondents by severity of hypertension (HPT), states and India (pooled), 2007**

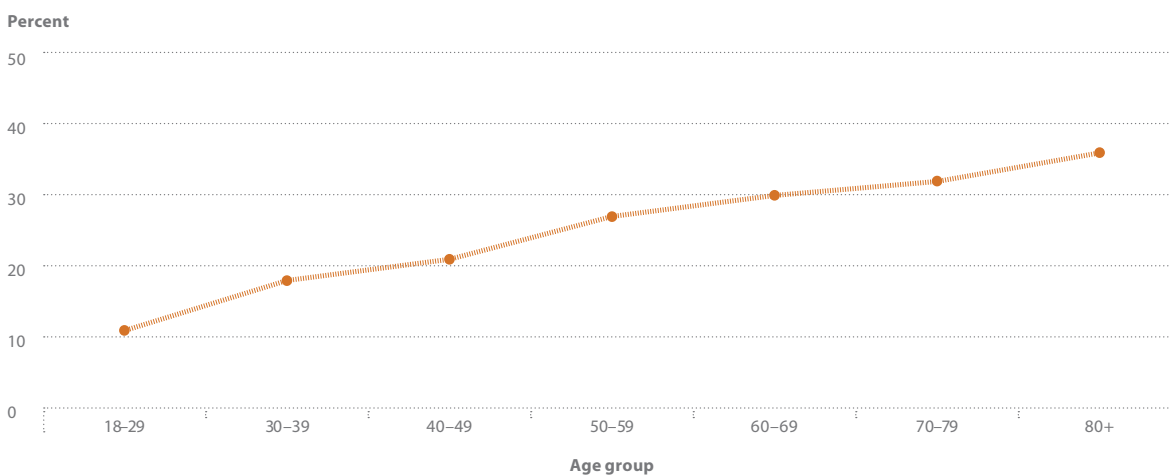
State	Aged 18-49							Aged 50-plus						
	Optimal	Normal	High normal	HPT mild	HPT moderate	HPT severe	Number	Optimal	Normal	High normal	HPT mild	HPT moderate	HPT severe	Number
Assam	50.8	15.2	17.6	10.3	2.7	3.5	512	32.0	15.8	16.1	18.6	11.5	6.1	671
Karnataka	49.1	16.1	14.7	15.7	3.0	1.3	610	32.8	17.7	15.1	19.6	9.5	5.1	893
Maharashtra	41.2	17.2	13.8	17.4	5.9	4.6	874	32.0	19.5	16.3	19.3	10.1	2.8	1,074
Rajasthan	46.7	21.2	15.3	13.0	2.9	0.9	844	34.9	19.9	16.2	19.2	5.3	4.5	1,374
Uttar Pradesh	60.5	19.9	10.3	6.8	1.5	1.1	880	45.6	19.8	13.2	14.8	4.5	2.2	1,285
West Bengal	48.5	19.0	15.8	11.3	3.8	1.6	895	35.3	15.5	14.9	19.7	9.7	5.0	1,161
India (pooled)	51.0	18.7	13.5	11.7	3.2	2.0	4,615	37.4	18.6	14.9	17.9	7.6	3.6	6,458

Note: Standard measure of blood pressure for adults (based on European Society of Cardiology and on European Society of Hypertension).

	Systolic BP (mmHg)			Diastolic BP (mmHg)		
Optimal	<120			<80		
Normal	120-129			80-84		
High-normal	130-139			85-89		
HPT-mild	140-159			90-99		
HPT-moderate	160-179			100-109		
HPT-severe	$\geq 180$			$\geq 110$		

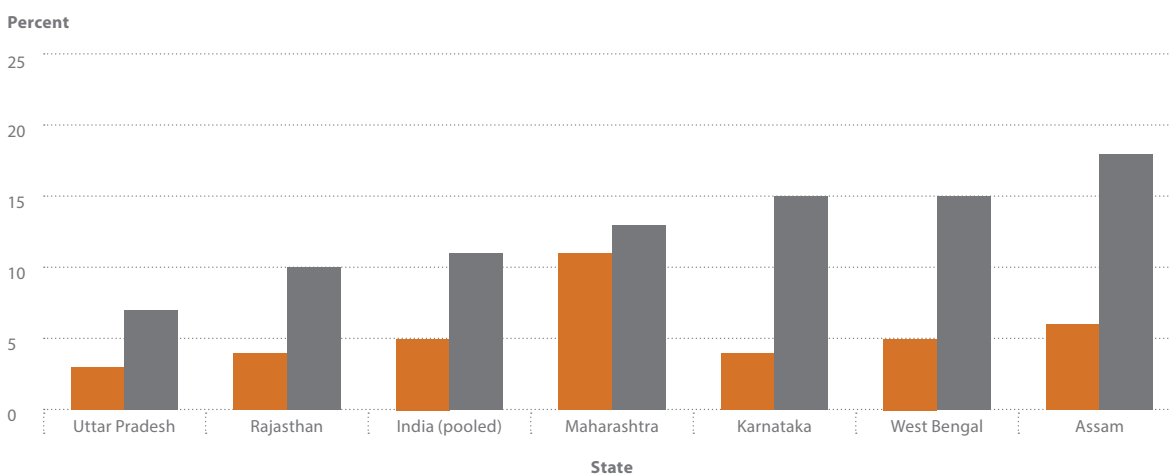


**Figure 8.4.2** Prevalence of hypertension by age groups, India (pooled), 2007



**Figure 8.4.3** Percentage of respondents with critical (Grade 2 or Grade 3) hypertension by age group, states and India (pooled), 2007

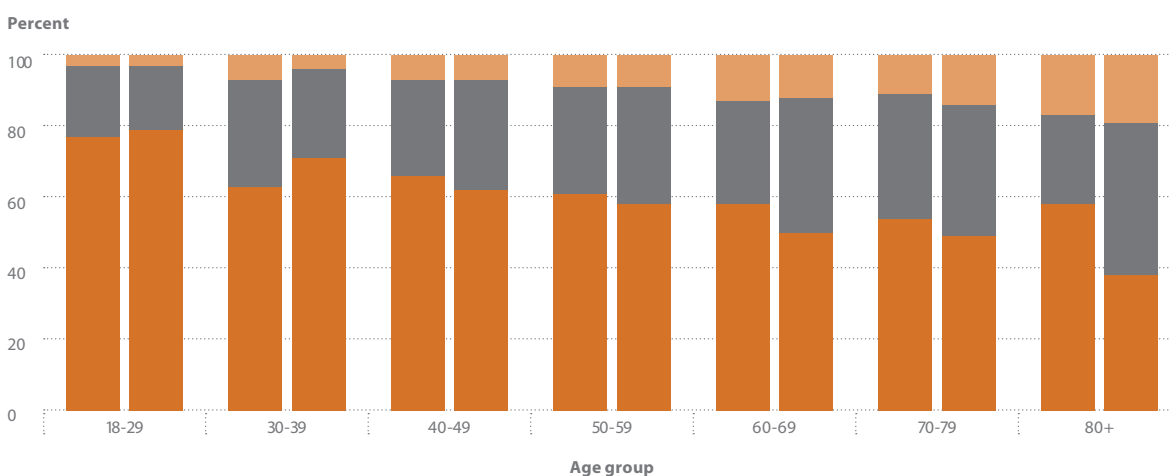
● 18-49 age group ● 50-plus age group



**Figure 8.4.4** Percent distribution of respondents by different risk conditions of hypertension according to age and sex, India (pooled), 2007

● Normal condition ● Need attention ● Critical condition

Left bar = male; right bar = female



**Table 8.4.4 Mean blood pressure and pulse rate for younger and older respondents, states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Pulse rate		Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Pulse rate	
	Mean	Number	Mean	Number	Mean	Number	Mean	Number	Mean	Number	Mean	Number
Assam	116.5	512	79.5	512	81.0	512	127.8	671	83.2	671	80.9	671
Karnataka	115.1	610	79.7	610	80.3	610	127.0	893	83.2	893	80.4	893
Maharashtra	117.1	874	82.8	874	82.1	874	124.3	1074	83.4	1074	80.6	1,074
Rajasthan	115.7	844	78.8	844	80.3	844	123.4	1,374	81.8	1,374	81.8	1,374
Uttar Pradesh	112.7	880	75.9	879	83.0	878	120.3	1,285	78.1	1,285	83.1	1,285
West Bengal	115.7	895	79.5	895	82.6	895	126.6	1,161	82.5	1,161	81.1	1,161
India (pooled)	115.0	4,615	78.9	4,614	82.0	4,669	123.8	6,458	81.3	6,458	81.7	6,559

81 mmHg. For younger respondents, the mean pulse rate was highest (83) in Uttar Pradesh, and lowest in Karnataka and Rajasthan (80). By state, blood pressure levels among younger respondents were lowest in Uttar Pradesh (SBP 113 mmHg; DBP 76 mmHg) and highest in Maharashtra (SBP 117 mmHg; DBP 83 mmHg).

Table 8.4.5 displays mean SBP and DBP by background characteristics of respondents. Mean SBP and DBP increased with age, from 113 mmHg for respondents aged 18-29 to 128 mmHg at age 80 and above. The gender differential in SBP and DBP at age 50-plus was higher among women than men, while it was less pronounced for adults aged 18-49.

Respondents from urban areas had high mean blood pressure compared to their rural counterparts among both younger and older respondents. Mean SBP increased with wealth quintile for respondents aged 50-plus. However, mean DBP showed much less variation by wealth quintile.

#### 8.4.4 Prevalence of isolated systolic or diastolic hypertension

Table 8.4.6 and Figure 8.4.5 compare the prevalence of systolic and diastolic hypertension between older and younger adults by state. For both groups, the prevalence of both systolic and diastolic hypertension (pre-hypertension and hypertension) was highest in Maharashtra (38 % - 58 % and 57 % - 60 % respectively), followed by Karnataka. Uttar Pradesh showed the lowest prevalence of systolic and diastolic hypertension.

Table 8.4.7 compares the prevalence of both systolic and diastolic pre-hypertension and hypertension in older and younger adults by background characteristics. Overall, the prevalence of both systolic and diastolic hypertension increased with age (Figure 8.4.6). By sex, the prevalence of hypertension was higher in women than men in older adults, but higher in men than women among younger adults. By marital status, the prevalence of hypertension was higher among widowed older adults. By residence, the prevalence of hypertension was higher for older adults in urban areas than those in rural areas. By caste, the prevalence of hypertension was higher among older and younger adults of scheduled tribes compared with other castes. Between older and younger adults, education and wealth showed varying effects on the prevalence of hypertension.

**Table 8.4.5** Mean systolic and diastolic blood pressure and pulse rate for younger and older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49					
	Systolic blood pressure		Diastolic blood pressure		Pulse rate	
	Mean	Number	Mean	Number	Mean	Number
<b>Age group</b>						
18-29	112.5	1,584	76.2	1,583	82.6	1527
30-39	115.4	1,636	80.2	1,636	81.3	1628
40-49	116.9	1,395	80.1	1,395	82.1	1388
<b>Sex</b>						
Male	116.1	1,033	79.4	1,033	79.0	1030
Female	113.8	3,582	78.4	3,581	85.0	3513
<b>Marital status</b>						
Never married	113.8	550	76.7	549	71.9	547
Currently married	115.1	3,809	79.2	3,809	81.9	3741
Widowed	114.9	219	78.6	219	83.1	218
Other <sup>1</sup>	116.0	37	79.0	37	81.4	36
<b>Residence</b>						
Urban	116.5	1,148	80.4	1,148	83.1	1136
Rural	114.5	3,467	78.4	3,466	81.6	3407
<b>Caste</b>						
Scheduled tribe	117.3	369	80.4	369	81.0	367
Scheduled caste	113.9	886	78.3	886	82.1	872
Other <sup>2</sup>	115.1	3,360	78.9	3,359	82.0	3304
<b>Religion</b>						
Hindu	115.0	3,857	78.9	3,856	81.8	3797
Muslim	114.8	589	78.3	589	83.2	576
Other <sup>3</sup>	116.0	169	81.0	169	81.4	170
<b>Education</b>						
No formal education	115.3	1,693	79.5	1,693	83.1	1669
Less than primary	115.5	427	78.9	427	80.2	418
Primary school	115.5	783	79.8	783	82.4	770
Secondary school	114.1	735	77.8	734	81.6	720
High school	113.9	649	77.9	649	81.1	644
College and above	115.9	328	79.2	328	81.2	322
<b>Wealth quintile</b>						
Lowest	114.8	951	79.2	951	82.3	933
Second	114.7	922	78.1	922	82.1	898
Middle	114.8	927	78.9	926	80.6	918
Fourth	114.7	923	78.5	923	81.5	914
Highest	115.9	892	79.7	892	82.8	880
<b>Total</b>	<b>115.0</b>	<b>4,615</b>	<b>78.9</b>	<b>4,614</b>	<b>82.0</b>	<b>4543</b>

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus					
	Systolic blood pressure		Diastolic blood pressure		Pulse rate	
	Mean	Number	Mean	Number	Mean	Number
<b>Age group</b>						
50-59	121.4	2,904	81.3	2,904	81.6	2887
60-69	125.2	2,195	81.3	2,195	81.7	2175
70-79	127.0	1,041	81.2	1,041	81.4	1,017
80+	127.9	318	81.2	318	82.9	293
<b>Sex</b>						
Male	122.0	3,257	80.3	3,257	79.8	3227
Female	125.6	3,201	82.3	3,201	83.6	3145
<b>Marital status</b>						
Never married	127.2	62	81.7	62	81.2	61
Currently married	122.6	4,789	80.9	4,789	81.2	4754
Widowed	127.9	1,565	82.5	1,565	83.1	1518
Other <sup>1</sup>	125.5	42	81.3	42	82.2	39
<b>Residence</b>						
Urban	125.1	1,636	82.0	1,636	82.0	1615
Rural	123.2	4,822	81.0	4,822	81.5	4757
<b>Caste</b>						
Scheduled tribe	124.0	395	83.4	395	81.8	390
Scheduled caste	122.7	1,073	80.4	1,073	81.0	1061
Other <sup>2</sup>	124.0	4,990	81.3	4,990	81.8	4921
<b>Religion</b>						
Hindu	123.9	5,448	81.4	5,448	81.4	5381
Muslim	122.4	777	79.9	777	83.2	761
Other <sup>3</sup>	124.6	233	83.5	233	81.1	230
<b>Education</b>						
No formal education	123.9	3,307	81.3	3,307	82.7	3258
Less than primary	123.7	739	81.3	739	82.0	722
Primary school	123.9	916	81.9	916	81.5	908
Secondary school	121.9	648	80.6	648	80.3	637
High school	123.4	531	80.4	531	80.0	531
College and above	126.4	317	81.8	317	76.6	316
<b>Wealth quintile</b>						
Lowest	121.9	1,290	80.1	1,290	82.2	1272
Second	124.0	1,295	81.6	1,295	82.6	1269
Middle	123.1	1,288	81.7	1,288	81.2	1270
Fourth	124.0	1,293	81.2	1,293	81.7	1287
Highest	126.2	1,292	82.0	1,292	80.3	1274
<b>Total</b>	<b>123.8</b>	<b>6,458</b>	<b>81.3</b>	<b>6,458</b>	<b>81.7</b>	<b>6372</b>

**Table 8.4.6** Percentage of younger and older respondents with systolic and diastolic pre-hypertension and hypertension, states and India (pooled), 2007

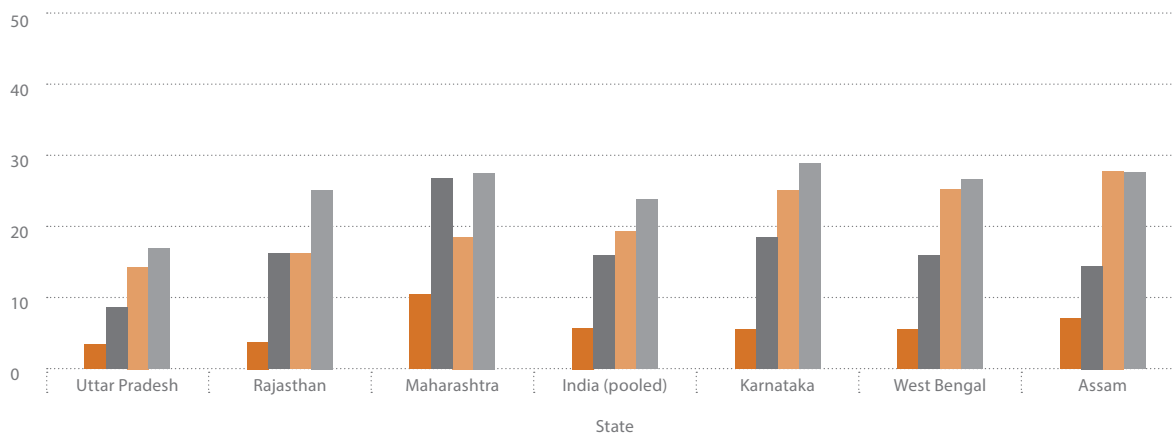
State	Aged 18-49				Aged 50-plus			
	PH systolic	H systolic	PH diastolic	H diastolic	PH systolic	H systolic	PH diastolic	H diastolic
Assam	27.6	7.1	31.2	14.5	32.8	27.9	29.9	27.7
Karnataka	28.4	5.6	29.6	18.5	34.8	25.1	25.9	28.9
Maharashtra	27.4	10.5	29.7	26.8	39.6	18.6	32.2	27.6
Rajasthan	35.1	3.8	31.8	16.3	40.5	16.3	27.7	25.2
Uttar Pradesh	23.4	3.5	24.3	8.7	30.5	14.4	26.7	17.0
West Bengal	29.8	5.6	32	16.0	29.6	25.3	26.1	26.7
India (pooled)	27.6	5.8	28.7	16.0	34.0	19.4	27.9	23.9

PH = pre-hypertension; H = hypertension

**Figure 8.4.5** Percentage of older and younger respondents with systolic and diastolic hypertension, states and India (pooled), 2007

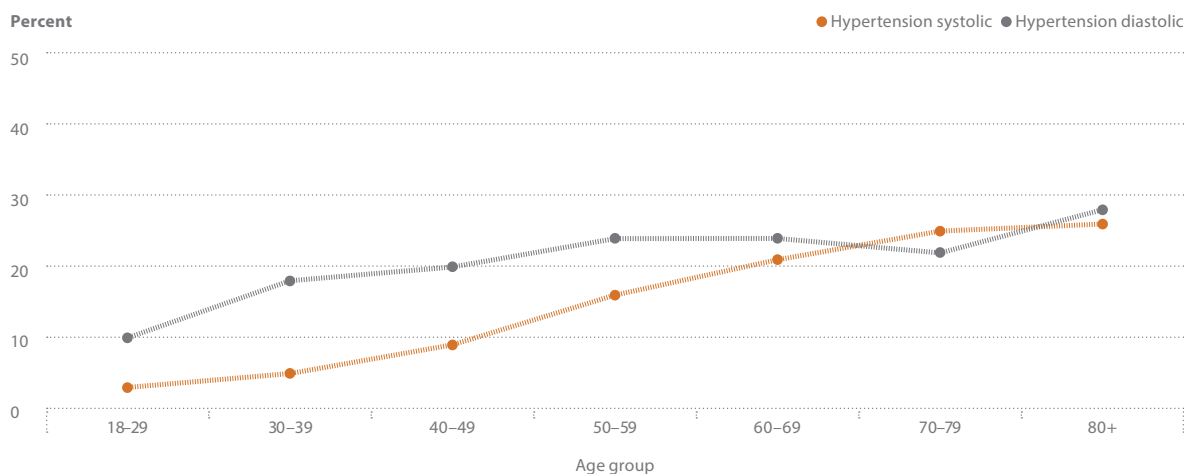
● Age 18-49 hypertension systolic ● Age 18-49 hypertension diastolic ● Age 50-plus hypertension systolic ● Age 50-plus hypertension diastolic

Percent



**Figure 8.4.6** Prevalence of systolic and diastolic hypertension by age group, India (pooled), 2007

Percent



**Table 8.4.7** Percentage of younger and older respondents with systolic and diastolic pre-hypertension and hypertension, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49			
	Pre-hypertension systolic	Hypertension systolic	Pre-hypertension diastolic	Hypertension diastolic
<b>Age group</b>				
18-29	21.8	2.8	24.8	10.2
30-39	31.2	5.2	32.4	17.6
40-49	29.4	9.0	28.6	19.7
<b>Sex</b>				
Male	29.8	6.4	29.0	16.7
Female	25.2	5.1	28.3	15.2
<b>Marital status</b>				
Never married	26.0	3.1	27.1	10.3
Currently married	28.0	5.9	29.1	16.8
Widowed	24.8	8.0	27.2	13.3
Other <sup>1</sup>	14.6	22.2	12.9	30.3
<b>Residence</b>				
Urban	28.5	8.8	28.9	19.7
Rural	27.3	4.8	28.6	14.8
<b>Caste</b>				
Scheduled tribe	32.8	7.2	33.9	20.1
Scheduled caste	24.9	4.6	26.3	16.2
Other <sup>2</sup>	27.8	6.0	28.9	15.5
<b>Religion</b>				
Hindu	27.3	5.8	28.7	16.0
Muslim	30.0	4.4	29.9	14.4
Other <sup>3</sup>	25.6	9.0	23.1	21.3
<b>Education</b>				
No formal education	29.1	5.2	31.9	16.8
Less than primary	26.9	6.5	31.1	13.9
Primary school	28.7	7.6	26.8	19.6
Secondary school	27.1	4.4	29.2	12.4
High school	20.8	5.1	24.5	14.7
College and above	32.7	7.5	26.0	17.4
<b>Wealth quintile</b>				
Lowest	29.2	5.4	30.9	15.6
Second	28.4	4.7	28.5	15.2
Middle	26.8	5.2	27.9	15.2
Fourth	26.4	6.6	25.8	16.0
Highest	26.6	7.2	29.8	18.0
<b>Total</b>	<b>27.6</b>	<b>5.8</b>	<b>28.7</b>	<b>16.0</b>

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 8.4.7

Continued

Background characteristics	Aged 50-plus			
	Pre-hypertension systolic	Hypertension systolic	Pre-hypertension diastolic	Hypertension diastolic
<b>Age group</b>				
50-59	33.1	15.8	27.4	24.0
60-69	34.9	21.4	28.4	24.0
70-79	34.1	24.6	30.5	22.0
80+	37.5	26.2	21.7	27.8
<b>Sex</b>				
Male	30.5	18.3	24.8	22.9
Female	37.6	20.5	31.2	24.8
<b>Marital status</b>				
Never married	21.0	31.7	18.7	30.7
Currently married	33.2	17.8	27.6	23.2
Widowed	37.0	24.6	29.7	25.8
Other <sup>1</sup>	51.2	19.7	20.7	29.5
<b>Residence</b>				
Urban	36.1	20.2	30.1	24.4
Rural	33.2	19.1	27.1	23.6
<b>Caste</b>				
Scheduled tribe	33.6	18.0	34.5	25.7
Scheduled caste	34.6	17.3	25.1	25.1
Other <sup>2</sup>	33.9	19.9	28.1	23.5
<b>Religion</b>				
Hindu	34.4	19.6	28.2	24.5
Muslim	31.0	17.4	25.1	19.5
Other <sup>3</sup>	35.4	20.2	32.8	25.3
<b>Education</b>				
No formal education	33.1	19.6	28.7	23.8
Less than primary	39.6	17.6	25.9	25.1
Primary school	35.5	19.1	26.8	26.2
Secondary school	30.2	18.2	23.6	23.4
High school	34.5	19.5	31.9	21.2
College and above	34.5	24.1	29.4	21.4
<b>Wealth quintile</b>				
Lowest	29.1	17.9	24.1	23.3
Second	32.0	19.9	25.5	26.2
Middle	36.0	17.9	30.4	24.3
Fourth	37.0	18.1	31.2	21.4
Highest	37.2	23.3	29.4	23.9
<b>Total</b>	<b>34.0</b>	<b>19.4</b>	<b>27.9</b>	<b>23.9</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## 8.5 Lung function

Lung function tests, also known as pulmonary function tests, assess lung function and provide information relevant to the diagnosis of asthma, pulmonary fibrosis, emphysema and chronic obstructive pulmonary disease (COPD). The tests record how much air (by volume) is held in the lungs and the rate of air moving in and out of the lungs, as well as how well the lungs put oxygen into and remove carbon dioxide from blood. According to WHO (2005) estimates, 80 million people have moderate to severe COPD, which accounted for 5% of global deaths in 2005; however, reliable data on COPD prevalence, morbidity and mortality are scarce in developing countries. Tobacco users are the most vulnerable to COPD, which is projected to increase by more than 30% in the next 10 years unless policy action is taken to reduce the risk factors.

SAGE conducted lung function tests for all consenting individuals who could blow into a spirometer. Lung function classifications were based on the average of three readings. SAGE lung function tests provided the following indicators:

- Forced volume vital capacity (FVC): the volume of air (litres) one can exhale with force after inhaling as deeply as possible
- Forced expiratory volume (FEV<sub>1</sub>): the volume of air (litres) one can exhale in 1 second
- Peak expiratory flow (PEF): how quickly one can exhale air (litres per minute)
- Forced expiratory volume percent (FEV<sub>1</sub> %): the ratio of FEV<sub>1</sub> to FVC
- Forced expiratory flow 25% to 75% (FEF 25-75): the volume (litres) of airflow halfway through an exhalation
- Forced expiratory time (FET): the length of the exhalation in seconds.

Table 8.5.1 presents the mean values of lung function measures by age for states and India. The mean value of FVC was two litres for younger respondents and 1.7 litres for older respondents. The average value of expiration in one second (FEV<sub>1</sub>) was 1.4 litres and 1.2 litres for younger and older respondents respectively. The average peak expiration (PEF) was 2.7 litres and 2.2 litres per minute of inhaled air for younger and older respondents respectively. In the halfway exhalation (FEF 25-75) measure, on average 1.7 and 1.3 litres of air were expelled by younger and older respondents respectively. Little

**Table 8.5.1 Mean values of lung function measures for younger and older respondents, states and India (pooled), 2007**

State	Aged 18-49								Aged 50-plus					
	Mean FVC	Mean FEV <sub>1</sub>	Mean FEV <sub>1</sub> %	Mean PEF	Mean FEF 25-75	Mean FET	Number	Mean FVC	Mean FEV <sub>1</sub>	Mean FEV <sub>1</sub> %	Mean PEF	Mean FEF 25-75	Mean FET	Number
Assam	2.1	1.6	66.2	2.7	1.7	5.6	469	1.7	1.1	62.4	2.1	1.4	5.8	594
Karnataka	2.0	1.6	77.6	3.1	1.8	4.5	516	1.7	1.3	74.5	2.6	1.4	4.8	672
Maharashtra	1.9	1.5	69.5	2.8	1.7	4.1	798	1.6	1.3	69.2	2.3	1.4	4.5	893
Rajasthan	2.3	1.8	65.9	2.9	1.8	5.1	797	2.1	1.6	64.5	2.7	1.6	5.1	1,245
Uttar Pradesh	2.0	1.4	67.8	2.6	1.6	5.0	803	1.6	1.1	62.4	1.9	1.1	5.2	1,164
West Bengal	1.9	1.5	72.5	2.5	1.5	5.5	855	1.6	1.1	68.0	2.1	1.1	5.7	1,084
India (pooled)	2.0	1.4	69.6	2.7	1.7	4.9	4,238	1.7	1.2	66.3	2.2	1.3	5.2	5,652



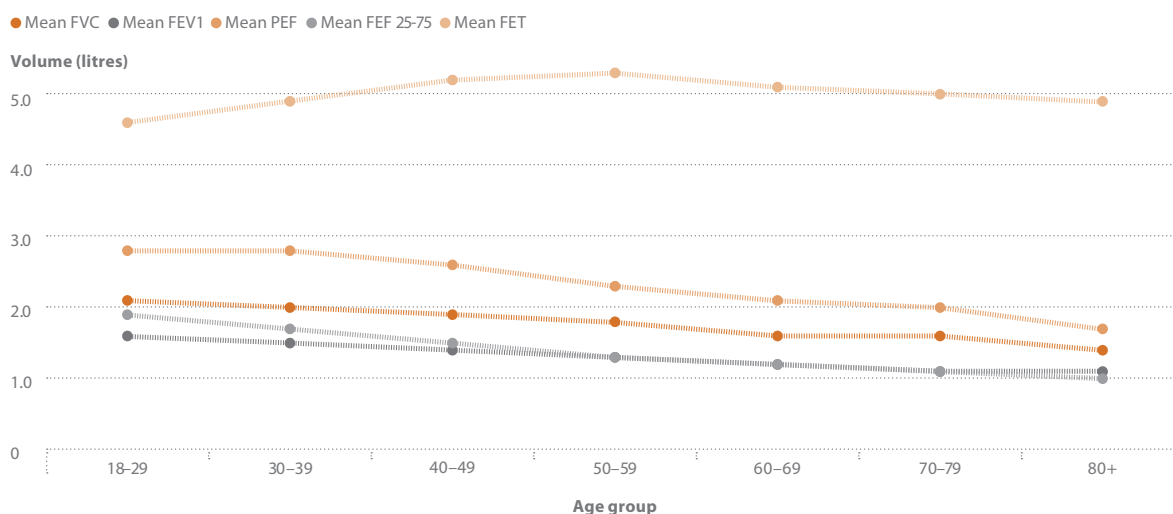
variation by state was observed in the mean FVC, mean FEV1, mean PEF and mean FEF 25-75, whereas mean FEV1% was lowest in Assam and highest in Karnataka. The time taken to complete one cycle of expiration (FET) was lowest in Maharashtra in both age groups, and highest in Assam (younger respondents) and West Bengal (older respondents).

Figure 8.5.1 displays age variations in the mean values of FVC, FEV1, FEF 25-75, FET and PEF. The mean values of lung function measures declined consistently with age. The air flow halfway through an exhalation (FEV 25-75) was more than the exhalation in one second up for respondents aged up to 50-59, but then tracked the latter value until older age (70-79); FEV1 remained high than the FEF 25-75 until the age of 80+. The length of expiration FET formed an inverted and flattened U curve with age and reached its peak at age 50-59.

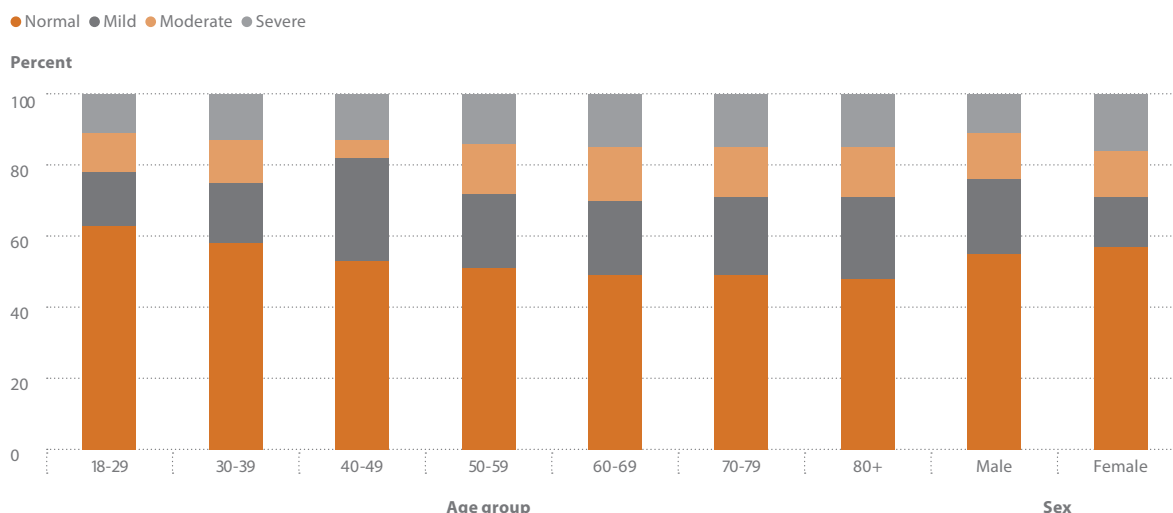
Table 8.5.2 presents the percentage distribution of levels of chronic obstructive pulmonary disease (COPD) based on FVC, FEV1 and predicted value of FEV1. The table shows that half (50%) of older adults and 42% of younger adults had either mild, moderate or severe levels of chronic obstruction in lung function. Among older adults, Assam was the state with the highest prevalence of COPD (62%), followed by Uttar Pradesh (60%). Karnataka was the state with the lowest prevalence (31%). Severe COPD was most prevalent in older adults in Uttar Pradesh (20%), and least prevalent in Karnataka (6%).

Figure 8.5.2 reveals COPD levels by age for India. The percentage of respondents with normal lung function decreased with age, while the prevalence of mild and moderate chronic obstruction increased with age. The prevalence of mild COPD was relatively high among

**Figure 8.5.1 Measures of lung functions by age group, India (pooled), 2007**



**Figure 8.5.2 Prevalence of COPD by age group and sex, India (pooled), 2007**



**Table 8.5.2 Percent distribution of younger and older respondents by stages of chronic obstructive pulmonary disease (COPD), states and India (pooled), 2007**

State	Aged 18-49						Aged 50-plus					
	Normal	Mild	Moderate	Severe	Total	Number	Normal	Mild	Moderate	Severe	Total	Number
Assam	51.5	17.2	17.3	14.1	100	469	38.4	29.4	15.8	16.5	100	594
Karnataka	73.9	11.9	7.0	7.3	100	513	69.0	17.1	8.2	5.7	100	666
Maharashtra	59.2	15.6	12.6	12.6	100	798	56.5	19.2	12.4	11.9	100	893
Rajasthan	51.6	23.5	11.7	13.1	100	794	48.7	27.3	12.3	11.8	100	1,241
Uttar Pradesh	54.0	18.0	13.5	14.5	100	805	40.2	23.2	17.0	19.6	100	1,153
West Bengal	61.5	15.3	13.6	9.6	100	854	55.0	15.7	14.5	14.7	100	1,083
India (pooled)	58.0	17.4	12.6	12.3	100	4,233	50.2	21.1	14.1	14.6	100	5,630

Note: Normal = FEV1/FVC  $\geq$  70; mild = FEV1/FVC  $\leq$  70 and FEV1  $\geq$  0.8 of predicted FEV1; moderate = FEV1/FVC  $\leq$  70 and 0.5  $\leq$  FEV1  $<$  0.8 of predicted FEV1; severe = FEV1/FVC  $\leq$  70 and FEV1  $<$  0.5 of predicted FEV1. Severe and very severe are combined as per standard classification by the Global Initiative for Chronic Obstructive Lung Diseases (GOLD) (Suzanne et al, 2002).

men compared with women, while the reverse was true for prevalence of moderate and severe COPD.

## 8.6 Visual acuity

Visual impairment is associated with functional limitation and affects the wellbeing of older people. Visual impairment increases as the number of eye diseases increases, and affects the health related quality of life (HRQOL) through reduced ability for self-care and treatment-seeking behaviour. According to WHO (ICD-10, 1999), a person with low vision is one who has "impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 3.2 (in decimal) to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for planning and/or execution of a task".

SAGE measured near and distance vision for both eyes using the tumbling E logMAR chart. Near vision was measured using a chart at a prescribed distance of 40 centimetres; distance vision was measured at four metres. Measured near and distance vision of respondents were classified into normal vision (0.32-1.6 decimal) and low vision (0.01-0.25 decimal).

Table 8.6.1 presents the prevalence of low near vision, low distance vision, and low near and/or distance vision by state. Among older adults, Karnataka had the greatest prevalence (77%) of low near and/or distance vision, followed by West Bengal (71%); Maharashtra was the state with the lowest (65%) prevalence of low near and/or low vision for this age group (Figure 8.6.1). In contrast, among younger adults Maharashtra was the state with the greatest prevalence (29%) of low near and/or distance vision. Notably, both younger and older adults had greater prevalence of low near vision compared with low distance vision.

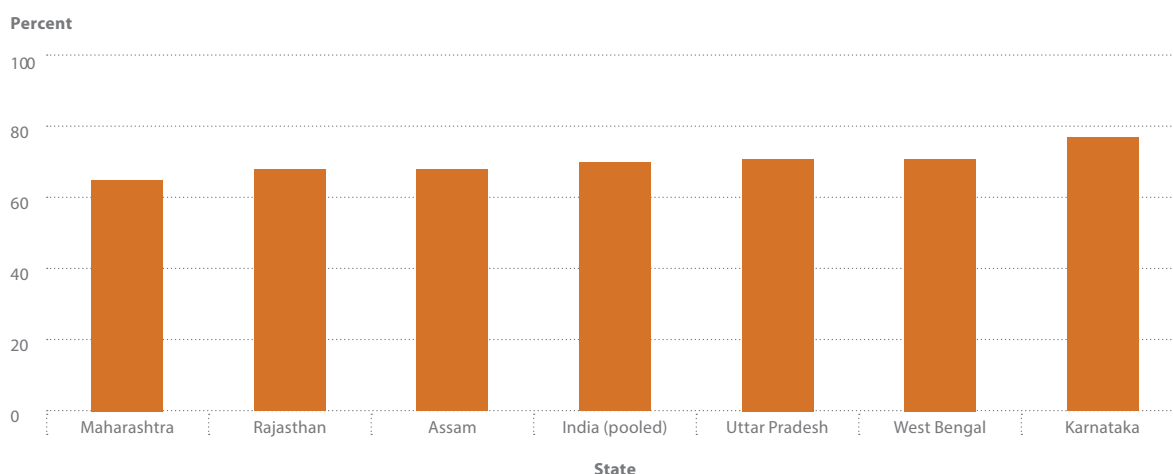
Table 8.6.2 presents the prevalence of low vision by background characteristics. The prevalence of low near and/or distance vision increased from 11% in younger adults to 86% for the oldest respondents aged 80-plus (Figure 8.6.2). Older women had a greater prevalence of low vision than older men across all three categories. The rural-urban difference in the prevalence of low distance vision was more pronounced for older adults than for younger adults. Education and wealth quintile showed strong negative gradients for the prevalence of low near and/or distance vision among younger adults.

**Table 8.6.1** Prevalence (%) of low near, low distance, and low near and/or distance vision in either or both eyes of younger and older respondents, states and India (pooled), 2007

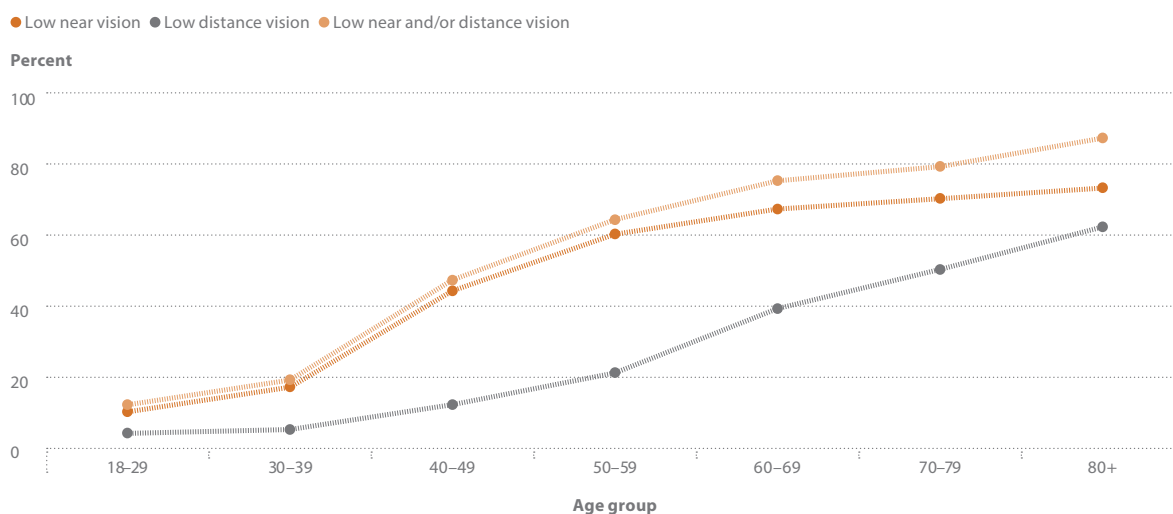
State	Aged 18-49				Aged 50-plus			
	Low near vision	Low distance vision	Low near and/or distance vision	Number	Low near vision	Low distance vision	Low near and/or distance vision	Number
Assam	25.9	5.8	28.3	510	62.3	24.5	68.3	672
Karnataka	24.4	6.4	26.9	597	70.1	34.4	76.5	848
Maharashtra	27.2	5.9	29.4	864	59.6	27.0	65.4	1,060
Rajasthan	23.6	6.2	26.4	826	61.5	27.6	67.6	1,307
Uttar Pradesh	20.3	7.0	22.9	876	61.7	39.8	70.6	1,306
West Bengal	20.7	3.1	22.0	887	67.4	23.0	70.9	1,144
India (pooled)	22.9	5.9	25.3	4,560	63.2	31.5	69.8	6,337

Note: Classification of vision tests is based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-10-CM). Acuity notation in decimal 0.01 - 0.25 - Low vision; 0.32 - 1.6 - Normal vision for both near and distant vision. Normal distant and near visual acuity were classified for values ranging from 0.3 to 2.0 on the LogMAR chart (better than 20/70 vision). Vision tests include the respondent's typical correcting aids (spectacles or other) if used. Low near and/or distance vision means low either in either one or both areas.

**Figure 8.6.1** Prevalence of low near and/or distance vision among older adults, states and India (pooled), 2007



**Figure 8.6.2** Prevalence of low vision by age group, India (pooled), 2007



**Table 8.6.2** Prevalence (%) of low near vision, low distance vision, and low near and/or distance vision in either eye by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49			
	Low near vision	Low distance vision	Low near and/or distance vision	Number
<b>Age group</b>				
18-29	8.7	2.7	10.5	1527
30-39	16.2	4.1	18.1	1628
40-49	42.7	10.5	45.7	1388
<b>Sex</b>				
Male	19.1	5.2	21.3	1030
Female	26.9	6.6	29.3	3513
<b>Marital status</b>				
Never married	9.3	2.8	10.8	547
Currently married	24.4	6.2	26.9	3741
Widowed	32.3	6.9	32.9	218
Other <sup>1</sup>	49.6	12.2	51.6	36
<b>Residence</b>				
Urban	22.9	4.8	24.7	1136
Rural	22.9	6.2	25.5	3407
<b>Caste</b>				
Scheduled tribe	26.7	5.0	28.9	367
Scheduled caste	19.0	4.0	20.7	872
Other <sup>2</sup>	23.7	6.5	26.2	3304
<b>Religion</b>				
Hindu	22.2	5.6	24.5	3797
Muslim	26.5	7.6	29.2	576
Other <sup>3</sup>	27.9	6.2	30.0	170
<b>Education</b>				
No formal education	31.6	7.9	33.9	1669
Less than primary	30.2	6.5	31.5	418
Primary school	23.6	6.0	26.3	770
Secondary school	17.3	4.7	19.4	720
High school	16.0	4.6	18.8	644
College and above	9.7	2.8	11.1	322
<b>Wealth quintile</b>				
Lowest	26.7	6.3	28.5	933
Second	25.2	7.7	27.5	898
Middle	22.5	5.0	25.2	918
Fourth	24.2	5.8	26.9	914
Highest	15.3	4.4	17.6	880
<b>Total</b>	<b>22.9</b>	<b>5.9</b>	<b>25.3</b>	<b>4543</b>

Note: Classification of vision tests is based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-10-CM). Acuity notation in decimal 0.01- 0.25- Low vision; 0.32- 1.6 - Normal vision for both near and distant vision. Normal distant and near visual acuity were classified for values ranging from 0.3 to 2.0 on the LogMAR chart (better than 20/70 vision). Vision tests include the respondent's typical correcting aids (spectacles or other) if used. Low near and/or distance vision means low either in either one or both areas.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 8.6.2

Continued

Background characteristics	Aged 50-plus			
	Low near vision	Low distance vision	Low near and/or distance vision	Number
<b>Age group</b>				
50-59	59.1	19.9	63.4	2887
60-69	65.9	37.5	73.8	2175
70-79	68.7	48.6	78.1	1,017
80+	72.4	61.3	85.7	293
<b>Sex</b>				
Male	58.4	29.0	64.8	3227
Female	68.3	34.0	75.0	3145
<b>Marital status</b>				
Never married	57.6	26.4	65.9	61
Currently married	61.6	27.8	67.2	4754
Widowed	69.2	44.9	79.2	1518
Other <sup>1</sup>	73.2	24.5	76.0	39
<b>Residence</b>				
Urban	64.0	26.1	68.7	1615
Rural	63.0	33.6	70.2	4757
<b>Caste</b>				
Scheduled tribe	67.4	33.1	72.2	390
Scheduled caste	59.3	31.1	65.9	1061
Other <sup>2</sup>	63.8	31.4	70.5	4921
<b>Religion</b>				
Hindu	63.5	31.7	70.1	5381
Muslim	60.1	29.6	67.3	761
Other <sup>3</sup>	68.7	33.0	72.5	230
<b>Education</b>				
No formal education	66.5	36.8	74.0	3258
Less than primary	65.8	33.0	73.3	722
Primary school	61.5	29.7	68.2	908
Secondary school	58.4	23.8	62.4	637
High school	55.2	21.1	60.2	531
College and above	54.5	13.6	56.8	316
<b>Wealth quintile</b>				
Lowest	63.5	39.6	70.9	1272
Second	65.9	32.1	72.6	1269
Middle	63.9	32.9	71.1	1270
Fourth	63.5	28.1	69.7	1287
Highest	59.0	23.2	64.2	1274
<b>Total</b>	<b>63.2</b>	<b>31.5</b>	<b>69.8</b>	<b>6372</b>

Note: Classification of vision tests is based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-10-CM). Acuity notation in decimal 0.01 - 0.25- Low vision; 0.32 - 1.6 - Normal vision for both near and distant vision. Normal distant and near visual acuity were classified for values ranging from 0.3 to 2.0 on the LogMAR chart (better than 20/70 vision). Vision tests include the respondent's typical correcting aids (spectacles or other) if used. Low near and/or distance vision means low either in either one or both areas.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

## 8.7 Cognition: Verbal Fluency (VF), Verbal Recall (VR), Forward Digit Span (FDS) and Backward Digit Span (BDS)

To gauge cognitive ability, SAGE included tests of verbal fluency and verbal recall, as well as a forward and backward digit test. A composite score was created from these individual tests.

The scores are presented by state in Table 8.7.1. Older respondents scored lower than their younger counterparts on every test and in every state. Indeed, the overall cognition score of older respondents was 49, almost 9 points lower than for younger respondents. Younger adults scored 11.1, 6.1, 4.8 and 2.7 for tests of verbal fluency, verbal recall, forward and backward digit tests respectively, with an overall cognition score of 58. There was little variation between states, but respondents in West Bengal generally scored lowest and those in Maharashtra scored highest.

Cognition scores are presented by selected background characteristics in Table 8.7.2. Scores for all four tests decreased progressively with age. The overall cognition score was 62 in the 18-29 age group, dropping to 39 in those aged 80-plus. Women scored lower than men on all tests, especially in the group aged 50-plus. The overall cognition score at age 18-49 for women was 2.7 points lower than for men in the same age group, and 6.4 points lower at age 50-plus. Cognition in women also declined much more with age: women aged 50-plus scored 11 points lower than at age 18-49, compared with 73 points among men. Never married respondents aged 18-49 scored much higher on cognition than their currently married counterparts, who in turn scored higher than those who were widowed. As mentioned earlier, this may reflect a higher proportion of younger persons being unmarried and of older persons being widowed. Respondents in urban areas scored higher on all four tests than their rural counterparts. Across all respondents, those aged 50-plus scored 9-10 points lower than their younger counterparts on overall cognition. Respondents from scheduled tribes scored lowest, followed by those from scheduled castes.

All four cognition tests showed a positive relationship with education and wealth: regardless of age, sex, residence, religion or caste, college-educated persons secured the highest scores. For those aged 50-plus, the overall cognition score increased from 43 for those with no formal education to 64 for college-educated persons. Similarly, the overall score increased from 43 in the lowest wealth quintile to 56 in the highest. However, cognitive ability deteriorated with age regardless of education or economic status.

**Table 8.7.1 Mean score for verbal fluency (VF), verbal recall (VR) and digit span (FDS and BDS) tests, states and India (pooled), 2007**

State	Aged 18-49							Aged 50-plus						
	Mean cognition scores				Overall score	Number	Mean cognition scores				Overall score	Number		
	VF	VR	FDS	BDS			VF	VR	FDS	BDS				
Assam	11.3	5.7	4.9	2.8	55.2	517	10.5	4.5	4.4	2.3	44.1	677		
Karnataka	11.5	6.3	4.5	2.9	59.9	630	10.7	5.2	4.1	2.4	49.7	923		
Maharashtra	12.1	6.2	5.1	3.1	60.4	884	10.9	5.2	4.4	2.5	49.8	1,097		
Rajasthan	11.9	6.2	4.7	2.6	58.9	847	11.5	5.3	4.0	1.9	50.0	1,378		
Uttar Pradesh	10.4	6.1	4.8	2.5	58.1	890	10.0	5.2	4.3	2.1	49.6	1,311		
West Bengal	10.2	5.7	4.8	2.3	54.0	901	9.7	4.8	4.4	2.0	46.7	1,173		
India (pooled)	11.1	6.1	4.8	2.7	58.0	4,669	10.4	5.1	4.3	2.2	48.9	6,559		

**Table 8.7.2** Mean score for verbal fluency (VF), verbal recall (VR) and digit span (FDS & BDS) tests in younger and older adults, India (pooled), 2007

Background characteristics	Aged 18-49					
	Mean cognition scores				Overall score	Number
	VF	VR	FDS	BDS		
Age group						
18-29	11.2	6.5	5.1	3.0	62.4	1527
30-39	11.0	6.0	4.7	2.6	57.0	1628
40-49	11.1	5.8	4.7	2.4	54.8	1388
Sex						
Male	11.6	6.1	5.0	3.0	59.3	1030
Female	10.5	6.0	4.6	2.3	56.6	3513
Marital status						
Never married	11.7	6.8	5.3	3.3	66.3	547
Currently married	11.0	6.0	4.8	2.6	56.9	3741
Widowed	10.9	5.9	4.7	2.5	56.1	218
Other <sup>1</sup>	10.0	5.7	4.3	2.3	54.5	36
Residence						
Urban	11.4	6.4	5.0	3.1	61.3	1136
Rural	11.0	6.0	4.7	2.5	56.9	3407
Caste						
Scheduled tribe	9.9	5.4	4.4	2.2	51.0	367
Scheduled caste	10.7	5.9	4.8	2.4	56.2	872
Other <sup>2</sup>	11.3	6.2	4.9	2.8	59.1	3304
Religion						
Hindu	11.1	6.1	4.8	2.7	58.2	3797
Muslim	10.5	5.9	4.7	2.5	56.4	576
Other <sup>3</sup>	11.2	6.1	4.9	2.9	58.4	170
Education						
No formal education	9.7	5.4	4.1	1.7	49.8	1669
Less than primary	10.7	5.6	4.3	2.1	52.2	418
Primary school	11.0	5.9	4.9	2.7	56.8	770
Secondary school	11.2	6.3	5.1	3.0	60.9	720
High school	12.5	6.8	5.5	3.5	66.5	644
College and above	13.2	7.2	5.8	4.0	71.5	322
Wealth quintile						
Lowest	10.0	5.4	4.4	2.0	50.2	933
Second	10.6	5.8	4.6	2.3	55.1	898
Middle	11.1	6.1	4.9	2.8	58.3	918
Fourth	12.0	6.4	5.1	3.0	62.3	914
Highest	12.0	6.8	5.3	3.4	66.1	880
Total	11.1	6.1	4.8	2.7	58.0	4543

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Continued

Background characteristics	Aged 50-plus					
	Mean cognition scores				Overall score	Number
	VF	VR	FDS	BDS		
Age group						
50-59	10.8	5.4	4.5	2.3	51.6	2887
60-69	10.3	5.1	4.3	2.2	48.5	2175
70-79	10.0	4.6	4.1	2.0	43.8	1,017
80+	8.8	4.1	3.5	1.5	39.1	293
Sex						
Male	11.1	5.3	4.7	2.7	52.0	3227
Female	9.7	4.9	3.9	1.6	45.6	3145
Marital status						
Never married	10.9	5.3	4.4	2.5	50.3	61
Currently married	10.7	5.3	4.4	2.4	50.8	4754
Widowed	9.4	4.6	3.9	1.6	42.4	1518
Other <sup>1</sup>	10.0	4.7	4.0	1.2	42.3	39
Residence						
Urban	11.1	5.3	4.6	2.7	51.6	1615
Rural	10.2	5.0	4.2	2.0	47.9	4757
Caste						
Scheduled tribe	9.6	4.5	3.7	1.8	43.7	390
Scheduled caste	10.1	4.9	4.1	1.8	46.1	1061
Other <sup>2</sup>	10.6	5.2	4.4	2.3	49.9	4921
Religion						
Hindu	10.5	5.2	4.3	2.2	49.3	5381
Muslim	9.7	4.9	4.2	2.0	46.1	761
Other <sup>3</sup>	11.6	5.1	4.3	2.8	50.9	230
Education						
No formal education	9.5	4.7	3.8	1.5	43.3	3258
Less than primary	10.7	5.0	4.4	2.3	48.6	722
Primary school	10.9	5.3	4.6	2.8	51.7	908
Secondary school	11.7	5.7	5.0	3.0	55.9	637
High school	11.9	5.9	5.2	3.4	58.9	531
College and above	13.0	6.4	5.5	3.8	64.2	316
Wealth quintile						
Lowest	9.5	4.7	3.9	1.6	43.5	1272
Second	9.9	4.9	4.2	2.0	46.4	1269
Middle	10.5	5.1	4.3	2.2	48.7	1270
Fourth	11.1	5.3	4.4	2.4	50.9	1287
Highest	11.5	5.7	4.7	2.9	55.9	1274
Total	10.4	5.1	4.3	2.2	48.9	6372



## 8.8 Subjective and objective appraisal in health surveys: hypertension and visual acuity

In view of considerable biases in self-reported health and substantial levels of undiagnosed health conditions, a critical objective of incorporating a biomarker module in SAGE was to compare measured prevalence of health conditions with self-reported prevalence. This section compares the measured prevalence of hypertension and vision problems/visual acuity with their self-reported prevalence.

### 8.8.1 Self-reported versus measured hypertension

Figure 8.8.1 compares the prevalence of self-reported vis-à-vis measured hypertension by age and sex of respondents in states. The four possible classifications are:

- Persons who reported hypertension diagnosis and hypertensive on measurement (R+ M+)
- Persons who reported no hypertension diagnosis but were hypertensive on measurement (R- M+)
- Persons who reported hypertension diagnosis but were not hypertensive on measurement (R+ M-)
- Persons who reported no hypertension diagnosis and were not hypertensive on measurement (R- M-)

The comparative results reveal a number of insights to better understand the prevalence of levels and variations in hypertension. First, age shows a strong positive gradient for those respondents who were hypertensive on measurement respective of their reporting, in all states and by sex. The prevalence of measured hypertension was relatively higher for women than men. Measured hypertension was highest in Maharashtra, West Bengal and Karnataka.

Second, for adults aged 50-plus, the prevalence of self-reported negatives but measured positives for hypertension varied from 20-32% between the sexes and states. For older adults, the category of reported negative but measured positive for hypertension represented the largest share (almost two-thirds) of the true positives of measured hypertension. The prevalence of both reported and measured positive for hypertension varied in the narrow range of 5-18% among states and between sexes, implying that this category represents just about a third of total prevalence of true positives, varying in

the range of 25-46%. This result potentially suggests that more than 25% of older adults have medically treatable hypertension but remained undiagnosed on account of lack of awareness and access to health care. By contrast, those who reported having a diagnosis of hypertension and were normotensive on measurement (R+M-), and also reported being on treatment, suggests a positive outcome for individuals and the health system.

The prevalence of undiagnosed self-reported negative but measured true positives for hypertension was relatively higher in Rajasthan. Respondents in Uttar Pradesh had the highest levels of both reported negatives and measured negatives for hypertension.

### 8.8.2 Self-reported versus measured low vision/visual acuity

Figure 8.8.2 compares the results of self-reported vision problems and measured prevalence of low near and/or distance visual acuity. The prevalence of measured vision problems (representing categories a and b in Figure 8.8.2 below) increased remarkably with age among adults aged 50-plus. Between 75-84% of older adults aged 70-plus had low visual acuity on measurement. At age 50-plus, the prevalence of self-reported and measured problems with low vision varied from 14-42% between states and between sexes. By comparison, the prevalence of adults in the same age group who reported no problems but had low visual acuity on the measured test (category b) varied from 22-61% across states, age and sex. Confirming the pattern of results shown for hypertension, the prevalence of those with no self-reported visual problems but low visual acuity on measurement (category b) was about two thirds of the respondents who had low visual acuity on measurement (category a and b). About 10% of adults aged 70-plus did not have low vision problems (either self-reported or on the measured test, category d). The results indicate an extremely high prevalence of low visual acuity (almost 90%) for adults aged 70-plus, suggesting the need for massive eye-care intervention.

## 8.9 Comparative trends in biomarkers by age

Figure 8.9 compares trends in a number of key biomarkers by age, including prevalence of underweight;

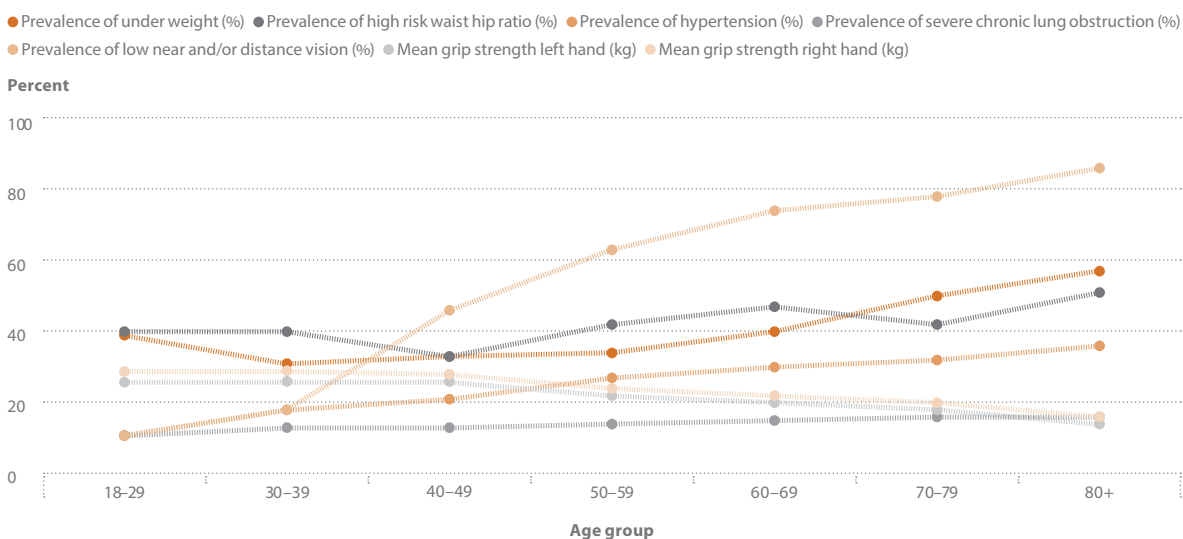
**Figure 8.8.1 Self-reported vs. measured prevalence of hypertension by age, sex and state, 2007**



**Figure 8.8.2 Self-reported and measured low near and/or distance vision according to age, sex and state, 2007**



**Figure 8.9** Biomarkers of health by age group, India (pooled), 2007



high risk waist-hip ratio; hypertension; severe chronic obstruction of lung function; low near and/or distance vision; and mean grip strength. A consistent gradient with age is seen for each health risk/condition, confirming increasing health risks with increasing age for

each biomarker. The prevalence of hypertension and low visual acuity increased rapidly with age, implying an age effect on these two high-risk chronic health conditions. This comparison also reveals the close association among the various biomarkers of health.





## 9. Health care utilization, system responsiveness and financing

The relationship between health and living conditions on the one hand, and health and development on the other, is complex, multi-faceted and multi-directional. Public provision of basic amenities like water, sanitation, shelter, access to education and health services can ensure significant improvement in health standards and longevity of a population.

The health status of a population is a reflection of a country's socioeconomic development. It is shaped by a variety of factors, such as income and standard of living, housing conditions, water and sanitation, education and employment, personal hygiene, health consciousness and expectations, and – importantly – the availability, accessibility and affordability of health care services.

Over the years, India has built up a vast network of health infrastructure and personnel for primary, secondary and tertiary care in the public, voluntary and private sectors. Considerable efforts have been made to enhance health standards, and this has been reflected in improvements in life expectancy, infant and child mortality, maternal mortality, and nutrition. Progress in human development, particularly education and economic well-being, has also reinforced the transition toward better health and longevity.

An important characteristic of a health system is its responsiveness. Health system responsiveness refers essentially to the extent to which the health system meets legitimate expectations of people that go beyond just improving health. A health care system's responsiveness may improve utilization and adherence to interventions and thus directly affect health outcomes, as well as increase people's trust in the health care system and also their willingness to pay (Valentine *et al.*, 2003). The framework developed by Donabedian *et al.* to characterise responsiveness uses descriptions of

patients' experiences as a complement to other types of information used in assessing and improving accountability and efficiency (Donabedian *et al.* 1980). Building on this, over the past decade, WHO has refined the concept and measurement of responsiveness to capture the full range of what transpires when an individual comes into contact with the health system, such as being treated with dignity, being involved in decisions about one's treatment, being assured of confidentiality of personal information, having access to information through clear communication, receiving prompt attention to one's health needs, being assured of the quality of basic amenities at health care facilities, having access to support networks during treatment and having a choice of health care providers (Valentine *et al.*, 2008).

The SAGE survey asked about the need for inpatient and outpatient health care. The responsiveness of the health system was further assessed in several domains, including prompt attention, dignity/respect, communication, choice, confidentiality, access to support and quality of care. Respondents were asked how they were treated by the health care system during their last visit.

### 9.1 Self-assessed need for health care

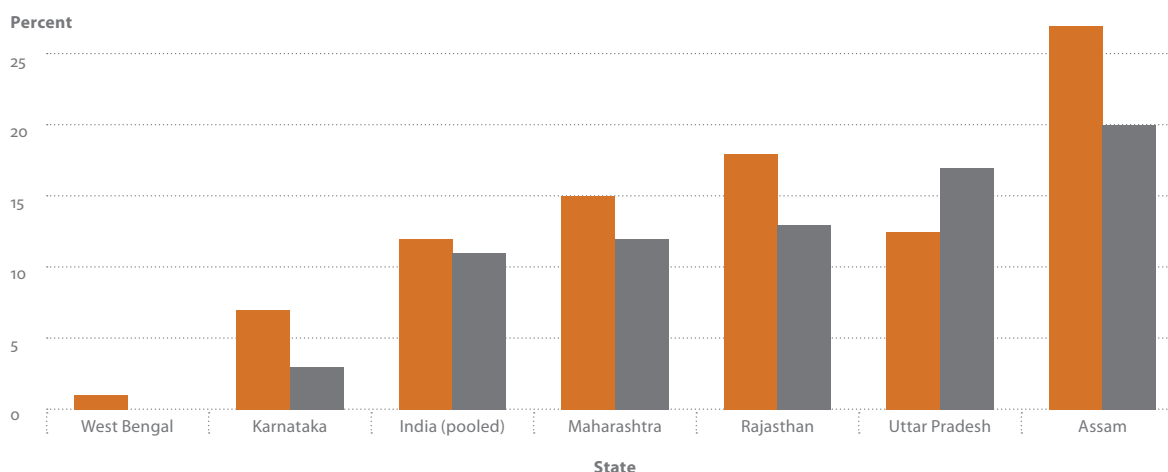
A health care system's responsiveness is measured by the system's ability to meet the health requirements of the country's population. SAGE respondents were asked, "When was the last time you needed health care?" This was followed by another question: "The last time you needed health care, did you get health care?" Responses were grouped by those who had never needed health care, those who had needed care in the previous year, and those who had needed care more than a year ago.

**Table 9.1.1** Percent distribution of the health care need for younger and older adults, states and India (pooled), 2007

State	Aged 18-49					Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number	In previous year	More than 1 year ago	Never needed	Total	Number
Assam	53.5	19.4	27.2	100	497	58.9	21.4	19.7	100	661
Karnataka	86.7	6.6	6.6	100	622	91.7	5.2	3.1	100	916
Maharashtra	75.8	8.9	15.3	100	876	78.1	10.1	11.9	100	1,085
Rajasthan	75.9	5.7	18.4	100	840	82.6	5.0	12.5	100	1,371
Uttar Pradesh	76.2	10.6	13.2	100	888	72.9	10.2	17.0	100	1,308
West Bengal	93.8	5.2	1.0	100	879	94.9	5.1	0.1	100	1,142
India (pooled)	78.9	8.8	12.3	100	4,602	80.5	8.6	10.9	100	6,483

**Figure 9.1.1** Percentage of respondents who reported never needing health care by age group, states and India (pooled), 2007

● Age 18-49 ● Age 50-plus



Respondents' self-assessed need for health care is presented in Table 9.1.1 and Figure 9.1.1. Among adults aged 50-plus, the proportion who had needed health care during the previous year ranged from 59% in Assam to 95% in West Bengal, with 81% for India as a whole. Notably, nearly 11% of older respondents reported not needing health care in the past three years, ranging from less than 1% in West Bengal to about 20% in Assam. The extent of self-assessed need for health care may be an indirect indicator of the levels and utilization of available health care services across the states. For adults aged 18-49, 79% needed health care during the previous year and 12% reported not having needed care.

Table 9.1.2 presents the results for younger and older adults by selected background characteristics. Need for health care services tended to increase with age. Women in older and younger age groups were more

likely to have needed health care during the year prior to the survey than men. There was little difference between rural and urban areas.

Table 9.1.3 presents the results for men by state and overall. About 75% of younger men and 78% of older men said they had needed health care during the year prior to the survey. Among older men, the need had been highest in West Bengal (94%) and lowest in Assam (57%). The proportion never needing health care was highest in Assam and Uttar Pradesh and lowest in West Bengal and Karnataka.

Table 9.1.4 presents results for men by selected background characteristics. Even within the older age group, the need for health care in the previous year increased considerably with age, increasing from 75% at age 50-59 to 85% among the oldest men aged 80-plus.

**Table 9.1.2** Percent distribution of younger and older respondents needing health care, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
18-29	78.3	8.3	13.5	100	1,585
30-39	77.7	9.3	13.0	100	1,628
40-49	80.5	9.0	10.6	100	1,389
<b>Sex</b>					
Male	75.3	10.0	14.6	100	1,032
Female	82.5	7.6	9.9	100	3,570
<b>Marital status</b>					
Never married	76.8	8.8	14.5	100	546
Currently married	79.0	8.9	12.1	100	3,798
Widowed	85.1	6.0	8.8	100	221
Other <sup>1</sup>	68.7	14.3	17.0	100	37
<b>Residence</b>					
Urban	79.3	10.7	10.0	100	1,160
Rural	78.7	8.2	13.1	100	3,442
<b>Caste</b>					
Scheduled tribe	68.2	13.6	18.2	100	362
Scheduled caste	81.0	6.8	12.2	100	879
Other <sup>2</sup>	79.3	9.0	11.8	100	3,361
<b>Religion</b>					
Hindu	79.4	8.2	12.4	100	3,845
Muslim	79.2	12.8	8.0	100	588
Other <sup>3</sup>	65.3	9.7	25.0	100	169
<b>Education</b>					
No formal education	81.1	9.4	9.5	100	1,687
Less than primary	77.8	10.6	11.6	100	421
Primary school	80.3	6.6	13.1	100	782
Secondary school	73.3	12.2	14.5	100	729
High school	81.0	6.8	12.3	100	649
College and above	76.7	6.8	16.5	100	334
<b>Wealth quintile</b>					
Lowest	76.8	10.6	12.6	100	942
Second	82.6	8.0	9.4	100	916
Middle	80.4	7.6	12.1	100	922
Fourth	76.5	10.0	13.5	100	920
Highest	77.6	8.1	14.4	100	902
<b>Total</b>	<b>78.9</b>	<b>8.8</b>	<b>12.3</b>	<b>100</b>	<b>4,602</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 9.1.2

Continued

Background characteristics	Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
50-59	80.1	8.5	11.5	100	2,899
60-69	79.9	9.4	10.7	100	2,212
70-79	82.5	7.9	9.7	100	1,049
80+	81.1	7.5	11.5	100	323
<b>Sex</b>					
Male	77.8	9.2	13.0	100	3,268
Female	83.2	8.1	8.7	100	3,215
<b>Marital status</b>					
Never married	70.7	13.8	15.5	100	62
Currently married	80.4	8.6	11.0	100	4,810
Widowed	80.7	8.9	10.4	100	1,569
Other <sup>1</sup>	89.0	1.3	9.7	100	42
<b>Residence</b>					
Urban	79.8	9.1	11.1	100	1,663
Rural	80.7	8.4	10.9	100	4,820
<b>Caste</b>					
Scheduled tribe	78.7	8.3	13.0	100	389
Scheduled caste	80.9	10.1	9.0	100	1,072
Other <sup>2</sup>	80.5	8.3	11.2	100	5,022
<b>Religion</b>					
Hindu	80.3	8.8	10.9	100	5,471
Muslim	83.4	5.6	11.0	100	779
Other <sup>3</sup>	74.4	15.1	10.5	100	233
<b>Education</b>					
No formal education	81.6	8.5	9.9	100	3,325
Less than primary	81.3	8.3	10.4	100	736
Primary school	78.2	10.6	11.3	100	915
Secondary school	79.5	9.3	11.2	100	644
High school	75.6	7.4	17.0	100	538
College and above	83.8	6.4	9.9	100	325
<b>Wealth quintile</b>					
Lowest	77.3	11.2	11.5	100	1,295
Second	83.7	8.2	8.0	100	1,280
Middle	78.1	10.4	11.5	100	1,302
Fourth	79.5	7.3	13.3	100	1,304
Highest	83.7	5.7	10.6	100	1,302
<b>Total</b>	<b>80.5</b>	<b>8.6</b>	<b>10.9</b>	<b>100</b>	<b>6,483</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



**Table 9.1.3** Percent distribution of younger and older men needing health care, states and India (pooled), 2007

State	Aged 18-49					Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number	In previous year	More than 1 year ago	Never needed	Total	Number
Assam	38.5	23.3	38.2	100	112	56.7	20.6	22.7	100	360
Karnataka	85.8	8.4	5.9	100	128	89.7	7.2	3.2	100	416
Maharashtra	72.3	12.1	15.6	100	197	72.1	13.8	14.1	100	539
Rajasthan	72.0	5.9	22.1	100	191	82.0	5.3	12.7	100	675
Uttar Pradesh	72.7	10.9	16.5	100	211	70.7	8.4	20.9	100	700
West Bengal	93.3	5.4	1.4	100	193	94.1	5.9	0.0	100	578
India (pooled)	75.3	10.0	14.6	100	1,032	77.8	9.2	13.0	100	3,268





**Table 9.1.4** Percent distribution of younger and older men needing health care, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
18-29	73.3	10.5	16.2	100	268
30-39	73.3	10.2	16.5	100	353
40-49	78.3	9.6	12.1	100	411
<b>Marital status</b>					
Never married	76.9	9.6	13.6	100	144
Currently married	74.9	10.0	15.1	100	864
Widowed	85.4	12.2	2.4	100	19
Other <sup>1</sup>	45.6	19.5	34.9	100	5
<b>Residence</b>					
Urban	76.2	12.4	11.4	100	237
Rural	75.1	9.4	15.5	100	795
<b>Caste</b>					
Scheduled tribe	55.2	17.8	27.0	100	82
Scheduled caste	79.3	6.8	14.0	100	209
Other <sup>2</sup>	76.0	10.3	13.8	100	741
<b>Religion</b>					
Hindu	75.8	9.0	15.2	100	848
Muslim	77.3	15.7	7.0	100	135
Other <sup>3</sup>	59.1	12.8	28.1	100	49
<b>Education</b>					
No formal education	76.7	11.9	11.5	100	207
Less than primary	76.5	13.7	9.8	100	105
Primary school	75.8	6.5	17.6	100	182
Secondary school	69.3	13.6	17.1	100	191
High school	78.8	7.6	13.7	100	209
College and above	75.7	7.9	16.4	100	138
<b>Wealth quintile</b>					
Lowest	72.9	11.7	15.4	100	220
Second	81.3	8.1	10.6	100	218
Middle	76.1	7.8	16.1	100	218
Fourth	70.5	14.0	15.5	100	190
Highest	75.0	9.2	15.9	100	186
<b>Total</b>	<b>75.3</b>	<b>10.0</b>	<b>14.6</b>	<b>100</b>	<b>1,032</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Background characteristics	Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
50-59	75.4	9.9	14.7	100	1,366
60-69	78.7	9.4	12.0	100	1,147
70-79	81.5	6.9	11.7	100	587
80+	85.2	8.3	6.5	100	168
<b>Marital status</b>					
Never married	68.8	13.2	17.9	100	43
Currently married	78.0	9.1	12.9	100	2,861
Widowed	76.3	10.4	13.4	100	354
Other <sup>1</sup>	81.9	1.1	17.0	100	10
<b>Residence</b>					
Urban	75.2	9.6	15.1	100	780
Rural	78.8	9.1	12.2	100	2,488
<b>Caste</b>					
Scheduled tribe	72.1	11.3	16.7	100	212
Scheduled caste	78.6	10.7	10.8	100	550
Other <sup>2</sup>	78.0	8.8	13.2	100	2,506
<b>Religion</b>					
Hindu	77.4	9.5	13.2	100	2,748
Muslim	82.0	5.4	12.7	100	407
Other <sup>3</sup>	72.5	17.4	10.2	100	113
<b>Education</b>					
No formal education	78.9	8.7	12.4	100	1,077
Less than primary	79.0	10.4	10.6	100	448
Primary school	75.3	10.6	14.1	100	567
Secondary school	78.0	10.3	11.7	100	487
High school	73.9	8.0	18.2	100	425
College and above	83.4	6.4	10.1	100	264
<b>Wealth quintile</b>					
Lowest	76.3	10.7	13.1	100	648
Second	79.7	9.3	11.0	100	652
Middle	75.5	13.0	11.4	100	643
Fourth	75.9	7.0	17.1	100	679
Highest	81.4	6.0	12.7	100	646
<b>Total</b>	<b>77.8</b>	<b>9.2</b>	<b>13.0</b>	<b>100</b>	<b>3,268</b>

**Table 9.1.5** Percent distribution of younger and older women needing health care, states and India (pooled), 2007

State	Aged 18-49					Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number	In previous year	More than 1 year ago	Never needed	Total	Number
Assam	69.1	15.3	15.6	100	385	61.4	22.4	16.4	100	301
Karnataka	87.8	4.8	7.4	100	494	93.6	3.4	3.1	100	500
Maharashtra	79.1	6.0	15.0	100	679	83.7	6.5	9.8	100	546
Rajasthan	80.2	5.5	14.2	100	649	83.1	4.6	12.2	100	696
Uttar Pradesh	80.1	10.4	9.6	100	677	75.3	12.2	12.5	100	608
West Bengal	94.3	5.0	0.7	100	686	95.8	4.2	0.1	100	564
India (pooled)	82.5	7.6	9.9	100	3,570	83.2	8.0	8.7	100	3,215



**Table 9.1.6** Percent distribution of younger and older women needing health care, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
18-29	82.1	6.5	11.4	100	1,317
30-39	82.0	8.4	9.6	100	1,275
40-49	83.7	8.0	8.3	100	978
<b>Marital status</b>					
Never married	76.7	7.7	15.6	100	402
Currently married	83.2	7.8	9.0	100	2,934
Widowed	85.0	3.5	11.5	100	202
Other <sup>1</sup>	75.1	12.9	12.0	100	32
<b>Residence</b>					
Urban	81.7	9.4	8.8	100	923
Rural	82.8	6.9	10.3	100	2,647
<b>Caste</b>					
Scheduled tribe	80.7	9.5	9.8	100	280
Scheduled caste	83.1	6.8	10.1	100	670
Other <sup>2</sup>	82.6	7.6	9.8	100	2,620
<b>Religion</b>					
Hindu	83.0	7.4	9.6	100	2,997
Muslim	81.2	9.6	9.2	100	453
Other <sup>3</sup>	73.8	5.4	20.8	100	120
<b>Education</b>					
No formal education	83.1	8.2	8.7	100	1,480
Less than primary	79.5	6.8	13.7	100	316
Primary school	84.8	6.8	8.5	100	600
Secondary school	78.8	10.3	10.9	100	538
High school	84.9	5.4	9.7	100	440
College and above	79.6	3.8	16.6	100	196
<b>Wealth quintile</b>					
Lowest	81.2	9.4	9.5	100	722
Second	84.0	7.9	8.2	100	698
Middle	85.2	7.3	7.5	100	704
Fourth	82.2	6.2	11.6	100	730
Highest	80.1	7.0	12.9	100	716
<b>Total</b>	<b>82.5</b>	<b>7.6</b>	<b>9.9</b>	<b>100</b>	<b>3,570</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 9.1.6

Continued

Background characteristics	Aged 50-plus				
	In previous year	More than 1 year ago	Never needed	Total	Number
<b>Age group</b>					
50-59	85.1	6.9	8.0	100	1,533
60-69	81.1	9.4	9.5	100	1,065
70-79	83.6	9.1	7.3	100	462
80+	77.7	6.8	15.5	100	154
<b>Marital status</b>					
Never married	77.8	15.7	6.4	100	19
Currently married	84.1	7.8	8.2	100	1,949
Widowed	81.6	8.6	9.8	100	1,215
Other <sup>1</sup>	90.9	1.3	7.8	100	32
<b>Residence</b>					
Urban	84.3	8.6	7.0	100	883
Rural	82.8	7.8	9.5	100	2,332
<b>Caste</b>					
Scheduled tribe	85.5	5.3	9.2	100	177
Scheduled caste	83.3	9.5	7.1	100	522
Other <sup>2</sup>	83.1	7.9	9.0	100	2,516
<b>Religion</b>					
Hindu	83.3	8.2	8.6	100	2,723
Muslim	85.0	5.8	9.2	100	372
Other <sup>3</sup>	76.4	13.8	10.8	100	120
<b>Education</b>					
No formal education	82.8	8.3	8.8	100	2,248
Less than primary	85.1	4.9	10.0	100	288
Primary school	82.9	10.5	6.7	100	348
Secondary school	85.2	5.4	9.4	100	157
High school	85.8	3.7	10.5	100	113
College and above	85.8	5.8	8.4	100	61
<b>Wealth quintile</b>					
Lowest	78.3	11.8	9.9	100	647
Second	87.8	7.1	5.1	100	628
Middle	80.8	7.6	11.6	100	659
Fourth	83.5	7.6	8.9	100	625
Highest	86.2	5.4	8.4	100	656
<b>Total</b>	<b>83.2</b>	<b>8.0</b>	<b>8.7</b>	<b>100</b>	<b>3,215</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

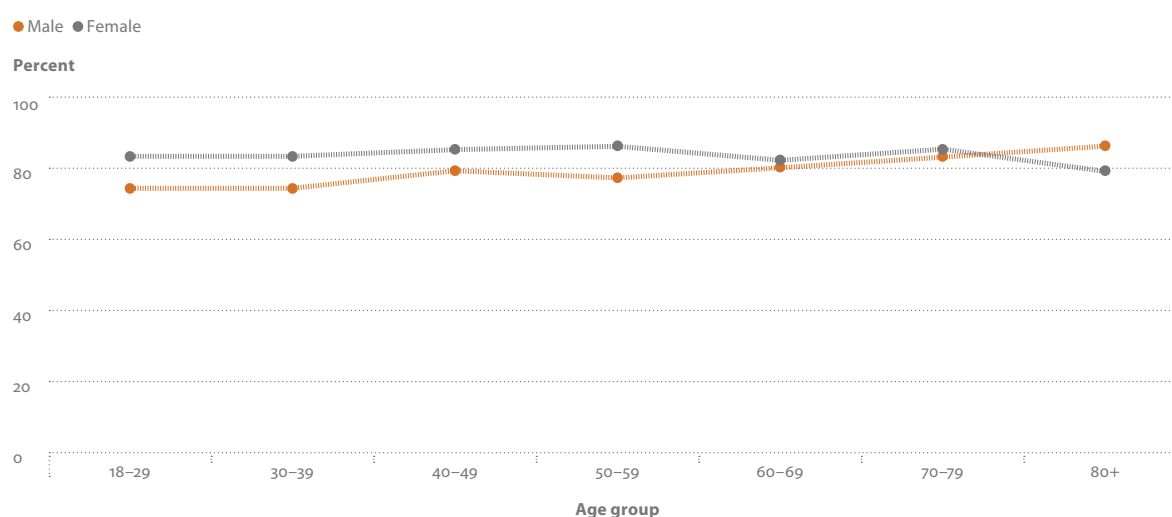
Consequently, the proportion of men reporting never needing health care decreased with advancing age: 15% of those aged 50-59 said they never needed any health care, this proportion decreased to 7% at age 80-plus. Younger men's health care needs differed by residence, caste and wealth quintile when compared to older men.

Tables 9.1.5 and 9.1.6 provide the same information for women. Of the six states, older women in West Bengal had the highest (96%) and Assam the lowest reported need in the previous year (61%). The patterns by state were largely similar in younger women, with higher need for younger than older women in some states.

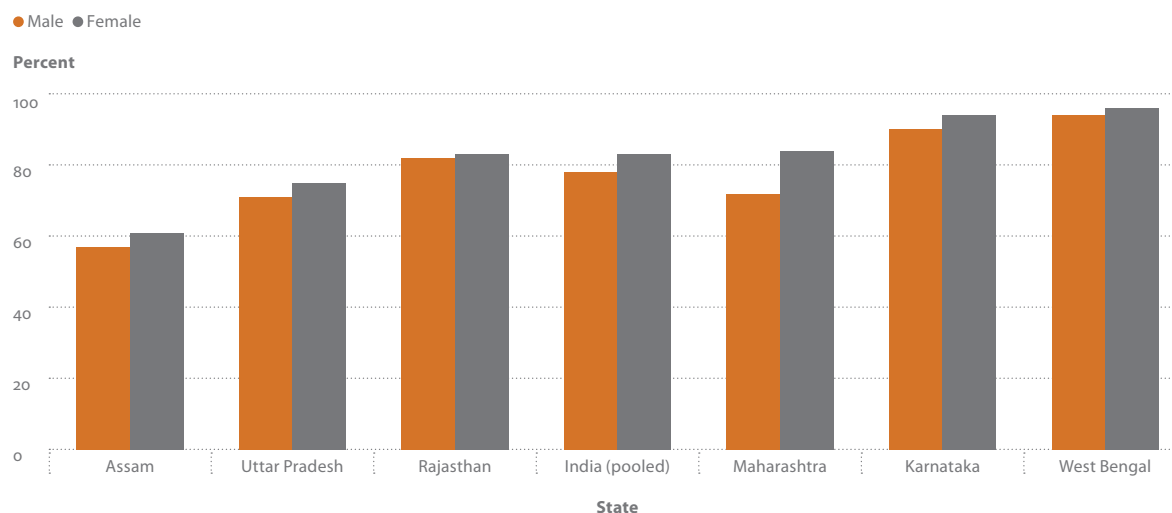
On average, 83% of both older and younger women said they had needed health care in the previous year (Table 9.1.6). The age gradient seen in men was not as obvious in women, but a larger portion of women than men reported health care need, except for the oldest age group (see Figure 9.1.2). Marginal differences were observed based on residence, religion, education and wealth quintiles.

Patterns of reported health care need by state and overall for those aged 50-plus reveal higher overall need for older women than older men, and in each of the sampled states (Figure 9.1.3). Reported need was also higher in West Bengal and Karnataka than Assam and Uttar Pradesh.

**Figure 9.1.2** Percentage of respondents reporting health care need in previous year, by age group, India (pooled), 2007



**Figure 9.1.3** Percentage of adults aged 50-plus who needed health care in the last year by sex, state and India (pooled) 2007



## 9.2 Use of inpatient and/or outpatient care

Information on types of health care received in the year prior to the survey is presented by state and overall in Table 9.2.1. Inpatients are those who have stayed in the hospital or any health care facility for at least one night. Outpatients are those who did not stay in the hospital overnight but required other types of treatment. Among adults aged 50-plus, around 80% of respondents reported receiving outpatient care and 15% inpatient care. Percentages of respondents receiving inpatient care varied considerably across the states, from 9% in Assam to 21% in Karnataka.

Those who said they had not received any health care (either inpatient or outpatient) totalled 6%-8% of all respondents. The percentage not receiving care

when needed was slightly higher in younger respondents and considerably higher in Assam than other states in both younger and older age groups (15–22%). For older adults, the rate reached 15.4% in Assam (Figure 9.2.1).

For those who received health care, there was little variation for older adults by residence, caste, religion, education and wealth quintile (Table 9.2.2). Older women were slightly more likely to have reported using outpatient care and slightly less likely to reported using inpatient care than older men.

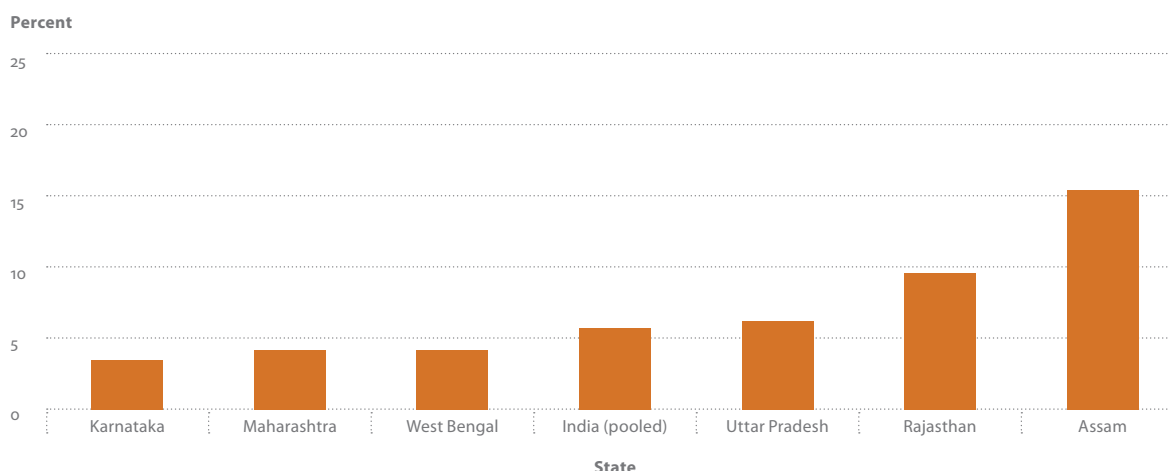
Table 9.2.3 presents results for men in the selected states and India. About 10% of men aged 18–49 and 15% of men aged 50-plus reporting receiving inpatient care. Among older men, those in Assam had the lowest reported use of inpatient care (11%), while those in Maharashtra reported the highest use (21%).

**Table 9.2.1** Percent distribution of respondents who required health care in the last year by the type of health care received\*, states and India (pooled), 2007

State	Aged 18–49					Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number	Inpatient care	Outpatient care	Did not receive	Percent	Number
Assam	11.8	66.5	21.7	100	307	9.3	75.3	15.4	100	386
Karnataka	19.0	73.2	7.8	100	546	20.5	76.1	3.5	100	828
Maharashtra	17.7	79.9	2.3	100	694	17.9	77.9	4.2	100	838
Rajasthan	12.2	78.0	9.8	100	675	13.4	77.1	9.6	100	1,136
Uttar Pradesh	9.4	83.4	7.2	100	715	11.2	82.6	6.2	100	1,005
West Bengal	12.8	78.4	8.8	100	834	13.9	81.9	4.2	100	1,077
India (pooled)	13.4	79.1	7.6	100	3,771	14.6	79.7	5.7	100	5,270

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

**Figure 9.2.1** Percentage of adults aged 50-plus who did not receive health care when needed, states and India (pooled), 2007



**Table 9.2.2** Percent distribution of younger and older respondents by type of health care received\* in the last year, by background characteristics India (pooled), 2007

Background characteristics	Aged 18-49				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
18-29	15.4	77.3	7.3	100	1,292
30-39	12.0	81.2	6.9	100	1,326
40-49	12.8	78.6	8.6	100	1,153
<b>Sex</b>					
Male	10.3	81.6	8.1	100	782
Female	16.2	76.6	7.2	100	2,989
<b>Marital status</b>					
Never married	5.1	86.4	8.5	100	416
Currently married	14.7	78.1	7.3	100	3,143
Widowed	11.1	77.7	11.2	100	186
Other <sup>1</sup>	6.8	82.5	10.8	100	26
<b>Residence</b>					
Urban	11.2	78.7	10.1	100	957
Rural	14.1	79.2	6.8	100	2,814
<b>Caste</b>					
Scheduled tribe	15.4	77.5	7.1	100	264
Scheduled caste	10.6	82.2	7.2	100	720
Other <sup>2</sup>	14.0	78.3	7.7	100	2,787
<b>Religion</b>					
Hindu	13.4	79.8	6.8	100	3,161
Muslim	12.1	75.2	12.7	100	488
Other <sup>3</sup>	18.3	72.7	9.1	100	122
<b>Education</b>					
No formal education	13.3	78.5	8.2	100	1,403
Less than primary	15.1	77.0	7.9	100	337
Primary school	12.1	80.2	7.7	100	660
Secondary school	13.1	79.8	7.2	100	566
High school	15.5	78.8	5.7	100	537
College and above	10.7	80.1	9.2	100	268
<b>Wealth quintile</b>					
Lowest	11.7	78.1	10.3	100	760
Second	11.2	80.6	8.2	100	766
Middle	13.7	79.6	6.7	100	762
Fourth	14.9	76.7	8.4	100	755
Highest	13.1	79.8	7.0	100	728
<b>Total</b>	<b>13.4</b>	<b>79.1</b>	<b>7.6</b>	<b>100</b>	<b>3,771</b>

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



Table 9.2.2

Continued

Background characteristics	Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
50-59	13.8	79.7	6.6	100	2,311
60-69	13.6	81.2	5.2	100	1,815
70-79	19.0	77.1	3.9	100	877
80+	15.1	78.0	6.9	100	267
<b>Sex</b>					
Male	15.5	78.2	6.4	100	2,568
Female	13.8	81.1	5.1	100	2,702
<b>Marital status</b>					
Never married	3.2	87.7	9.1	100	47
Currently married	15.3	78.7	6.0	100	3,887
Widowed	12.7	82.7	4.5	100	1,299
Other <sup>1</sup>	8.2	86.9	5.0	100	37
<b>Residence</b>					
Urban	15.6	79.3	5.1	100	1,390
Rural	14.2	79.8	6.0	100	3,880
<b>Caste</b>					
Scheduled tribe	13.7	79.2	7.2	100	274
Scheduled caste	10.2	83.4	6.4	100	870
Other <sup>2</sup>	15.6	78.9	5.5	100	4,126
<b>Religion</b>					
Hindu	13.8	80.7	5.5	100	4,441
Muslim	17.3	75.2	7.5	100	654
Other <sup>3</sup>	26.5	67.9	5.6	100	175
<b>Education</b>					
No formal education	13.6	81.0	5.4	100	2,731
Less than primary	17.0	74.1	8.9	100	607
Primary school	16.0	79.7	4.3	100	753
Secondary school	12.9	82.2	5.0	100	496
High school	17.6	75.8	6.6	100	419
College and above	15.4	78.3	6.3	100	264
<b>Wealth quintile</b>					
Lowest	12.4	79.5	8.1	100	1,027
Second	12.8	81.6	5.6	100	1,060
Middle	15.5	79.0	5.6	100	1,038
Fourth	16.5	78.5	5.0	100	1,075
Highest	15.2	79.4	5.5	100	1,070
<b>Total</b>	<b>14.6</b>	<b>79.7</b>	<b>5.7</b>	<b>100</b>	<b>5,270</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

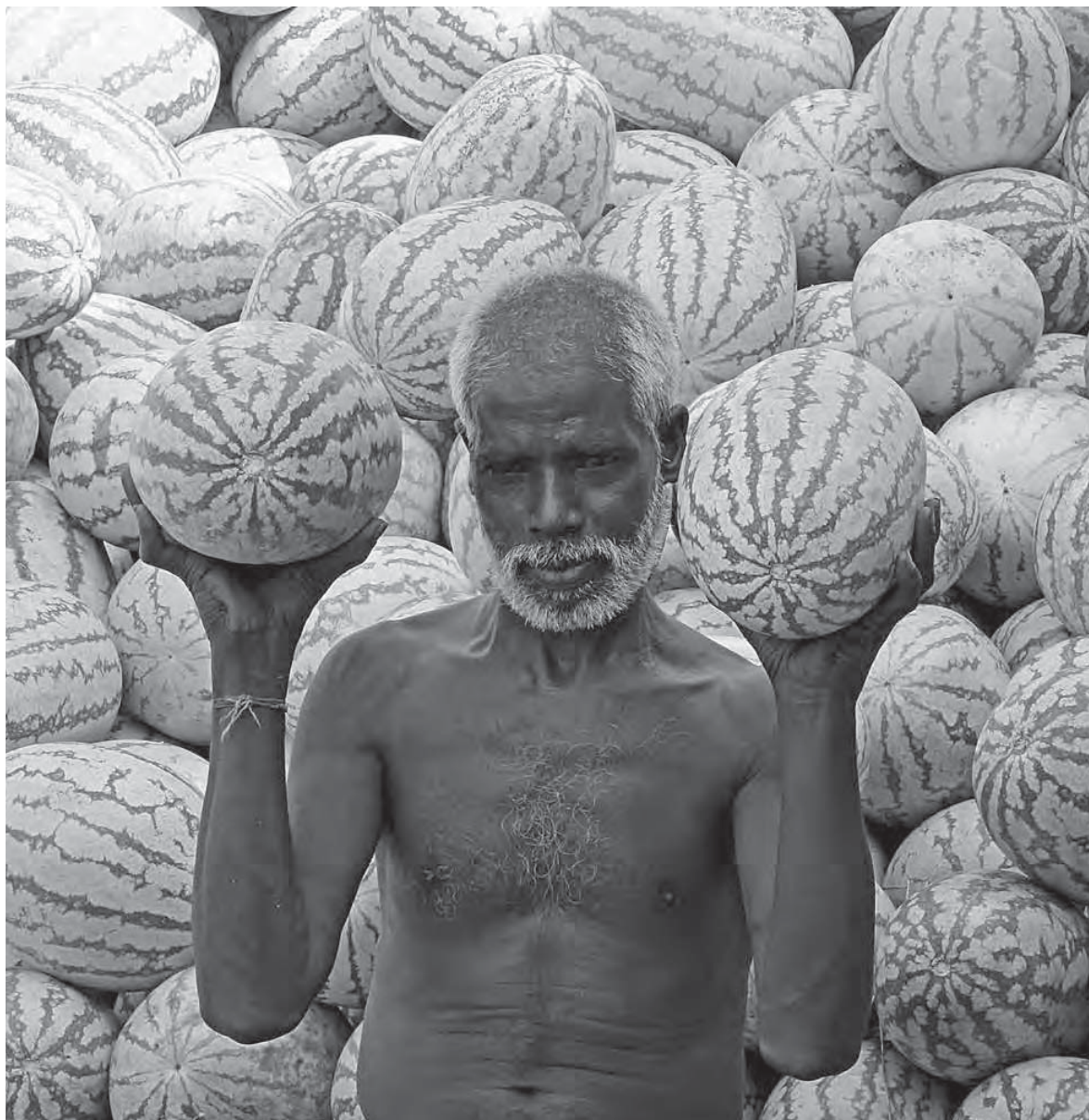
<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 9.2.3** Percent distribution of younger and older men by type of health care received\* in the last year, states and India (pooled), 2007

State	Aged 18-49					Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number	Inpatient care	Outpatient care	Did not receive	Percent	Number
Assam	9.0	67.4	23.6	100	45	10.5	74.7	15.0	100	198
Karnataka	18.1	75.8	6.1	100	112	20.3	75.9	3.9	100	364
Maharashtra	16.8	80.6	2.6	100	142	20.5	75.2	4.3	100	392
Rajasthan	8.8	84.1	7.1	100	143	15.3	73.6	10.8	100	555
Uttar Pradesh	7.7	82.1	10.3	100	159	11.5	81.4	7.4	100	529
West Bengal	4.9	86.4	8.8	100	182	13.2	80.7	6.1	100	537
<b>India (pooled)</b>	<b>10.3</b>	<b>81.6</b>	<b>8.1</b>	<b>100</b>	<b>783</b>	<b>15.1</b>	<b>78.1</b>	<b>6.8</b>	<b>100</b>	<b>2,575</b>

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.



**Table 9.2.4** Percent distribution of younger and older men by type of health care received\* in the last year and background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
18-29	8.9	83.6	7.6	100	198
30-39	10.3	84.3	5.3	100	259
40-49	11.2	78.4	10.4	100	326
<b>Marital status</b>					
Never married	4.7	89.3	6.0	100	109
Currently married	11.4	80.3	8.3	100	655
Widowed	5.0	84.2	10.8	100	17
Other <sup>1</sup>	0.0	55.5	44.5	100	2
<b>Residence</b>					
Urban	7.6	79.7	12.7	100	181
Rural	11.1	82.1	6.8	100	601
<b>Caste</b>					
Scheduled tribe	11.9	86.7	1.4	100	42
Scheduled caste	5.4	86.6	7.9	100	164
Other <sup>2</sup>	11.7	79.8	8.5	100	577
<b>Religion</b>					
Hindu	10.2	82.6	7.3	100	644
Muslim	8.9	78.6	12.5	100	106
Other <sup>3</sup>	20.1	69.6	10.3	100	33
<b>Education</b>					
No formal education	8.7	80.9	10.4	100	161
Less than primary	12.4	83.2	4.4	100	81
Primary school	7.4	82.3	10.3	100	137
Secondary school	9.4	83.6	7.0	100	133
High school	15.7	79.2	5.1	100	163
College and above	7.7	82.0	10.3	100	108
<b>Wealth quintile</b>					
Lowest	9.1	80.9	10.0	100	161
Second	11.0	81.6	7.3	100	178
Middle	9.8	85.2	5.0	100	160
Fourth	12.0	79.1	8.9	100	145
Highest	10.3	80.3	9.4	100	138
<b>Total</b>	<b>10.3</b>	<b>81.6</b>	<b>8.1</b>	<b>100</b>	<b>783</b>

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

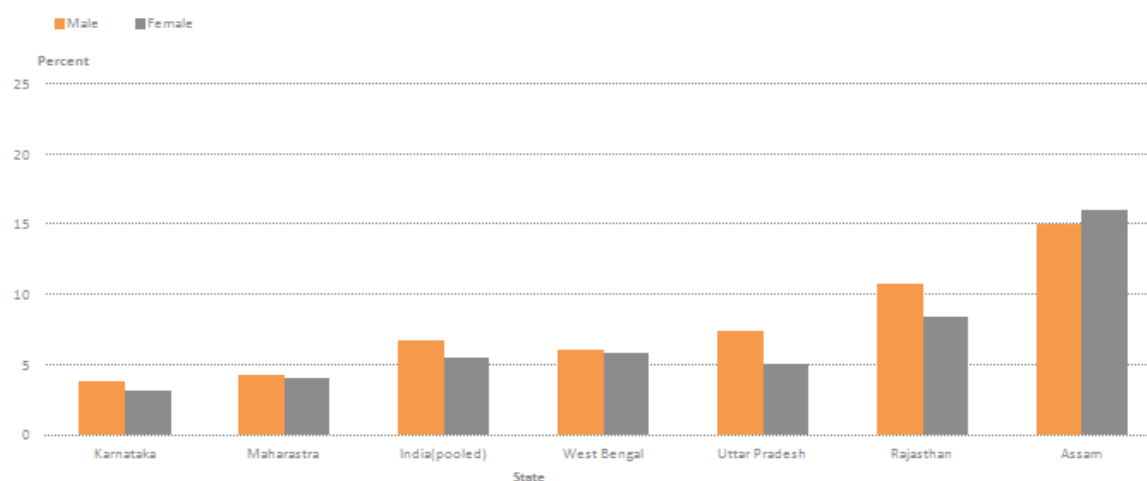
Background characteristics	Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
50-59	14.0	78.4	7.6	100	1,028
60-69	13.1	81.5	5.4	100	924
70-79	22.3	73.0	4.7	100	481
80+	20.6	73.9	5.5	100	142
<b>Marital status</b>					
Never married	4.1	84.5	11.4	100	33
Currently married	15.3	77.8	6.9	100	2,257
Widowed	15.6	79.6	4.8	100	277
Other <sup>1</sup>	0.0	100	0.0	100	8
<b>Residence</b>					
Urban	19.5	74.3	6.2	100	625
Rural	13.9	79.7	6.4	100	1,950
<b>Caste</b>					
Scheduled tribe	16.4	73.5	10.1	100	135
Scheduled caste	8.6	83.6	7.8	100	434
Other <sup>2</sup>	16.9	77.3	5.8	100	2,006
<b>Religion</b>					
Hindu	13.9	80.1	6.0	100	2,165
Muslim	20.2	71.3	8.6	100	329
Other <sup>3</sup>	38.9	54.4	6.7	100	81
<b>Education</b>					
No formal education	12.8	81.7	5.5	100	859
Less than primary	17.3	72.5	10.2	100	359
Primary school	17.9	76.7	5.4	100	449
Secondary school	12.3	81.9	5.9	100	372
High school	18.6	74.3	7.1	100	323
College and above	16.7	76.5	6.8	100	213
<b>Wealth quintile</b>					
Lowest	13.7	79.8	6.5	100	499
Second	12.2	81.7	6.1	100	518
Middle	19.0	75.3	5.7	100	498
Fourth	17.0	76.4	6.7	100	545
Highest	16.0	77.2	6.8	100	515
<b>Total</b>	<b>15.1</b>	<b>78.1</b>	<b>6.8</b>	<b>100</b>	<b>2,575</b>

**Table 9.2.5** Percent distribution of women by type of health care received\* in the last year, states and India (pooled), 2007

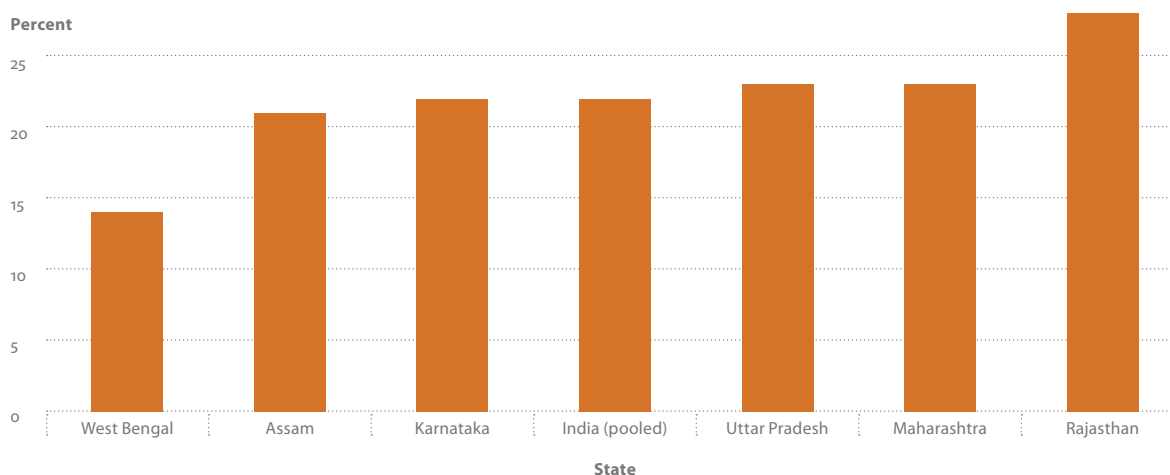
State	Aged 18-49					Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number	Inpatient care	Outpatient care	Did not receive	Percent	Number
Assam	13.4	65.9	20.7	100	262	8.0	75.9	16.1	100	188
Karnataka	19.9	70.5	9.6	100	434	20.6	76.2	3.2	100	464
Maharashtra	18.5	79.3	2.2	100	552	15.8	80.1	4.1	100	446
Rajasthan	15.6	71.9	12.5	100	532	11.3	80.3	8.4	100	581
Uttar Pradesh	11.1	84.7	4.1	100	556	11.0	84.0	5.1	100	476
West Bengal	20.6	70.6	8.9	100	652	11.0	83.1	5.9	100	540
India (pooled)	16.2	76.6	7.2	100	2,988	13.3	81.1	5.5	100	2,695

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

**Figure 9.2.2** Percentage of adults aged 50-plus who did not receive any health care in the last year by sex, states and India (pooled), 2007



**Figure 9.2.3** Percentage of adults aged 50-plus who received inpatient health care for non-communicable and chronic diseases (among respondents receiving inpatient care in the past 12 months), by state and India (pooled), 2007



**Table 9.2.6** Percent distribution of younger and older women by type of health care received\* in the last year and background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
18-29	19.9	73.1	7.0	100	1,094
30-39	13.4	78.4	8.2	100	1,067
40-49	14.9	79.0	6.1	100	827
<b>Marital status</b>					
Never married	5.7	82.5	11.8	100	307
Currently married	17.7	76.0	6.4	100	2,488
Widowed	13.6	75.0	11.4	100	169
Other <sup>1</sup>	7.9	87.0	5.1	100	24
<b>Residence</b>					
Urban	13.8	78.0	8.2	100	776
Rural	17.1	76.1	6.8	100	2,212
<b>Caste</b>					
Scheduled tribe	17.7	71.5	10.8	100	222
Scheduled caste	16.5	77.1	6.4	100	556
Other <sup>2</sup>	16.0	77.0	7.0	100	2,210
<b>Religion</b>					
Hindu	16.3	77.3	6.4	100	2,517
Muslim	15.4	71.7	12.9	100	382
Other <sup>3</sup>	16.3	76.0	7.7	100	89
<b>Education</b>					
No formal education	15.3	77.4	7.3	100	1,242
Less than primary	18.4	69.8	11.8	100	256
Primary school	16.3	78.3	5.4	100	523
Secondary school	17.6	75.0	7.5	100	433
High school	15.3	78.1	6.6	100	374
College and above	18.8	74.8	6.3	100	160
<b>Wealth quintile</b>					
Lowest	17.0	75.2	7.9	100	599
Second	13.7	79.7	6.7	100	588
Middle	17.7	74.0	8.3	100	602
Fourth	17.1	74.7	8.2	100	610
Highest	15.8	79.4	4.8	100	590
<b>Total</b>	<b>15.1</b>	<b>76.6</b>	<b>8.2</b>	<b>100</b>	<b>2,988</b>

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 9.2.6

Continued

Background characteristics	Aged 50-plus				
	Inpatient care	Outpatient care	Did not receive	Percent	Number
<b>Age group</b>					
50-59	12.8	80.9	6.2	100	1,283
60-69	13.8	81.0	5.2	100	891
70-79	14.8	81.9	3.3	100	396
80+	10.2	81.7	8.2	100	125
<b>Marital status</b>					
Never married	0.0	98.3	1.7	100	14
Currently married	14.9	79.7	5.5	100	1,630
Widowed	12.2	83.4	4.5	100	1,022
Other <sup>1</sup>	10.1	83.8	6.1	100	29
<b>Residence</b>					
Urban	12.1	83.8	4.1	100	765
Rural	14.5	79.9	5.6	100	1,930
<b>Caste</b>					
Scheduled tribe	11.3	84.2	4.5	100	139
Scheduled caste	11.9	83.1	5.0	100	436
Other <sup>2</sup>	14.4	80.4	5.2	100	2,120
<b>Religion</b>					
Hindu	13.1	81.4	5.0	100	2,276
Muslim	14.3	79.4	6.3	100	325
Other <sup>3</sup>	14.0	80.7	5.4	100	94
<b>Education</b>					
No formal education	13.9	80.7	5.4	100	1,872
Less than primary	16.6	76.7	6.7	100	248
Primary school	13.2	84.1	2.7	100	304
Secondary school	12.6	83.4	4.1	100	124
High school	11.1	83.6	5.3	100	96
College and above	7.7	88.8	3.7	100	51
<b>Wealth quintile</b>					
Lowest	11.9	79.2	7.2	100	530
Second	12.8	81.5	5.1	100	543
Middle	11.9	82.6	5.4	100	542
Fourth	16.1	80.6	3.3	100	530
Highest	14.3	81.6	4.1	100	557
<b>Total</b>	<b>13.3</b>	<b>81.1</b>	<b>5.5</b>	<b>100</b>	<b>2,695</b>

Note: \* Listed under inpatient care if reported receiving both inpatient and outpatient care.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



Assam also had the overall lowest proportion of outpatient care (67% for younger men and 75% for older men). In addition, Assam had the highest proportions who had not received any health care (24 % for younger men and 15% for older men).

The results for younger and older men are also presented by selected background characteristics in Table 9.2.4. Receipt of inpatient health care generally increased with increasing age. Large differences were seen between older and younger men in use of inpatient care in urban areas. Younger adults belonging to other castes or scheduled tribes (both 12%) were more likely than members of scheduled castes to reported using inpatient care (5 %). The proportion of older males who received inpatient care did not show consistent gradients by education and wealth quintiles.

Tables 9.2.5 and 9.2.6 present health care utilization information for women. Among women aged 50-plus, 81% had received outpatient care in the previous year, 13% had received inpatient care and around 6% had not received any health care. Outpatient care was more common in older women than younger women, reflecting the shifts in likely health care needs across the age spectrum from child-bearing to chronic conditions. The proportion of older women who had not received any health care was highest in Assam (16%) and lowest in Karnataka (3%). Among women aged 18-49, about 7% had not received any health care. The proportion of younger women who had not received any health care was highest in Assam (21%) and lowest in Maharashtra (2%). The proportion of older adults who had not received health care was much higher in the poorer states of Assam and Rajasthan compared with the demographically advanced states of Maharashtra and Karnataka (figure 9.2.2).

No clear age patterns were discernible in use of inpatient care, but a consistent increase in use of outpatient care was seen with increasing age (Table 9.2.6). Slight differences were seen in urban and rural areas, but otherwise, no clear patterns emerged by any of the other respondent characteristics.

### 9.2.1 Reasons for needing inpatient care

A total of 13ser fo %pondents had sought inpatient health care during the year prior to the survey. Their need for inpatient care was analysed by the self-reported reason for admission. Information was collected for 18 different types of diseases/treatments, including communicable diseases, nutritional deficiencies, maternal and pre-natal conditions, chronic pain, diabetes or related complications,

**Table 9.2.7 Percent distribution of respondents who received inpatient care during the last year by main reason for care need, states and India (pooled) 2007**

State	Aged 18-49						Aged 50-plus			
	Maternal health	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total
Assam	22.3	2.9	4.6	70.2	100	29	21.1	10.8	68.2	100
Karnataka	22.7	10.6	14.8	52	100	90	21.6	23.2	55.2	100
Maharashtra	12.8	11.7	22	53.5	100	99	23.2	10.2	66.6	100
Rajasthan	28.3	1.8	9.3	60.7	100	67	27.8	15.0	57.2	100
Uttar Pradesh	30.2	7.7	9.3	52.9	100	54	22.5	16.8	60.7	100
West Bengal	18.5	1.3	24.6	55.6	100	51	14.2	20.7	65.2	100
India (pooled)	21.5	8.2	15.6	54.8	100	390	21.9	16.1	61.9	100
										570

Note: Maternal health not tabulated for adults aged 50-plus.

Responses broadly classified under: 1) maternal health; 2) non-communicable and chronic diseases (diabetes or related complications, heart problems including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); 3) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); 4) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis).



**Table 9.2.8** Percent distribution of respondents who received inpatient care during the last year, by main reason for care need and background characteristics, India, 2007

Background characteristics	Aged 18-49					
	Maternal health	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number
Age group						
18-29	46.3	2.9	10.6	40.3	100	176
30-39	11.5	8.1	26.5	53.9	100	108
40-49	0.0	14.6	12.1	73.2	100	106
Sex						
Male	0.0	5.6	17.2	77.2	100	61
Female	34.3	9.7	14.6	41.4	100	329
Marital status						
Never married	0.0	4.0	17.8	78.1	100	20
Currently married	23.3	8.6	15.2	52.9	100	358
Widowed	0.0	0.0	24.3	75.8	100	11
Other <sup>1</sup>	0.0	0.0	0.0	100.0	100	1
Residence						
Urban	24.6	10.5	15.8	49.1	100	99
Rural	20.6	7.5	15.5	56.4	100	291
Caste						
Scheduled tribe	10.8	2.4	25.9	60.9	100	31
Scheduled caste	12.2	13.5	23.1	51.1	100	52
Other <sup>2</sup>	24.0	7.8	13.4	54.8	100	307
Religion						
Hindu	23.6	8.7	12.2	55.6	100	317
Muslim	16.6	7.4	25.0	50.9	100	56
Other <sup>3</sup>	3.5	3.1	42.2	51.2	100	17
Education						
No formal education	16.7	9.8	19.1	54.5	100	134
Less than primary	9.6	12.1	16.7	61.6	100	36
Primary school	23.8	5.7	30.5	40.0	100	62
Secondary school	28.1	10.8	2.8	58.3	100	63
High school	20.9	6.8	9.1	63.2	100	64
College and above	38.7	0.0	10.1	51.3	100	31
Wealth quintile						
Lowest	7.7	3.3	33.5	55.6	100	70
Second	17.2	9.7	2.3	70.9	100	73
Middle	27.6	7.6	14.9	50.0	100	79
Fourth	22.8	12.8	19.0	45.4	100	83
Highest	32.8	8.3	7.7	51.2	100	85
Total	21.5	8.2	15.6	54.8	100	390

Note: Maternal health not tabulated for adults aged 50-plus.

Responses broadly classified under: 1) maternal health; 2) non-communicable and chronic diseases (diabetes or related complications, heart problems including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); 3) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); 4) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis).

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Background characteristics	Aged 50-plus				
	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number
<b>Age group</b>					
50-59	24.2	21.9	53.9	100	215
60-69	17.5	13.4	68.9	100	201
70-79	24.2	8.6	67.2	100	123
80+	17.3	24.6	58.1	100	31
<b>Sex</b>					
Male	26.5	14.0	59.5	100	288
Female	17.2	19.4	63.3	100	282
<b>Marital status</b>					
Never married	0.0	0.0	100.0	100	1
Currently married	21.7	17.2	61.0	100	430
Widowed	23.0	14.4	62.2	100	137
Other <sup>1</sup>	4.2	0.0	95.8	100	2
<b>Residence</b>					
Urban	29.1	18.2	52.7	100	162
Rural	18.5	15.9	65.4	100	408
<b>Caste</b>					
Scheduled tribe	1.8	9.8	88.4	100	21
Scheduled caste	16.5	23.7	59.5	100	76
Other <sup>2</sup>	23.8	16.1	60.2	100	473
<b>Religion</b>					
Hindu	21.7	17.7	60.6	100	484
Muslim	19.4	18.4	62.2	100	60
Other <sup>3</sup>	30.8	0.4	68.8	100	26
<b>Education</b>					
No formal education	21.4	17.4	61.1	100	291
Less than primary	10.3	25.7	64.1	100	69
Primary school	22.0	15.7	62.3	100	87
Secondary school	25.9	15.0	59.1	100	50
High school	33.5	6.9	59.6	100	47
College and above	31.4	8.3	60.3	100	26
<b>Wealth quintile</b>					
Lowest	21.1	13.7	65.2	100	120
Second	12.8	16.8	70.0	100	99
Middle	22.2	23.0	54.7	100	108
Fourth	29.1	16.7	54.2	100	127
Highest	22.8	12.4	64.8	100	116
<b>Total</b>	<b>21.9</b>	<b>16.7</b>	<b>61.4</b>	<b>100</b>	<b>570</b>

problems related to heart and chest, high blood pressure/hypertension, cancer, depression/anxiety, occupational and other injury or other reasons. For the purpose of analysis, these were categorized into four broad groups as presented in Tables 9.2.7 and 9.2.8. The four groups were a) maternal and pre-natal conditions; b) non-communicable and chronic diseases (diabetes or related complications, heart problems, including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); c) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); d) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis, other diseases). The first category, maternal and pre-natal conditions, was not tabulated for respondents aged 50-plus.

Among respondents aged 50-plus, 22% had received inpatient care for non-communicable and chronic diseases and 17% for acute diseases during the previous year. Treatment for non-communicable and chronic diseases was more common among men (27%) than women (17%), and more common in urban areas (29%) than in rural areas (19%).

## 9.2.2 Reasons for needing outpatient care

Outpatient care was considered to be health care received in a clinic, hospital, dispensary, private nursing home or at home, where the treatment did not necessitate an overnight stay outside the patient's home. The percentage of those treated for acute diseases varied considerably across the states, from a high of 51% in Uttar Pradesh to a low of 17% in Assam (Table 9.2.9).

Nationally, 42% of older adults received outpatient care for acute diseases and 19% for non-communicable and chronic diseases in the year prior to the survey (Table 9.2.10). About 50% of younger respondents aged 18-49 had received outpatient care for acute diseases, 9% for non-communicable and chronic diseases, and 3% for reproductive health problems. As might be expected, outpatient care received for reproductive health was highest among the youngest age group (7%), and decreased with increasing age for women. Outpatient care for non-communicable and chronic diseases increased from 4% for adults aged 18-29 to 17% for adults aged 50-59 and 27% in the oldest persons aged 80-plus. As with inpatient care, outpatient care

**Table 9.2.9 Percent distribution of respondents who received outpatient care during the last year by main reason for care need, states and India (pooled), 2007**

State	Aged 18-49					Aged 50-plus				
	Maternal health	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total
Assam	4.8	16.5	29.0	49.7	100	199	28.4	17.0	54.1	100
Karnataka	2.3	10.0	50.4	37.4	100	406	18.1	38.6	43.2	100
Maharashtra	2.9	7.3	43.6	46.2	100	55.6	19.5	38.0	42.5	100
Rajasthan	3.6	7.4	47.6	41.4	100	507	16.6	49.4	34.0	100
Uttar Pradesh	3.1	7.1	59.5	30.3	100	593	17.0	50.7	32.0	100
West Bengal	0.9	10.9	47.0	41.2	100	646	19.9	36.6	43.5	100
India (pooled)	2.6	8.6	50.4	38.4	100	2,907	18.6	42.3	39.0	100
										4,173

Note: Maternal health not tabulated for adults aged 50-plus.

Responses broadly classified under: 1) maternal health; 2) non-communicable and chronic diseases (diabetes or related complications, heart problems including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); 3) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); 4) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis).

**Table 9.2.10** Percent distribution of younger and older respondents who received outpatient care during the last year by reason for care need and background characteristics, India 2007

Background characteristics	Aged 18-49					
	Maternal health	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number
Age group						
18-29	6.9	4.3	54.9	33.9	100	949
30-39	1.2	6.6	49.9	42.4	100	1,052
40-49	0.3	14.2	46.9	38.6	100	906
Sex						
Male	NA	9.6	55.0	35.5	100	639
Female	5.3	7.6	45.8	41.4	100	2,267
Marital status						
Never married	0.0	4.0	58.8	37.2	100	356
Currently married	3.2	9.4	48.9	38.5	100	2,386
Widowed	0.0	6.4	50.7	43	100	144
Other <sup>1</sup>	0.0	4.4	83.2	12.4	100	21
Residence						
Urban	3.3	12.0	47.2	37.6	100	743
Rural	2.4	7.5	51.5	38.7	100	2,164
Caste						
Scheduled tribe	2.4	12.5	48.3	36.9	100	191
Scheduled caste	2.0	6.7	56.4	34.9	100	561
Other <sup>2</sup>	2.8	8.8	48.8	39.5	100	2,155
Religion						
Hindu	2.6	9.0	50.7	37.7	100	2,450
Muslim	2.4	6.4	49.4	41.8	100	365
Other <sup>3</sup>	3.5	5.2	45.9	45.5	100	92
Education						
No formal education	2.3	7.0	49.8	41.0	100	1,068
Less than primary	2.4	12.0	45.4	40.3	100	250
Primary school	2.4	9.1	51.5	37.1	100	535
Secondary school	4.3	8.4	51.2	36.0	100	430
High school	2.1	9.7	48.4	39.7	100	412
College and above	2.4	8.4	57.1	32.1	100	212
Wealth quintile						
Lowest	1.3	6.4	49.5	42.8	100	576
Second	3.7	7.3	53.3	35.8	100	595
Middle	1.8	9.5	49.3	39.3	100	593
Fourth	3.8	9.5	47.3	39.5	100	576
Highest	2.8	10.8	51.7	34.7	100	567
Total	2.6	8.6	50.4	38.4	100	2,907

Note: Maternal health not tabulated for adults aged 50-plus.

Responses broadly classified under: 1) maternal health; 2) non-communicable and chronic diseases (diabetes or related complications, heart problems including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); 3) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); 4) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis).

1 Includes divorced, separated or cohabiting.

2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 9.2.10

Continued

Background characteristics	Aged 50-plus				
	Non-communicable and chronic diseases	Acute diseases	Other diseases	Total	Number
<b>Age group</b>					
50-59	17.3	42.5	40.1	100	1,854
60-69	18.6	41.8	39.4	100	1,428
70-79	20.1	44.3	35.4	100	679
80+	27.1	36.2	36.7	100	212
<b>Sex</b>					
Male	21.3	43.1	35.6	100	2,020
Female	16.1	41.5	42.2	100	2,153
<b>Marital status</b>					
Never married	25.0	63.4	11.6	100	39
Currently married	18.1	42.6	39.2	100	3,062
Widowed	20.1	40.6	39.1	100	1,040
Other <sup>1</sup>	15.0	46.5	38.5	100	32
<b>Residence</b>					
Urban	23.6	39.9	36.5	100	1,100
Rural	16.6	43.3	40.0	100	3,073
<b>Caste</b>					
Scheduled tribe	17.5	51.3	31.2	100	212
Scheduled caste	14.7	48.9	36.4	100	703
Other <sup>2</sup>	19.5	40.2	40.1	100	3,258
<b>Religion</b>					
Hindu	18.2	43.5	38.3	100	3,517
Muslim	21.1	35.4	43.1	100	528
Other <sup>3</sup>	21.8	33.5	44.7	100	128
<b>Education</b>					
No formal education	14.0	46.1	39.7	100	2,177
Less than primary	18.0	40.8	41.1	100	466
Primary school	20.8	40.0	39.2	100	599
Secondary school	26.9	40.6	32.5	100	397
High school	20.9	38.8	40.4	100	327
College and above	40.0	21.4	38.6	100	207
<b>Wealth quintile</b>					
Lowest	14.0	46.7	39.2	100	812
Second	15.3	47.3	37.3	100	834
Middle	15.9	44.2	39.8	100	822
Fourth	21.4	39.6	38.9	100	856
Highest	27.2	32.5	40.1	100	849
<b>Total</b>	<b>18.6</b>	<b>42.3</b>	<b>39.0</b>	<b>100</b>	<b>4,173</b>

Note: Maternal health not tabulated for adults aged 50-plus.

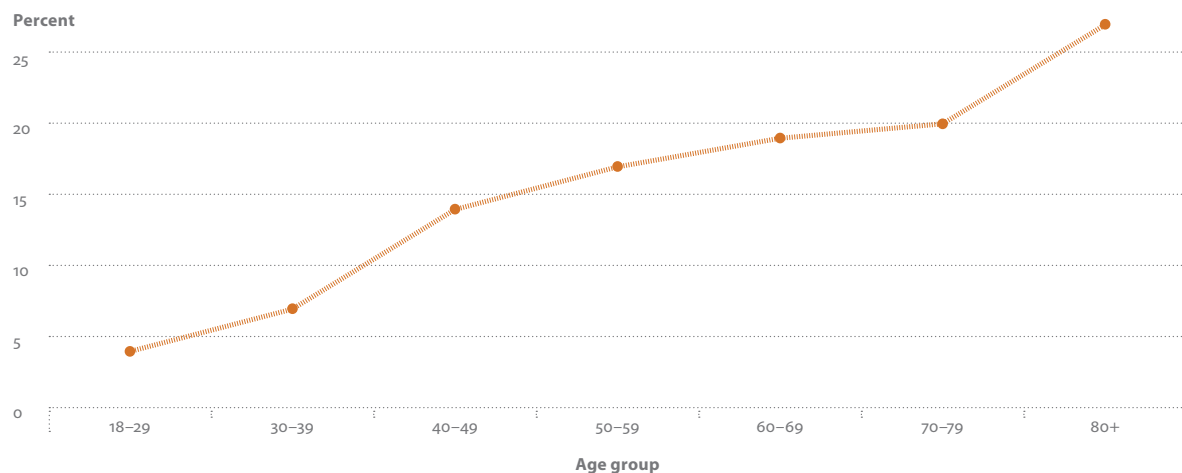
Responses broadly classified under: 1) maternal health; 2) non-communicable and chronic diseases (diabetes or related complications, heart problems including unexplained pain in the chest, problems with mouth, teeth or swallowing, problems with breathing, high blood pressure/hypertension, stroke/paralysis of one side of the body, generalized pain, depression/anxiety, cancer); 3) acute diseases (diarrhoea, fever, flu, headache, infections, malaria, tuberculosis, HIV); 4) other diseases (nutritional deficiencies, injury, surgery, sleep problems, occupation/work related condition/injury, chronic pain in joints/arthritis).

1 Includes divorced, separated or cohabiting.

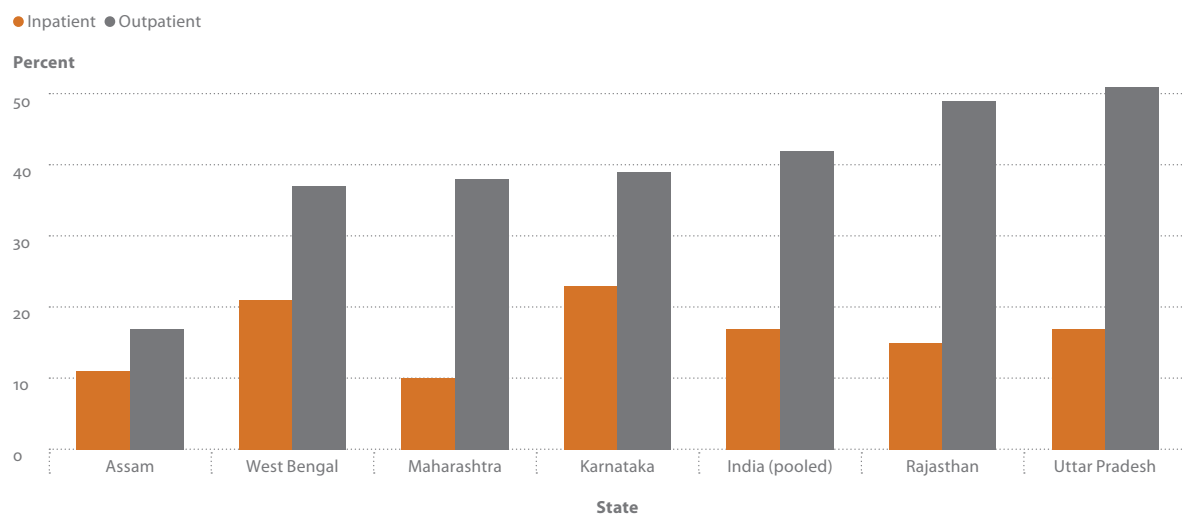
2 Includes non-scheduled caste or tribe and no caste or tribe.

3 Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 9.2.4** Percentage of respondents who received outpatient health care for non-communicable and chronic diseases by age, India (pooled), 2007



**Figure 9.2.5** Percentage of respondents who received health care for acute diseases, states and India (pooled), 2007



for non-communicable and chronic diseases was more common among older men (21%) than older women (16%), and was also higher in urban than in rural areas. The percentage of older respondents who received health care for non-communicable disease increased with age (figure 9.2.4). The percentage of older respondents who received health care acute diseases was much higher in the states of Uttar Pradesh and Rajasthan than Assam and West Bengal (figure 9.2.5).

### 9.3 Health system responsiveness

Health system responsiveness was based on responses from health care users to questions in the following seven domains:

1. *Access*: the ease with which the patient could see a health care provider.
2. *Choice*: freedom of respondents in choosing health care providers, as well as access to information about the choice of health care provider.
3. *Communication*: how clearly the providers explained things to patients and allocated time to them.
4. *Confidentiality*: consultation in a manner that safeguards the individual's privacy, privileged communication and confidentiality of the medical treatment.
5. *Dignity/respect*: respect and care in treatment as well as privacy during physical examinations.
6. *Quality of basic amenities*: clean surroundings, proper ventilation, adequate furniture and provision of healthy and appropriate water and food.

7. *Promptness of attention*: short waiting times for treatment, tests, and consultations and short waiting lists for non-emergency surgery.

Rating of inpatient services was based on respondents' impressions of their last overnight stay in any hospital or health facility, and rating of outpatient services was based on respondents' experience of their last visit to any hospital or health facility where they did not stay overnight. Respondents were asked about "... the amount of time you waited before being attended to; your experience of being treated respectfully; how clearly health care providers explained things to you; your experience of being involved in making decisions for your treatment; the way the health services ensured that you could talk privately to providers; the ease with which you could see a health care provider you were

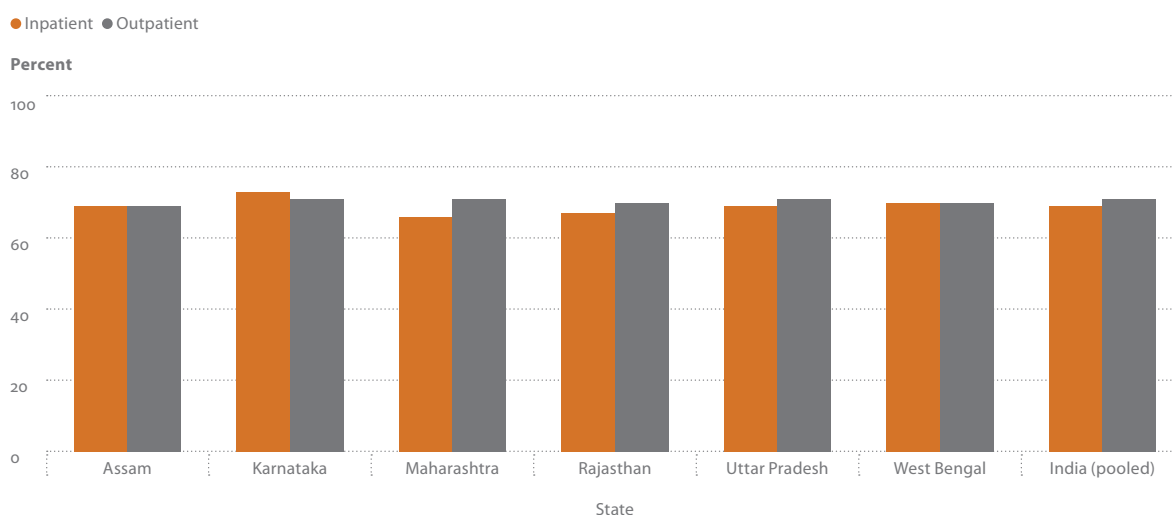
happy with; cleanliness in the health facility". The responses were ranked on the scale: very good = 5, good = 4, moderate = 3, bad = 2, very bad = 1. The responses were rescaled and the score ranged from 0-100, with a higher score indicating better responsiveness.

Overall mean responsiveness scores for inpatient and outpatient services are presented in Table 9.3.1 for the states and India. Ratings for outpatient care services were more stable across the states than for inpatient services (see Figure 9.3.1). There were small differences between inpatient and outpatient scores among younger adults by state, with outpatient services slightly more responsive to younger users than inpatient services (Table 9.3.1). However, older adults scored outpatient treatment (71) as more responsive than inpatient care (69), on average (Table 9.3.2).

**Table 9.3.1** Health system responsiveness score for hospitals or long term care facilities, states and India (pooled), 2007

State	Aged 18-49				Aged 50-plus			
	Inpatient		Outpatient		Inpatient		Outpatient	
	Mean score	Number	Mean score	Number	Mean score	Number	Mean score	Number
Assam	64.9	27	67.7	217	68.7	24	68.7	306
Karnataka	73.0	98	72.1	521	73.2	154	71.3	814
Maharashtra	66.4	108	71.1	685	65.7	130	71.4	825
Rajasthan	67.0	69	70.4	589	66.8	112	70.1	991
Uttar Pradesh	71.7	63	71.8	715	68.9	92	70.7	1,005
West Bengal	66.1	47	68.0	724	69.5	85	69.5	993
India (pooled)	69.2	412	70.7	3,451	68.9	597	70.6	4,934

**Figure 9.3.1** Health system responsiveness score of adults aged 50-plus, states and India (pooled), 2007



**Table 9.3.2** Health system responsiveness score for hospitals or long term care facilities, by background characteristics of the respondents, India (pooled), 2007

Background characteristics	Aged 18-49			
	Inpatient		Outpatient	
	Mean score	Number	Mean score	Number
<b>Age group</b>				
18-29	69.7	183	71.0	1164
30-39	70.6	116	70.6	1,219
40-49	67.4	113	70.5	1,069
<b>Sex</b>				
Male	69.6	66	71.8	737
Female	69.0	346	69.7	2,714
<b>Marital status</b>				
Never married	67.3	21	71.3	386
Currently married	69.5	378	70.7	2,885
Widowed	63.2	12	70.0	158
Other <sup>1</sup>	70.1	1	68.5	22
<b>Residence</b>				
Urban	74.2	113	71.7	878
Rural	67.6	299	70.4	2,573
<b>Caste</b>				
Scheduled tribe	67.0	31	65.7	227
Scheduled caste	66.2	54	68.7	641
Other <sup>2</sup>	70.0	327	71.6	2,583
<b>Religion</b>				
Hindu	69.5	335	70.8	2,904
Muslim	72.3	60	70.2	439
Other <sup>3</sup>	58.0	17	69.9	108
<b>Education</b>				
No formal education	68.8	141	68.6	1,278
Less than primary	70.6	38	68.9	300
Primary school	68.6	68	69.2	613
Secondary school	71.0	68	71.2	519
High school	65.1	65	73.9	486
College and above	76.7	32	75.8	255
<b>Wealth quintile</b>				
Lowest	66.1	74	66.7	681
Second	63.9	73	68.0	707
Middle	69.0	83	70.6	691
Fourth	73.8	88	72.4	688
Highest	73.8	94	76.0	684
<b>Total</b>	<b>69.2</b>	<b>412</b>	<b>70.7</b>	<b>3,451</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.



Table 9.3.2

Continued

Background characteristics	Aged 50-plus			
	Inpatient		Outpatient	
	Mean score	Number	Mean score	Number
<b>Age group</b>				
50-59	68.9	226	71.3	2,158
60-69	66.7	212	70.4	1,687
70-79	67.1	125	68.5	847
80+	69.7	34	71.4	243
<b>Sex</b>				
Male	70.1	305	71.8	2,412
Female	67.5	292	69.4	2,522
<b>Marital status</b>				
Never married	68.0	2	68.3	40
Currently married	69.6	453	71.2	3,638
Widowed	65.6	140	68.4	1,222
Other <sup>1</sup>	68.0	2	69.9	34
<b>Residence</b>				
Urban	70.9	170	72.1	1,331
Rural	67.9	427	69.9	3,604
<b>Caste</b>				
Scheduled tribe	60.4	20	67.8	236
Scheduled caste	66.6	83	67.8	810
Other <sup>2</sup>	69.6	494	71.3	3,889
<b>Religion</b>				
Hindu	68.9	508	70.7	4,172
Muslim	70.5	61	70.0	601
Other <sup>3</sup>	64.3	28	70.1	161
<b>Education</b>				
No formal education	65.8	308	68.3	2,555
Less than primary	71.5	70	70.7	552
Primary school	66.1	88	71.5	713
Secondary school	70.5	52	72.8	473
High school	80.0	51	75.3	395
College and above	77.0	28	78.5	246
<b>Wealth quintile</b>				
Lowest	62.2	123	67.0	955
Second	65.8	107	68.6	985
Middle	70.7	115	70.5	985
Fourth	70.2	129	71.4	998
Highest	75.6	123	75.8	1,011
<b>Total</b>	<b>68.9</b>	<b>597</b>	<b>70.6</b>	<b>4,934</b>

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Figure 9.3.2** Health care responsiveness score for adults aged 50-plus according to wealth quintile, sex and residence, India (pooled), 2007

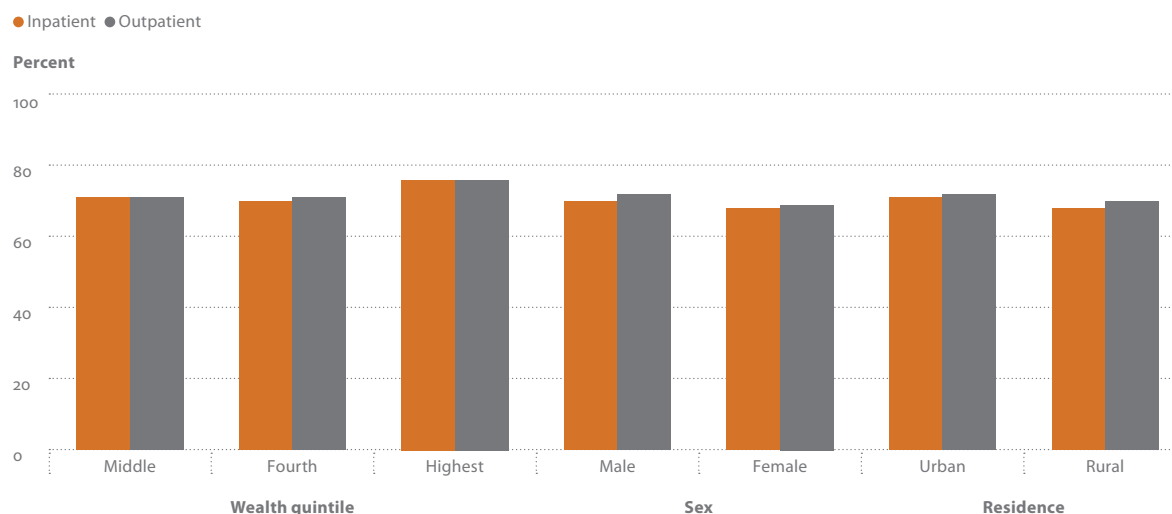


Table 9.3.2 presents the health system responsiveness scores by respondents' background characteristics. Scores were higher in urban than in rural areas in both categories of treatment. With an increase in wealth quintile, the responsiveness score increased considerably. In general, those with better education also found the health facilities more responsive. This may be because people who are educationally and economically better off usually prefer better and more expensive health care facilities, which usually are more patient-friendly and better equipped in terms of infrastructure.

## 9.4 Household consumption and health expenditures

Catastrophic spending on health occurs when a household must reduce its basic expenses over a period of time in order to cope with the health care expenses of one or more of its members. Since insurance coverage is very low in India, poor households tend to spend large proportions of their income on health care. This means poor households bear a heavy financial burden on account of illness (Selvaraju, 2000). In a country like India, characterised by inadequate and inefficient provision of public health, information on the share of total household expenditure going to health care is crucial to health sector planning and interventions, whether by government or donor agencies.

This section presents household expenditure on health care services, food and household items. Household

consumption expenditure consisted both of monetary and in-kind payments on all goods and services, and the monetary value of home-made products consumed. Household health expenditure included out-of-pocket (OOP) health payments made by households for health services received by household members. Health payments included doctors' consultation fees, purchases of medications or traditional medicines, and hospital bills, but excluded expenditure on ambulance/transportation and special nutrition. Any reimbursements (for example, from insurance, employers or the government) were deducted to yield the net out-of-pocket health expenditure.

SAGE collected data on food items bought in the seven days prior to the survey, non-food items and health care and services purchased in the previous 30 days, and large purchases or expenses that might be more periodic (in the previous 12 months). The different time frames were used to minimize recall bias on expenditures, and also to take into account those items that are purchased irregularly. As per WHO's 2005 criterion, the poverty line was calculated on the basis of subsistence expenditure per (equivalent) capita being less than the median of the country as a whole, and households with consumption expenditure below the poverty line were regarded as poor. Non-subsistence spending was also collected, which constitutes the aggregate of all other household expenditures including on health and non-food items,

Table 9.4.1 shows state-level variation in mean monthly household consumption expenditure, percentage of

**Table 9.4.1 Mean monthly household consumption and health payments (Rs.) and impoverishment (%), states and India (pooled), 2007**

	Mean household expenditure (Rs.)	Percent poor	Percent impoverished	Percent incurring catastrophic health payments	OOP* as percentage of household expenditure	OOP as percentage of non-subsistence spending	Mean OOP health payments (Rs.)
Assam	4,710	46.5	7.6	32.1	10.4	25.3	611
Karnataka	6,686	22.6	5.4	23.1	11.1	21.0	962
Maharashtra	6,713	29.9	5.8	17.9	8.9	17.6	851
Rajasthan	9,196	11.5	5.0	19.7	10.1	18.0	1,015
Uttar Pradesh	7,063	34.5	9.5	30.1	11.8	25.8	1,031
West Bengal	4,989	37.8	7.1	20.4	8.3	20.3	426
<b>India (pooled)</b>	<b>6,671</b>	<b>30.9</b>	<b>7.2</b>	<b>23.9</b>	<b>10.2</b>	<b>21.6</b>	<b>847</b>

\* OOP = out-of-pocket.

Note: Catastrophic health expenditure occurs when a household's total OOP health payments equal or exceed 40% of household's capacity to pay or non-subsistence spending. Subsistence spending is the minimum requirement to maintain basic life. The analysis used the poverty line – calculated on the basis of subsistence expenditure per (equivalent) capita being less than the median of the country as a whole – to set subsistence levels.

poor households, and effects of OOP health payments on household economic conditions. Nationally, the mean household expenditure was Rs. 6,671 per month, and mean OOP health care expenditure was Rs. 847. On average, OOP health care expenditure was 10% of total household expenditure, and 22% of non-subsistence spending. For more than one-fifth (24%) of households, spending on health care came to 22% or more of non-subsistence spending; in other words, these households incurred catastrophic expenditure on health. More than one-quarter (31%) of the households were poor as defined by consumption expenditure below the poverty line described above; in addition, 7% of the households that were originally not classified as being poor (using the definition above) were considered to have been impoverished due to spending on health care.

Mean household expenditure varied across the states, from a high of Rs. 9,196 in Rajasthan to a low of Rs. 4,710 in Assam. By the same token, the proportion of poor households was highest in Assam (47%) and lowest in Rajasthan (12%). Households in Uttar Pradesh and Rajasthan spent over Rs. 1,000 on health, while those in West Bengal spent only Rs. 426. OOP expenditure on health varied across the states from 8-12% of household expenditure and 18-26% of non-subsistent expenditure, with the lowest levels consistently in West Bengal and the highest in Uttar Pradesh. Around one-third of households in Assam and Uttar Pradesh incurred catastrophic expenditure on health care, as did more than one-sixth of households in Maharashtra. While 12-47% of households were poor to begin with, another 5-10% became impoverished due to health care expenditure.

Table 9.4.2 shows the results according to background characteristics of households. Incurring catastrophic health expenditures did not substantially affect mean household expenditure, but it did affect mean health expenditure. Some 24% of households incurred catastrophic expenditures on health.

Mean monthly consumption expenditure of non-poor households was Rs. 8580 compared to Rs. 2392 for poor households. Among both poor and non-poor households, 23-27% incurred catastrophic health expenditures. OOP health payments constituted 12% of monthly consumption expenditure for non-poor households and 7% for poor households.

A miniscule proportion of households had at least one member with health insurance. Households with any

**Table 9.4.2** Mean monthly household consumption and health payments (Rs.) and impoverishment (%), states and India (pooled), 2007

	Mean household expenditure (Rs.)	Percent poor	Percent impoverished	Percent incurring catastrophic health payments	OOP* as percentage of household expenditure	OOP as percentage of non-subsistence spending	Mean OOP health payments (Rs.)
<b>Catastrophic</b>							
No	6,968	29.7	1.9	–	4.4	9.7	369
Yes	5,724	34.6	24.1	–	28.6	59.7	2,370
<b>Poor</b>							
No	8,580	–	10.4	22.6	11.8	21.4	1,159
Yes	2,392	–	0.0	26.7	6.6	22.0	145
<b>Insurance</b>							
No	6,355	32.3	7.5	24.5	10.2	22.0	823
Yes	11,669	8.1	2.0	13.7	9.4	14.9	1,216
<b>Residence</b>							
Urban	8,446	21.3	4.5	16.5	8.6	16.7	894
Rural	6,019	34.4	8.2	26.5	10.8	23.3	824
<b>Wealth quintile</b>							
Lowest	2,817	61.8	10.4	33.4	10.4	27.6	417
Second	4,340	39.4	8.8	27.4	10.5	24.0	585
Middle	6,833	23.3	8.2	23.5	10.1	21.1	687
Fourth	7,141	14.4	6.3	18.9	10.2	18.6	1,131
Highest	13,536	4.2	1.6	13.1	9.6	14.7	1,497
<b>Member of household 50-plus</b>							
No	5,595	33.2	7.2	21.3	9.1	19.8	715
Yes	7,196	29.7	7.2	25.1	10.7	22.4	911
<b>Total</b>	<b>6671</b>	<b>30.9</b>	<b>7.2</b>	<b>23.9</b>	<b>10.2</b>	<b>21.6</b>	<b>846</b>

\* OOP = out-of-pocket.

Note: Catastrophic health expenditure occurs when a household's total OOP health payments equal or exceed 40% of household's capacity to pay or non-subsistence spending. Subsistence spending is the minimum requirement to maintain basic life. The analysis used the poverty line – calculated on the basis of subsistence expenditure per (equivalent) capita being less than the median of the country as a whole – to set subsistence levels.

insured members spent Rs. 11,669 on monthly consumption, compared to uninsured households, which spent Rs. 6355. Impoverishment due to catastrophic health expenditure was 8% among uninsured households, which spent Rs. 823 on OOP health payments; only 2% for insured households experienced a similar fate, despite a higher monthly health expenditure of Rs. 1216. OOP health payments equalled 22% of non-subsistence spending for uninsured households and only 15% for insured households. Only 21% of households in urban areas were poor, compared to 34% in

rural areas. Rates of impoverishment due to catastrophic health payments in rural areas were almost double those in urban areas.

Monthly consumption expenditure rose with economic status, from Rs. 2,817 in the lowest wealth quintile to Rs. 13,536 in the highest. The lowest quintile had the highest rate of impoverishment (10%) due to catastrophic health payments. Mean OOP health payments increased from Rs. 417 in the lowest quintile to Rs. 1497 in the highest.

### 9.4.1 Structure of out-of-pocket payments

Information about different types of expenses involved in OOP health payments can help planners to understand patterns of health expenditure. The SAGE survey included questions about payments for consultations with doctors, medication, long-term care, etc. For items such as medication and diagnostic visits, respondents were asked about their expenditure in the month prior to the survey; for items such as long-term care and the purchase of health aids, the questions covered the previous 12 months.

Table 9.4.3 shows results by state for different classes of OOP health payments. Payment for medications was the largest category in all states, but it varied from 73% in West Bengal down to 37% in Karnataka. More was spent on outpatient care than inpatient care in all states except Rajasthan and Karnataka. Uttar Pradesh was far ahead of the rest of the states in health payments for traditional medicine – 5.9% of OOP health payments, compared to a national average of 2.8%. Payment for diagnostic tests accounted for less than 5% of OOP health payments in all six states. Karnataka and Rajasthan had the highest payments for inpatient treatment and also long-term care, suggesting that inpatient hospitalization resulted in high long-term care costs.

Table 9.4.4 shows the nature of OOP payments by household characteristics. The largest component of OOP costs (58%) was medications. Households incurring catastrophic health payments spent 16% for inpatient care and 7% each on diagnosis and long-term care, compared with 7% on inpatient care, 2% on diagnosis and 5% on long-term care for households without catastrophic expenditure. Poor households spent more on medications (66%) than non-poor households (56%). Outpatient health care accounted for 15% of payments in urban areas, compared to 12% in rural areas. Rural households spent 60% on medications compared to 54% in urban areas. The percentage share of inpatient and outpatient care rose with increases in wealth quintile, while the percentage share of OOP payments for medications decreased.

### 9.4.2 Source of health care financing

Households depend on many sources to finance their health expenditure. From a policy point of view, these sources are relevant to achieving equity in health care financing. Table 9.4.5 shows that current income was

**Table 9.4.3 Percent distribution of out-of-pocket payments by different items of health care, states and India (pooled), 2007**

	Inpatient	Outpatient	Traditional	Diagnostic	Medications	Ambulance	Health aids	Long-term care	Others	Total
Assam	8.1	10.9	1.7	3.3	68.3	0.4	0.7	6.0	1.1	100
Karnataka	13.1	12.8	0.8	4.4	37.1	0.5	6.6	10.9	14.1	100
Maharashtra	8.9	21.8	1.5	3.5	51.7	0.0	5.3	4.0	3.7	100
Rajasthan	10.2	6.0	1.7	3.9	63.8	0.0	1.5	11.2	1.9	100
Uttar Pradesh	9.1	10.5	5.9	4.6	58.4	0.1	2.5	6.0	2.9	100
West Bengal	8.0	12.3	1.4	2.1	72.6	0.2	1.3	0.4	2.1	100
India (pooled)	9.4	12.9	2.8	3.7	58.3	0.2	3.1	5.7	4.1	100

**Table 9.4.4** Percent distribution of out-of-pocket payments by different items of health care by background characteristics, India (pooled), 2007

	Inpatient	Outpatient	Traditional	Diagnosis	Medications	Ambulance	Health aids	Long term care	Others	Total
<b>Catastrophic</b>										
No	6.6	13.5	2.7	2.4	60.4	0.2	4.2	5.3	5.1	100
Yes	16.2	11.4	3.1	6.9	53.4	0.1	0.7	6.7	1.8	100
<b>Poor</b>										
No	10.5	13.4	2.3	4.3	55.6	0.2	3.2	6.5	4.3	100
Yes	6.3	11.5	4.5	1.9	66.1	0.0	3.1	3.4	3.5	100
<b>Insurance</b>										
No	9.2	12.9	2.9	3.6	59.0	0.2	3.1	5.5	4.0	100
Yes	13.1	13.2	2.2	5.3	48.2	0.4	4.3	7.9	5.7	100
<b>Residence</b>										
Urban	8.0	15.3	2.6	4.3	53.6	0.3	4.9	5.5	6.0	100
Rural	10.0	12.0	2.9	3.5	60.0	0.1	2.5	5.8	3.4	100
<b>Wealth quintile</b>										
Lowest	8.2	12.0	3.3	2.5	66.0	0.0	1.5	3.5	3.3	100
Second	7.8	11.1	3.8	2.9	61.7	0.1	3.3	5.9	3.6	100
Middle	9.7	13.1	1.9	3.3	58.8	0.4	2.4	5.3	5.3	100
Fourth	10.6	14.7	2.4	4.5	51.7	0.2	4.7	6.7	4.9	100
Highest	11.2	14.0	2.3	5.4	52.4	0.3	3.8	7.1	4.1	100
<b>Member of household 50-plus</b>										
No	9.4	13.0	2.9	3.8	58.1	0.2	3.1	5.7	4.2	100
Yes	10.6	10.9	2.1	2.0	62.1	0.2	4.9	5.3	2.0	100
<b>Total</b>	<b>9.4</b>	<b>12.9</b>	<b>2.8</b>	<b>3.7</b>	<b>58.3</b>	<b>0.2</b>	<b>3.1</b>	<b>5.7</b>	<b>4.1</b>	<b>100</b>

Note: Catastrophic health expenditure occurs when a household's total OOP health payments equal or exceed 40% of household's capacity to pay or non-subsistence spending. Subsistence spending is the minimum requirement to maintain basic life. The analysis used the poverty line – calculated on the basis of subsistence expenditure per (equivalent) capita being less than the median of the country as a whole – to set subsistence levels.

**Table 9.4.5** Percentage of households by sources of health care financing, states and India (pooled), 2007

	Current income	Savings	Borrowed from relatives	Borrowed from others	Sold items	Health insurance	Other
Assam	55.4	29.4	15.6	5.0	13.5	0.4	10.6
Karnataka	67.4	23.8	30.9	16.1	13.8	4.4	32.5
Maharashtra	85.7	13.7	18.5	9.2	8.2	1.5	4.5
Rajasthan	88.9	11.9	19.8	2.4	5.4	2.3	1.5
Uttar Pradesh	62.6	39.8	20.3	4.5	6.3	0.5	7.3
West Bengal	79.1	24.0	13.1	1.6	6.2	0.5	8.8
<b>India (pooled)</b>	<b>73.6</b>	<b>25.9</b>	<b>19.6</b>	<b>6.1</b>	<b>7.8</b>	<b>1.4</b>	<b>9.8</b>

Note: Row totals do not equal 100 due to multiple responses.

the major source of finance across all states, followed by savings. In Rajasthan and Maharashtra, over 85% relied on current income, while about 40% in Uttar Pradesh and 29% in Assam drew on their savings. Borrowing from relatives was the third major source of health care financing, varying from 13% in West Bengal to 31% in Karnataka. Some 8% of all households sold assets such as furniture, cattle or jewellery to finance health care. Only 1.4% paid for health care through insurance.

Table 9.4.6 shows sources of health finance by characteristics of households. As OOP health payments accounted for an increasing share of non-subsistence spending, households used their savings to finance health care. When a household member was hospitalised as an inpatient, 35% of households borrowed from relatives, compared with 16% with no inpatient hospitalisation. Among households with insurance, 83% used their current income and 31% used savings to pay for health care. Urban households were more

likely than rural households to use current income 85% and 69% respectively. Households in the lowest and highest wealth quintiles drew on different sources to finance health care.

### 9.4.3 Health insurance coverage

Health insurance coverage in India is far from satisfactory, especially since a large proportion of people live below the poverty line and under great health risks. This section examines the extent of coverage by health insurance along with the characteristics of insurance plans. The two major insurance schemes are mandatory and voluntary insurance. Mandatory health insurance includes the Employee State Insurance Scheme (ESIS), Central Government Health Scheme (CGHS), and medical reimbursement by some employers (both government and private). Voluntary insurance consists of coverage by other personal insurance companies such as Mediciam.

**Table 9.4.6** Source of health care financing by background characteristics, India (pooled), 2007

Background characteristics	Current income	Savings	Borrow from relatives	Borrow from others	Sold items	Health insurance	Other
<b>OOP* as percentage of non-subsistence spending</b>							
Less than 0-10%	78.7	22.3	9.9	5.2	4.4	1.9	8.8
11-20%	76.7	24.3	14.5	5.5	6.2	1.1	9.6
21-40%	73.9	26.5	19.8	6.8	9.3	0.9	9.7
More than 41%	64.1	31.6	36.3	7.2	12.4	1.4	11.2
<b>Hospitalization</b>							
No	73.2	25.3	15.5	4.6	6.1	1.1	9.3
Yes	74.1	27.6	35.0	12.0	14.6	2.3	11.1
<b>Insurance</b>							
No	72.7	25.4	19.6	5.7	7.7	0.6	9.4
Yes	82.5	30.6	16.8	11.5	9.4	12.0	13.0
<b>Residence</b>							
Rural	69.0	27.7	20.2	6.3	8.6	1.1	10.9
Urban	85.4	20.6	17.3	5.6	5.6	2.2	6.2
<b>Wealth quintile</b>							
Lowest	67.5	23.5	18.4	2.8	6.1	0.2	8.7
Second	69.5	23.8	18.7	4.1	6.8	0.6	10.8
Middle	73.0	23.8	20.6	4.8	7.5	0.9	10.5
Fourth	73.9	26.2	20.1	7.7	9.3	1.5	11.4
Highest	80.6	30.4	19.0	9.8	8.6	3.2	7.0
<b>Member of household 50-plus</b>							
No	73.7	25.1	19.6	6.1	7.5	1.4	9.1
Yes	72.8	27.2	19.0	6.0	8.3	1.3	10.9
<b>Total</b>	<b>73.4</b>	<b>25.8</b>	<b>19.4</b>	<b>6.1</b>	<b>7.8</b>	<b>1.4</b>	<b>9.7</b>

\* OOP = out-of-pocket.

**Table 9.4.7** Percent distribution of household population by health insurance coverage, states and India (pooled), 2007

	Mandatory insurance <sup>1</sup>	Voluntary insurance <sup>2</sup>	None	Total
Assam	0.1	0.2	99.7	100
Karnataka	2.8	6.1	91.1	100
Maharashtra	0.7	0.7	98.5	100
Rajasthan	1.3	0.1	98.6	100
Uttar Pradesh	0.3	0.2	99.4	100
West Bengal	1.8	1.1	97.0	100
<b>India (pooled)</b>	<b>1.0</b>	<b>1.1</b>	<b>97.8</b>	<b>100</b>

<sup>1</sup> Includes ESIS, CGHS, RHS, DMS, ECHS and others.

<sup>2</sup> Includes CHIS, BPL and SEWA Schemes, Commercial Health Schemes and others.

According to the National Family Health Survey (2005-06), only 5% of households have at least one member covered by a health scheme or health insurance. Private providers of health insurance have only recently emerged after the liberalization of the economy. Table 9.4.7 shows that only 2.2% of respondents were covered under any health insurance policy. Mandatory insurance and voluntary coverage were each just 1%. Health insurance coverage was highest in Karnataka (9%) followed by West Bengal (3%). There was virtually no coverage under health insurance in Assam and Uttar Pradesh.

Insurance coverage by household characteristics is presented in Table 9.4.8. More urban households (5%) were covered under health insurance than their rural counterparts (1.4%). The households most likely to have health insurance were those headed by older women or older men (3% each). More than 5% of households in the highest wealth quintile were covered by health insurance, compared with virtually none in the first, second or third quintiles. In other words, insurance is practically absent among poor households in India.

**Table 9.4.8** Percent distribution of household population by health insurance coverage by background characteristics, states and India (pooled), 2007

	Mandatory insurance <sup>1</sup>	Voluntary insurance <sup>2</sup>	None	Total
<b>Residence</b>				
Urban	2.2	2.3	95.5	100
Rural	0.6	0.7	98.6	100
<b>Household head type</b>				
Female 18-49	0.2	0.5	99.3	100
Female 50-plus	1.4	1.6	97	100
Male 18-49	0.9	0.9	98.2	100
Male 50-plus	1.1	1.2	97.5	100
<b>Wealth quintile</b>				
Lowest	0.2	0.2	99.7	100
Second	0.2	0.3	99.4	100
Middle	0.3	0.6	98.9	100
Fourth	1.4	1.4	97.1	100
Highest	2.6	2.5	94.6	100
<b>Total</b>	<b>1.0</b>	<b>1.1</b>	<b>97.8</b>	<b>100</b>

<sup>1</sup> Includes ESIS, CGHS, RHS, DMS, ECHS and others.

<sup>2</sup> Includes CHIS, BPL and SEWA Schemes, Commercial Health Schemes and others.





## 10. Subjective well-being and quality of life

Life expectancy around the world has risen by about two decades during the past half century. This increase has been associated with economic growth and rising levels of subjective well-being (SWB) globally. An increased interest from scientists in studying happiness (or SWB) 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, Sen, and Fitoussi, 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.

Well-being and quality of life encompass subjective individual feelings about various aspects of one's life, such as health, degree of independence, social relationships, personal beliefs, financial condition and living conditions. Psychologists, sociologists and others have tried to quantify measurement of this inherently subjective topic using various concepts such as well-being, subjective well-being, happiness and life satisfaction.

The relationship between subjective well-being and ageing is unclear. Individual aspirations and adaptations to circumstances of health and life influence happiness over the life course. As health declines with age, happiness tends to decline, especially among those with poorer health. Nevertheless, circumstances such as marriage and the extent and nature of social support clearly modify 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 in which older adults spend their time, the circumstances in which they live, the nature of their work and leisure activities, and changes in these over time – along with their health and its determinants – will need to be tracked 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 SWB can be separated into evaluative well-being (a global assessment of an individual's satisfaction with their entire life) and experienced happiness (the affective experiences of daily life). 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). SAGE used the eight-item WHO Quality of Life (WHOQoL) instrument to measure evaluative well-being (Schmidt *et al.*, 2006). Meanwhile, experienced happiness fluctuates from day to day, depending on how people use their time.

SAGE used the Day Reconstruction Method (DRM) to measure the experienced well-being/happiness component of subjective well-being (Kahneman *et al.*, 2004).

## 10.1 Evaluative well-being

Evaluative well-being, or quality of life (QoL), is defined as individuals' perception of their position in life in the context of their culture and value systems and in relation to their goals, expectations, standards and concerns (WHOQOL Group, 1994). Quality of life is assessed by perceptions about sufficiency of energy and money for daily needs and satisfaction about oneself, health and ability to perform daily activities, personal relationships, and living conditions. In SAGE, QoL was assessed by asking respondents to rate their satisfaction with different domains of their lives on a 5-point scale, ranging from very satisfied to very dissatisfied, as well as rating their overall life satisfaction. A composite score was

created by summing the responses across the different questions and rescaling the responses from 0-100, where a higher score indicated better quality of life.

Table 10.1.1 presents quality of life scores (WHOQoL) by state for older and younger adults. The mean WHOQoL score of older respondents was 49, with West Bengal and Assam scoring lower than other states (42 and 46, respectively). Compared with the older adults, younger respondents reported better quality of life (mean WHOQoL score 55). The pattern of mean WHOQoL score by state for younger adults was similar to that for older adults, with West Bengal and Assam having the lowest scores (47.9 and 51.2, respectively) and Maharashtra and Uttar Pradesh the highest (57 and 56.9 respectively).

Table 10.1.2 presents mean WHOQoL scores by state and sex for both older and younger respondents. Respondents resident in Assam and West Bengal consistently had lower WHOQoL scores than respondents from other states. Among the older adults, the mean WHOQoL

**Table 10.1.1 Mean WHOQoL scores for younger and older adults, states and India (pooled), 2007**

	Aged 18-49		Aged 50-plus	
	Mean WHOQoL score*	Number	Mean WHOQoL score	Number
Assam	51.2	517	46.1	677
Karnataka	55.4	630	50.2	923
Maharashtra	57.0	885	50.2	1,098
Rajasthan	56.8	847	51.3	1,378
Uttar Pradesh	56.9	890	52.3	1,311
West Bengal	47.9	901	41.5	1,173
India (pooled)	54.9	4670	49.3	6,560

\* 0 = worst quality of life, 100 = best quality of life.

**Table 10.1.2 Mean WHOQoL scores for younger and older men and women, states and India (pooled), 2007**

	Male 18-49		Female 18-49		Male 50-plus		Female 50-plus	
	Mean WHOQoL score*	Number	Mean WHOQoL score	Number	Mean WHOQoL score	Number	Mean WHOQoL score	Number
Assam	51.7	114	50.6	403	48.3	368	43.7	309
Karnataka	55.5	130	55.3	500	51.2	419	49.3	504
Maharashtra	58.3	202	55.7	683	52.7	548	47.8	550
Rajasthan	56.9	193	56.7	654	52.6	677	50.1	701
Uttar Pradesh	57.0	213	56.8	677	53.1	703	51.3	608
West Bengal	48.7	193	47.0	708	44.0	589	38.7	584
India (pooled)	55.4	1,045	54.3	3,625	50.9	3,304	47.6	3,256

\* 0 = worst quality of life, 100 = best quality of life.

**Table 10.1.3** Mean WHOQoL scores for younger and older respondents, by background characteristics, India (pooled), 2007

Background characteristics	Aged 18-49			Aged 50-plus	
	Mean WHOQoL score*	Number		Mean WHOQoL score	Number
Age group					
18-29	57.9	1,606	50-59	51.4	2,939
30-39	54.2	1,657	60-69	48.6	2,235
40-49	52.6	1,407	70-79	46.1	1,058
			80+	42.3	328
Sex					
Male	55.4	1,045		50.9	3,304
Female	54.3	3,625		47.6	3,256
Marital status					
Never married	59.2	557		48.1	64
Currently married	54.6	3,849		50.6	4,860
Widowed	47.8	222		44.9	1,592
Other¹	51.0	42		45.3	44
Residence					
Urban	56.2	1,169		51.5	1,676
Rural	54.4	3,501		48.4	4,884
Caste					
Scheduled tribe	52.8	374		44.7	400
Scheduled caste	53.2	893		45.7	1,085
Other²	55.5	3,403		50.4	5,075
Religion					
Hindu	55.4	3,907		49.6	5,532
Muslim	50.7	593		47.0	791
Other³	55.7	170		49.5	237
Education					
No formal education	51.9	1,688		46.5	3,341
Less than primary	52.4	411		48.5	763
Primary school	53.8	817		50.1	923
Secondary school	55.1	746		52.4	645
High school	58.7	660		55.5	565
College and above	61.6	348		59.2	322
Wealth quintile					
Lowest	49.2	959		43.1	1,312
Second	52.7	933		46.9	1,312
Middle	54.5	935		49.5	1,313
Fourth	57.2	934		51.9	1,311
Highest	62.1	909		56.4	1,312
Total	54.9	4,670		49.3	6,560

\* 0 = worst quality of life, 100 = best quality of life.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

**Table 10.1.4** Mean WHOQoL scores for younger and older men and women, by background characteristics, India (pooled), 2007

Background characteristics	Men, 18-49		Women, 18-49	
	Mean WHOQoL score*	Number	Mean WHOQoL score	Number
<b>Age group</b>				
18-29	58.6	272	57.5	1,334
30-39	55.4	359	53.1	1,298
40-49	53.3	414	51.7	993
<b>Marital status</b>				
Never married	58.3	147	60.4	410
Currently married	55.1	874	54.0	2,979
Widowed	49.7	19	47.0	203
Other <sup>1</sup>	57.6	5	49.7	33
<b>Residence</b>				
Urban	58.2	240	54.6	929
Rural	54.7	805	54.2	2,696
<b>Caste</b>				
Scheduled tribe	53.7	84	52.0	290
Scheduled caste	54.5	210	51.7	683
Other <sup>2</sup>	55.8	751	55.2	2,652
<b>Religion</b>				
Hindu	56.2	861	54.7	3,046
Muslim	50.1	135	51.4	458
Other <sup>3</sup>	56.3	49	54.8	121
<b>Education</b>				
No formal education	51.8	210	51.9	1,505
Less than primary	54.2	107	50.3	324
Primary school	53.9	183	53.7	605
Secondary school	53.8	194	57.0	547
High school	58.3	211	59.2	445
College and above	61.0	140	63.5	199
<b>Wealth quintile</b>				
Lowest	49.5	220	48.9	739
Second	52.4	222	52.9	711
Middle	55.7	222	53.2	713
Fourth	58.0	194	56.5	740
Highest	63.3	187	60.9	722
<b>Total</b>	<b>55.4</b>	<b>1,045</b>	<b>54.3</b>	<b>3,625</b>

\* 0 = worst quality of life, 100 = best quality of life.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

Table 10.1.4

Continued

Background characteristics	Male 50-plus		Female 50-plus	
	Mean WHOQoL score	Number	Mean WHOQoL score	Number
<b>Age group</b>				
50-59	52.9	1,388	49.7	1,551
60-69	50.2	1,156	47.0	1,079
70-79	47.5	591	44.5	467
80+	44.6	169	40.5	159
<b>Marital status</b>				
Never married	47.8	45	49.3	19
Currently married	51.1	2,895	49.8	1,967
Widowed	49.4	354	43.9	1,238
Other <sup>1</sup>	40.5	10	46.5	32
<b>Residence</b>				
Urban	53.4	788	49.5	888
Rural	49.9	2,516	46.8	2,368
<b>Caste</b>				
Scheduled tribe	45.5	215	43.8	185
Scheduled caste	47.9	557	43.2	528
Other <sup>2</sup>	51.9	2,532	48.8	2,543
<b>Religion</b>				
Hindu	51.3	2,779	47.9	2,753
Muslim	48.5	411	45.5	380
Other <sup>3</sup>	52.0	114	48.1	123
<b>Education</b>				
No formal education	46.7	1,084	46.4	2,281
Less than primary	49.0	454	47.7	292
Primary school	50.3	580	49.6	349
Secondary school	52.5	498	52.2	159
High school	55.4	427	56.4	114
College and above	59.5	264	58.2	61
<b>Wealth quintile</b>				
Lowest	44.1	654	42.2	658
Second	48.0	668	45.8	644
Middle	51.4	648	47.4	665
Fourth	53.2	684	50.3	627
Highest	58.6	650	54.0	662
<b>Total</b>	<b>50.9</b>	<b>3,304</b>	<b>47.6</b>	<b>3,256</b>

\* 0 = worst quality of life, 100 = best quality of life.

<sup>1</sup> Includes divorced, separated or cohabiting.

<sup>2</sup> Includes non-scheduled caste or tribe and no caste or tribe.

<sup>3</sup> Includes Buddhism, Christianity, Jainism, Sikhism and other religions.

score for women was three points lower than that for men, with older women in Assam, Maharashtra and West Bengal reporting the lowest scores. The patterns by state were the similar in older men. Patterns in younger adults follow similar sex and state differentials in mean WHOQoL scores.

Tables 10.1.3 and 10.1.4 show mean WHOQoL scores varying across sex, residence, caste, religion, marital status, education and income. Quality of life deteriorated progressively with age: the mean score dropped from 58 in the 18-29 age group to 42 in the 80-plus age group. The gender gap was four points in those aged 50-plus, compared to one point in the youngest age group (18-49 years). Quality of life was better in urban areas than rural areas.

Tables 10.1.3 and 10.1.4 depict positive socioeconomic gradients in quality of life for both sexes of older and younger adults, with respondents with higher education levels or higher wealth registering better quality of life scores. Though, there are age and sex differences with being disadvantaged in terms of quality of life.

## 10.2 Experienced well-being

SAGE India measured experienced well-being based on the Day Reconstruction Method (DRM). Respondents were divided randomly into four groups and either asked to describe a part of their previous day (morning, afternoon or evening) or asked for a summary description of their entire day. Respondents were asked to sequentially describe their activities, if anyone was with the respondent, the duration of each of the activities, and whether the activity was enjoyable and associated with a positive feeling (such as feeling calm)—or with a negative feeling (such as being depressed, irritated or angry). Based on these responses, the individual's emotional state was quantified and summarized as being overall in positive affect or negative affect, averaged over the duration of that part of the day for which they responded. A measure referred to as the U-Index, or unpleasantness index, was obtained by calculating for each participant the proportion of time in which the highest-rated feeling was a negative one. A higher score suggests less happiness.

Table 10.2.1 presents results for the U-Index in older adults. Women generally tended to spend more time in an unpleasant state than men. No clear pattern was discernible with increasing age. However, a clear gradient was seen in education: those with higher education reported a smaller portion of their day spent with



negative feelings, as compared to those with little or no education. Respondents who were separated, divorced or widowed experienced a greater portion of their day with unpleasantness, as did those living in rural areas. As with education, a clear gradient was also seen with wealth, with the richer groups spending far less time in a state of unpleasantness as compared to their poorer counterparts.

## Conclusion

Our results for SWB reveal very clear patterns for both the evaluative as well as the experienced components. The social gradient in SWB is striking in terms of the evident inequality: those from the poorer and less educated strata of society in India have markedly lower SWB. The relationship between education and income on the one hand and SWB on the other has in fact been the subject of several recent studies. For example, a large study in the United States found that income and education were closely related to evaluative well-being, with life evaluation rising steadily with income, although emotional well-being tended to plateau after a certain level of wealth (Kahneman and Deaton, 2010).

With an increasing recognition that Gross Domestic Product alone does not indicate the progress of a society, there is a growing interest in the monitoring of the SWB of populations in order to measure the impact of policy (Stiglitz, Sen, and Fitoussi, 2009; Forgeard *et al.* 2011). A recent survey of 148 countries in 2011 ranked India 128<sup>th</sup> in terms of the happiness of its population (Gallup World Poll, 2011). SAGE India's results clearly point to the need to understand various factors in people's lives – such as health, living conditions, social relationships and feelings of loneliness – that relate to SWB and to monitor SWB indicators in national population surveys in order to develop appropriate policy responses.

**Table 10.2.1** Mean U-Index values and standard errors (SE), by background characteristics, India (pooled), 2007

Background characteristics	Mean U-index*		Number
	mean	SE	
Sex			
Men	0.074	0.007	3,345
Women	0.091	0.006	3,215
Total	0.083	0.005	6,560
Age group			
50-59	0.082	0.006	3,189
60-69	0.080	0.008	2,026
70-79	0.079	0.010	1,048
80+	0.119	0.027	297
Total	0.083	0.005	6,560
Education			
No formal education	0.107	0.008	3,361
Less than primary	0.067	0.009	659
Primary school completed	0.063	0.009	971
Secondary school completed	0.062	0.012	667
High school completed	0.047	0.009	564
College completed	0.021	0.007	224
Post graduate degree completed	0.028	0.016	113
Total	0.083	0.005	6,560
Marital status			
Never	0.072	0.025	48
Currently married	0.079	0.005	5,046
Separated or divorced	0.107	0.070	32
Widowed	0.095	0.009	1,434
Total	0.083	0.005	6,560
Income quintile			
Lowest	0.102	0.010	1,190
Second	0.103	0.012	1,276
Middle	0.094	0.013	1,230
Fourth	0.085	0.009	1,285
Highest	0.041	0.006	1,564
Total	0.083	0.005	6,545
Residence			
Urban	0.065	0.009	1,896
Rural	0.090	0.005	4,664
Total	0.083	0.005	6,560

\*Relative proportion of day spent in an unpleasant state.





## Glossary

**Activities of daily living (ADL):** Activities necessary for daily self-care and independent community living. Self-care includes using the toilet and grooming, dressing, and feeding oneself; independent community living includes driving, shopping, homemaking, care of family, work activities, and so on.

**Alcohol products:** A broad range of types of beverages containing alcohol (ethanol), including wine (10–14% alcohol), distilled spirits (greater than 20% alcohol), ciders, pulque, schochu and other local beverages.

**Angina:** Also known as angina pectoris or ischaemic disease, characterised by a temporary pain in the chest that radiates to other parts of the upper body, mainly to the left arm. Some persons with angina may experience increasingly severe episodes that can lead to a heart attack. The condition can be controlled by lifestyle changes and use of medicines or drugs.

**Arthritis:** A chronic inflammatory disease which affects the joints and impairs their functioning. Swelling, redness, raised temperature and pain in the joints are common signs of arthritis.

**Asthma:** Also called allergic respiratory disease, a condition that affects the airways or bronchi and bronchioles, the tubes that carry air in and out of the lungs. Asthma causes the airways to become narrowed or completely blocked, impeding normal breathing. The obstruction of the lungs is reversible, either spontaneously or with medication.

**Anthropometry (height, weight, hip and waist circumference):** Measurements indicating the general nutritional status of an individual or a population group. Widely used, inexpensive and non-invasive, anthropometry is used to assess and predict performance, health and survival of individuals and reflect the economic and social wellbeing of populations.

**Body mass index (BMI):** is a simple index of weight-for-height that is commonly used to classify overweight and obesity. It is defined as a person's weight in kilograms divided by the square of their height in meters ( $\text{kg/m}^2$ ).

**Blood pressure (BP):** the pressure exerted by circulating blood upon the walls of blood vessels, and one of the principal vital signs. "Blood pressure" usually refers to the arterial pressure of the systemic circulation. During each heartbeat, BP varies between a maximum (systolic) and a minimum (diastolic) pressure. Systolic blood pressure is the pressure in vessels during a heartbeat. Diastolic blood pressure is the pressure between heartbeats.

**Breast cancer:** A cancer originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk. The overwhelming majority of cases of breast cancer in humans are in women, but men can also develop breast cancer. In the SAGE questionnaire, questions on breast cancer were only directed to women.

**Capacity to pay:** A household's capacity to pay is defined as effective income remaining after basic subsistence needs have been met i.e. household non-subsistence spending. ([http://www.who.int/health\\_financing/documents/dp\\_e\\_05\\_2-distribution\\_of\\_health\\_payments.pdf](http://www.who.int/health_financing/documents/dp_e_05_2-distribution_of_health_payments.pdf)).

**Cataract:** Changes in clarity of the natural lens inside the eye that gradually degrade visual quality. The natural lens sits behind the coloured part of the eye (iris) in the area of the pupil, and cannot be directly seen with the naked eye unless it becomes extremely cloudy. Significant cataracts block and distort light passing through the lens, causing visual symptoms and complaints.



**Catastrophic health expenditure:** When a household's total out-of-pocket health payments equal or exceed 40% of the household's capacity to pay on non-subsistence spending. ([http://www.who.int/health\\_financing/documents/dp\\_e\\_05\\_2-distribution\\_of\\_health\\_payments.pdf](http://www.who.int/health_financing/documents/dp_e_05_2-distribution_of_health_payments.pdf)).

**Cervical cancer:** Cancer of the cervix uteri or cervical area. One of the most common symptoms is abnormal vaginal bleeding, but there may be no obvious symptoms until the cancer is in its advanced stages. Treatment consists of surgery (including local excision) in early stages and chemotherapy and radiotherapy in advanced stages of the disease. Pap smear screening can identify potentially precancerous changes in cells.

**Chronic lung disease:** Chronic obstructive pulmonary disease (COPD), also known as chronic obstructive lung disease (COLD), chronic obstructive airway disease (COAD), chronic airflow limitation (CAL) and chronic obstructive respiratory disease (CORD). COPD is the co-occurrence of chronic bronchitis and emphysema, a pair of commonly co-existing diseases of the lungs in which the airways become narrowed. This leads to limitation of the flow of air to and from the lungs, causing shortness of breath. In clinical practice, COPD is defined by its characteristically low airflow on lung function tests.

**Co-morbidity:** Either the presence of one or more disorders (or diseases) in addition to a primary disease or disorder, or the effect of such additional disorders or diseases. For example, someone can have hypertension (high blood pressure) and not have diabetes. But on the other hand, someone with diabetes very often has hypertension too. So hypertension is a common co-morbidity of diabetes. Other common co-morbidities of diabetes are hyper-lipidemia, cardiovascular disease, kidney disease, non-alcoholic fatty liver disease, and obesity.

**Composite health score:** An instrument for the quantitative measurement of health-related quality of life. It commonly consists of a number of questions grouped into different domains or health concepts. The numerical scores given in answer to these questions are summed separately and reported as composite scales.

**Crude birth rate (CBR):** The number of live births (b) in a year divided by the total midyear population (p), multiplied by 1,000:  $CBR = (b/p) \times 1000$ .

**Crude death rate (CDR):** The total number of deaths in a geographic area (country, state, county) divided by the midyear population of the same area for a specified time period (usually a calendar year), and multiplied by 100,000.

**Day Reconstruction Method (DRM):** Used to assess quality of life and well-being, by asking participants to systematically reconstruct the activities and experiences of the preceding day with procedures designed to reduce recall biases. DRM assesses how people spend their time and how they experience the various activities and settings of their lives, combining features of time-budget measurement and experience sampling.

**Depression:** A condition of mood disorder or anxiety, characterised by a depressed mood, lack of interest in activities normally enjoyed, changes in weight and sleep, fatigue, feelings of worthlessness or guilt, difficulty concentrating and thoughts of death. Although depression is common, it is often undetected because it may be attributed to a person's physical, social or economic difficulties. If left untreated, it can lead to a poor quality of life and even suicide.

**Diabetes mellitus:** A chronic condition in which a person's pancreas has problems producing insulin, which is necessary to turn sugars and starches from food into glucose, to help regulate the body's blood sugar levels. People with diabetes eventually develop a high blood sugar level, which can lead to blood vessel abnormalities that can damage the kidneys, nerves and heart.

**Diarrheal diseases:** The passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). Frequent passing of formed stools is not diarrhea, nor is the passing of loose, "pasty" stools by breastfed babies. Diarrhea is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral and parasitic organisms.

**Digit span test:** A test of attention and working memory. The digit span task is a common component of many IQ tests. It is generally done in two phases, forward recall, or backward recall.

**Disability adjusted life years (DALYs):** A composite summary measure which combines years lost through premature death and years lost through disability for incident cases of the health condition. One DALY can be thought of as one lost year of healthy life. The sum of DALYs across the population, or the burden of disease,

can be thought of as a measurement of the gap between the current health of the population and an ideal situation in which everyone in the population lives into old age in full health.

**Drinking water piped to household:** A high level of technology, which usually includes treatment to make the water safe and quality monitoring, where minimal or no disease transmission occurs through drinking water.

**Edentulism:** Dental health problems and the condition of being toothless to at least some degree. Loss of some or all teeth results in partial or complete edentulism respectively.

**Flush toilet to sewage system:** A high level of technology, where sanitation takes place not onsite but municipally. This technology minimizes the possibility of contact between the facility's user and human excreta.

**Geographic Information (GI):** Information that contains a reference to its location (longitude, latitude and altitude) on the earth surface.

**Geographic Information System (GIS):** A computer package for capturing, storing, checking, integrating, manipulating, analysing and displaying data related to positions on the Earth's surface.

**Global Positioning System (GPS):** A satellite-based system allowing precise identification of locations (longitude, latitude and altitude) on the earth's surface. This system offers highly precise location data in any weather conditions, 24 hours a day. It is mainly used for navigation, positioning and other research applications.

**Health:** A state of complete physical, mental, and social wellbeing; not merely the absence of disease or infirmity.

**Health expenditure:** Expenditure by the household and all its members, in cash or in-kind, on health care and services. In SAGE it referred to expenses incurred in the previous 30 days. It excluded costs reimbursed by insurance. ([http://www.who.int/health\\_financing/documents/dp\\_e\\_05\\_2-distribution\\_of\\_health\\_payments.pdf](http://www.who.int/health_financing/documents/dp_e_05_2-distribution_of_health_payments.pdf)).

**Household consumption expenditure:** The expenditure by the household and all its members on food, household items, health services and other goods and services. Such expenditures can be monetary or in-kind. The estimated value of homemade or home-grown items consumed, by the household is included in the expenditure. ([http://www.who.int/health\\_financing/documents/dp\\_e\\_05\\_2-distribution\\_of\\_health\\_payments.pdf](http://www.who.int/health_financing/documents/dp_e_05_2-distribution_of_health_payments.pdf)).

**Household food expenditure:** The amount spent on all foodstuffs by the household, plus the value of family's own food production consumed within the household. It excludes expenditure on alcoholic beverages, tobacco and food consumed outside the home. ([http://www.who.int/health\\_financing/documents/dp\\_e\\_05\\_2-distribution\\_of\\_health\\_payments.pdf](http://www.who.int/health_financing/documents/dp_e_05_2-distribution_of_health_payments.pdf)).

**Household subsistence spending:** Also known as the poverty line, the minimum requirement to maintain basic life in a society. The subsistence need is estimated using the food expenditure of the household with the median food share in total household expenditure, which is then adjusted for household size. This subsistence need is used as the poverty line in the poverty impact analysis. According to this poverty line, 26% of the Indian households were classified as poor.

**Human Resources for Health (HRH):** All individuals engaged in the promotion, protection or improvement of population health.

**Hypertension (HTN):** Also called high blood pressure, a chronic cardiac medical condition in which the systemic arterial blood pressure is elevated. It is the opposite of hypotension. Persistent hypertension is one of the risk factors for stroke, myocardial infarction, heart failure and arterial aneurysm, and is a leading cause of chronic kidney failure.

**Impoverishment:** When a household becomes poor after paying for health services.

**Improved drinking water:** Sources likely to provide safe drinking water and sufficient quantities of drinking water.

**Improved sanitation:** Facilities likely to provide adequate sanitation, which means they are private and not shared between multiple households, and they hygienically separate human excreta from human contact.

**Improved stove:** A stove that reduces emissions from solid fuel burning by venting the smoke to the exterior of the home through a chimney, hood or flue. In a vented and closed improved stove, the combustion process is contained within a compartment, resulting in more complete combustion and often higher fuel efficiency. Many stoves sold as "improved" are fuel-efficient but do not actually reduce emissions.

**In-patient fees:** Expenditure incurred by a patient for treatment while staying in hospital, including consultation fees, payment for medicines, transport charges and charges for staying in the hospital.

**Instrumental activities of daily living (IADLs):**

Indicators of functional wellbeing that measure the ability to perform more complex tasks necessary for maintaining a person's immediate environment, e.g., obtaining food, cooking, housework, managing medications, getting around outside, travelling, managing money, and using a telephone. IADL measures an elderly, disabled or terminally ill person's ability to live independently.

**Item non-response:** When a respondent fails to respond to one or more relevant item (s) in the survey.

**Kerosene:** Hydrocarbon oil used as fuel for lighting, cooking and heating in many parts of the world. In terms of indoor air pollution levels, kerosene is intermediate between solid and gaseous fuels.

**Kish Tables:** A method by which each eligible person has an equal probability of selection in the survey sample.

**Log MAR charts:** Charts used to assess a person's visual acuity (VA). Log MAR means the logarithm of the Minimum Angle of Resolution. Log MAR charts are recommended whenever research on visual acuity is done.

**Lower respiratory infection:** Often used as a synonym for pneumonia, it can also refer to other types of infection of the respiratory tract below the vocal cords, including lung abscess and acute bronchitis. Symptoms include shortness of breath, weakness, high fever, coughing and fatigue.

**Moderate intensity physical activity:** Activities that take moderate physical effort and make a person breathe somewhat harder than normal. Examples include carrying light loads, bicycling at a regular pace or playing tennis. Walking is not included in the SAGE definition of moderate activity because another item assesses all types of walking separately. Moderate intensity activities require an energy expenditure of 3-6 METs.

**National AIDS Research Institute (NARI):** Does research on the determinants and dynamics of HIV infection; also develops HIV prevention and control strategies, including field-based prevention and intervention research.

**National Old-Age Pension Scheme (NOAPS):** A centrally sponsored scheme for which 100% assistance is made available to India's States and Union Territories, to provide benefits for older persons according to the norms, guidelines and conditions set by the Central Government. The scheme is implemented by district-level authorities headed by the District Collector/ Magistrate/ Deputy Commissioner, with the assistance

of the Panchayats and Municipalities. The objective is to provide financial assistance to older people who have no regular means of subsistence from their own income or through financial support from family members or other sources.

**Need vs coverage:** Need refers to the percentage of a population diagnosed with morbidity and coverage refers to the percentage of the population treated for the morbidity.

**Non-communicable diseases:** Diseases that spread because of changing lifestyles, principally cardiovascular diseases, cancer, chronic respiratory disorder, and diabetes. Together they represent the world's largest killer, causing an estimated 35 million deaths per year.

**OASIS (Old Age Social and Income Security):** A project to examine the policy questions connected with old age income security in India, under the Ministry of Social Justice and Empowerment. The basic mandate of the project is to make concrete recommendations for actions which the Government of India can take, so that every young person can build up a stock of wealth through his or her working life to serve as a shield against poverty in old age.

**Out-of-pocket (OOP) health payments:** The payments made by households when they receive health services. Typically these include doctor's fees, purchases of medication and hospital bills. Although spending on alternative and/or traditional medicine is included in out of pocket payments, expenditure on health-related transportation and special nutrition are excluded. Out-of-pocket payments are net of any insurance reimbursement.

**Outpatient fees:** The fees incurred by the patient at the time of consultation with the doctor. It includes consultation fees, payment made for the medicines and transport charges.

**Overweight or obesity:** Abnormal or excessive fat accumulation that presents a risk to health. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in meters). A person with a BMI of 30 or more is generally considered obese. A person with a BMI of 25 or more is considered overweight.

**Physical activity:** Activities undertaken at work, around the home and garden, to get to and from places (i.e. for transport) and for recreation, fitness exercise or sport.

**Physical test:** Also called clinical examination, the process by which a doctor investigates the body of a patient for signs of disease. It generally follows the taking of the medical history – an account of the symptoms as experienced by the patient. Together with the medical history, the physical examination aids in determining the diagnosis and devising the treatment plan. These data then become part of the medical record.

**Sample Deviation Index (SDI):** Shows the representativeness of a sample in terms of certain main characteristics e.g. sex, age, education.

**Rasch model:** One of the psychometric models. The most famous application of Rasch model can be found in large education data sets, such as TIMSS and NELS, in the forms of student academic achievement scores. Rasch models are used for analysing data from assessments to measure variables such as abilities, attitudes, and personality traits.

**Solid fuels:** Include wood, agriculture residues, animal dung, charcoal and coal. Use of these fuels for cooking and heating can result in high levels of health-damaging indoor air pollution. In contrast, the use of nonsolid, cleaner fuels (gas, liquid, electricity) is associated with low levels or no indoor pollution.

**Spirometry:** The most common of the Pulmonary Function Tests (PFTs), measuring lung function, specifically the measurement of the amount (volume) and/or speed (flow) of air that can be inhaled and exhaled. Spirometry is an important tool for generating pneumotachographs which are helpful in assessing conditions such as asthma, pulmonary fibrosis, cystic fibrosis and COPD.

**Stroke:** Rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain, previously known medically as a cerebrovascular accident (CVA). This can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or a haemorrhage (leakage of blood). The affected area of the brain is unable to function, which might result in inability to move one or more limbs on one side of the body, inability to understand or formulate speech, or inability to see one side of the visual field.

**Total fertility rate (TFR):** The number of children that a hypothetical cohort of 1,000 females in the specified population would bear, if they all went through their childbearing years experiencing the same age-specific birth rates for a specified time period.

**Tuberculosis (TB):** A contagious disease which spreads through the air like the common cold. Only people who are sick with TB in their lungs are infectious. When infectious people cough, sneeze, talk or spit, they propel TB germs, known as bacilli, into the air. A person needs only to inhale a small number of these to be infected.

**U-Index:** U-Index, or unpleasantness index, was obtained by calculating for each participant the net proportion of time in which the highest-rated feeling was a negative one. A higher score suggests less happiness.

**Unipolar major depression:** See Depression.

**Verbal fluency:** The ability to produce as many words as possible in one minute. This tests retrieval of information from semantic memory.

**Vignettes:** Hypothetical stories about peoples' health conditions and their experiences with the health care system. Respondents are asked to rate the condition and experience of the person in the story as if it was their own experience.

**Wealth quintile:** A statistical division of sample households into five equal parts, based on wealth (assets). Quintile 1 contains the poorest households and quintile 5 the richest households. Household wealth quintiles used in this analysis reflect relative inequalities in income.

**WHODAS:** A practical, generic instrument of assessment that can measure health and disability at population level or in clinical practice. WHODAS 2.0 captures the level of functioning in six domains of life:

- Domain 1:  
Cognition – understanding and communicating
- Domain 2:  
Mobility – moving and getting around
- Domain 3:  
Self-care – attending to one's hygiene, dressing, eating and staying alone
- Domain 4:  
Getting along – interacting with other people
- Domain 5:  
Life activities – domestic responsibilities, leisure, work and school
- Domain 6:  
Participation – joining in community activities, participating in society

The six domains were selected after a careful review of existing research and survey instruments, and a cross-cultural applicability study. For all six domains, WHODAS 2.0 provides a profile and a summary measure of functioning and disability that is reliable and applicable across cultures, in all adult populations. WHODAS 2.0 provides a common metric of the impact of any health condition in terms of functioning. Being a generic measure, the instrument does not target a specific disease – it can thus be used to compare disability caused by different conditions.

**WHOQOL:** The World Health Organization Quality of Life (WHOQOL) project, initiated in 1991. The aim was to develop an international cross-culturally comparable instrument for assessing quality of life. It assesses the individual's perceptions in the context of their culture and value systems, and their personal goals, standards and concerns. The brief WHOQOL instrument used in SAGE comprises eight items, which measure the broad domains of physical health, psychological health, social relationships and environment.





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## Appendices

### Appendix 1

#### WHO Disability Assessment Scale (WHODAS-12 item)

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

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

## Appendix 2

### ADL and IADL items

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

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

## Appendix 3

### Education mapping

Education levels by country, based on UNESCO 1997 international classification scheme		
SAGE Code	Description	India
	Q0409, Q1016, Q1028, Q1032	
0	No formal schooling	None
1	Less than primary school	1 to 4
2	Primary school completed	5 to 7
3	Secondary school completed	8 to 9
4	High school (or equivalent) completed	10 to 13, 14 (high school + higher secondary school)
5	College/University completed	15 to 16
6	University post-graduate degree completed	17+

See ISCED97 classification scheme, [www.uis.unesco.org/Library/Documents/isc97-en.pdf](http://www.uis.unesco.org/Library/Documents/isc97-en.pdf)

## Occupation coding

For Q1027, Q1031 and Q1510 of the SAGE Individual Questionnaire

ILO International Standard Classification of Occupations (ISCO-88)

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

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

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

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

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

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

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

## Appendix 4

### Text describing the income or wealth quintiles (permanent income)

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

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

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

### Text describing health score

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



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 India and five other countries (China, Ghana, Mexico, Russian Federation and South Africa). Financial support for SAGE was provided by the US National Institute on Aging and the World Health Organization. Each country's national report is a descriptive summary of results, including this report of SAGE Wave 1. Wave 2 will be implemented in 2013 and Wave 3 in 2015. More information is available at: [www.who.int/healthinfo/sage](http://www.who.int/healthinfo/sage) and [www.iipsindia.org/research\\_sage](http://www.iipsindia.org/research_sage)

