

A close-up portrait of an elderly man with a weathered face, wearing a blue cap. The background is a solid red color. A semi-transparent grey banner is overlaid across the middle of the image, containing the title text.

China country assessment report on ageing and health



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China country assessment report on ageing and health

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Chinese Longitudinal Healthy Longevity Survey (CLHLS); the China Chronic Disease Risk Factor Surveillance, 2010; the Sixth National Population Census of China; and various population-based research studies and systematic reviews published in peer-reviewed journals.

Acronyms and abbreviations

ADL	activities of daily living
BMI	body mass index
CLHLS	Chinese Longitudinal Healthy Longevity Survey
COPD	chronic obstructive pulmonary disease
DALY	disability-adjusted life years
HALE	healthy life expectancy
IADL	instrumental activities of daily living
MCI	mild cognitive impairment
NHSS	National Health Service Surveys (China)
PCA	personal care assistant
SAGE	Study on global AGEing and adult health
WHO	World Health Organization

1. Introduction: China in transition

1.1 Population ageing in China

The Chinese population is ageing dramatically. This demographic trend is the result of falling mortality at younger ages, followed by decreasing fertility. Between 1950 and 2015, the total fertility rate per woman declined from 6.11 to 1.66. Over the same time, the overall mortality rate declined (from 22.2 to 7.2 per 10 000 population) resulting in a steady increase in life expectancy (see Figure 1). In China, average life expectancy at birth has risen from 44.6 years in 1950 to 75.3 years in 2015, and is expected to be at around 80 years by 2050 (UN DESA, 2013a).

Importantly, the pace of population ageing is much faster in China than many other high-income or low- and middle-income countries. In the next 25 years, the percentage of people in China aged 60 years or over is expected to more than double, from 12.4% (168 million people) in 2010 to 28% (402 million) in 2040 (UN DESA, 2013a). In contrast, it took France 115 years, Sweden 85 years and the United States of America 69 years for the proportion of the population aged over 60 years to double from 7% to 14%. Moreover, in the near future, a person who reaches age 60 in China can expect to live longer than his or her ancestors. In 2013, there were 22.6 million people aged 80 years or over in the country, and by 2050 this number is expected to increase fourfold to 90.4 million – representing the world’s largest population of this most elderly age group (UN DESA, 2013b).

Women are likely to live longer than men in China. In 1950, the average life expectancy at birth for women and men in China was 44.6 years. By 2030, the life expectancy of Chinese women will be 79 years compared to 76 years for men. Also, while the difference in life expectancy is expected to narrow in most high-income countries, the difference will expand in China. In 2010, women accounted for

nearly 60% of the population aged over 80 years, and this percentage will rise steadily in the next few decades (UN DESA, 2013b).

In China, more people aged 60 years and over are expected to live in rural areas than in large megacities. Most metropolitan cities (Beijing, Chengdu, Chongqing, Guangzhou, Shanghai, Shenzhen, Tianjin and Wuhan) have 10% of their population aged over 60 years (Woetzel et al., 2009). Further, rural–urban migration contributes to rapid ageing in rural areas: by 2030, the proportion of people aged 60 years or over in rural and urban areas will be 21.8% and 14.8%, respectively (Cai & Wang, 2005).

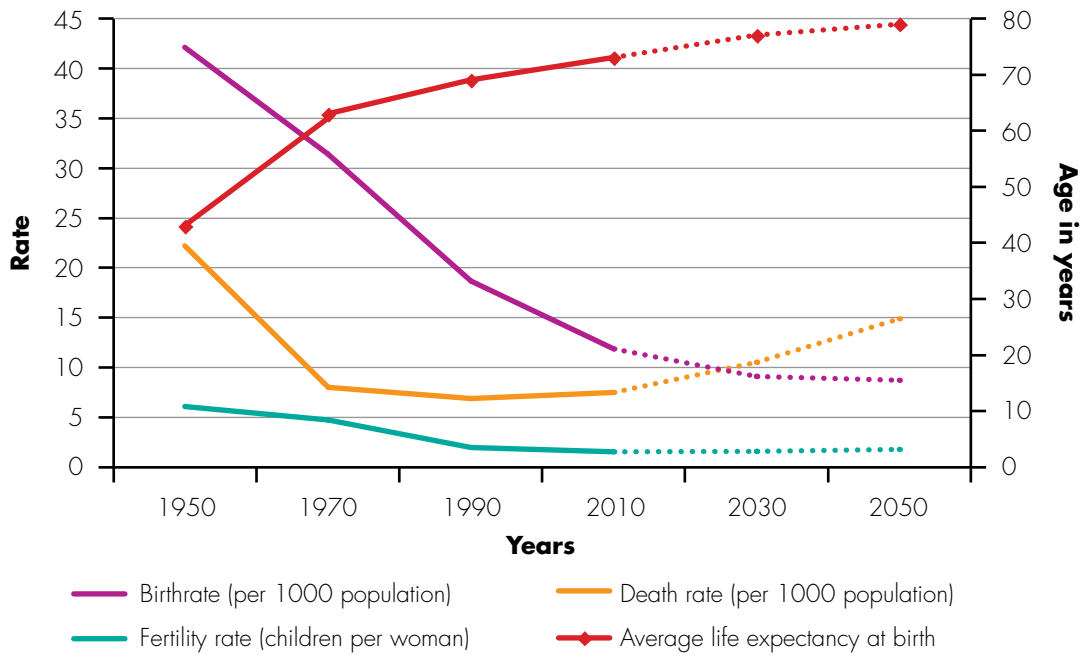
1.2 Health transition: a current and future issue

Closely linked to this demographic shift is a health or epidemiological transition, involving a progressive shift in the burden of disease away from maternal, child and communicable disorders to chronic noncommunicable diseases. One major concern in relation to population ageing is the associated increase in the burden of chronic disease. In 2013, of the 202 million older people¹ in China (Wu & Dang, 2013), more than 100 million had at least one chronic noncommunicable disease (Wang & Chen, 2014). Many had multiple chronic diseases at the same time. As the population ages further, age-dependent chronic (noncommunicable) diseases such as ischaemic heart disease, cancer, stroke, arthritis and dementia are likely to increase in terms of the absolute number of people affected (Prince et al., 2015).

This health transition is gathering pace: in 2012, nearly 80% of deaths among people aged 60 years or

¹ In this document, the terms “older people”, “elderly people” and “the elderly” denote people aged 60 years or over.

Figure 1: Demographic transition in China, 1950–2050



Source: UN DESA, 2013a.

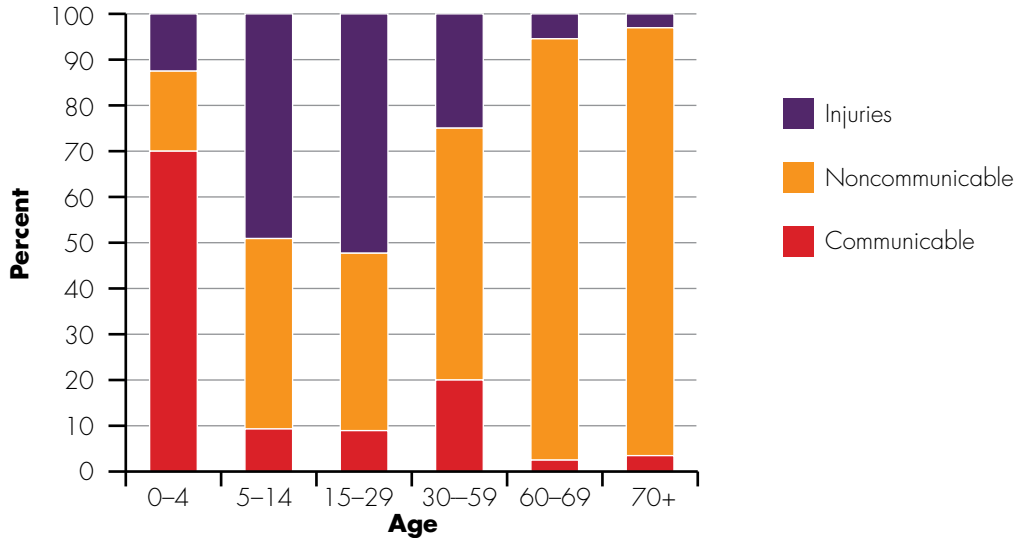


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over in China was attributable to noncommunicable diseases (WHO, 2012a; see Figure 2). According to current projections, China's rapidly ageing population is expected to be associated with at least a 40%

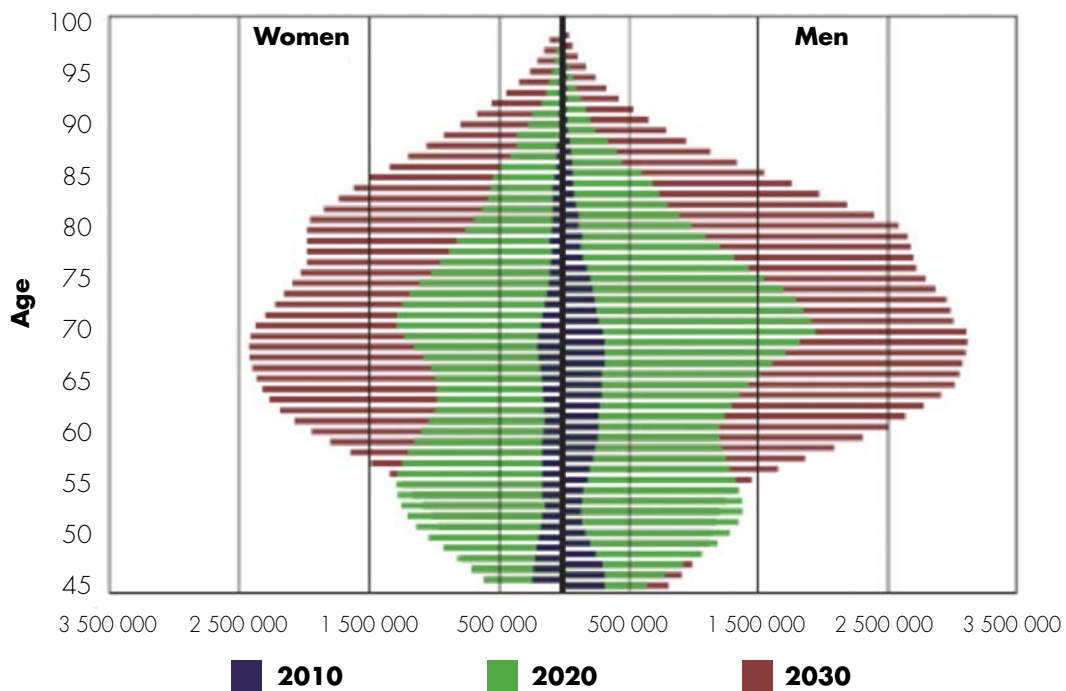
increase in the burden of chronic noncommunicable disease by the year 2030 (Wang, Marquez & Langenbrunner, 2011; see Figure 3). There is also unequal contribution by men and women due to

Figure 2: Mortality from communicable and noncommunicable diseases, and injuries, in China



Source: WHO, 2012a.

Figure 3: Effect of ageing on the number of people suffering from at least one chronic (noncommunicable) disease in China, by sex, 2010, 2020 and 2030



Source: Wang, Marquez & Langenbrunner, 2011.

higher prevalence of risk factors for chronic disease in men. By 2030, there will be three times more people living with at least one chronic disease – both men and women.

1.3 Changing family structure and traditional care arrangements

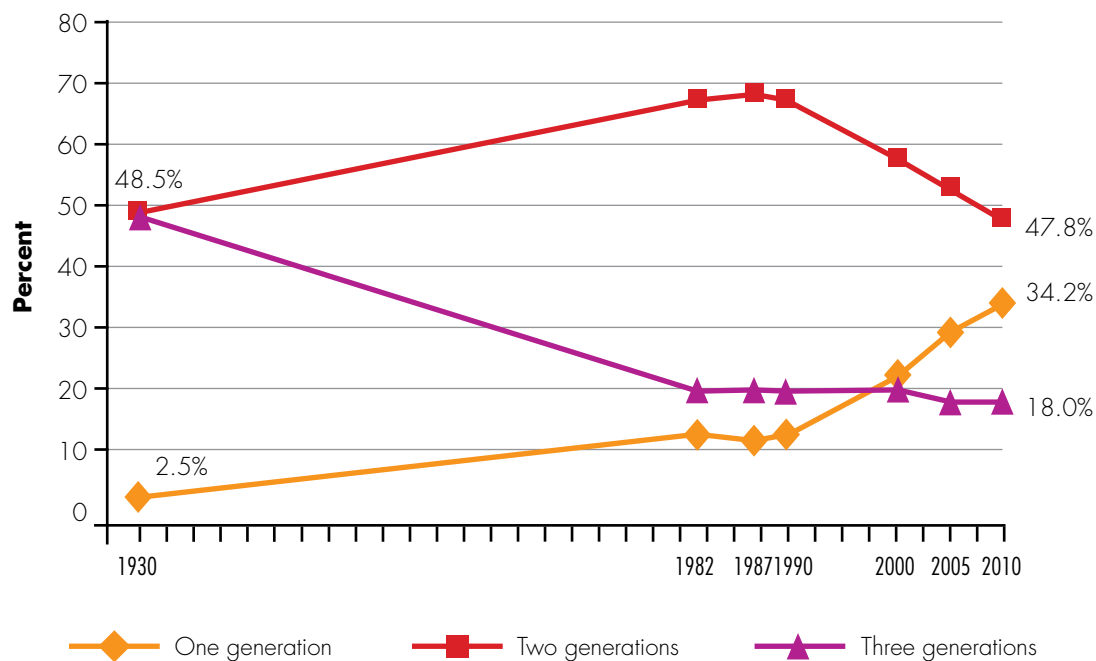
In tandem with demographic and health transitions, China is also undergoing a massive social transition. The country is witnessing key changes in family structures, urbanization, and increasing participation of women in the labour market. These shifts are challenging the traditional family-based care arrangement for older people (Kalache, 1986).

In traditional Chinese society, the extended family unit was a social security system that guaranteed basic care for all family members, including orphans, people with disabilities, older people, widows and those who were temporarily unemployed. In an extended family, as many as three generations or

more (including all brothers and sisters and their families) live together and share a common property, income and kitchen. In this patriarchal family structure, sons inherit their fathers' occupation, ensuring the continuity of expertise and knowledge through generations. This traditional family system placed great value on the role of older people in society. However, educational advancement, internal migration and technological development are shifting these traditional arrangements. In today's Chinese society, older people are less likely to live with younger generations and are less likely to be consulted by their children for advice. This has direct consequences in terms of access to social care and financial security, and may even influence the quality of life and mental health of the elderly.

These changes are reflected in China's family size and structure, which changed dramatically between 1930 and 2010 (see Figure 4). The average family size was just under five people in 1974, around four people in 1990, 3.4 in 2000, and 3.1 in 2010. In 1930, nearly 48% of Chinese families had three generations, and a

Figure 4: Changing trend of number of generations in the family, 1930–2010



Source: Compiled by Yang J, 2012, from multiple sources.

similar proportion had only two generations; one-generation families represented less than 5% of all families in China. However, by 2010, the number of three-generation families decreased to only 18% of families and two-generation families, which reached a high between 1980 and 1990, had begun to decline gradually. There has been a corresponding increase in one-generation families since 2000; in 2010, nearly 80% of the families in China were one-generation or two-generation families compared to approximately 50% in 1930 (Yang, 2012).

Push factors such as population pressures, and pull factors such as wider economic opportunities and modern communication, cause young people to migrate from rural to urban areas (Yang, 2012).

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Those who migrate may experience their own financial difficulties, and parents cannot depend on working children for financial support. Many older people remaining in rural areas must continue to work despite functional disability, and may also be lonely and socially isolated.

The changing role of women in Chinese society and their increased participation in the labour market is also likely to impact negatively on the care arrangements for older family members. In 2010, 71% of women between the ages of 18 and 64 years were employed, 61% in urban areas and 82.0% in rural areas (Yanqiu, 2011). While many working couples find that having parents in the home provides emotional support and is of great help in caring for the young children, high costs of living, and expenditure on health care make it harder for adult children to have parents living with them. Changing roles and expectations of women, their concepts of privacy and space, a desire not to be encumbered by the responsibility of caring for elderly parents for long periods, career ambitions, and employment outside the home all suggest that families have much less time for caregiving. Thus, younger family members (mainly children) can no longer be relied upon as comprehensive providers of long-term care for older people.

The rapidly ageing population, ageing-associated disease burden and the above-mentioned changes in care arrangements strongly suggest the need for policy interventions to address the situation of older people in China. At present, while social welfare is a stated goal, social security systems to support older people are in their infancy, and a care system based on the principles of equitable access and use of care services is underdeveloped (Xiao et al., 2014; Zhang & Wei, 2014). The current system for elder care is largely driven by the market, with limited regulations; this exacerbates health inequalities for older Chinese people (Wang et al., 2014; Xiao et al., 2014). Moreover, informal care for older people with long-standing health conditions is very limited in China. Nurse-led long-term care models in a

mixed-skill care setting and a multidisciplinary care approach have not been explored. Thus, the vast majority of older people who have complex health issues and are unable to perform the activities of daily living (ADLs) still rely on their children and spouses to care for them. The quality of care and quality of life for this population have become issues of concern in the research literature (Wang, 2014; Xiao et al., 2014; Zhang & Wei, 2014).

One consequence is that many Chinese people continue to work far into their older years. In 2010, 7.2% of older women and 22.9% of older men participated in paid work. Engagement in work is particularly common among older Chinese people in rural areas, with the majority of people still working at aged 60–69 years, and workforce participation rates decreasing to below 20% only after age 80 years (SCDC, 2012; Zhao et al., 2013).

Box 1: Key facts

- China is ageing much faster than other low- and middle-income countries. The proportion of the population aged 60 years and over will increase from 12.4% in 2010 to 28% in 2040. Women outlive men, and populations in rural areas have higher proportions of older people.
- Social and economic transitions are changing traditional care arrangements for older people in China. In the future, for every younger couple there will be four or more older family members who require daily care and assistance.
- A health transition from communicable to noncommunicable disease is well under way in China. Chronic noncommunicable disease prevalence will increase by at least 40% by 2030. Almost 80% of all deaths in people aged 60 years or over are attributable to chronic noncommunicable disease.
- Timely and appropriate policy interventions based on the principles of equitable access and use of care services are imperative in order to address the care needs of older people in China and improve quality of life for both the care recipients and caregivers.

2. Care dependence and loss of healthy life

2.1 Longevity and healthy life expectancy

Healthy life expectancy (HALE) is the number of years that a person at a given age can expect to live in good health, in the absence of mortality, morbidity and functional incapacity (WHO, 2012b). According to WHO 2012 estimates for China, the HALE at birth for men is 67 years and for women is 69 years. Between 2000 and 2012, there has been a considerable increase in life expectancy and HALE at birth for both men and women (four and three years, respectively). However, the gap between HALE and average life expectancy increases rapidly with age, and this difference is greater for women than men in China (Salomon et al., 2012). The equivalent lost healthy years (i.e. life expectancy minus HALE) is seven years for men and eight years for women (see Figure 5).

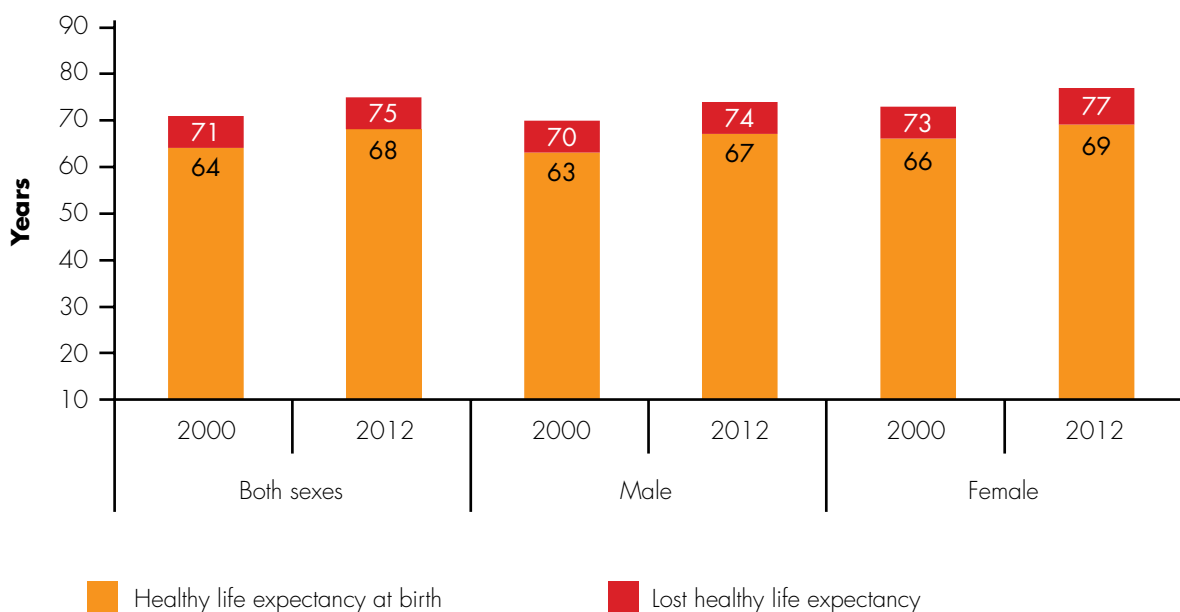
2.2 Dependence in older people: a key public health problem

Dependence is defined as “the need for frequent human help or care beyond that habitually required by a healthy adult”. This report uses “dependence” to refer to the number of people requiring daily care. The most prominent factors that contribute to dependence among older people include age-dependent chronic diseases (particularly stroke and dementia) and frailty (WHO, 2002).

2.2.1 Prevalence of dependence

As a net result of demographic and epidemiological transitions, China is expecting a marked increase in the number of care-dependent elderly people. The prevalence of dependence among older people doubles with every five years of age. Dependence rates are

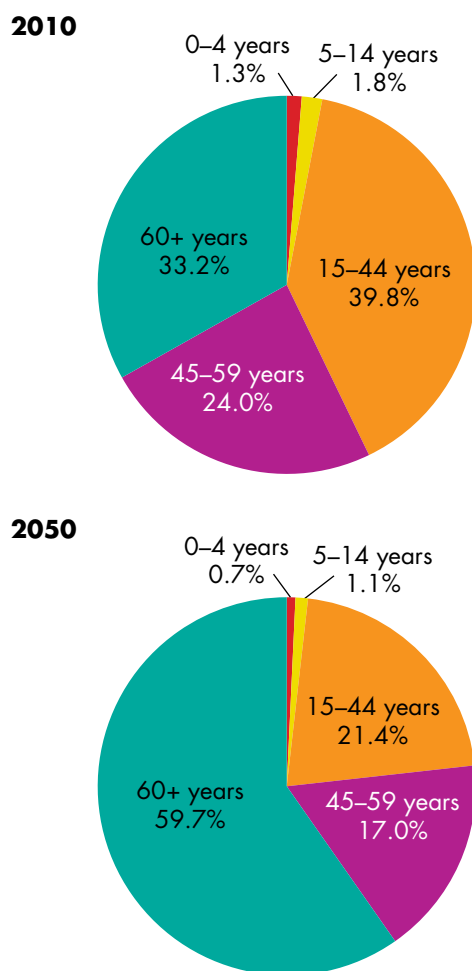
Figure 5: Life expectancy, healthy life expectancy, and lost healthy life for men and women in China, 2000 and 2012



Source: WHO, 2012b.

generally lower in men than women, and they are lower among older people with high educational attainment. Between 2010 and 2050, the prevalence of dependence will rise from 5.6% to 7.6% of the total population (Harwood, Sayer & Hirschfeld, 2004). In absolute numbers, this represents 76.2 million people who require daily care, of whom 1 million (2%) are children younger than 15 years old, and 25.3 million (33%) are aged 60 years or over. By 2050 it is predicted that there will be 110.5 million dependent people in China, of whom 66 million (60%) will be at least 60 years old (see Figure 6).

Figure 6: Projected change in percentage of people requiring daily care and assistance in China, by age group, 2010 and 2050



Source: Harwood, Sayer & Hirschfeld, 2004.

2.2.2 Consequence of care dependence

Dependence is a double burden. It has a profound impact not only on dependent older people, but also on their families. The perceived quality of life and mental health of dependent older people is strongly associated with the level of dependence on others for assistance with ADLs (Sousa & Figueiredo, 2002). There is also a strong association between an older person's ADL dependence level and caregiving strain (Pinquart & Sorensen, 2003). As a result of overwhelming caregiving activities, many family caregivers experience psychological problems and poor quality of life. Caregiving can also limit younger people's ability to participate in the workforce. A study from China found a strong inverse association between an older person's needs for care and the quality of life of their family caregivers (Yang X et al., 2012). Moreover, the health status of older people (specifically those with depression, dementia, stroke and physical impairments) is a strong determinant of psychological morbidity among their co-residents (mainly family caregivers) (Honyashiki et al., 2011). Thus, living with an older person with a disabling chronic disease is an important determinant of co-residents' mental health.

2.3 Physical function and impairments

The primary cause of care dependence in older people is loss of functioning, resulting from chronic disease and age-associated impairments (Stuck et al., 1999). One way of assessing the decline in overall functioning in older people is to measure their ability to perform ADLs independently. In 2010, 33 million people aged over 60 years (19% of people in this age group) reported difficulties with ADLs, of whom 11 million (6%) were completely dependent (Zhang, 2011). These numbers are expected to rise in the future. By 2015, 40 million older people are estimated to be experiencing difficulties in performing ADLs. A large proportion of older people needing care and assistance with ADLs live in rural areas.

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The capacity for social participation is measured by another assessment: the ability to perform instrumental activities of daily living (IADLs). This includes handling household affairs, taking part in social activities, doing routine work (e.g. cooking, cleaning and driving) and using public transport. Loss of ability in performing IADLs indicates the need for more intensive care, and can be addressed through provision of a supportive environment. A national survey conducted in 22 provinces in China found that nearly 40.5% of people aged 65 years and over had difficulties in performing IADLs and 22.5% had limitations in performing ADLs (Hu, 2012). Overall, IADL performance is lower in older men compared to women and low ability to perform IADLs is more common among rural than urban residents, especially in people aged over 70 years (SCDC, 2012).

2.3.1 Mobility impairment

Mobility impairment, often measured by walking speed, has been found to be strongly associated with functional status and mortality in older people (Studenski, Perera & Patel, 2011). The prevalence of inability to walk 1 km or climb stairs is higher in older women (26%) than in older men (11.3%) (Hicks et al., 2012). In a longitudinal study conducted among community-dwelling older people in Hong

Kong, reduced walking speed and stride length were associated with increased risk of dependency, mortality and institutionalization (Woo, Ho & Yu 1999). Decline in walking speed is progressive with increasing age, and in China it progresses more rapidly in older women than in older men (Auyeung et al., 2014).

2.3.2 Vision impairment

Vision impairment is a key predictor of dependence, mortality, risk of falls, institutionalization and use of health services in older people (Jacobs et al., 2005; Keller et al., 1999). In China, 75.5 million people suffer from visual impairment (this is 26.5% of the total population with visual impairment worldwide), and the majority of them are people over 60 years. The major causes of visual impairment in the elderly are uncorrected refractive error (i.e. lack of corrective eyeglasses or eye surgery) and cataracts (Pascolini & Mariotti, 2012). The prevalence of visual impairment is higher among older people living in rural areas than in urban regions (Huang et al., 2009). In rural China, the prevalence of poor vision in people aged over 60 years ranges from 1.6% to 35%, compared to an urban prevalence of 1.2–11.4%. A study conducted in Taiwan found that nearly 10% of people aged 65 years or older have correctable visual impairment (Kuang et al., 2007). This was higher in women than men, and poor vision was strongly associated with loss of physical function.

2.3.3 Hearing impairment

In 2012, WHO estimated that two thirds of people over age 65 years have hearing loss, and the majority of them live in low- and middle-income countries (WHO, 2012c). In 2006, it was estimated that more than 14 million Chinese residents aged over 60 years have a hearing impairment (SCIO, 2006). A national survey conducted in a representative population in China estimated that 29% of people aged over 60 years suffer from hearing impairment, and this proportion is slightly higher in rural (31.6%) compared to urban areas (25.2%) (CHSI, 2009).

The prevalence of hearing impairment reported in other population-based surveys ranges from 12.8% to 34.7% in people aged 60 years and over (Chou & Chi, 2004; Liu et al., 2001). The heterogeneity in reported prevalence can be explained by screening methods and definitions applied for hearing impairment. Nevertheless, hearing impairment contributes to significant functional loss in older people. A recent study found that hearing loss was strongly linked to cognitive decline and social withdrawal in older people in China (Lin, Yaffe & Xia, 2013).

2.3.4 Cognitive impairment

Mild cognitive impairment (MCI) is an intermediate stage between the expected cognitive decline of normal ageing and the more serious decline of dementia. Older people who have MCI may experience problems with memory, language, thinking and judgment that are greater than normal age-related changes (Jia, Zhou et al., 2014). In a recent review, the prevalence of MCI among people aged over 60 years was estimated at 12.7% in China (Nie et al., 2011). The estimated prevalence varied by regions, with 9.6% in eastern China and 14.7% in the western part of the country. Further, the prevalence of MCI was found to be higher among

older women than men. In another population-based survey conducted in three districts of Chongqing City, nearly 15% of people aged over 60 years had cognitive impairment (Liu et al., 2009). Cognitive impairment has both a direct and indirect relationship with functional dependence. For example, older people with cognitive impairment are at high risk for fall-related injuries, which can lead to insidious functional dependence (Muir, Gopaul & Montero Odasso, 2012).

2.3.5 Urinary incontinence

Urinary incontinence is a neglected problem in older people and is a strong indicator of the need for care (Yuan, Williams & Liu, 2011). Urinary incontinence is the involuntary loss of urine associated with urgency or with effort, physical exertion, sneezing or coughing (Abrams et al., 2002). In a study conducted in rural China, the prevalence of urinary incontinence was 33.4% among people aged over 60 years (Yu et al., 2009). The prevalence of urinary incontinence increases with age and is much higher in women than men across all age groups (Milsom et al., 2014). Women aged over 60 years are 2.3 times more likely to suffer from urinary incontinence than women in younger age groups (Zhu et al., 2010).

Box 2: Key facts

- According to WHO 2012 estimates, the healthy life expectancy at birth for men and women in China is 67 and 69 years, respectively. The equivalent lost healthy years is seven years for men and eight years for women in China.
- Lost healthy life expectancy indicates the need for care. In 2010 there were 76.2 million people who needed daily care in China; of these, 1 million (2%) were children younger than 15 years and 25.3 million (33%) were people aged 60 years and over. The number of older people in China requiring daily care and assistance will increase by up to 60% by 2050.
- Impaired mobility, vision, hearing, cognitive function and continence are highly prevalent and more common than chronic diseases.
- Based on current estimates, 25.3 million people aged 60 years or over are dependent on others for their daily care.
- Care dependence is a double burden: it impacts the quality of life of older people and it can jeopardize families' economic health and quality of life if caregivers need to cut back on paid work and other activities in order to care for older people.

3. Chronic disease and health risks

3.1 Burden of chronic (noncommunicable) disease in China

In 2013, nearly 50% (100 million) of older people in China experienced noncommunicable diseases; of these, more than 37 million had significant reductions in physical function (Wu & Dang, 2013). As anticipated, the growth of the number of older people in the population substantially increased the total disease burden, measured in disability-adjusted life years (DALYs, see Box 3), in terms of absolute numbers.

According to the WHO Global Burden of Disease estimate 2012 (WHO, 2012d), nearly 45% of the DALYs in China are attributable to health conditions among those aged 60 years and over. Globally, this proportion is 49.2% in high-income countries, compared to 19.9% in low- and middle-income

countries (Prince et al., 2015). Among the condition clusters (see Figure 7), the leading contributors to disease burden among older people in China are:

- stroke (35.9 million DALYs, accounting for 27% of the total burden among those aged 60 years and over);
- malignant neoplasms (30 million DALYs);
- ischaemic heart disease (22.6 million DALYs);
- respiratory diseases (16 million DALYs);
- diabetes mellitus (5.6 million DALYs);
- mental health conditions such as depression, suicide and dementia (5.3 million DALYs);
- hypertensive heart diseases (3.6 million DALYs); and
- falls (3 million DALYs).

The rank order of the contribution of these conditions does not vary greatly by sex; however, the contribution of chronic obstructive pulmonary

Box 3: Metrics – disability-adjusted life year (DALY)

One DALY can be thought of as one lost year of healthy life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.

How is it calculated?

DALYs for a disease or health condition are calculated as the sum of the years of life lost (YLL) due to premature mortality in the population and the years lived with disability (YLD) for people living with the health condition or its consequence.

DALY

Disability-adjusted life years is a measure of overall disease burden, expressed as the cumulative number of years lost due to ill health, disability or early death

$$= \text{YLD} \quad + \quad \text{YLL}$$

Years lived with disability Years of life lost

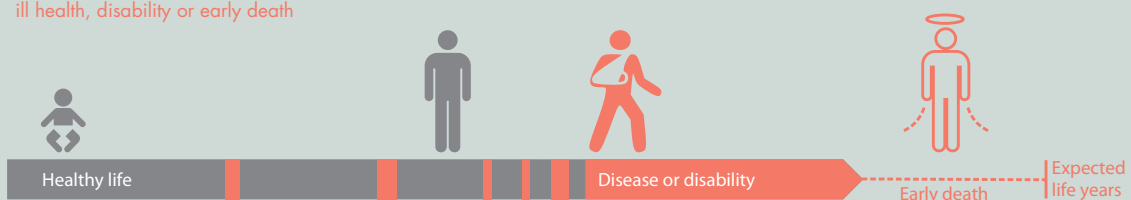
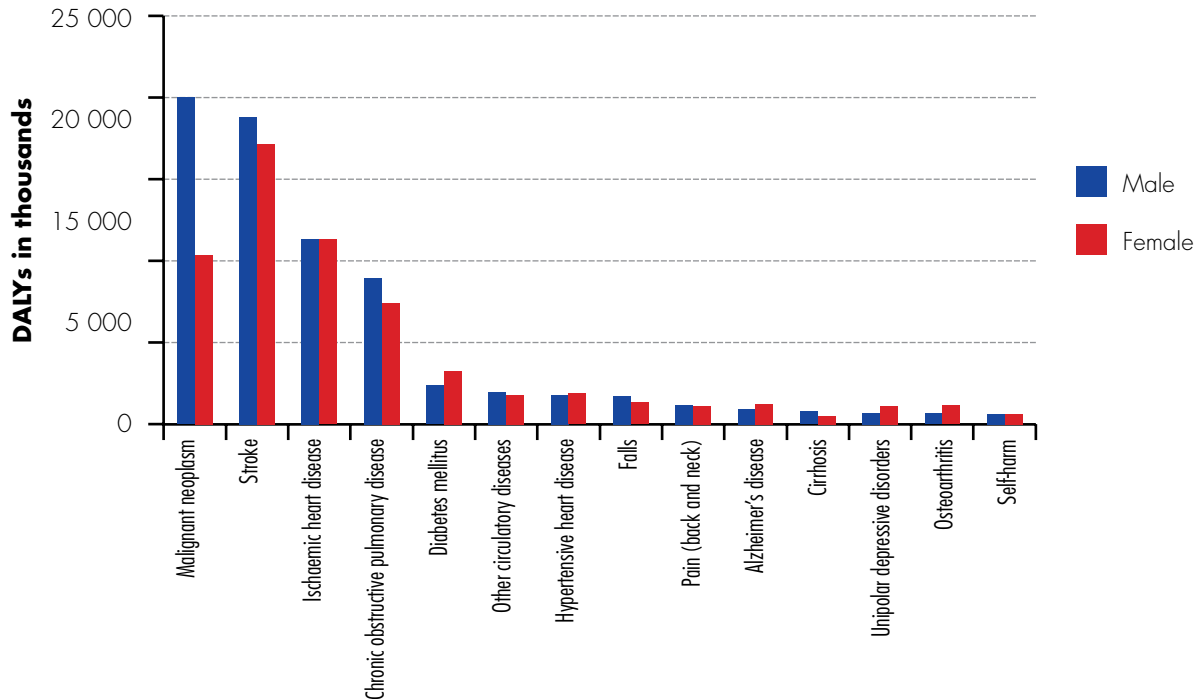


Figure 7: Major condition-specific DALYs among people aged 60 years and over in China, by sex, 2012 estimates



Source: WHO, 2012d.

disease (COPD), malignant neoplasm, stroke, falls, and other circulatory diseases to DALYs in older men is higher than for older women. Similarly, DALYs for Alzheimer's disease, hypertensive heart disease, diabetes mellitus and osteoarthritis were slightly higher in older women than men (see Figure 7).

The per capita disease burden is higher among older people in China than in other low- and middle-income countries, due to the greater burden arising from stroke, ischaemic heart disease, COPD, cancer and mental health conditions (Prince et al., 2015).

3.2 Prevalence of chronic disease and risk factors in older people

The prevalence of most chronic diseases increases with age. Among older people in China, the prevalence of some conditions differed remarkably by sex and by urban versus rural residency. The evidence summarized in this section draws mainly from WHO Study on global AGEing and adult health

(SAGE) data (SCDC, 2012) and Chronic Disease Risk Factor Surveillance data 2013 (NCCNDC, 2012). However, key systematic reviews and population-based studies are also included.

3.2.1 Hypertension

The prevalence of hypertension among people aged 60 and over in China was 66.9%; it was lower in men than in women and increased with age and there was no notable difference between urban and rural areas. The awareness rate (number of persons who are aware of a diagnosis of hypertension) was 45.4%, and this was lower in men (43.5%) than in women (47.2%) and significantly higher in urban versus rural areas (53.3% versus 41.6%), without a remarkable difference between different age groups. The treatment rate (87.9%) was lower in men (84.6%) than in women (90.6%), slightly higher in urban (89.2%) than in rural areas (87.0%), and increased with age. The control rate was 14.6%, without any major gap between men (14.9%) and women (14.4%); however

the rate was significantly higher in urban (20.2%) compared to rural (11.0%) areas (SCDC, 2012).

3.2.2 Diabetes

The overall prevalence of diabetes among people aged 60 years and over was 19.6%; it was lower in men than in women (18.3% and 20.8%), and higher in urban (25.0%) than in rural areas (17.0%). The awareness rate was 42.3%; this was lower in men (40.5%) than in women (43.8%), and significantly higher in urban (52.3%) than in rural areas (35.2%). The treatment rate was 93.5%, with no difference between urban and rural areas. The control rate was 36.7% – slightly lower in men (35.0%) than in women (38.1%), and higher in rural (37.9%) than in urban areas (35.6%) (NCCNDC, 2012).

3.2.3 Cardiovascular diseases

According to the 2010 national Chronic Disease Risk Factor Surveillance Survey, the self-reported annual rate of myocardial infarction among people aged over 60 years was 1.3%, with no difference among men and women. However, this rate was higher among older people in urban areas (2.1%) than in rural (1.4%) areas (NCCNDC, 2012). According to the WHO SAGE study, the self-reported prevalence of stroke among people aged 60 years and over was (5.7%) and this rate steadily increased with age (SCDC, 2012). The prevalence of stroke was higher among older men than women, and slightly higher among urban compared to rural residents (NCCNDC, 2012).

3.2.4 Arthritis

The prevalence of arthritis was 25% in people aged 60 years and over. The condition is more common in women (30.0%) than in men (20.0%), and among urban residents (26.6%) compared to rural populations (23.1%). The prevalence of arthritis was spread disproportionately across income groups; higher among older people in the lowest income quintile (22%) compared to the high-income group (17%) (SCDC, 2012).

3.2.5 Chronic obstructive pulmonary disease

According to the 2010 national survey, the prevalence of COPD was 15.5% in people aged 60 years and over. The prevalence is remarkably higher in older men than women (NCCNDC, 2012).

3.2.6 Asthma

The overall prevalence of asthma was 3.4% among people aged 60 years and over. This rate increased with age and was more common among older people in the lowest income group (6.3%) compared to the highest earners (2.1%). There was a noticeable difference in prevalence by gender, with more men (4.0%) than women (2.8%) suffering from the condition (NCCNDC, 2012).

3.2.7 Mental disorders and neurological conditions

Alzheimer's disease and other dementias

The prevalence of Alzheimer's disease and other types of dementia increased with age, and was more common among women than men (Chan et al., 2013). In 2010, the age-specific prevalence of Alzheimer's disease was 0.5% in the 60–64 years age group and prevalence ranged from 18% in the 85–89 year age group to 48% among people aged 95 years and over. Prevalence of other types of dementias ranged from 1.3% among people aged 60–64 years old to 60% among people aged 95 years or more. According to a population-based study conducted in China, the overall prevalence of dementia among people aged over 65 years was significantly higher in rural areas than in urban ones (6.05% versus 4.40%, $P < 0.001$) (Jia, Wang et al., 2014).

Suicide

According to WHO 2012 estimates, the rate of suicide is 8.7 per 100 000 population in China (WHO, 2014). Overall, the suicide rate steadily increases with age (see Figure 8), and at age 70 years and over men had higher rates of suicide compared to women (55.8 versus 47.7 per 100 000). According to



Depression

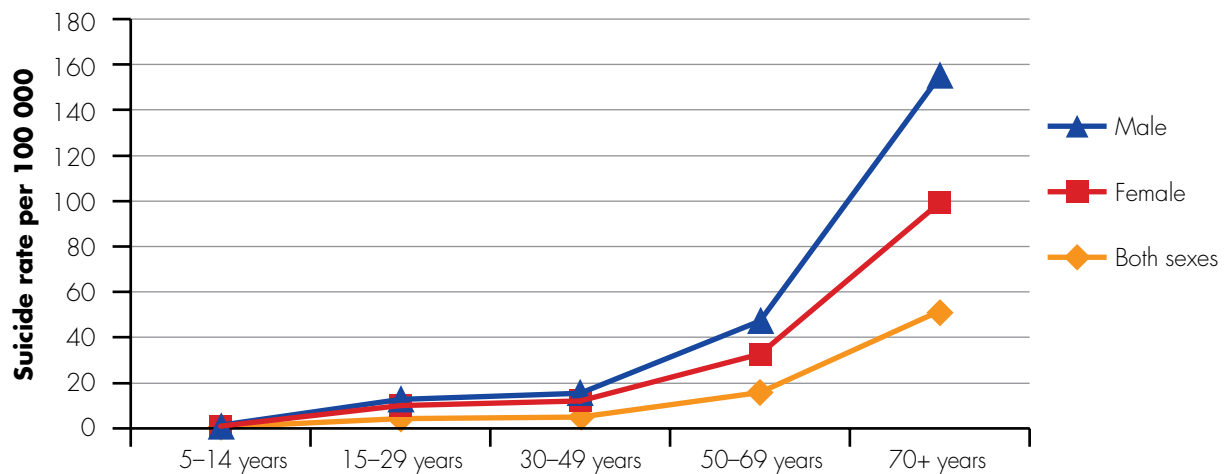
The prevalence of depression was measured using depression rating scales. Prevalence ranged from 11% to 57% among people aged over 60 years (Chen, Hicks & While, 2012). Based on a systematic review, the pooled prevalence of depressive symptoms among people aged over 80 was 30.3%, which was slightly higher than in other elderly age groups (22.3% among people 60–70 years old and 25.0% in the 70–80 age group) (Li, Zhang et al., 2014). According to the SAGE study, the self-reported prevalence of depression was higher among older women than men. However, less than 10% of older people with depression were being treated for it. Twice as many people were not receiving treatment in rural areas, compared to urban centres. The prevalence also varied with economic status, with higher rates of depression among older people in the lowest income group compared to high earners.

a systematic review, the prevalence of suicidal ideation ranged from 13% to 17% among people aged 60 years and over (Simon et al., 2013). At the population level, the mean annual suicide rate was 23 people per 100 000 people. The suicide trend in China also shows unique demographic patterns with age. People in the oldest age group (over 80 years) are at highest risk of suicide death. Further, suicide rates are much higher among older people in rural areas than urban regions (NDMS, 2012).

Parkinson's disease

National figures for the prevalence of Parkinson's disease are unavailable for China. According to a cross-sectional study, the prevalence of Parkinson's disease was 1.6% in people aged 65 years and over, and there are an estimated 1.98 million older people living with Parkinson's disease in China (Zhang et al., 2005). The prevalence increases with age and differs between men and women. The study also

Figure 8: Crude age-specific suicide rate (per 100 000) in China



Source: WHO, 2014.

identified that over 20% of older people reported dyskinesia, a condition characterized by involuntary muscle movement that requires long-term care and support.

3.2.8 Falls

Unintentional injury was ranked as the fourth most common cause of mortality among older people in China, after cardiovascular diseases, cancer and respiratory diseases (CHSI, 2009). Falls are the major reason for severe injury in older people. Injuries are most likely to occur at home, accounting for 49.3% of all injuries; 6.2% of injuries lead to significant disability among people aged 65 or above (CHSI, 2009). According to a systematic review, the reported annual rate of falls in older people living in the community ranged from 11% to 34% in retrospective studies and 15% to 26% in prospective studies in China. The annual incidence of falling two or more times was 4–5% among older people in China. On average, 44% of falls occurred at home, with living and dining areas and the bedroom reported as the

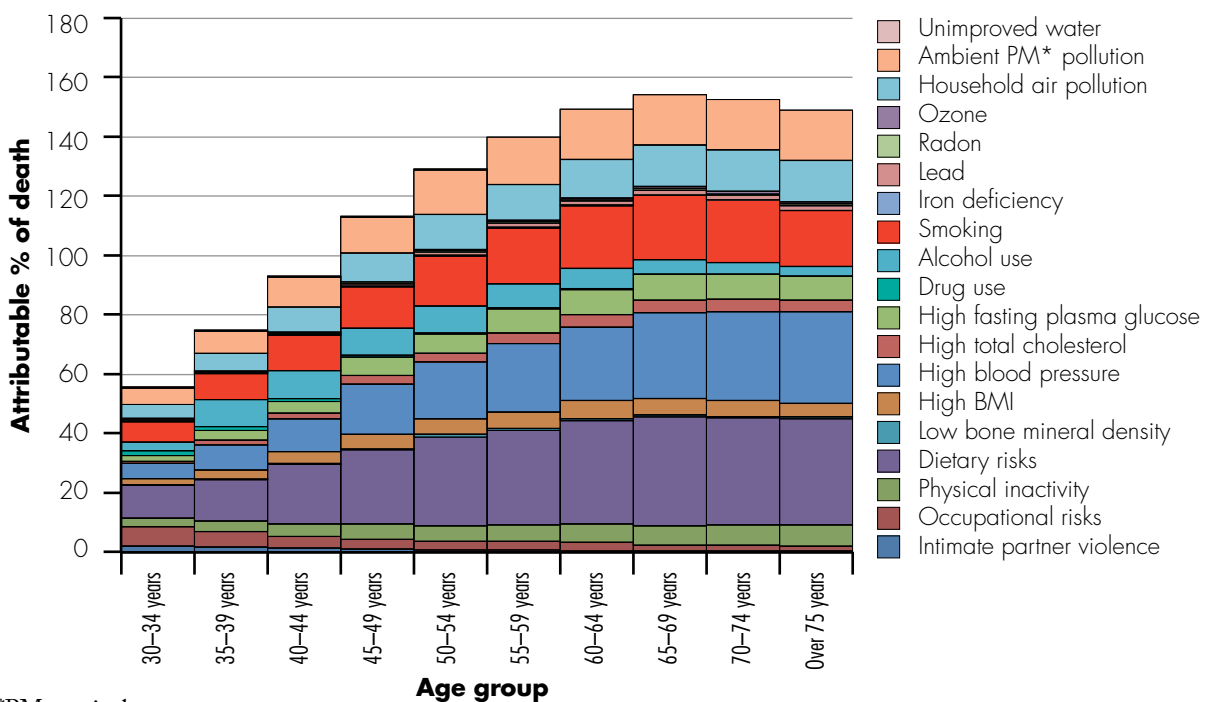
most common indoor locations. Nearly 22–76% of falls outside the home occurred in the street or on a sidewalk. Most falls (59–97%) occurred during the daytime, and the proportion who fell during the daytime was significantly higher in rural areas (88%) than in urban ones (69%) (Kwan et al., 2011).

3.3 Chronic disease risk factors

In this section, data from the following sources were compiled to estimate the chronic disease risk factors among older people in China: the 2010 Chronic Disease Risk Factor Surveillance Survey in China, 2012 WHO Global Burden of Disease, and the 2010 WHO China SAGE study, as well as key scientific papers and national sources.

According to WHO estimates (WHO, 2012d), dietary risks (over- and undernutrition), high blood pressure, smoking, high fasting glucose, air pollution (indoor and outdoor), and physical inactivity cause nearly 80% of deaths among older people in China

Figure 9: Estimated cause of death by risk factors in China, 2010



*PM: particulate matter
Source: WHO, 2012d.

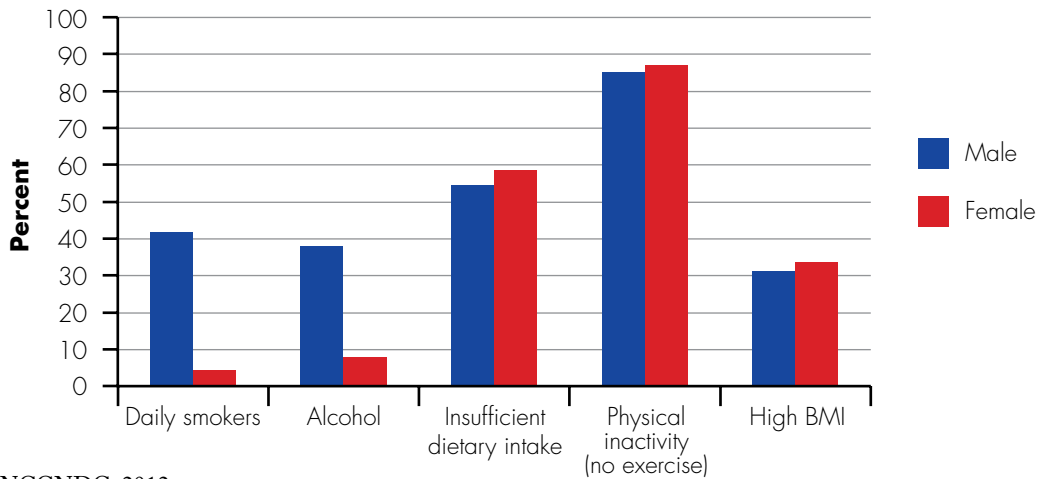
(see Figure 9). Of these deaths, over 50% were attributed to dietary risks and high blood pressure in people aged over 60 years in China (WHO, 2012d).

Data from the 2010 Chronic Disease and Risk Factor Surveillance Survey suggest that chronic disease risk factors are more common in men aged over 60 years, compared to elderly women (see Figure 10). Specifically, the prevalence of smoking and alcohol are much higher in men than women. In terms of nutrition and body weight, over 50% of older people

were physically inactive and consumed an insufficient diet, and nearly 30% of them had a high body mass index (BMI) (NCCNDC, 2012).

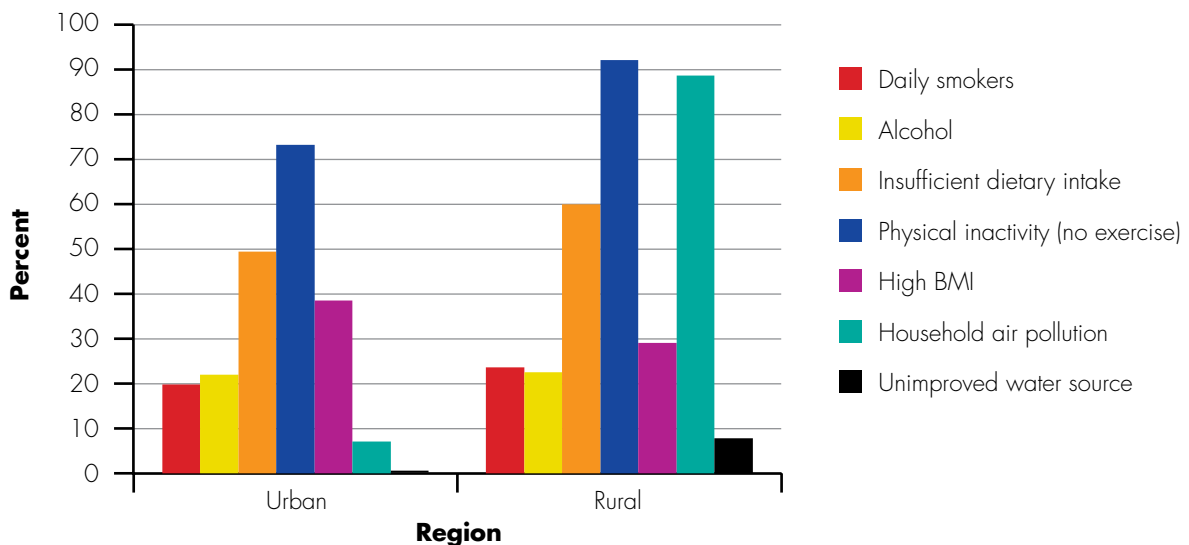
There was a marked disparity in the distribution of risk factors among rural and urban residents, with overall prevalence being higher among rural residents than urban (see Figure 11). Particularly, household air pollution, insufficient dietary intake and physical inactivity were highly prevalent among older people in rural communities compared to urban centres.

Figure 10: Prevalence of chronic disease risk factors by sex, among people aged 60 years and over in China, 2010



Source: NCCNDC, 2012.

Figure 11: Prevalence of chronic disease risk factors in older people by region, 2010



Source: NCCNDC, 2012.

3.3.1 Tobacco smoking

According to the 2010 Chronic Disease Risk Factor Surveillance Survey (NCCNDC, 2012), the prevalence of smoking in people aged over 60 years is 22.4%. The prevalence is substantially higher among men (41.5%) than among women (4.3%) and is slightly higher among older people in rural areas (23.7%) than urban areas (19.9%). The success rate of older people giving up smoking is the same among men and women (25%), but it is more difficult for rural residents to quit (22%) than it is for city dwellers (31%) (NCCNDC, 2012).

3.3.2 Alcohol

The overall prevalence of alcohol drinkers among people aged over 60 years is 22.4% (NCCNDC, 2012). Alcohol consumption is higher among older men (37.9%) than women (7.6%) and is higher among rural residents than among urban residents. The percentage of hazardous drinking (alcohol consumption that results in harmful consequences) was nearly 9.3% in elderly Chinese people, with more older men drinking to excess (10.5%) than women (4.2%). Similarly, the prevalence of harmful drinking (a pattern of drinking that is already causing damage to physical or mental health) is 11.4% among people aged 60 years and over; this higher in men (13.3%) than women (4%) and is more common among rural residents (13.3%) than urban (7.5%).

3.3.3 Insufficient dietary intake

Insufficient diet is defined as a daily intake of less than 400 g vegetables and fruit (NCCNDC, 2012). Inadequate dietary intake is strongly associated with increasing age in Chinese people over 60 years old. According to the national Chronic Disease Risk Factor Surveillance Survey 2010, the prevalence of insufficient diet is 56.6% in people aged over 60 years and slightly higher in older women (58.5%) than men (54.6%). Poor diet is more common among rural residents (60.0%) than urban populations (49.5%) (NCCNDC, 2012).

Presently, the consumption of macronutrients (i.e. protein, fat and carbohydrate) among people aged 60 years and over is below the recommended norms for daily consumption. While the recommended intake of milk is 300 g, older people's consumption is only 33 g on average. In particular, the average intake of macronutrients is very low among older people in rural compared to urban areas. Similarly, the consumption of eggs and beans is 24.3 g and 24 g, respectively among rural residents whereas in urban it is 32 g and 38 g. Remarkably, older people living in urban areas consume three times the amount of milk as their rural counterparts (62.8 g versus 18.6 g) (NCCNDC, 2012).

3.3.4 Physical inactivity

According to the 2010 Chronic Disease Risk Factor Surveillance Survey, nearly 84% of older people do not engage in regular physical activities. "Frequent physical exercise" is defined as at least 10 minutes of exercise at least three times per week. The frequency of physical exercise is slightly better in older men (14%) than older women (12%), and there was a marked difference among older people in urban (24%) compared to rural areas (7.1%) (NCCNDC, 2012).

3.3.5 Body mass index

According to the Working Group on Obesity in China, older people's weight is classified as low (BMI <18.5), normal (BMI >18.5–24), high (BMI 24–28) or obese (BMI >28). Between 2002 and 2010, the prevalence of high BMI and obesity increased from 24.3% and 8.9%, respectively, to 32.3% and 12.5% (NCCNDC, 2012). However, among people aged 60 years and over in China, the prevalence of low BMI increases with age, while the prevalence of high BMI and obesity decreases with age. Generally, both high BMI and obesity prevalence is higher among older women and urban residents in China than among men and rural residents. According to national surveys, the prevalence of underweight in older people was 6.7%, which has dropped from 12.4% in 2002. The

prevalence of underweight among older people in rural areas was 14.9% in 2002 – nearly three times higher than in urban areas (5.4%) (MOH, 2005).

3.3.6 Household and outdoor air pollution

The major sources of household air pollution are use of wood, coal, straw or other fuels for cooking or heating. According to the WHO China SAGE study, nearly 45% of people aged 60 years and over use unclean fuel for cooking (SCDC, 2012). The prevalence of unclean fuel use was much greater among older people in rural areas (89%) than in urban centres (7.1%). The use of paraffin and kerosene as fuel was almost non-existent. In urban areas, most households used liquid or gas fuel (92.8%), while in rural areas most households used solid fuel, which causes more pollution (86.1%). As household income levels increased, the proportion of households using clean fuel increased progressively, and the proportion using solid fuel declined. In the highest income quartile, 88.3% of households used clean fuel.

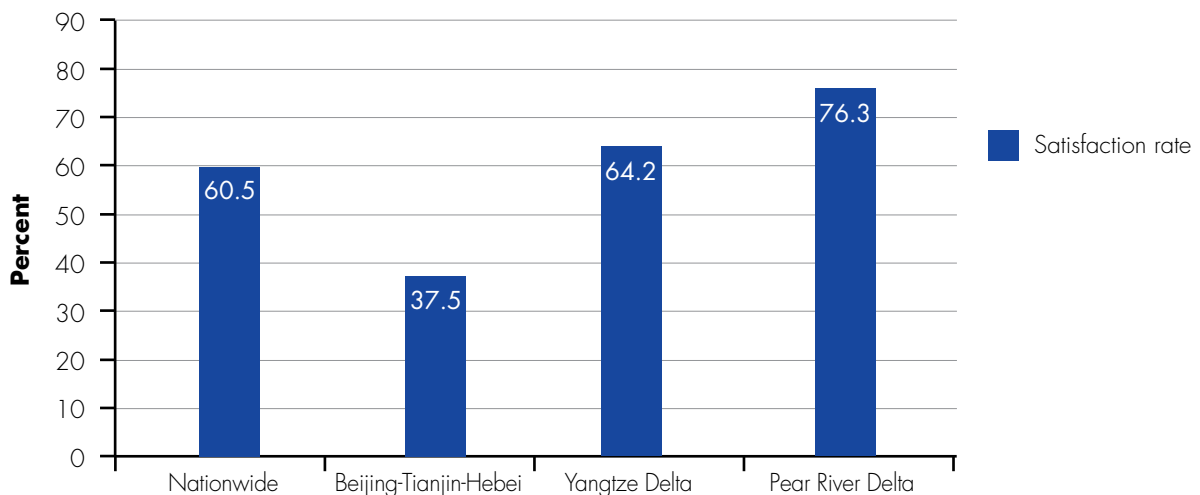
Outdoor air quality is greatly compromised in many regions of the country. According to the China National Environmental Monitoring Centre 2013 Air Quality Monitoring Survey (MEP, 2013), only

the cities Haikou, Lhasa and Zhoushan met the standard for air quality, whereas Beijing-Tianjin-Hebei, the Yangtze Delta and the Pear River Delta were the most polluted regions (see Figure 12). The air pollution trend in China varies by season, with the highest levels of pollution in the first and fourth quarters of the year. For example, the particulate matter 2.5 (PM_{2.5}) concentration respectively reached 96 µg/m³ and 93 µg/m³ in the 74 cities – twice the levels of the second and third quarters. The highest incidences of severe air pollution were recorded during the winter months (MEP, 2013).

3.3.7 Unimproved drinking water sources

Access to clean drinking water and sanitation is a basic human need and right. The WHO China SAGE study found that around 96.3% of households with elderly people has access to improved drinking water (SCDC, 2012). However, only a small proportion (7%) of older people in rural areas consumed clean drinking water. This proportion largely varied by income, with nearly 12% of older people in the lowest income group having no access to improved drinking water, compared to 100% having access in the highest-income group (SCDC, 2012).

Figure 12: Air quality monitoring results, 2013



Source: MEP, 2013.



Photo: Gina Smith / Shutterstock.com

Box 4: Key facts

- Nearly 33% of the total disease burden in China is attributable to health conditions among those aged 60 years and over. With the population ageing, the disease profile of China is shifting from predominately infectious diseases to chronic noncommunicable diseases, such as hypertension, heart disease, stroke and cancer.
- In older people, the leading contributor of DALY is stroke, followed by malignant neoplasms, ischaemic heart disease, respiratory diseases and mental health conditions. Almost 54 million lost years of healthy life are attributable to these conditions in China. The DALY for most chronic conditions has substantially increased in the last 10 years, with a 10–30% increase in DALYs for ischaemic heart disease, cancer and diabetes.
- The prevalence of noncommunicable diseases increases with age. While hypertension, diabetes, angina, arthritis, suicide, depression and dementia were found to be more common among women, conditions such as cardiovascular disease, stroke, COPD and unintentional injuries were more prevalent among men aged over 60 years. Mental health conditions (e.g. suicide and depression) and fall-related injuries were more common among older people dwelling in rural regions. The four main noncommunicable disease risk factors – insufficient diet, physical inactivity, tobacco smoking and household air pollution – were more common among rural older people. All of these factors are modifiable, and elimination of these factors would prevent 80% of all heart disease, stroke and type 2 diabetes and over 40% of all cancers (WHO, 2005).
- Chronic disease risk factors are unevenly distributed among older women and men in China. Nearly half of men aged 60 years and over are smokers and 38% of older men are consuming alcohol on a regular basis. In contrast, physical inactivity, insufficient dietary intake and high body mass index were higher in older women.
- Dietary risks (over- and under-nutrition), high blood pressure, smoking, high fasting glucose, air pollution (indoor and outdoor) and physical inactivity contribute to nearly 80% of deaths among elderly people in China. More than 50% of deaths were attributed to dietary risks and high blood pressure in people aged over 60 years.

4. Disparity in life expectancy and health service use

Disparity in health status is widespread in China and is particularly evident in older people. Evidence from population-based studies suggests that the health status of older people varies significantly by income, gender, education, occupation and place of residence (Yang & Kanavos, 2012). Similar disparities are also reflected in life expectancy and functional limitation among older people (Kaneda, Zimmer & Tag, 2004).

4.1 Disparity in life expectancy and health status

Increasing life expectancy is viewed as a societal achievement; however, there is a large disparity in life expectancy within the older population. Men aged 55 years and over with higher education (university or college) can expect to live 20% longer than those with lower education; those with higher incomes can expect to live 37% longer than those with lower incomes; those engaged in light physical labour can expect to live 27% longer than those working under more strenuous conditions; and finally those with a greater household income and assets can expect to live 30% longer than those with a lower household income. Similar patterns are observed for women, but the gaps are noticeably smaller. Differences in life expectancy at older ages are even more striking. By age 80 years in China, those with higher socioeconomic status can expect to live 40–52% longer than those with low socioeconomic status (Kaneda, Zimmer & Tag, 2004). Regional differences in health status and life expectancy are also marked. Older people living in economically well developed regions have a higher disability-free life expectancy than older people residing in rural and/or underdeveloped parts of China (Liu et al., 2010; Zimmer et al., 2010).

Poverty is strongly associated with all measures of poor health in elderly people (Levy & Sidel, 2006).

Self-rated health status is a good predictor of death, disability, dependence and current health status. Older people with a low economic status are less likely to report their health as excellent or good and are more likely to have functional limitations (Yang & Kanavos, 2012). Compared to rural regions, older people in urban regions have a better health status (Park, Shen & Strauss, 2012). More notably, education, occupation and economic status are strongly linked with quality of life in older people (Ma & McGhee, 2013). Older people with higher education and income report better quality of life than older people with low socioeconomic status. Further, older people who experienced economic hardship early life are more likely to report a poorer quality of life.

4.2 Disparity in health service use

Although disadvantaged groups have more health-care needs, their use of health services is lower than among better-off populations. Unmet health-care needs are more common among older people in low-income strata. The health service usage gap between rich and poor is 1.6 times for outpatient services and 3.8 times in inpatient services (Xie et al., 2014). Further, this difference was more common among older people suffering from chronic diseases than for those with general health conditions (Elwell-Sutton et al., 2013)

In China, chronic noncommunicable diseases contribute to the large inequality in the health status of older people. Older people in a poor financial position are more often affected by chronic disease than their more affluent counterparts. This is mainly because: chronic diseases risk factors (e.g. hypertension) are more common among economically disadvantaged older people; they have limited access to basic quality health care; and they experience the adverse

consequences of chronic health conditions more profoundly than wealthier sectors of the population. Further, uncontrolled health conditions also contribute to high out-of-pocket expenditures on health, which again exacerbate inequities in both health status and access to health care. For example, the prevalence of hospitalization was much lower among poor older people with multiple comorbidities, and they are less likely to access health services. Even in urban areas, nearly 37.6% of people with chronic conditions do not get hospitalized, mainly due to financial constraints. Another study also showed that people with chronic conditions in rural areas were more likely to drop out of health treatments for financial reasons than patients in cities (Jian, 2010).



Photo: neverevero / iStock.com

Box 5: Key facts

- Health in older age is significantly influenced by economic status, educational attainment, and place of residence in China. There are large disparities in life expectancy, health status and health service use between older people of low and high socioeconomic status.
- Men aged 55 years and over with higher incomes can expect to live 37% longer than those with lower incomes. This difference increases with age. After age 80 years, those with higher socioeconomic status can expect to live 40–52% longer than those with low socioeconomic status. A similar pattern was observed for women but the difference is noticeably smaller.
- Poverty is strongly associated with poor self-rated health among people aged 60 years and over, and they are more likely to experience functional limitations.
- Although the need for health care is greater in older people with low economic status, unmet health-care needs are higher. The health service usage gap between rich and poor is 1.6 times for outpatient care and 3.8 times for inpatient health services.

5. Health care for older people in China

5.1 China's health care system: an overview

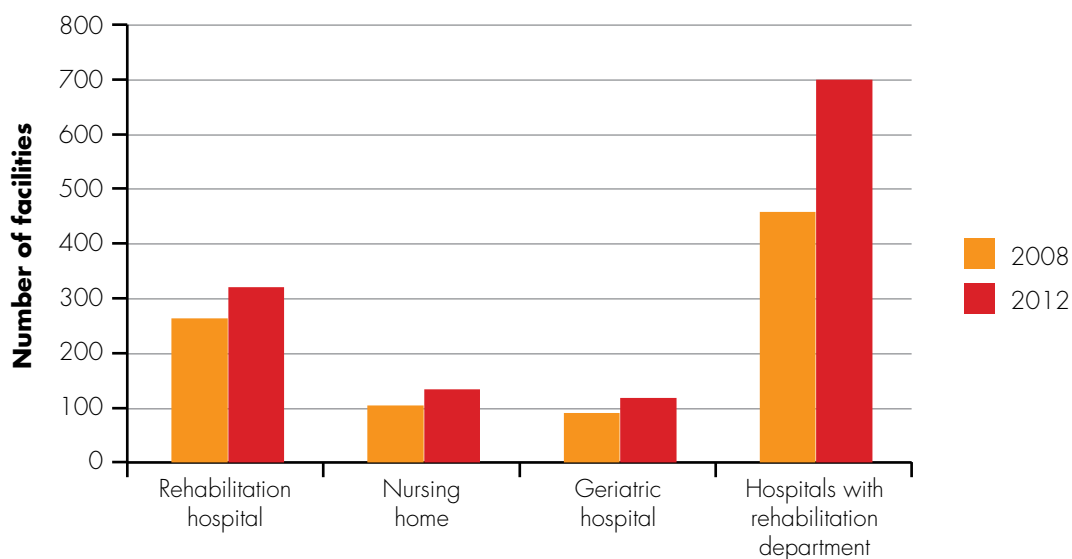
In this chapter, data were compiled from four sources to estimate the health service use and health-care infrastructure in China. These include the Third National Health Services Survey (CHSI, 2005), the Fourth National Health Services Survey (CHSI, 2009), the Fifth National Health Services Survey (CHSI, 2012), and the China Statistical Yearbook 2013 (NBS, 2013), as well as key scientific papers from China.

Health care for China's 1.3 billion people is organized through two main streams: hospitals and primary health care institutions. In 2012, China had a total of 22 575 hospitals, including 15 021 general hospitals (66.6% of the total number of hospitals), 2889 traditional Chinese medicine hospitals (12.8%) and 4665 specialist hospitals (20.6%) (NBS, 2013). Nearly 62% of hospitals are public and the rest are private (Shanlian, 2013). Specialized public health facilities are very limited and most are located in economically active regions (e.g. mainly in eastern

China) (Jiang et al., 2013). In the last few years there has been a steady increase in the number of specialized health-care facilities for older people in China (see Figure 13).

In 2011, nearly 63% of all outpatient treatment for the general population was provided at grassroots-level health-care facilities. The number of people visiting outpatient clinics in 2011 was 204 million (36.8%) in urban hospitals, 48.5 million (8.8%) in community health centres, 90.1 million (16.3%) in township health centres, 165 million (30%) in village health posts, and 50 million (9%) in clinical outpatient centres. Inpatient numbers were 94.8 million (70.6%) in urban hospitals, 36 million (27.4%) in rural township health centres, and 2.6 million (2%) in urban community health centres (Shanlian, 2013). In 2010, 23.2 million older people in China received inpatient treatment – accounting for 20% of all hospital admissions. Among people aged over 60 years and over, both inpatient and outpatient care has increased in recent years. The number of social welfare institutions (e.g. nursing homes) has jumped in recent years, and most of

Figure 13: Number of specialized health-care institutions in China, 2008 and 2012



Source: NHFPC, 2013.

these are private and located in rural communities in order to keep operational costs low. However, this system provides care for only 1% of older people in the country and is largely driven by the market (Chu & Chi 2008; Wang, 2014). For example, most nursing homes will only accept older people who can live independently, often refusing potential clients who have higher needs or advanced behavioural and psychological symptoms of dementia, or who need palliative care (Wang, 2014).

There are four main challenges to addressing the health and social care needs of older people: (a) access to affordable health care, (b) equitable distribution of health-care resources, (c) efficient and quality care, and (d) adequate coverage for health expenditure.

5.1.1 Access to affordable health care

At present a significant proportion of older people in urban and rural areas do not have access to affordable health care. The situation is worse in rural areas, where nearly 31% of the rural population is unable to afford proper medical services (Li, Wu et al., 2014). In a study conducted in urban areas, nearly 61.7% of older people who reported illness in the past two weeks did not use medical services and 14% of them cited financial difficulties as the main reason (Sun et al., 2014). Length of hospitalization in older people increases with age, with the average length of hospital stay ranging from 27 to 52 days in people aged 60 years and over. Since cost of care increases with length of hospital stay, older people who cannot meet the costs tend to self-discharge early from hospital (Flaherty et al., 2007). In a survey conducted among urban older people, 16% of those who left hospital prematurely reported lack of affordability as the main reason (Sun et al., 2014). In addition, inability to afford the cost of medications is the main factor contributing to non-compliance with treatment for chronic conditions after discharge (Wang et al., 2014). It is estimated that re-admission rates are higher among older people due to non-compliance with treatment and lack of options for transition to long-term care after hospitalization.

5.1.2 Equitable distribution of health-care resources

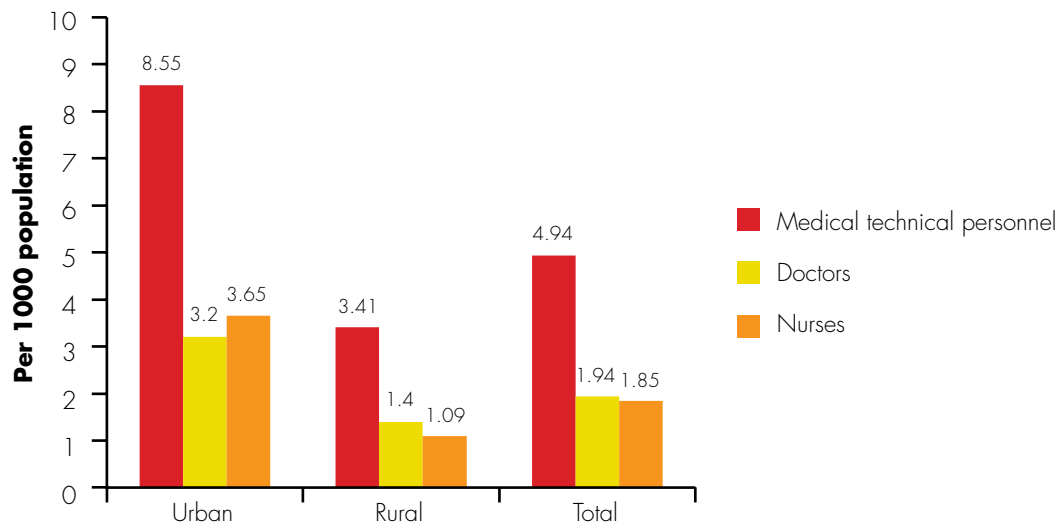
Older people in urban areas have privileged access comprehensive health care, compared to those living in rural areas. In China, health professionals and specialized health-care facilities are centred in and around economically developed regions, while the majority of older people live in rural parts (NBS, 2013). The ratio of medical doctors to patients in urban and rural areas is 3.2 and 1.4 per 1000 people, respectively. Similar distribution ratios exist for other health professionals. The distribution of human resources between urban and rural region is generally unequal in China (Figure 14). Compared to rural regions, more than twice as many technical medical staff and doctors are located in urban centres. Similarly, at the county level there is high inequality in the distribution of medical professionals (doctors and nurses) in China, with most of this inequality accounted for by within-province inequalities (82% or more) rather than by between-province inequalities. Urban-rural disparities in doctor and nurse density account for about a third of overall inter-county inequality (Anand et al., 2008).

In recent decades, the number of specialized, rehabilitation and geriatric hospitals has increased steadily. However, three quarters of these specialized units are located in economically well developed regions of China. Similarly, there is also a remarkable disparity in inpatient bed density between urban and rural areas, with 6.24 beds/1000 people in urban areas, and only 2.80 beds/1000 people in rural areas (MOH, 2011).

5.1.3 Efficient and quality care

According to an observational study conducted in three major hospitals, geriatric syndromes such as falls, urinary incontinence, pressure ulcers, frailty and functional impairment were often overlooked by medical professionals (Flaherty et al., 2007). Polypharmacy was more common among hospitalized older people in China. Even

Figure 14: Distribution of health-care personnel between urban and rural regions of China, 2012



Source: NBS, 2013.

in outpatient care, polypharmacy seems more common in China than in the United States of America. This is mainly due to high use of traditional Chinese medications concomitantly with Western pharmaceuticals. Urinary incontinence is very common among hospitalized older people; however, urinary catheters were rarely used, except in the intensive care units of hospitals, where prevalence rates were greater than 40%. Further, nearly 15% of older people in urban areas and 14% in rural areas do not admit themselves to hospital based on the belief that there is no treatment available for their problems (CHSI, 2009). In another study, lack of adequacy, quality and continuity in health care were reported by older people as important problems with the existing health services in China (Woo et al., 2011).

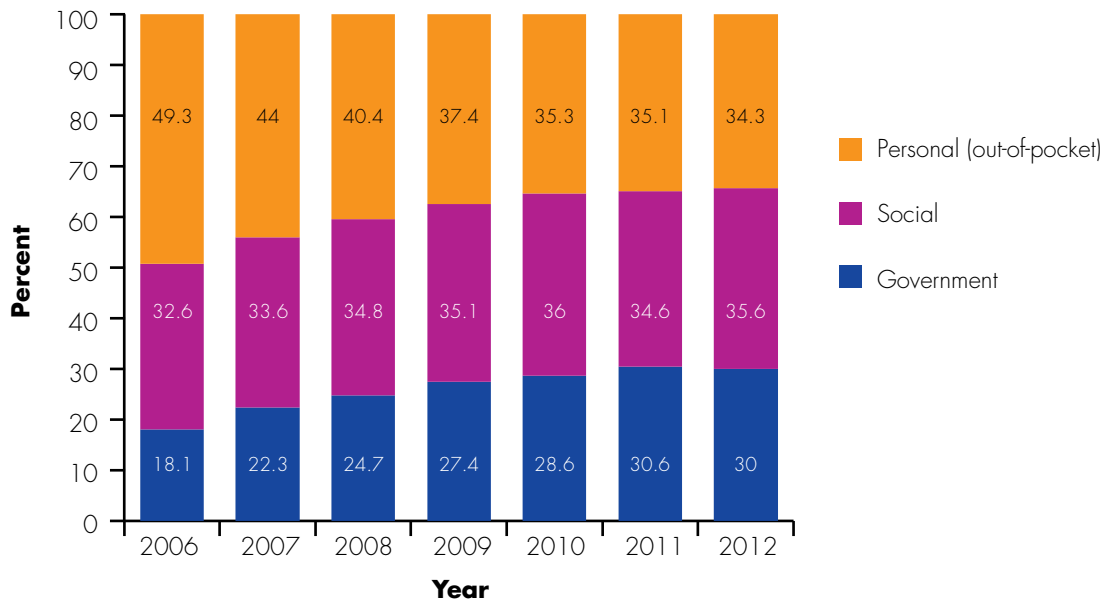
5.1.4 Coverage of health insurance

China has made several efforts to eliminate impoverishment due to medical expenses, and government investment in health insurance coverage has increased considerably over recent years. In 2000 only 33.2% of people aged 60 years and over had medical insurance. Remarkably, 98.4% of older people were reported to be covered by public

medical insurance. However, compared to high-income countries and some low- and middle-income countries, China's investment in health remains low (World Bank, 2013). Although individual out-of-pocket expenses on health were reduced significantly from 49.3% in 2006 to 34.3% in 2012 (SCIO, 2012), the proportion of people who must pay out of pocket for health services remains high (34%) (see Figure 15).

A health insurance safety net is facilitated through the Urban Employee Basic Medical Insurance Program, the Urban Resident Basic Medical Insurance Program, the New Cooperative Rural Medical Scheme, and the urban and rural medical assistance programme to provide access to health care for select groups of Chinese citizens. However, the degree of coverage provided through these programmes is very small, in terms of both financial protection and service packages (Hu et al., 2008). For example, outpatient services are very inadequately, if at all, covered by these schemes. Inpatient services are covered, but patients are still required to make significant co-payments and pay additional fees for services. Although reimbursement amounts and rates have increased over time, they remain low in

Figure 15: Health-care expenditures by source of payment in China, 2006–2012

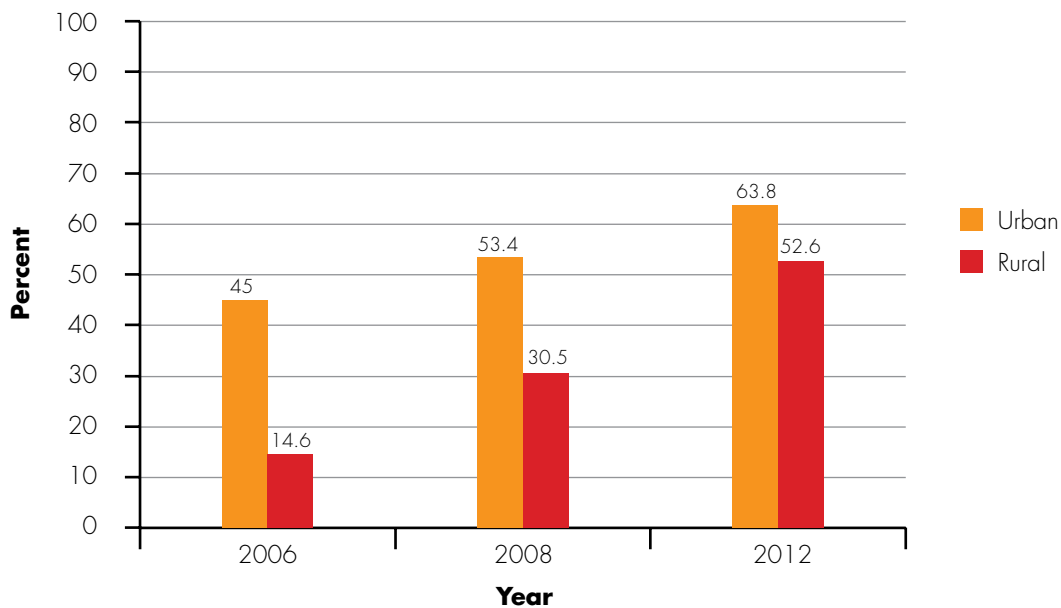


Source: NBS, 2013.

both urban and rural areas (see Figure 16). Hospital expense reimbursement rates for older people in urban areas are higher than for rural residents. In 2013, nearly 64% of hospitalization expenses for older people in urban centres and 53% in rural areas were reimbursed by medical insurance (see Figure 16). A

study conducted in rural populations reported that only 37% of hospital expenses of inpatient services were reimbursed under the New Cooperative Rural Medical Scheme (Li, Wu et al., 2014). The medical assistance programme for low-income rural residents focuses on enrolling them in the rural scheme rather

Figure 16: Percentage of reimbursement of hospitalization expenses in people aged 60 years and over in China, in 2006, 2008 and 2012



Source: CHSI, 2012.



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than improving the coverage of the cost. As a result, access to primary health care for older people living in poverty has not greatly improved, and financial protection against high health expenditures is likely to remain insecure (Hu et al., 2008).

Catastrophic health expenditure occurs when the burden of out-of-pocket health expenses is so high that the household will compromise spending on the basic needs of living (e.g. food) in order to meet the medical expenses for family member(s). Households with people over 60 years of age with chronic disease were three times more likely to experience catastrophic health expenditure in rural areas (Li, Wu et al., 2014).

Finally, enrolment in a health insurance programme may not improve the health service use among older people in many parts of China. One reason may be lack of health literacy. A study conducted in an urban population observed that nearly 62% of older people who reported illness did not use outpatient services. Similarly, 22.6% of those enrolled in an urban insurance scheme did not use inpatient services

despite being recommended by the treating physician, and nearly 47% of them refused to be admitted, citing financial reasons (Sun et al., 2014).

5.2 Health system response to ageing

The existing health system in China is fragmented and poorly equipped for addressing the health-care needs of the growing population of older people. In China, around 80% of people aged 60 years and over report the need for health care during any three-year period (SCDC, 2012). The prevalence of health-care needs has grown among both rural and urban residents. However, the proportion of respondents to the SAGE study who stated never having had a need for health services was higher among the urban population (8.8%) compared to the rural population (2.3%). Other research suggests that older people in rural areas (6.1%) were strikingly less likely to use health services than urban residents (38.6%) (SCDC, 2012). Underuse by rural older people compared to urban populations was apparent for primary care

services (3.8% versus 20.9%), hospital services (2.2% versus 23.4%) and hospital admission (0.5% versus 2.4%) (SCDC, 2012).

An example of unmet need is the assessment and treatment of hypertension, which is the second-largest risk factor causing disability and death among older people in China, with a prevalence in the range of 54–67% among people aged 60 years and over. Nearly half of those who were diagnosed with hypertension were unaware they had it (Zhao, Smith & Strauss, 2014). Awareness of hypertension was lower among rural populations than urban ones, and detected cases were much less likely to be controlled in rural areas: only 2.6% of all cases of hypertension in older people in rural areas were controlled, compared to 35.1% in urban areas. In addition, people with hypertension who lived in rural areas and had low income levels were even less likely to receive regular health care, compared to middle- and high-income people in rural China (odds ratio = 1.2) (Tian et al., 2013). China's public health system achieved significant progress in the control of infectious disease by promoting use of safe drinking water, childhood vaccinations, and safe obstetric delivery at hospital. However, the system has been less efficient in the management of long-standing chronic illness (Tian et al., 2013).

5.3 Demand for provision of long-term care in China

Declining physical and mental capacities in older people have increased the demand for long-term care. By definition, “long-term care is the system of activities undertaken by informal caregivers (family, friends, neighbours) and/or formal caregivers (health professionals) to ensure that a person who is not fully capable of self-care can maintain the highest possible quality of life, according to his or her individual preferences, with the greatest possible degree of independence, autonomy, participation, personal fulfilment and human dignity” (WHO, 2000). Formal long-term care and provision of support

through residential care or home-based community programmes have not yet been developed in China, for the most part. However, the number of older people requiring daily care is expected to increase by up to 60% by 2050, indicating a rapid increase in the demand for long-term care.

Estimates indicate that home care support service provision in urban China satisfies only 16% of expressed need, and there are currently no specific government targets for the future expansion of services (Wong & Leung, 2012). The financing of home care is the responsibility of local government and varies geographically, with better-resourced local governments providing more services. China has done more than most middle-income countries to provide services to support home care, and the city of Shanghai stands out as an exceptional case that has developed an extensive set of home-care support services. Shanghai's municipal government provides financial support to 60% of older residents receiving home care, representing 6% of the city's older population (Wong & Leung, 2012). Shanghai has also pioneered the provision of 44 000 at-home hospital beds for older people, which are primarily funded by the local government with a small additional user fee. The experience of Shanghai is not, however, representative of China as a whole. Many parts of China lack the resources required to develop a range of services to compare with those on offer in Shanghai.

In older people, chronic diseases in general and multimorbidity in particular are very common, and are associated with increased use of health services and out-of-pocket expenditure on health, which has a strong link to poverty. For households just above the poverty line, even a small out-of-pocket expenditure can push them below that line. This exacerbates the double burden on families, especially if caregivers need to cut back on paid work to focus on caregiving.

In China, older people have traditionally been indivisible from their families. As a result, many family members had to take time out of paid work

to care for a dependent older person in the family. It has been estimated that 15% of caregivers of older people with dementia in China had to leave or reduce their paid work to care for a dependent older person (Prince, 2004). Bolstering informal care can help family members (usually women) to remain in the workforce and is beneficial for care-dependent older people, who generally prefer to be looked after by family and friends. This support is also beneficial

for public finances, because it involves far less public expenditure for a given amount of care than if this was provided wholly in the formal sector. In the absence of formal support systems in China, it is crucially important to encourage and support the continuation of informal support received by care-dependent older people from family, relatives and friends as unpaid carers.

Box 6: Key facts

- There is a health and medical workforce shortage in the public health system.
- Human resources for health care are unevenly distributed in China, with the majority of health-care professionals concentrated in economically developed regions.
- Age-appropriate health services are underdeveloped in urban areas and do not exist in rural regions, where the majority of older people live.
- Public health facilities that are capable of providing comprehensive health care are very limited and most are located in urban areas. Three quarters of specialized geriatric units are located in economically well developed regions of China.
- Nearly 31% of the elderly rural population and 14% of older people in urban areas are unable to afford proper medical services for illness. Government rural health insurance covers only catastrophic medical expenses arising from hospital admission. Primary care and prevention services remain uncovered.
- Increases in medical insurance coverage have not been accompanied by a reduction in catastrophic health expenditure in China. Rural households with older people are at particularly high risk of catastrophic health expenditure.
- The existing health-care system is fragmented and unprepared to provide the full continuum of chronic disease care. There is a pressing need to develop integrated efficient care for China's ageing population.

6. Addressing the health-care needs of older people

6.1 The backdrop

The life expectancy of the Chinese population is rising sharply (UN DESA, 2013b). Increased longevity is the result of improved living conditions, better child health, reduced mortality due to communicable disease and, to some extent, medical advances that reduce the fatality rate from chronic disease in adult life. However, this increased longevity has been accompanied by a rise in the number and proportion of older people living in poor health, with disability, and who are dependent on care.

In China, the number of people aged over 40 years living with at least one noncommunicable disease (NCD) will double or even triple over the next two decades. About 50% of the NCD burden in China occurs in people aged 65 years over (Wang et al., 2011). While cancer and heart disease are the main contributors to mortality, much of the burden arises from years lived with disability due to other chronic diseases (stroke, dementia and mental disorders). Therefore, one major concern for this ageing population is functional dependence resulting from these impairments. Preventing or postponing these functional limitations will benefit individual older people as well as benefiting society in general. But this will require effective and timely interventions administered through an accessible and affordable public health system.

At present, the health system response to the needs of older people in China is inadequate. A key challenge for China will be to develop widespread accessible and equitable preventive and supportive health systems that meet the needs of the rapidly expanding older population, and which enable these older people and their children to continue to make contributions to China's economy and society. How China meets

this challenge will influence global health, because innovations and strategies developed in this region – which is home to one fifth of the world's population – will provide useful insights for other countries.

6.2 Top priorities for addressing the health-care needs of older people in China

6.2.1 Raise political awareness for collective actions

There is a great need to raise political awareness of the health concerns of ageing citizens in China. As in many other countries, the medical sector in



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China remains insular and is struggling to manage age-related chronic conditions. In older people, genetic factors account for only 25% of successful ageing, while behavioural, social and environmental factors account for 70% (Brooks-Wilson, 2013). Therefore, initiatives for improving the health of older people should be placed in their wider social and environmental context. Many ministries other than health – such as industrial development, finance, education, transportation, public security, environmental protection and civil society – should share a common vision to improve the health and well-being of China's ageing population. Such intersectoral and interministerial actions should promote a safe environment, good housing, disability-friendly settings, social connectivity, adequate sanitation, quality food and financial security.

6.2.2 Prioritize the health of China's ageing population in the development agenda

Increased life expectancy should be viewed as a major achievement for China. The perception that population ageing is a burden to public policies and budgeting disregards the evidence showing that older people make substantial contributions to their families and communities. Their contributions to the society need to be given greater emphasis and integrated into discourses on human development, gender advancement and economic stability. Non-biomedical approaches that can improve this population's health should be endorsed in this development agenda. These include: (a) increasing opportunities for education, (b) providing adequate housing, (c) guaranteeing access to universal health care, including long-term care, and (d) creating environments that promote healthy behaviours (good diet and exercise) throughout the lifespan.

6.2.3 Improve fairness in public health services

In China, people with the highest need for care often get the least care; they are frequently from the

most disadvantaged populations. Presently, older people with high needs for care are unlikely to get equitable treatment because of their age, area of residence and socioeconomic status. Reducing this inequity in health care and long-term care is an ethical and social imperative and is crucial for social cohesion. For example, in contrast to China, a female infant born today in Japan is expected to live up to 85 years. She will be fully vaccinated and will receive adequate nutrition and extensive education. If she gets pregnant, she will receive adequate maternity care. If she develops chronic disease, she is likely to get excellent treatment and rehabilitation, and will also receive compensation towards medication expenses. This supportive environment is not within reach for women born into a low socioeconomic class and residing in rural China (Levi, Factor & Deutsch, 2013). Therefore, there is a pressing need to develop accessible, affordable, effective and age- and gender-appropriate health services for all Chinese people.

6.2.4 Improve the capacity of human resources for health

Presently, there is a shortage of trained health workers in China, and the available resources are unequally distributed across the country. Unlike other countries, China has more doctors than nurses, but 70% of them are in urban areas. The doctor-to-patient ratio in urban areas is twice that in rural regions and similarly there are more nurses in urban areas than in rural regions. Inequality in distribution of health workers (quality and quantity) between low- and high-income provinces is even more striking, with low-income provinces having a smaller and less-educated workforce in the public health system (Anand et al., 2008).

Further, since most of the patients with whom these health workers will work are elderly, there is an urgent need to train the existing and future workforce in core aspects of geriatric care across all care settings. This will be a major challenge since, in general, trained health professionals are scarce. A survey on the quality of health care found that

doctors' skills, services provided, medical equipment and outpatient waiting times need to be improved in community-based primary health care (Niu et al., 2010; Wang et al., 2014). In addition, there is a strong demand among families with dependent older people to develop and scale up the nursing workforce in community health service centres to enable nurse-led education and home-based coaching for family caregivers in managing dementia and preventing complications (Wang et al., 2014). As China aspires to accelerate community-based primary health care for older people, developing existing human resources is essential.

In long-term care settings, evidence has shown that nurses play a crucial role in a multidisciplinary team to deliver coordinated and integrated care to meet the complex needs of older people (Chenoweth et al., 2009; Moyle et al., 2013; Xiao et al., 2015). They also play a leadership role in managing care programmes and packages, take responsibility for care quality, and supervise unlicensed personal care assistants (PCAs) in the mixed-skill setting. This group needs to be well prepared through education programmes to demonstrate geriatric nursing competencies. In addition, the nurse-to-client ratio must be mandated in government-funded and -regulated long-term care settings to ensure that all components of prevention (e.g. fall risk assessment and prevention), medical treatment, clinical care (e.g. skill/wound care, continence care, dementia behavioural management) and palliative care are included and care objectives are achieved.

Unlicensed PCAs usually form the majority of the long-term care workforce. They should be required to successfully complete vocational education programmes accredited by government agencies in order to gain employment. Also, the PCA-to-client ratio needs to be mandated to ensure high-quality care for clients, along with a reasonable workload for PCAs in order to protect their rights in the workplace. Evidence from global and Chinese studies has shown that PCAs come from diverse backgrounds, and a large proportion of them are

migrant workers (many are internal migrant workers from rural areas). They are vulnerable to abuse and exploitation in the absence of government regulation of the long-term care sector (WHO, 2000; Wang, 2014).

6.2.5 Prevent chronic disease risk factors throughout the lifespan

Healthy ageing requires lifelong health promotion efforts that are rooted in the value system of society, the family and the individual. Even in later life, many chronic diseases of old age can be prevented or delayed through health-promotion and disease-prevention strategies. Nearly, 80% of heart disease, stroke and type 2 diabetes can be prevented or delayed by reducing the primary risk factors at the population level (WHO, 2013). Promisingly, preventive actions are already under way in China, with success in some areas. For example, the prevalence of smoking has decreased since 1980 (Qian et al., 2010) and new policy for tobacco control is currently being developed that is expected to reduce the prevalence of tobacco use to 5% by 2050 (Levy et al., 2013).

6.2.6 Prevent or delay care dependence

The epidemic of chronic diseases is now very much on the development agenda in China. However, until now discussions have largely focused on the prevention of premature mortality, rather than addressing the increasing demand for age-appropriate health care for older people. Interventions that delay the onset of functional decline, thereby reducing the needs of already care-dependent older people, or that mitigate the impact of care provision, should also be prioritized. Research suggests that frailty and chronic diseases are two primary risk markers for targeting efforts to improve the health of older people at risk of dependence (Clegg et al., 2013). In the elderly, frailty can occur even in the absence of chronic disease and it carries its own consequences (Strandberg & Pitkala, 2007). This dynamic nature provides opportunities to prevent

or delay care dependence (i.e. in the absence of disease) and manage dependence (with disease) by supporting family caregivers through relevant home-care packages. Thus, an integrated service model that includes transition care programmes (at home, in a rehabilitation ward or in a residential care facility) needs to be developed for the prevention and management of dependence.

6.2.7 Support informal (family) care

Moving to a residential care home is not an option for many older people in China, nor is it always the best option considering the strong influence of filial piety, a core value of Confucianism in the Chinese culture. Nearly 60% of older people seek institutional care when their children are unable to provide care or if they do not want to be a burden (Wong & Leung, 2012). In urban China, 49% of older people require daily care and assistance, and 25% need someone to help with domestic activities. However, urban home-care services currently only satisfy 16% of the care needs of dependent older people. Further, market-driven policy is likely to increase the cost of institutional care, leaving many older people unable to afford this option. This situation is even worse in rural areas (Wong & Leung, 2012).

Traditionally, organizing care for an older person is considered to be the family's ultimate responsibility (Xiao et al., 2014). However, the sustainability of this approach is now altered by demographic changes, and this system of caring is becoming less common (Feng et al., 2012). The availability of informal support varies from family to family and is not guaranteed (Liu et al., 2009; Xiao et al., 2014). Some chronic diseases such as dementia have profound impact on family caregivers' quality of life (Liu et al., 2009; Xiao et al., 2014). Research shows that continuous support to family caregivers reduces caregiving strain, improves their quality of life (Gavrilova et al., 2009; Xiao et al., 2015) and might improve the health of older people. Therefore, home-based support to family caregivers and older people might benefit family members and help keep older people

at home. However, such service development needs to be streamlined with existing health services and must be well connected and coordinated at all levels of service.

In modern Chinese society, people demonstrate their filial piety in different ways; providing care activities is only one of these ways. Enabling and sustaining the new concept of filial piety in China's social and health care transition requires policy interventions, cross-sector collaboration and the establishment of a government-regulated long-term care system. Global evidence has shown that family caregivers need adequate support in order to fulfil their role. They perform well in the presence of care arrangement options in a long-term care system that includes home-care packages, dementia care, palliative care, respite care, transition care and residential aged care. Family caregivers still have a crucial role to play in these options. In the absence of an adequate long-term care system, family caregivers expect to experience higher levels of psychological, emotional and physical burden while taking responsibility for the care of their family members. Quality of care and the dignity of care recipients can be jeopardized if caregivers are unable to manage complex care activities. Moreover, the lack of care arrangement options in the public system may have a negative impact on family relationships, eventually affecting the harmony of the community.

Family caregivers need to be acknowledged as part of the workforce, contributing to society by helping older people stay at home and relieving the public health system. Considering that China has committed to universal health coverage, family caregivers should be entitled to receive adequate support from the public system; for example, education/training programmes in managing chronic conditions and dementia at home, as well as preventing falls and other complications. Government-funded caregiver support and respite care that enables caregivers to overcome social isolation are in high demand. In addition, financial remuneration needs to be considered for caregivers



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who live below the poverty line or who may fall into poverty because of their family commitments. These caregiver support strategies will reinforce China's achievements in universal health coverage and in poverty reduction.

6.2.8 Reform medical insurance coverage and finance long-term care

In China, government insurance schemes are one of the significant steps towards mitigating high out-of-pocket payments and inequality in access to health care (Hu et al., 2008; Wang & Chen, 2014). However, to date the medical coverage provided through these programmes is minimal (Hao et al., 2010). Although the health insurance system covers 95% of the population, there are many disparities for older people between the New Cooperative Medical Scheme, Urban Resident Basic Medical Insurance, Urban Employee Basic Medical Insurance, and Official Medical Insurance system (WHO, 2014). Coverage for inpatient and outpatient services is inadequate and is not insured in many regions. For example, the Rural Cooperative Medical

Scheme reimburses only around 30% of inpatient expenditures. Many long-standing health conditions in older people (e.g. hypertension and diabetes) require long-term outpatient visits to primary and secondary care, which may not be covered. As a result, health care use among older people living in poverty remains unimproved (Wagstaff et al., 2009; Yu et al., 2010). Further reform to medical insurance is essential to address the imbalance in coverage and to improve access to health care, particularly among older people in rural areas and poorer sections of society.

A well designed and sustained long-term care system in China must be affordable for the average family. Universal coverage and equitable access for all Chinese citizens should be guiding principles in the design, implementation and regulation of the long-term care system and in decision-making for funding options. Evidence-based lessons learnt from other financing mechanisms implemented in other countries with well established long-term care systems can be used to inform decisions and be adapted to a Chinese social context. Conducting

public consultations on the design of the system and payment sharing can help meet public expectations for the care of older people in China.

6.2.9 Implement person-centred and integrated services

Currently, there are large treatment gaps for older people with multimorbidities of chronic disease. Evidence shows that treating each health condition independently is much less effective than assessing and managing an older person's needs in a holistic way. Care is best delivered integrated under one roof, with an emphasis on the care of people within their own social and environmental contexts. Development of such integrated care programmes should be given immediate priority. However, this will require converging the activities of many national flagship programmes – a real challenge.

The most compelling example of this sort of integrated care is the Program of Research to Integrate the Services for the Maintenance of Autonomy (PRISMA) model in Quebec, Canada, which targets frail dependent older people in general, rather than those with dementia or stroke (Hebert et al., 2003). In a quasi-experimental trial, this integrated service delivery system reduced functional decline, unmet needs, visits to emergency rooms and hospitalizations (Hebert et al., 2008), and also improved satisfaction with services and general empowerment of elderly people (Hebert et al., 2010). In the districts where PRISMA was implemented, a joint governing board was established to oversee all health and social services along with organizations from the public, private and voluntary sectors. The board is responsible for the governance and management of service delivery of all care-dependent older people in the district. There is a single entry point for all PRISMA services via telephone or written referral and one-stop access, in which a dedicated case-manager designs an integrated plan of

health and social care tailored to the specific needs of each older person. Each case manager has a case load of no more than 40 clients. The system is in the process of being rolled out nationally.

6.3 Recommendations for immediate action

6.3.1 Chronic disease control, prevention and self-management programmes for older people

- Scale up the screening, early diagnosis and control of chronic conditions such as hypertension and diabetes at the primary care and community health levels.
- Pilot models for more effective management of comorbidities and polypharmacy.
- Improve access to essential medication for hypertension and diabetes.
- Scale up health literacy programmes on self-management and control of chronic diseases for older people and their family caregivers, particularly for those at greatest risk (rural residents and those with lower socioeconomic status).

6.3.2 Prevention of functional decline and care dependence at the community level

- Establish a community health worker programme to undertake screening for frailty and common impairments in older people at the primary care and community health levels.
- Provide training for community health workers to assess and provide home-based care for common impairments: undernutrition, mobility impairment, cognitive impairment and sensory impairment.
- Monitor the functioning of older people by incorporating physical function measures into routinely collected health information.

6.3.3 Establish a community-based long-term care system that supports informal care and provides care arrangement options

- Establish a nationwide programme to offer formal support to volunteers and caregivers within communities.
- Establish government policies, guidelines, standards and regulations to ensure that community-based long-term care is built on universal coverage and equal access in the public system.
- Establish an accreditation agency within the national long-term care system to monitor the quality of care provided for older people.
- Prepare elderly care assessment teams and use standardized assessment tools to evaluate the use of long-term care services and care packages.
- Support the workforce in providing high-quality, equitable and cost-effective community-based long-term care.
- Pilot an insurance system that will provide support for older people who have limitations in performing ADLs.
- Expand the infrastructure for long-term care, shifting the emphasis from institutional care to community- and home-based care and providing the above-mentioned range of care services. Scale up this system by creating a network of day centres linked to community-based volunteers and health workers.
- Pilot nurse-led or coordinated home-care packages that emphasize home-based caregiver coaching in assisting with ADLs, nutrition/hydration, stroke rehabilitation, fall risk reduction and prevention, continence care, dementia behaviour management, wound/skin care, pain management and palliative care.
- Pilot nurse-led residential aged care in mixed-skill settings to provide holistic care for older people with complex needs, and for those who require end-of-life care.
- Pilot nurse-led dementia care units in residential care, and ensure a person-centred care approach in order to protect the dignity of people with dementia.

6.3.4 Enable healthy ageing and optimal participation by older people

- Promote a healthy lifestyle, including proper diet, physical activity and smoking cessation for all age groups.
- Encourage the development of age-friendly homes and neighbourhoods. These should include accessibility features, welcoming and safe public spaces, mechanisms to facilitate the use of public transport, mechanisms for improving social connectivity, and design standards that address the needs of older people.
- Provide health education to older people and their families.
- Improve access to vaccinations for older people.

6.4 Role of WHO in supporting care of older people in China

WHO can support the Ministry of Health of China as follows:

- Support the National Health and Family Planning Commission on the development of National Ageing and Health Strategy and Implementation Plan.
- Co-chair the national ageing steering group for development, implementation and monitoring the health programme for targeted functional dependence in older people.
- Improve the capacity of primary health care by facilitating training programmes for health professionals at grassroots-level health-care facilities in identifying and managing older people at risk of functional decline.
- Support development of clinical guideline for managing care needs of older people with chronic disease at primary health care level.
- Provide technical support to pilot test the aforementioned new initiatives for cost-effectiveness, feasibility and sustainability.

Box 7: Ten good reasons for taking action to improve care for older people in China

- **To meet the demand for long-term care.** Establishing a government-regulated long-term care system based on human rights and ethics for older people and for those who care for them is a win-win solution for the government and the public. Market-driven institutional care will only enlarge existing disparities in service access and use.
- **To enhance universal health coverage.** Prevention of chronic disease and functional decline will reduce hospital admissions. Transition care within the long-term care system will shorten the length of hospital stay, reduce readmission and support older people to return home. All of these will reduce health costs.
- **To reinforce the achievement of poverty reduction.** Long-term care based on equitable access and use of care services will provide a safe net for older people and protect them from disability associated with poverty in later life.
- **To restore filial piety.** Filial piety as a core value in Chinese culture has been weakened due to the demographic change and social transition. Its restoration relies on a community approach to enabling the family to care for older people and the solidarity of the nation to support this approach.
- **To improve care efficiency.** The long-term care package options led by health professionals will enable early diagnosis, treatment and management of health issues for older people in primary care settings and reduce care crises and costs of specialist care.
- **To improve quality of care and quality of life.** Well designed long-term care options will support family caregivers to sustain quality care at home, relieve caregiver burden and improve quality of life for both care recipients and caregivers.
- **To improve dementia care.** Home-based coaching and counselling support provided by geriatricians and nurse specialists will enable family caregivers to manage behavioural and psychological symptoms at home and reduce caregiver distress and care crises.
- **To improve end-of-life care.** Long-term care with a palliative care component provided by palliative care team will enable older people to be free from pain and free from distress at the end of life in home-care or residential care settings. Therefore, it will avoid admission to hospitals for end-of-life care in the most stressful period for the dying person and the family.
- **To create a geriatric care speciality.** A long-term care system will create leadership and career advancement opportunities for medical doctors, nurses and allied health professionals specialized in geriatric care. The quality of care for older people will be further enhanced through the workforce development.
- **To create jobs.** The demand for provision of long-term care will help government to sustain vocational education for those who choose to work as personal care assistants and create jobs for them. Therefore, it is another win-win solution for the government and for job seekers.

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