

**Socioeconomic inequalities in health care
and financial protection among people with non-
communicable diseases in China**

Yang Zhao

ORCID ID: 0000-0002-6011-5948

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The Nossal Institute for Global Health
Melbourne School of Population and Global Health
The University of Melbourne

ABSTRACT

Background

Under the sustainable development goals agenda, advancing universal health coverage (UHC) is the centrepiece of health policy in many countries. To address the burden of non-communicable diseases (NCDs) and achieve UHC, China officially launched the New Health System Reform in 2009. This thesis investigates trends and socioeconomic inequalities in health service utilisation and financial risk protection among patients with NCDs in China, using two nationally-representative datasets.

Methods

We used data from the three waves of the nationally-representative China Health and Retirement Longitudinal Study (CHARLS 2011-2015), which included 17,706 participants aged ≥ 45 years, and data from four rounds of the China Family Panel Studies (CFPS 2010-2016) 2010-2016, with a sample size of 14,960 households. Financial risk protection is measured by catastrophic health expenditure (CHE) and impoverishment due to health spending. The concentration curve and concentration index were used to assess socioeconomic inequalities in healthcare service use. Linear regression models were used to analyse the determinants of systolic blood pressure (SBP) and diastolic blood pressure (DBP). Random-effects negative binomial models were used to assess the relationship between the number of NCDs and the frequency of health service use. Multivariable logistic regression models were performed to identify the impacts of the family member with chronic diseases on CHE and impoverishment.

Results

The review of the literature on chronic diseases, with a particular focus on hypertension and chronic disease multimorbidity, its burden, and the socioeconomic inequalities in healthcare and financial protection, was presented in **Chapter 2**. The study frameworks related to UHC, data sources, measures, and statistical methods were presented in **Chapter 3**. **Chapter 4**: The overall effective treatment coverage of hypertension among the middle-aged and older population in China between 2011 and 2013 was 22.40%. It was much less than the overall treatment coverage of hypertension (55.86%). Female individuals had higher treatment coverage and effective treatment coverage (62.42%,

24.16%) than male patients (48.68%, 20.48%). Considerable variations in effective treatment coverage of hypertension were observed between patients without health insurance and those with insurance(s), ranging from 18.41% to 29.31%. **Chapter 5:** Among hypertensive individuals, there were increasing trends in the rate of awareness and treatment from 55.87% and 48.44% in 2011, to 68.31% and 61.97% in 2015 respectively. However, the proportion of treated and controlled patients in the wealthiest quintile were 1.16 times and 1.41 times that in the poorest quintile in China in 2015. The proportion of outpatient visits, inpatient visits and health education in the richest quintile of hypertensive patients were 1.47, 2.91 and 1.36 times of that in the poorest quintile. **Chapter 6:** There was a greater than 10% lower rate of undiagnosed, untreated, and uncontrolled hypertensive residents of urban areas in 2015, compared with those in rural areas and those rural-to-urban immigrant individuals in China. The regions with the lowest economic indicators were 8.5 times more likely to leave the residents undiagnosed, 2.8 times more likely untreated and 2.6 times more likely uncontrolled across China. **Chapter 7:** 62% of study participants had multimorbidity in China in 2015. A higher number of chronic diseases was associated with more outpatient visits ($\beta=0.25$, 95% CI=0.24, 0.27), more days of hospitalisation ($\beta=0.32$, 95% CI=0.30, 0.34), and a higher likelihood of experiencing CHE (OR=1.29 for the overall population, 95% CI=1.26, 1.32). **Chapter 8:** Between 2010 and 2016, the incidence of CHE in China decreased from 19.37% to 15.11%, and from 7.34% to 5.14% for health impoverishment; however, the decrease in level of impoverishment less in rural areas (from 8.46% down to 7.81%) than in urban areas (from 6.16% down to 3.03%). The multivariable analysis also showed that households with two or more members suffering NCDs were more likely to incur CHE (OR=2.46, 95% CI: 1.93-3.13) and impoverishment (OR=2.66, 95% CI: 1.87-3.78) compared to households with no NCD members.

Conclusion

These findings are useful for evaluating the recent performance of China's health system and trends in socioeconomic disparities in healthcare delivery for NCDs. The findings can be helpful in informing the development of an equitable health policy that can more effectively provide healthcare services and financial risk protection to the growing number of people with hypertension and multimorbidity in China and in other developing countries.

DECLARATION

I, Yang Zhao, declare that

- (1). The thesis comprises only my original work towards the Doctor of Philosophy except where indicated in the preface.
- (2). Due acknowledgement has been made in the text to all other material used.
- (3). The thesis is fewer than 100,000 words in length, exclusive of tables, maps, bibliographies and appendices.

Full Name: Yang Zhao

Date: 18/08/2019

PREFACE

My thesis is under the supervision of Prof Brian Oldenburg from The University of Melbourne (Principal Supervisor), Prof Ajay Mahal from The University of Melbourne (Co-supervisor), and Prof Shenglan Tang from Duke University in the United States (Co-supervisor).

The analyses contained in this thesis were based on publicly available datasets from the China Health and Retirement Longitudinal Study (CHARLS) from 2011 to 2015 and the China Family Panel Studies (CFPS) from 2010 to 2016. CHARLS was approved by the Peking University Biomedical Ethics Review Committee, and all participants signed an informed consent before participation. For the CHARLS, the approval number is IRB00001052-11015 (Appendix A), and for the CFPS, the approval number is IRB00001052-14010 (Appendix B). All the data were accessible on the CHARLS webpage (<http://charls.pku.edu.cn/en>) and the CFPS webpage (<http://opendata.pku.edu.cn/dataverse/CFPS>).

The thesis was written as “Thesis with Publication”. Five multi-authored research articles have been included in my thesis as result chapters 4-8. Chapter 6 has been included in my thesis from an accepted and in-press article. Chapter 4, 5, 7 and 8 have been included in the main text from four submitted and under peer-review articles.

I am the first author of all the papers for publication. For each publication where applicable, I designed the study, undertook the data analysis, drafted the manuscript for submission, and led the manuscript revision and the response to the reviewer’s comments. Details of these publications and contributions of my co-authors are as follows:

Publications (First author)

1. **Zhao Y**, Mahal A, Tang S, Haregu T, Oldenburg B Effective coverage for hypertension treatment among middle-aged adults and the older population in China, 2011 to 2013: a nationwide longitudinal study. *Journal of Global Health*. 2020; 10(1):010805. [https://doi: 10.7189/jogh.10.010805](https://doi:10.7189/jogh.10.010805). (Chapter 4, Published on 23-March-2020)

YZ and AM contributed to study design. BO, TS and TH contributed to data

interpretation. YZ wrote the first draft of the paper, and all co-authors contributed to manuscript editing.

2. **Zhao Y**, Oldenburg B, Mahal A, Haregu T, Katar A, Zhang L. Trends and inequalities in the health care and hypertension outcomes in China, 2011 to 2015. *International Journal of Environmental Research and Public Health*. 2019; 16(22): 4578. <https://doi.org/10.3390/ijerph16224578>. (Chapter 5, Published on 19-November 2019)

YZ, LZ and AM contributed to study design. YZ and BO carried out the initial analysis and supervised data analysis. YZ wrote the first draft of the paper, LZ and AM, BO, AK and TH provided advice on the first draft. All co-authors contributed to manuscript editing.

3. **Zhao Y**, 6. Zhao Y, Oldenburg B, Zhao S, Haregu T, Zhang L. Temporal trends and geographic disparity in hypertension care in China. *Journal of Epidemiology*. 2019; 30(8). <https://doi.org/10.2188/jea>. (Chapter 6, Published on 20-July-2019)

YZ and LZ designed the study; YZ and SZ carried out the initial analysis and supervised data analysis. YZ wrote the first draft of the paper, and BO, LZ, SZ and TH provided advice on the first draft. All co-authors contributed to manuscript editing.

4. **Zhao Y**, Atun R, Oldenburg B, McPake B, Tang S, Mercer S, Cowling T, Sum G, Qin V, Lee J. Physical multimorbidity, health service use, and catastrophic health expenditure by socioeconomic groups in China: an analysis of population-based panel data. *Lancet Global Health*. 2020. (Chapter 7, Accepted on 26-March-2020)

YZ and JL conceived and designed the study. YZ and BO carried out the initial analysis. RA, TC and BM interpreted the data. VQ and YZ analysed the literature. YZ wrote the first draft of the paper. RA, BO, BM, ST, SM, TC, GS, VQ and JL provided advice on the first draft and revised the article critically for important intellectual content.

5. **Zhao Y**, Oldenburg B, Mahal A, Lin Y, Tang S, Liu X. Trends and socioeconomic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016. *Tropical Medicine & International Health*. 2019; 24(12). <https://doi.org/10.1111/tmi.13344>. (Chapter 8, Published on 12-November-2019)

YZ and XY designed the study; YZ and BO did the initial analysis and supervised data

analysis; YZ wrote the first draft of the paper; and BO, XL, AM, YL and ST provided advice on the first draft. All co-authors contributed to manuscript editing.

Publications during PhD candidature (Co-author)

1. Liu X, Sun X, **Zhao Y**, Meng Q. Financial protection of rural health insurance for patients with hypertension and diabetes: repeated cross-sectional surveys in rural China. *BMC health services research*. 2016; 16(1): 481.
2. Hu D, Zhu W, Fu Y, **Zhao Y**, Zhang M, Hanson K, Martinez-Alvarez M, Liu X. Development of village doctors in China: financial compensation and health system support. *International journal for equity in health*. 2017; 16(1): 9.
3. Zhang L, Zou H, **Zhao Y**, Hu C, Atanda A, Qin X, Jia P, Jiang Y, Qi Z. Association Between Blood Circulating Vitamin D and Colorectal Cancer Risk in Asian Countries: A Systematic Review and Dose-Response Meta-analysis. *BMJ Open*. 2019; 9(12).

Conference presentation of research papers

1. **Zhao Y**, Oldenburg B. “Effective coverage” of hypertension treatment among middle-aged and older populations in China: the China Health and Retirement Longitudinal Study 2011-2013. Health Systems for Ageing Societies in Asia and the Pacific Conference, Melbourne. Australia | Oct 2016. (Oral presentation)
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4. **Zhao Y**. Trends and Socioeconomic Disparity in Financial Protection in China from 2010 to 2016. International Health Economics Association (iHEA) World Congress. Basel, Switzerland | July 2019. (Oral presentation)
5. **Zhao Y**. Trends in the geographic disparity in hypertension care in China: A repeated cross-sectional study. 2019 Planetary Health Annual Meeting. The Lancet Planetary Health. CA. USA | Sep 2019. (Poster presentation)
6. **Zhao Y**, Zhang L. Impact of multimorbidity on health service use and catastrophic health expenditure in China: an analysis of data from a nationwide longitudinal survey.

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7. **Zhao Y.** Trends and socioeconomic disparities in financial risk protection in China from 2010 to 2016: a repeated cross-sectional analysis of 14960 households. The Lancet-CAMS Health Summit. Chendu, China | Oct 2019. (Oral presentation)

Scholarships and awards received during my PhD candidature

My PhD project was supported by the Melbourne Research Scholarship (MRS) from the University of Melbourne in Australia (from 2016.2 to 2019.8). I was awarded the Open Access Publication Funding from the Melbourne School of Population and Global Health at the University of Melbourne in Australia. I was also awarded the Peking University Alumni Association Scholarship and the Best Presenter Award in the West China Health Policy and Economics Doctoral forum from Sichuan University in China.

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ABBREVIATIONS

AOR	Adjusted odds ratio
BMI	Body mass index
BP	Blood pressure
CAPI	Computer-assisted personal interview
CC	Concentration curve
CDC	Centers for Disease Control and Prevention
CFPS	China Family Panel Studies
CHARLS	China Health and Retirement Longitudinal Study
CHE	Catastrophic health expenditure
CHNS	China Health and Nutrition Survey
CI	Confidence interval / Concentration index
CNY	Chinese Yuan (currency)
CVD	Cardiovascular disease
DBP	Diastolic blood pressure
EC	Effective coverage
EMS	Essential medicine system
ETC	Effective treatment coverage
FEM	Fixed-effects model
GDP	Gross Domestic Product
HP	Hypertension
HRS	Health and Retirement Study
ID	Identifier
NA	Not available
NCD	Non-communicable disease
NCMS	New Rural Cooperative Medical Scheme
NHSR	New Health System Reform
NPAP	National Poverty Alleviation Projects
NPHI	National Public Health Initiative
OOP	Out-Of-Pocket
OOPE	Out-Of-Pocket Expenditure
OR	Odds ratio
PCE	Per capita household consumption expenditure

PHSE	Public health service equalization
PPS	Probability-proportionate-to-size
REM	Random-effects model
SAGE	Study on Global Ageing and Adult Health
SBP	Systolic blood pressure
SDG	Sustainable development goals
SES	Socioeconomic status
TC	Treatment coverage
UEBMI	Urban Employee-Based Medical Insurance
UHC	Universal health coverage
URHI	Unified Resident Health Insurance
URBMI	Urban Resident-Based Medical Insurance
UK	United Kingdom
US	United States
USD	United States Dollar
WHO	World Health Organization

Chapter one: Introduction

1.1 Background

With an ageing population and increasing exposure to risk factors, the burden of NCDs has grown rapidly worldwide [1, 2]. Globally, the economic burden of NCDs has been estimated at approximately US\$47 trillion from 2010 through to 2030, or 75% of global GDP in 2010 [3]. China has experienced an epidemiological transition from infectious diseases to non-communicable diseases (NCDs), including hypertension, diabetes, cardiovascular disease and cancers, over the past decades. [4] NCDs account for 86.6% of total deaths in China [1]. Chronic diseases are a significant contributor to inequalities in healthcare and represent the leading cause of premature mortality in China [2,5]. The challenge is so great that an integrated government response, including comprehensive health system reform, is required to address critical risks and to reduce the burden of these diseases [4, 6]. The Chinese government, via its Healthy China 2030 Plan and through a series of far-reaching health reforms, has set a bold vision for reducing premature mortality due to NCDs by 25% by 2030 [7, 8].

In the context of the sustainable development goals (SDG) agenda, UHC has become a major goal of health reform in many countries and a priority objective of WHO. [9, 10]. To achieve UHC, some developing countries have introduced a series of health system reforms to increase access to primary healthcare and to lower the financial burden of illness [11]. China officially launched a New Health System Reform (NHSR) in 2009, aiming to provide every Chinese citizen with access to healthcare at an affordable cost with basic universal provision of safe, effective, convenient, and low-cost services. This comprehensive reform resulted in a significant increase in health insurance coverage [12]. Almost the entire Chinese population (around 1.2 billion, over 95%) is currently covered by one of the three major social health insurance programmes (the Urban Employee Basic Medical Insurance (UEBMI) scheme, the Urban Resident Basic Medical Insurance (URBMI) scheme, and the New Rural Cooperative Medical Scheme (NCMS)) [11, 13]; however, strong performance in one feature of UHC (proportion of the population covered) did not guarantee strong performance in the other (depth of financial protection). The benefits packages and degree of financial protection still vary

across public insurance schemes in China, especially for NCD populations [12]. Low levels of service coverage and high levels of patient cost-sharing (out-of-pocket fees) have raised concerns about a lack of financial protection for patients with chronic conditions [13].

Several studies from China have focused on socioeconomic inequality in healthcare and service utilisation among the Chinese population [14-16]. Socioeconomic inequalities in healthcare, and financial protection may be underestimated for individuals with NCDs if analyses do not separate study subjects with NCDs from the general healthy population. A few studies have examined socioeconomic disparities in health service use among people with chronic diseases [17]. Some studies have also examined the degree of CHE or health impoverishment at the sub-national level or in rural areas in China [18-21]. Since 2011, three studies have focused on the trends in financial protection in China at the national level [13, 22, 23]; however, there is limited research assessing the trends and geographic variations in healthcare and management for NCDs [24-27]. Most previous studies based on cross-sectional or early period datasets before 2009 [27-29] may not reflect the longitudinal effects of the ongoing reform of the healthcare system in China. Following China's health system reform, the changes, and extent of those changes, in socioeconomic disparities in healthcare and financial protection in the NCD population over the last decade are still unclear.

Furthermore, existing evidence on the economic burden of chronic conditions to date has mainly focused on individual NCDs, with little attention to multimorbidity. The implications of NCD multimorbidity on the attainment of universal health coverage (UHC) across socioeconomic groups is an emerging area of research inquiry. While there have been many studies conducted in high-income countries (HICs) on the burden and causes of multimorbidity [30-39], and the effectiveness of strategies to address it, this topic is still an emerging area of research inquiry in low-to-middle income countries (LMICs) where already fragile healthcare systems are further stretched by the dual burden of NCDs and infectious diseases [40]. There is a dearth of evidence on the impact of chronic disease multimorbidity on healthcare utilisation, out-of-pocket spending, and catastrophic health expenditure by socioeconomic groups and populations covered by various social health insurance schemes in China. Such knowledge gaps limit the capacity to identify people at particular risk of multimorbidity and to develop specific interventions to prevent multimorbidity. Research is urgently

required to generate better evidence to improve healthcare, patient outcomes, and financial protection for people with severe chronic diseases and multimorbidity.

1.2 Aims and research questions

This thesis aims to assess the impact of socioeconomic inequalities in the utilisation of health services, on the financial burden, and on health outcomes among individuals with NCDs since the commencement of China's new comprehensive health system reform in 2009. The research project also identifies key factors influencing healthcare, service use and financial protection, and offers suggestions for health system reform in developing countries that will significantly decrease inequalities in the healthcare and outcome for NCDs.

Objectives and Research Questions (RQ):

I). To identify socioeconomic inequalities in healthcare and explore the impact of health insurance schemes on health outcomes among Chinese adults with hypertension (Chapter 4 & 5).

RQ, i). Has China's health system provided effective coverage of healthcare to the population with hypertension?

RQ ii). What is the degree of socioeconomic inequality in the management of hypertension?

II). To examine trends and geographic disparities in the diagnosis, treatment and control of hypertension in China, and to investigate the association between regional factors and hypertension care (Chapter 6).

RQ, iii). What are the trends in geographic disparity in hypertension care between 2011 and 2015?

RQ, iv). How do regional factors affect hypertension care in China?

III). To investigate the socioeconomic difference of prevalence of NCD multimorbidity, as well as the differential impact on health service use and health expenditure using nationally representative data in China. (Chapter 7).

RQ v). Does the distribution of multimorbidity vary between economic groups at the national level in China?

RQ, vi). Do the relationships between multimorbidity, health service use, and health expenditure vary by economic status and health insurance groups?

IV). To assess the trends and socioeconomic disparities in catastrophic health

expenditure and impoverishment due to medical payments in China, and to explore the influence of chronic diseases and socioeconomic factors on financial risk protection. (Chapter 8).

RQ, vii). How have socioeconomic inequalities in financial protection changed in China following the health system reform since 2009?

RQ, viii). What is the difference in financial risk protection across household groups with one or more members suffering chronic diseases in China ?

Chapter two: Literature Review

Summary

The chapter reviews the literature on the burden and management of chronic non-communicable diseases in China, with a particular focus on hypertension and multimorbidity (defined as two or more co-existing chronic conditions). The chapter also provides a brief description of China's health insurance system and a series of far-reaching related reforms since 2009 that had the potential for significant impact upon improvements in healthcare utilisation, financial risk protection, and chronic disease management in China. The chapter reviews the international literature and the evidence from China on socioeconomic inequalities in health service utilisation and financial risk protection among the general population and those with NCDs. Following the literature review, the research gaps are identified. Relatively few studies examine socioeconomic inequalities in healthcare use and health expenditure among persons with NCDs in China. Since the 2009 China New Health System Reform, no research has investigated trends in financial risk protection among households with a family member suffering from chronic disease. At the national level, there is a shortage of evidence on the impact of chronic disease multimorbidity on health service use and catastrophic health expenditure among socioeconomic groups and populations covered by various social health insurance schemes in China. Research is urgently required to generate better evidence to improve healthcare, patient outcomes and financial protection for people with NCDs and multimorbidity.

2.1 The burden of non-communicable diseases

2.1.1 Epidemiological transition of non-communicable diseases

Human health worldwide is now facing a dramatic transition. The primary diseases affecting human health have switched from infectious diseases to NCDs [41]. Globally, deaths due to NCDs rose by 14.3% between 2005 and 2015, with an increase of 5.0 million deaths [42]. The number of disability-adjusted life years (DALYs) lost caused by non-communicable diseases has increased progressively, rising from 1.1 billion in

1990 to 1.5 billion in 2015 [4]. The contribution of NCDs to total DALYs (69.8%) was significantly higher compared to communicable, maternal, neonatal, and nutritional disorders (30.1%) in 2015 [4]. Evidence similarly suggests that non-communicable diseases result in 65% of all deaths [6] and 54% of all healthy life years lost as measured by DALYs [43]. Among the 56 million deaths each year, 38 million are due to NCDs, and over 40% (16 million) of these deaths are premature (before 70 years of age). Approximately 80% of premature deaths from NCDs occur in low and middle-income countries [44].

The prevalence of chronic diseases, however, specifically NCDs such as cardiovascular disease (CVD), stroke, diabetes, and cancers, are likely to rise substantially over the coming decades [3]. The annual number of deaths due to NCDs is projected to increase to around 52 million by 2030, whereas the number of deaths due to infectious diseases is expected to decrease annually [44]. China, with the world's largest population, is in step with the trends in epidemiological transition and faces a remarkably severe threat from NCDs.

NCDs are significant causes of death in China. Around 86% of the disease burden is due to NCDs in China, and this proportion is projected to rise [1, 45]. Apart from the significant burden to quality of life, NCDs now represent an increasing burden for health systems and society [46]. Globally, it is estimated that the economic burden of NCDs will be approximately \$47 trillion between 2010 and 2030 (measured in USD with the base year being 2010, or 75% of global GDP in 2010) [47]. Chronic diseases are also a significant contributor to inequalities in healthcare and are the leading cause of premature mortality in China [2, 5]. The challenge is so great that an integrated government response, including comprehensive health system reform, is required to address critical risks and to reduce the burden of these diseases. Multiple interventions, such as strengthening primary care and people-centred integrated care, are needed to address the world's most exceptional emerging threat from NCDs and to improve national health [46].

In the next sections, I describe the prevalence, burden and management of hypertension, which is one of the most critical risk factors for CVDs, and which has several potential comorbidities leading to a higher degree of mortality and disability, and placed a substantial financial burden on individuals and society [48]. In addition to understanding the challenge of hypertension and its management in China, I also

examine the multimorbidity that involves hypertension and other chronic diseases.

2.1.2 Hypertension and management in China

Hypertension is prevalent worldwide, estimated to affect more than a billion people, nearly three-quarters of whom live in low- and middle-income countries (LMICs) [49]. Hypertension has been estimated to contribute to 55% of global mortality caused by cardiovascular diseases and 7% of all disability-adjusted life years [50]. It is a consistent and independent risk factor associated with cardiovascular diseases, kidney diseases, stroke, and other chronic diseases [51]. There are clear, evidence-based treatments available for hypertension. In most individuals, it can be treated and controlled at a relatively low cost, even in resource-poor settings [52-55]. In the developed world, more than 80% of people with hypertension are having their condition diagnosed and are receiving treatment [56-58]; however, the health system in most developing countries fails to detect and manage hypertension effectively [59, 60].

In China, the overall prevalence of hypertension rose substantially from 20% in 2002 to 34% in 2010 [61-63]. Between 2014 and 2017, about 45% of Chinese adults aged 35–75 years were hypertensive [64]. The number of people with hypertension has steadily increased over time [2]. While the prevention and control of NCDs have been on China's policy agenda for decades [5], the management of hypertension in China has been ineffective for many years [62-65]. In 2017, the awareness, treatment coverage among all hypertensive participants, and blood pressure control among all hypertensive participants were 42.6%, 34.1%, and 9.3%, respectively [66]. It has been estimated that hypertension was associated with 20% of the deaths recorded in China in 2005, including 2.33 million – nearly 80% – of the deaths from CVDs [67]. Hypertension not only causes premature death; it also adds considerably to household costs. In a study conducted in rural China, for example, it was estimated that 4.1% of households suffered impoverishment as a result of hypertension [68].

For an effective response, the Chinese government commenced a substantial reform of the national health system in 2009. The main aim of this reform was to achieve universal coverage with affordable and equitable primary healthcare [69, 70]. Three of the five pillars of the reform – a national programme of primary healthcare, a national essential medicine system, and universal health insurance – are directly linked to the

management of NCDs. As one of five major projects in the reform, the national public health service equalisation (PHSE) program aimed to improve health equity and strengthen access to primary public health services, including by introducing approaches for the identification and management of individuals with hypertension. The characteristics of the free public healthcare service for hypertensive patients are as follows [71]:

- 1) *For residents aged 35 and over, their blood pressure is measured free of charge every year (measured three times, not on the same day). For patients with hypertension, health professionals would recommend a timely referral to the hospital.*
- 2) *For patients with hypertension, at least four face-to-face follow-ups are provided each year. Blood pressure is measured to assess whether there is a critical situation, such as systolic blood pressure $\geq 180\text{mmHg}$ and/or diastolic blood pressure $\geq 110\text{mmHg}$ and to check for severe headache or dizziness, wheezing and so on. For emergency referrals, health professionals from township hospitals, village clinics, and community health centres would follow up the hypertensive patients within two weeks.*
- 3) *Classification of interventions: health workers should provide health education for all patients with hypertension, working with patients to develop a healthy lifestyle. For patients whose blood pressure is under control, the health professional would make an appointment for the next follow-up time. For patients with uncontrolled blood pressure or with adverse drug reactions and new complications or complications, it is recommended they be referred to a higher-level hospital for follow-up within two weeks.*
- 4) *For hypertensive patients, at least one more comprehensive health check is provided each year, which can be combined with doctors' follow-ups. The checks include routine physical examinations of body temperature, pulse, respiration, blood pressure, height, weight, waist circumference, skin, superficial lymph nodes, heart, lungs, and abdomen, and testing of oral, visual, hearing, and motor functions.*

Several studies from China have reported the extent of diagnosis, treatment and control of hypertension; however, most previous studies are cross-sectional in design, which is

not well suited to capturing changes in treatment adherence and blood pressure control over time. There are few longitudinal studies assessing trends in hypertension management and health service utilisation following healthcare reform in China over the last ten years. Very few studies conduct panel analysis based on the same population group at the national level to examine the effectiveness of hypertension treatment on blood pressure control. Furthermore, while China is a large country with internal economic and regional disparities, there is a lack of research assessing trends in the geographic distribution of hypertension management following health system reform in China. This study, therefore, applied random-effects regression models to examine the impact of regional factors on hypertension care. In addition to understanding the challenge of hypertension and its management in China, the study also examines chronic disease multimorbidity that involves hypertension and other comorbidities.

2.1.3 The burden of chronic disease multimorbidity and its effects

The burden of chronic disease has grown rapidly worldwide due to an ageing population [31, 72]. In terms of multimorbidity, most studies refer to the concurrence of two or more chronic conditions in a single individual [73]. The World Health Organization in 2008 also defined multimorbidity as two or more chronic conditions existing simultaneously [74]. Multimorbidity has been recognised as a significant public health issue [31, 75, 76]. Studies in high-income countries (HICs) have shown that the prevalence of multimorbidity increases over time, with age, although there are difficulties of comparison given the different conditions captured by various surveys [30-32]. Recently, a large study in Scotland showed that across forty chronic disorders, there were more people with multimorbidity than with a single chronic disease [30]. This study demonstrated that NCD multimorbidity affected nearly 65% of the study population aged 65 to 84, although this percentage was only 2% for those individuals aged less than 25 [31]. Patients with multimorbidity, especially the elderly, are becoming the norm rather than the exception [33]. Evidence from HICs has established that, apart from health outcomes themselves, chronic diseases impose significant economic costs [44] – patients with chronic diseases not only incur substantial medical expenses to address the conditions [32, 34] but are also more likely to be absent from work and are less productive [35], resulting in an economic burden which is only projected to increase with time.

Recently, there has been growing attention paid to the economic burden of multimorbidity compared to that of individual NCDs [37-39]. Extrapolating from single to multiple conditions is not straightforward, as it cannot be assumed that the impact of conditions is additive. Combined costs could potentially be reduced if the care of one health condition contributed to the management of another, but it is also possible that a second condition could exacerbate and complicate management, adding more to overall costs. A nationally representative study in the UK [77] suggested that conditions could be either cost-increasing or cost-limiting depending on other comorbidities, but depression was strongly associated with increased cost. Furthermore, the relationship between multimorbidity and healthcare utilisation is complicated in patients with high numbers of chronic conditions; for example, a systematic review [54] found that, as the number of chronic diseases increased from none to one, the annual out-of-pocket expenditure (OOPE) on medicine increased 2.7 times. An increase from one to two conditions and from two to three grew OOPE 5.2 and 10.1 times, respectively. The results of the study underlined the complicated relationship between multimorbidity and healthcare utilisation as well as out-of-pocket expenditure (OOPE), which can severely compromise financial protection and universal health coverage [78].

While there have been many studies conducted in HICs on the burden and causes of NCD multimorbidity and the effectiveness of strategies, this topic is still an emerging area of research inquiry in middle-income countries (MICs) and low-to-middle income countries (LMICs) where already fragile healthcare systems are further stretched by the dual burden of NCDs and infectious diseases [40]. Lee and his colleagues' study is one of the first to look at the prevalence of multimorbidity for the adult population using a large, nationally-representative dataset in six MICs [36]. This research found that the prevalence of multimorbidity among nine included chronic diseases in the 70+ age group was 16% in Ghana, 29% in South Africa, 30% in India, 30% in Mexico, 38 % in China, and 66% in Russia [36].

With populations ageing and increasing exposure to risk factors, LMICs, including China, have been undergoing a health transition [79]. There may be dangers in extrapolating findings from HICs to LMICs, where health systems differ significantly [80, 81]. It is also worth noting that, in stark contrast to HICs, a substantial part of the cost burden was attributed to patients incurring out-of-pocket treatment costs in LMICs, which highlights the importance of enhanced financial protection for patients with

multimorbidity [80, 82]. The prevalence of NCD multimorbidity is likely to increase rapidly, and is expected to play an essential role in healthcare service delivery, medical education and reforming health systems in China and other countries alike [83-85].

We conducted a literature review using the keywords “multimorbidity”, “multiple chronic diseases”, “healthcare utilisation”, “economic burden”, “health expenditure”, and “China”. Few studies have examined this issue in China [86-88], though one of the most important examined the association between multimorbidity and healthcare utilisation amongst 162,464 subjects in Guangdong province in China [89]. The implications of multimorbidity on the healthcare system and the attainment of UHC, including access to healthcare and financial protection, especially for the poor [90], remain largely unknown. At the national level, there is a dearth of evidence on the impact of multimorbidity on out-of-pocket spending and catastrophic health expenditure by socioeconomic groups and populations covered by various social health insurance schemes in China. Such knowledge gaps limit the capacity to identify people at particular risk of multimorbidity or to develop specific interventions to prevent multimorbidity and impoverishment due to healthcare payments. Research is urgently required to generate better evidence to improve healthcare, patient outcomes, and financial protection for people with multimorbidity.

2.2 China public health insurance system and recent reforms

Over the past 30 years, the momentum of epidemiological transition has continued unabated in China. Many risk factors for NCDs (including diet, physical activity, automobile use, tobacco and alcohol consumption) have dramatically increased, accompanying societal change, including rapid economic development. [2] Chronic diseases have presented particular challenges to the current healthcare system in China [2, 5]. Since 2009, China has been engaged in a comprehensive New Health System Reform (NHSR) to improve access to healthcare and financial protection by substantially increasing health insurance coverage and lowering user charges. There are three main health insurance schemes in China: the Urban Employee Basic Medical Insurance scheme, the Urban Resident Basic Medical Insurance Scheme, and the New Rural Cooperative Medical Scheme. (The panel 1 summarises China's primary social health insurance schemes.) Aimed at improving access to primary care and equity in financial protection, China's New Health System Reform resulted in a significant

increase in health insurance coverage, with 95.7% of the Chinese population being covered by either one of the three main health insurance schemes in 2011 [13].

Panel 1: China's main social health insurance schemes

Urban Employee Basic Medical Insurance scheme

Urban workers are covered by the Urban Employee Basic Medical Insurance (UEBMI) scheme, launched by the Chinese State Council in 1998. All urban employees are required to join. Roughly 283 million were enrolled in UEBMI in 2014 [91]. This scheme consists of a pooled fund for inpatient stays and individual medical savings accounts for outpatient visits. It is financed through payroll income from employees (2%) and employers (6%) [92]. The per capita fund of UEBMI is US\$424.7 [12].

Urban Resident Basic Medical Insurance scheme

The Urban Resident Basic Medical Insurance scheme (URBMI) aims to ensure coverage for the rest of the urban population, including children, students, and other unemployed urban residents, not previously covered by the UEBMI. In 2014, 315 million people were covered by the URBMI [93]. The scheme is funded by government subsidy (70%) and individual contributions (30%). The per capita fund of this scheme is US\$66.2 [93].

New Rural Cooperative Medical Scheme

For the rural population, the Chinese government launched the new rural cooperative medical scheme (NCMS) in 2003, replacing older arrangements. The rapid expansion of NCMS resulted in coverage of about 802 million rural residents by 2013 [92]. NCMS funds are pooled at the county level. This scheme is financed by enrollees' premiums (about 20%) and generous subsidies from both central and local governments (about 80%). Annual government subsidies per enrollee increased from 20 Chinese yuan (about US\$2.9) in 2003 to 380 Chinese yuan (about US\$55.2) in 2015. The per capita fund of NCMS is US\$61.2 [93].

Furthermore, a medical assistance programme for poor people has been set up, jointly funded by central and local governments. At the end of 2015, China officially announced the decision to integrate URBMI and NCMS as the urban-rural resident medical insurance (URRMI) [94], marking a commendable milestone towards UHC [95]. In the implementation of this integration, the most critical element was the further extension of funding pools and narrowing of disparities in healthcare services and medications covered in the merged URRMI and UEBMI.

Some ten years have passed since comprehensive health system reform in China, but

studies have suggested that the implementation of the reform might not have been effective in reducing the financial burden of healthcare for households [13], especially those families with chronic disease members [96]. The rate of CHE was 12.9% in China in 2011, higher than rates in other LIMCs [12, 97], while income inequality in CHE occurrence was higher in 2013 compared to that in 2008 in rural areas [98]. In China, the benefits package and degree of financial protection for patients with NCDs vary between the three major insurance schemes [12, 99]. People enrolled in the URBMI and NCMS have lower levels of financial protection than those individuals with UEBMI. The per-person annual fund contribution for UEBMI is about six times higher than that for URBMI, and seven times for NCMS [100]. A study using nationally-representative data from the China Health and Nutrition Survey found that the cost reimbursement level of UEBMI is 25% greater than in the other two health insurance schemes [101]. The NCMS offers the lowest rate of cost reimbursement and covers fewer essential drugs than the other two insurance schemes [102]. Moreover, people living in a rural area have more restricted access to healthcare than the urban population, and have a more substantial financial burden, mainly due to lower funds for NCMS [12, 103]. Meanwhile, fragmentation between the three insurance schemes leads to inequalities in the provision of healthcare and financial risk protection, especially for people with NCDs [12].

At the end of 2015, China had officially announced the merger of URBMI and NCMS [94], representing a commendable milestone towards universal coverage [95]. China's National Healthcare Security Administration and local health insurance bureaus were set up to manage basic health insurance schemes in 2018. Consolidation of NCMS and URBMI was initiated because of the similarities in their funding sources and levels [12]. Despite these advances, the current health insurance system still leaves much financial risk for households to bear, and a high incidence of impoverishment. People enrolled in URBMI and NCMS enjoy a lower level of financial protection than those with UEBMI; it is a scheme limited by annual reimbursement limits, an incomplete list of covered drugs, and other issues. In the implementation of this integration, the most critical element was the further extension of funding pools and narrowing of disparities in services covered and medications included between the Unified Resident Health Insurance (URHI) and UEBMI [12]. Some developed provinces were able to pilot the consolidation of NCMS and URBMI with UEBMI as well, plus further merging the

universal benefit packages. Rural households, unemployed residents, and the elderly in China will significantly benefit from the consolidation of these insurance schemes.

In theory, social health insurance schemes should reduce inequalities in the utilisation of health services while financially protecting people living in disadvantaged communities; however, there is no nationally representative longitudinal study in place to assess the changes over time in inequalities in healthcare utilisation and financial protection among patients with NCDs in China following the new comprehensive reform of China's health system. At the national level, no longitudinal research has examined the impacts of health insurance schemes on these inequalities among the highly vulnerable population, namely, patients with severe chronic disease or multimorbidity. Based on a national representative longitudinal survey, therefore, my research aims to assess the degrees of inequality and trends in inequality in the utilisation of health services, financial protection and health outcomes among people with NCDs in China.

2.3 Study of inequality in healthcare delivery and utilisation

China has experienced a tremendous socioeconomic change in more recent decades, influencing the lifestyles of Chinese citizens [47]. NCDs, significant contributors to socioeconomic inequality in health, could also be risk factors in variations in healthcare, service use, and financial protection. Changes in China's health system have nevertheless been remarkable in the past decade in efforts to achieve universal health coverage by 2030. A few studies from China have reported growing inequalities between rural and urban areas in health outcomes, service utilisation and financial burden [13]; however, limited research has examined the socioeconomic disparities in healthcare use and financial risk protection among people with NCDs in China following the new health system reform. I refer to existing studies and reviews published in the international literature. The following two sections will provide a review of the literature on socioeconomic inequalities in health service use and financial risk protection among the Chinese population, with a particular focus on people with chronic diseases.

2.3.1 Concepts and measurements related to health inequity

Inequity and inequality are easily confused but cannot be interchanged. The former refers to unfair, avoidable differences between individuals and population groups. The latter refers to the uneven distribution of health or healthcare as a result of socioeconomic factors or the lack of resources [104]. In terms of the concepts, definitions and measurements related to inequity and inequality in health and healthcare, please see panel 2. In the field of health economics and public health, the concentration curve (CC) and concentration index (CI) are standard tools commonly used in measuring inequality in health and healthcare [105, 106]. Generally, inequality or inequity can be categorised in two ways: horizontal equity means "equal treatment of equals, regardless of the socioeconomic characteristics", and vertical equity refers to "appropriate unequal treatment of unequal" [105, 107]. **(Panel 2)** In empirical studies, horizontal inequity is more often used to analyse whether equitable access to healthcare has been provided for people who have the same needs; however, vertical inequity is applied to measure the progressivity of financial contributions to the health sector at the national level [106].

Panel 2: Definitions and measurements regarding health inequality

Health inequality

"Health inequalities" are defined as the differences, variations, and disparities in health status, or the distribution of health determinants between specific population groups. Health inequalities mean the same thing as health disparities [108]. They are simply differences in the presence of disease, health outcomes, or access to health care between population groups. Health inequality is a descriptive term that need not imply moral judgment. [109]

Health inequity

"Health inequities" are defined as systematic differences in people's health that are deemed to be unfair or stemming from some form of injustice [109]. Health inequities are rooted in social injustices that make some population groups more vulnerable to poor health than other groups.

Horizontal equity

"Horizontal equity" is defined as equity between people with the same health care needs [105]. It means "equal treatment for equal medical need, irrespective of other characteristics

such as income, race, place of residence, etc. [110].

Vertical equity

"Vertical equity" is defined as equity between people with unequal needs who should receive different or unequal health care [105]. It means unequal treatment of unequal [107].

Concentration curve

The "Concentration curve" (CC) plots shares of the health sector variable against economic status or living standards. "It plots the cumulative percentage of the health-related variable (y-axis) against the cumulative percentage of the population, ranked by economic level or living standards, beginning with the poorest, and ending with the richest (x-axis)." "CC can be used to identify whether socioeconomic inequality in some health sector variable exists and whether it is more pronounced at one point in time than another or in one country than another." [105]

Concentration index

The "Concentration index" (CI) is defined as twice the area between the CC and the 45-degree line (the line of equality for which there is no socioeconomic-related inequality). "The convention is that the index takes a negative value when the curve lies above the 45-degree line, indicating the disproportionate concentration of the health variable among the poor, and a positive value when it lies below 45-degree line." [106]

2.3.2 Socioeconomic inequalities in healthcare delivery: evidence from global studies

Since 1990, several studies have tracked inequalities in health service utilisation in both developed and developing countries or regions, including South Korea, Japan, USA, UK, Thailand, India, Brazil, Chile, Mexico, and Zambia. Previous studies showed that improvements in pro-rich inequality in healthcare utilisation had been achieved. Evidence from the Korean National Health and Nutrition Examination Survey of 2005 and 2010 found that equitable distribution of overall healthcare utilisation with pro-poor tendencies in South Korea. Moreover, access to general hospitals was substantially improved over the period from 2005 to 2010, although the length of stay in general hospitals shows a pro-rich tendency [111].

A study in Japan shows that the values of CI were almost constant (between -0.032 and

-0.052) across the years from 1986 to 2007 [112]. Overall, CIs for healthcare use were negative throughout the study period, indicating that the poor enjoyed relatively more utilisation of health services. In Thailand, for example, several studies revealed a decrease in trends in healthcare inequalities due to expanded coverage of health insurance [113], as one example illustrates: both outpatient services and inpatient services utilisation favoured the poorer population [11].

An English study also showed no inequality or pro-poor trends in healthcare use in some fields, such as day-care and inpatient hospital utilisation, after allowing for need during 1998-2000 [114]. The evidence from the National Health Service (NHS) 2001-2008 found pro-poor inequality in both outpatient and non-emergency inpatient hospital care in each year of the period, after allowing for need variables, such as age, gender, size of the population, disease registries, and so forth [115]. Inequality in the use of other healthcare services has also been studied. Analyses of data from the 1998 to 2001 US National Health Interview Survey showed that ambulatory care utilisation was disproportionately concentrated among the poor due to their greater healthcare needs [116]; however, when the need was accounted for, ambulatory care use was found to favour the population with higher incomes.

Several studies also show great pro-rich inequality in utilisation of health services. Evidence from several developing countries and countries in transition (Burkina Faso, Zambia, Kazakhstan, Guatemala, and South Africa) suggested that people with better living standards were more likely to use outpatient services and receive medical treatment than the poor [117]. An Indian study showed absolute disparities across states in outpatient care (from 4.42% to 21.72%) and inpatient care (from 1% to 10%) in 2004 [118]. Pro-rich inequality was evident in both outpatient and inpatient care in the majority of states in India and between rural and urban areas [118]. Another study based on the same survey also found a pro-rich distribution in hospitalisation rates in three northern states (Haryana, Punjab, and Union Territory of Chandigarh) in India, indicating poor utilisation of health services by disadvantaged households [119].

Some studies also focused on older people, comparing them with the younger population. Evidence from nationwide surveys in India between 1995 and 2014 showed that the pro-rich inequity in outpatient care was higher for the older population (CI: 0.085) than for the younger population (0.039; 0.034, 0.043) in 1995-96, but by 2014 this inequity had become similar [120]. Results from the World Health Organisation's

Study of global AGEing and adult health (SAGE) revealed however that the standardised concentration index for healthcare utilisation was 0.364, indicating significantly frequent use of health services by wealthier older adults [121].

To explore the sources of inequality in healthcare service utilisation, the decomposition analysis approach for CI has been often applied in healthcare inequality studies. In terms of factors related to inequalities in healthcare use, several studies reported that household wealth conditions, usually measured by annual income or consumption expenditure per capita, play the most crucial role in service use [111-113, 118-122]; however, several results from international cross-country studies examining healthcare inequality show variation from country to country, which might be due to the different healthcare systems, social health insurance schemes, or financial protection systems, and many other factors at national, local, or individual level.

Decomposition of CIs from a Japan study, for example, revealed that health and income status were significant contributors to widening inequality, which suggests that changes in the economic situation of households and the co-payment policy in Japan from 1986 to 2007 were responsible for the decrease in disparities in use of healthcare [112]. Another study in Iran found that the level of household wealth contributed the most to inequity in the utilisation of health services and was the only factor related to inequity in all types of healthcare, whether delivered by a general physician, specialist, or health worker [122]. Moreover, evidence from South Korea implied that the non-need variables, such as living standard, health insurance, and education level, were critical, contributing to pro-rich inequality in utilisation of healthcare [111].

2.3.3 Socioeconomic inequality in healthcare delivery in the general population: evidence from China

In this field, the number of Chinese studies related to socioeconomic inequality or inequity in healthcare use has increased since 2000, following an international research trend since 1990. A trends study using the Chinese National Health Services Surveys (NHSS) conducted in 2003 and 2008 revealed that inequality in outpatient care use reduced gradually in rural China from 1993 to 2008 (need-standardised concentration index: 0.049 in 1993 versus need-standardised concentration index: -0.011 in 2008) [123]. The gap in outpatient service use between the poorest and wealthiest quartiles

decreased in China between 2003 and 2011, as evidenced by another national trend study based on three rounds of the NHSS [13].

Compared with outpatient care usage, however, the use of inpatient care was more unequal. For utilisation of inpatient service, the concentration index is 0.053, 0.154, 0.233 and 0.131 in 1993, 1998, 2003 and 2008, respectively [123]. It suggested that inequality in the use of inpatient care increased dramatically between 1993 and 2003, and then decreased significantly between 2003 and 2008. In rural China, even with comparable healthcare needs, rich rural residents utilised more healthcare services than poor rural residents. They also found that household income was the principal determinant of pro-rich inequality in inpatient admission [123].

These studies occurred at the national level, but most researchers conducted health service inequality analysis at the provincial level. Wang and his colleagues found that there was pro-rich inequality in the probability of health service utilisation in Gansu province (CI outpatient, 0.067; CI inpatient, 0.011) and outpatient care in Zhejiang province (CI, 0.016), but a pro-poor inequality in inpatient care in Zhejiang province (CI, -0.090) [124].

A study in the Sichuan province of China found that utilisation of healthcare was concentrated among more affluent users [80]. Pro-rich inequity in healthcare utilisation increased after the UHC reform launched in 2009. People with better living standards were considerably more likely than the poor to seek care at hospitals rather than at clinics or health centres. Health insurance enrolment became the main driver of pro-rich inequity in the level of healthcare utilisation after the reforms [14].

Evidence from a study in Shaanxi Province also revealed the effects of China's urban basic health insurance schemes on the equity of health service use [125]. For people covered by UEBMI and uninsured citizens, the horizontal inequity indexes of outpatient care are 0.126 and -0.051, respectively, and the horizontal inequity indexes of inpatient care are 0.122 and 0.275, respectively. In terms of the URBMI, the horizontal inequity indexes of outpatient care are -0.159 and 0.097 for the URBMI insured and uninsured citizens, and the horizontal inequity indexes of inpatient care are 0.193 and 0.320 respectively [125].

In Shaanxi Province in China, the UEBMI increased the pro-rich inequity of outpatient care use, while the URBMI increased the pro-poor inequity of outpatient care use. The

two public health insurance schemes reduced the pro-rich inequity of inpatient care use [125]. Recent attempts in China to increase coverage of public health insurance and primary care might be a contributing factor in counteracting the inequity of service utilisation [17], but more fair benefit packages across insurance schemes and better delivery strategies still need to be further tested and scaled up to reduce future inequity in healthcare use in China.

2.3.4 Socioeconomic inequality in healthcare in the Chinese population with NCDs

Most of the previous studies in China examined the socioeconomic inequalities in health and healthcare among the general Chinese population, but there has been limited research focused on people with NCDs in China. To date, there has been no longitudinal study to systematically examine the trends in inequality in health service utilisation among individuals with NCDs at the national level in China. Only one national-level study has investigated socioeconomic inequality in healthcare use among patients with chronic diseases in China, that conducted by Xie and colleagues using the Horizontal Inequity Index (HI) and a cross-sectional design in 2008 [17].

Their study found more substantial pro-rich inequity in the utilisation of healthcare among patients with chronic diseases than among the general population in China. A higher level of pro-rich inequity (Horizontal inequity index, 0.253) was found in inpatient care utilisation compared to that in outpatient care (Horizontal inequity index, 0.089) [17]. Household income status could be the most critical factor in inequity in both outpatient and inpatient service use among NCD patients. Inequality in healthcare use amongst the population with NCDs in China remains largely determined by the financial capacity of patients. Current public health insurance schemes in China are insufficient to address this inequality.

Cross-sectional studies may be unable to thoroughly control the heterogeneity, unlike longitudinal studies with panel datasets; however, there is no study focusing on the trends in inequality in healthcare utilisation after China's health system reform launched in 2009. This PhD project, therefore, aims to examine trends in socioeconomic inequalities in healthcare utilisation among people with NCDs from 2011 to 2015 in China, based on a national longitudinal survey. We also seek to explain the extent of socioeconomic inequalities in health service utilisation and to identify the key

contributors to the inequality in healthcare. Unlike in existing studies, this project thus proposes a measure of the reform policies' effect on inequality in utilisation of healthcare among the NCD population. It establishes a mechanism for measuring how implementation of health reform strategies affects inequality in healthcare use and tests whether improved benefits packages in public insurance schemes can reduce economically-related inequality in healthcare use.

2.4 Study of inequality in financial risk protection

Universal health coverage means that everyone can use the essential health services they need, while also ensuring that the use of these services does not expose the users to financial hardship [126]. In other words, in addition to equity of access to high-quality care, it means that the cost of using care does not put people at risk of financial harm. UHC has become a major goal for health reform in many countries and a priority objective of WHO [126,127]. Recently, there is growing attention being paid to the financial burden of chronic disease and NCD multimorbidity [48-50], particularly in LMICs, where already fragile healthcare systems are further stretched by the dual burden of NCDs and infectious diseases [40]. I conducted a literature review, using the keywords “socioeconomic inequality”, “socioeconomic inequity”, financial risk”, “economic burden”, “financial protection”, and/or “China”. This section provides an overview of the evidence from international studies and Chinese studies that focused on socioeconomic inequality in financial risk protection.

2.4.1 Socioeconomic inequality in financial protection: evidence from international studies

Previous studies have revealed the decrease in degree of inequality in financial risk protection due to the expanded coverage of health insurance [11,113]; for example, a few reviews from Thailand found that there was a decrease in trends in inequality in financial protection due to the expanded coverage of health insurance [113]: direct payments for healthcare by household, for instance, declined gradually from 45% of total health expenditure in 1994 to 20% in 2006, and even fell below 15% in 2010 [11]. After the achievement of universal health coverage, there was also a considerable decrease in the number of households impoverished due to healthcare costs [128]. In

India, the occurrence of catastrophic health expenditure and health impoverishment was 18.2% and 8.0% in 2010, respectively [129]. A cross-sectional survey in Nepal showed that about 14% of households faced CHE, with the threshold set at 40 % of the household's capacity to pay [130]. A study in the West of Iran indicated that the rate of households facing CHE was 4.8% after the implementation of its Health Sector Evolution Plan in 2014 [131]. In relation to income-related inequality, the better-off are more likely to spend a large fraction of total household resources on healthcare in most low- to middle-income countries, such as Vietnam, Nepal, Kenya and Georgia [132], whereas in Kyrgyzstan and Vietnam, where there are no exemptions for the poor from charges, they are as likely, or even more likely, to incur catastrophic payments. [132]

2.4.2 Socioeconomic inequality in financial protection: evidence from China

Several Chinese studies have examined socioeconomic inequalities in healthcare utilisation and changes in healthcare inequality among the general population and people with chronic diseases [14, 15, 17, 125]. Some previous studies have also evaluated the degree of catastrophic health spending and/or impoverishment due to healthcare payment at the sub-national level or in rural areas in China [124, 133-135]; however, most of them are cross-sectional in design which may not be well suited to capturing changes in financial protection within the same population over time, and which cannot ensure heterogeneity.

There is a limited number of longitudinal studies assessing trends in financial protection in the ten years following China's healthcare reform. Since 2009, very few studies have focused on the trends in financial protection in China at the national level; they are all cross-sectional in design. Meng and colleagues, for instance, conducted a cross-sectional study estimating the trends in access to health services and financial protection in China between 2003 and 2011. Using data from the National Health Services Survey, they observed that rural households (13.8%) experienced CHE more often than urban households (10.9%), at the 40%-threshold [13]. With the data obtained from the National Health Services Survey (NHSS) in Shaanxi Province, Xu et al. concluded that the overall level of CHE occurrence in households with chronic disease patients remained stable between 2008 and 2013 at about 24% [136]. Specifically, the incidence of CHE in rural areas declined from 29% to 24% [136]. Long and colleagues, who assessed the changes in health expenditure in China in the 2000s, found that health

system reform improved affordability for essential healthcare [22]. Another study performed by Xie and colleagues explored the impact of the NCMS on the trends in catastrophic health expenditure in Chinese rural households from 2003 to 2013 [23]. The changes over the last decade in socioeconomic disparity in financial protection in China, and their extent, nevertheless remains unclear.

In the context of the sustainable development goals (SDG) agenda, advancing UHC is the centrepiece of health policy in many countries [10]. To achieve UHC, some developing countries have conducted a series of health system reforms to increase access to primary healthcare and to reduce the financial burden of illness [11]. China officially launched a new healthcare system reform which aimed to provide every Chinese citizen with access to healthcare at an affordable cost by establishing the universal provision of safe, effective, convenient, and low-cost services. While this comprehensive reform resulted in a significant increase in health insurance coverage [12], reliable performance in one aspect of UHC (proportion of the population covered) did not guarantee stable performance in the other (depth of financial protection). The benefits packages and degree of financial protection still varied across public insurance schemes in China, especially for people with NCDs and multimorbidity [12]. The critical feature of UHC, therefore, financial risk protection and its inequality in NCD population, needs to be further examined in China following its health system reforms.

In summary, most previous Chinese studies based on cross-sectional analyses or early period datasets before 2009 [137–140] may not reflect the longitudinal effects of the ongoing reform of China's healthcare system. Some studies have examined healthcare inequalities in the general Chinese population and compared the differences between rural and urban residents in financial protection. Following China's health system reform, however, the changes in, and the extent of, socioeconomic disparities in healthcare and financial protection in NCD population are still unclear. Furthermore, there is a dearth of evidence on the impact of chronic disease multimorbidity on health service use, out-of-pocket spending, and catastrophic health expenditure by socioeconomic groups and populations covered by various social health insurance schemes in China. Such knowledge gaps limit the capacity to identify people at particular risk of multimorbidity or to develop specific interventions to prevent multimorbidity. Research is urgently required to generate better evidence to improve healthcare, patient outcomes, and financial protection for people with severe chronic

diseases and multimorbidity.

Chapter three: Methodology for research

3.1 Research framework

3.1.1 A conceptual framework for universal health coverage

Universal health coverage means that all individuals and communities can use the health services they need without suffering financial hardship linked to paying for these services [141]. The 2010 World Health Report's conceptual framework for UHC suggested three dimensions, namely, the percentage of the covered population (population coverage), the extent of covered health services (service coverage) and the part of the total costs covered through insurance or other risk pooling mechanisms (financial coverage) [142]. The blue box below shows the situation of a hypothetical country or region, with 50% of the covered citizens, 50% of the health services, but less than 50% of the covered costs. (**Figure 3.1**). To achieve the goal of UHC, this country or region still needs to extend coverage to more populations, provide more available healthcare services, and pay a higher percentage of the healthcare-related costs [141]. The extent and distribution of coverage across population groups are reflected by one or more of these three dimensions, which suggests that there is inequality in healthcare coverage across socio-economic groups, gender, age, rural-urban residence, region, and migrant status.

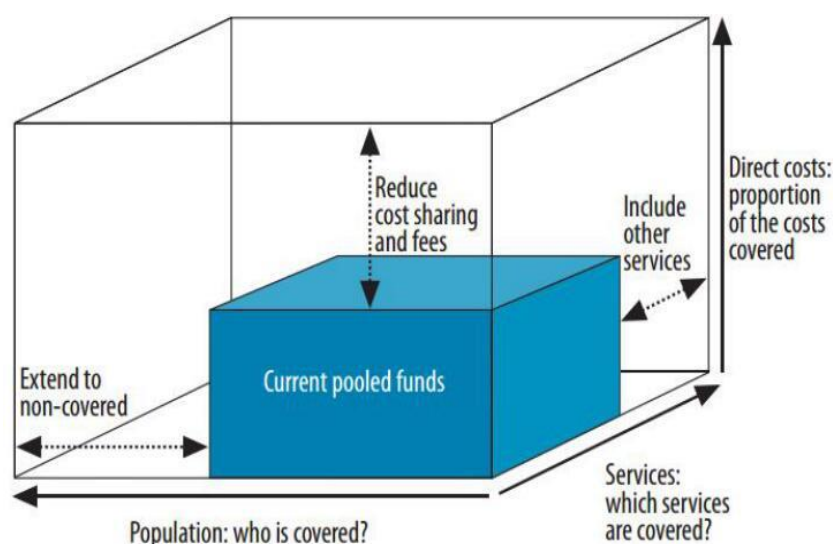


Figure 3.1 Three dimensions towards universal health coverage

(Source: The World Health Report 2010: Health Systems Financing: the Path to Universal

Coverage. WHO. 2010)

The three-dimension framework has been widely accepted, and the importance of systematically monitoring UHC has been highlighted in the 2013 World Health Report [143]. Nevertheless, there is lack of measurable indicators and empirical evidence for tracking progress in UHC. How should progress towards UHC be monitored at the country level? For answering this question, “the most useful metric for monitoring progress in UHC should encompass the multifaceted nature of UHC [144, 145].” To measure service coverage in a country, a concept of Effective Coverage (EC) was noted [144]. EC is defined as “the fraction of potential health gain that can be delivered to the population through a specific intervention or health system, given its capacity [145].” It can be measured for a single, or multiple interventions, and/or for the whole health system [146]. In contrast to crude coverage of services, which focuses mainly on healthcare access or use, EC is a metric that unites intervention need, use, and quality. The comprehensiveness of this metric makes it more suitable for tracking the progress in attaining UHC [147–150]. In this thesis, the concept of effective coverage has been used to measure the effectiveness of interventions on chronic diseases, taking hypertension as an example. (For details of calculations, please refer to **Chapter 4**).

3.1.2 Framework for this study

The definition of UHC embodies the equity in access to health services, the quality of healthcare received and financial risk protection [141]. The model recommended by WHO offers a deep understanding of three main dimensions when moving towards UHC. This research is based on this three-dimensional framework for UHC, and also focuses on health outcomes or the effective coverage of healthcare services. In the context of China, I developed a research framework for this study based on the concept of UHC and effective coverage. (**Figure 3.2**) There are several potential factors affecting health service utilisation and financial risk protection among patients with chronic conditions, at the individual level and the macro environment or health system level. Several variables (e.g. age, gender, level of education, household wealth status, behaviours/lifestyles and number of chronic diseases, etc.) have been identified as the key factors influencing utilisation of healthcare services and financial protection among people with NCDs. In addition to these potential need-factors, there are critical factors

related to health insurance that could not be ignored, in order to achieve UHC and equal health outcomes.

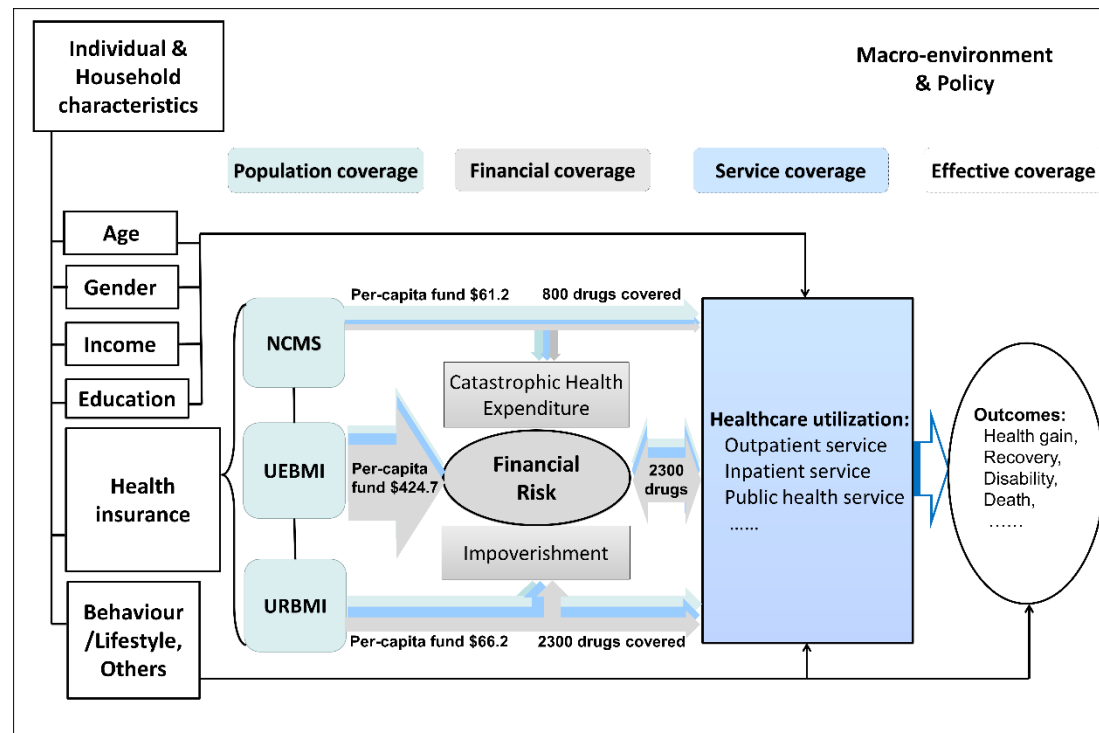


Figure 3.2 Relationships between healthcare utilisation, financial protection and health outcomes in China, based on dimensions of universal health coverage

Note: NCMS: the rural new cooperative medical scheme, UEBMI: the urban employee basic medical insurance scheme, URBMI: the urban resident basic medical insurance scheme. (Source: The author)

China’s health insurance system reforms are more concerned about the demand side (populations in need), to reduce the economic burden of households with members suffering severe chronic diseases and improving financial risk protection for these households. Although it has nearly achieved the universal coverage of the Chinese population by three public health insurance schemes since 2011, the benefits packages and extent of financial protection are not equal across the schemes in current China [9]. (See **panel 1** in the literature review chapter) For example, the per-person annual fund contribution for UEBMI is about six times higher than that for URBMI, and seven times for NCMS [19]. The reimbursement is 10% lower, and health service coverage is smaller for NCMS than for the other two insurance schemes [20].

There could be interaction effects between financial risk and health service utilisation, which even result in a vicious cycle, during the long-term treatment of patients with chronic diseases. For individuals with lower socio-economic status, the inpatient care could be more likely to lead to health expenditure catastrophe or impoverishment due to high OOPe; In the next stage, the individuals or households suffering CHE or medical impoverishment, would further reduce the use of health services, even if they do need it, and then negatively influence the disease rehabilitation and health outcomes of patients with NCDs. One of the aims of this study is to examine the association of multiple chronic diseases with health service use and financial protection, and whether these relationships varied by economic groups and current three health insurance schemes in China.

3.2 Indicator sets and variables

This study includes three sets of indicators to measure the extent of health service utilisation, financial protection and health outcomes among Chinese individuals with NCDs.

3.2.1 Utilisation of health services

The utilisation of health services was measured by the utilisation of outpatient service, inpatient service, and public health service. Surveyed respondents were asked about their utilisation of healthcare services: “Whether or not they had an outpatient visit in the past month; and any hospital stay in the past year?” “How many times did you visit a general hospital, specialised hospital, clinic or other medical facilities for outpatient care in the past month? Also, how many days did you stay in hospital over the past year?” In this study, the public health service refers to health education/advice provided by health professionals, which includes weight control, exercise, healthy diet, and smoking control.

3.2.2 Financial risk protection

Financial risk protection is measured by CHE and impoverishment due to health care. In the thesis, CHE is measured by using the indicators reported by Wagstaff et al (2003). [151]. Although there is no consensus on the threshold value, this study estimates the

CHE by applying the threshold of 40%. The capacity to pay is defined as the non-food household consumption expenditure, which is considered as the denominator. CHE occurs when the self-paying health expenditure equal or exceeds 40% of non-food household consumption expenditure [151].

This project calculates the proportion of households impoverished due to large healthcare payment. The impoverishment due to healthcare payment means that a non-poor household is impoverished after paying for health care. It is also defined as a binary variable, taking the value of one when household consumption expenditure per capita is equal to or higher than the poverty line, but lower than this line after subtracting per-capita household health spending. This study used the international, 1.90 US\$ (12.86 CNY in 2010) per day, poverty line of consumption expenditure, which is defined by the World Bank and often referred to as the extreme poverty line. It is an update of the old \$1.25 per day poverty line and underlies SDG target 1.1 [152]. After adjustment of the 2010 exchange rate; this poverty line is equal to 4694.65 CNY per year in 2010 price [153].

3.2.3 Indicators related to health outcomes

In this study, hypertension is defined as survey participants having systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg for an average of 3 readings taken consecutively, and/or their being on antihypertensive medication treatment for raised blood pressure [154, 155]. Among hypertensive adults identified, those whose systolic blood pressure was less than 140 mmHg and those whose diastolic blood pressure was less than 90 mmHg were considered as effectively controlling their hypertension [156]. In addition to calculating the proportion of fully controlled hypertension, this study also uses the WHO recommended metric “effective coverage”, as a health outcome indicator, to examine the effectiveness of hypertension treatment.

Multimorbidity is defined as the presence of two or more chronic health conditions in a single individual [73, 74]. A total of eleven NCDs were used to measure multimorbidity, including diagnosed hypertension and ten self-reported diagnosed chronic diseases (diabetes, dyslipidaemia, heart disease, stroke, cancer, chronic lung disease, digestive disease, liver disease, kidney disease and arthritis). We counted the number of NCDs for each participant to identify those with multimorbidity.

3.3 Data sources:

3.3.1 The China Health and Retirement Longitudinal Study

The CHARLS is a longitudinal survey of middle-aged and elderly populations (people aged 45 years and over) in China, with representativeness at the national level [157]. The study aims to provide a high quality, publicly available and comprehensive database to inform scientific and policy research. To ensure the adoption of best practices and international comparability of research results, CHARLS is harmonised with leading international research studies in the Health and Retirement Study (HRS) model. The CHARLS baseline survey had been conducted in 2011 and included 17,708 individual participants from 150 districts or counties across 28 provinces in China [157]. The follow-up survey is conducted every two years. The CHARLS chose all samples with the sampling technique of multistage probability. The CHARLS randomly chose a total of 150 district/county-level units through the probability-proportional-to-size (PPS) sampling method from a sampling frame containing all district/county-level units except Tibet. **(Figure 3.3)** There is a flow diagram with both household and individual response rates for the CHARLS baseline survey. **(Figure 3.4)**

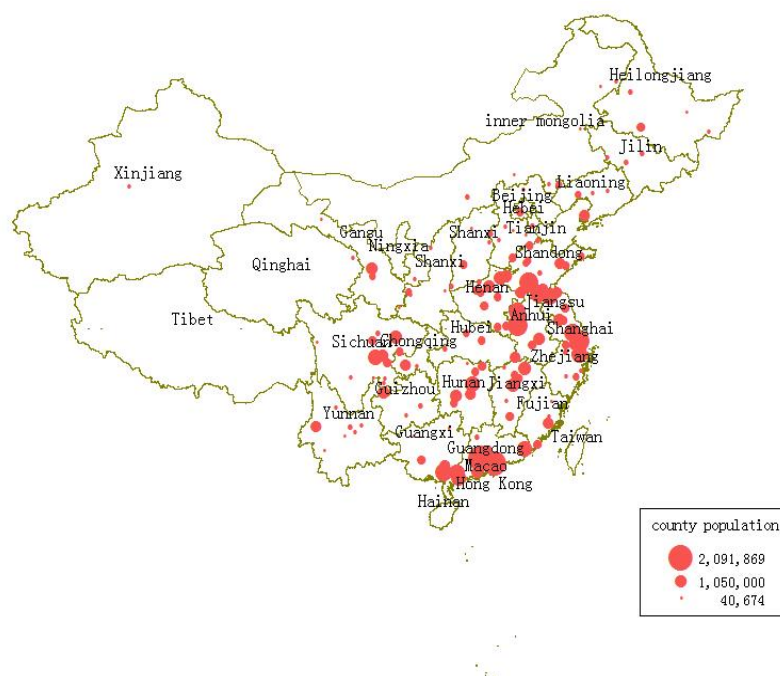


Figure 3.3 The distribution of sampled counties and districts of the China Health and Retirement Longitudinal Study

(Source: Yaohui Zhao, et al., the CHARLS user's guide of national baseline, 2013.)

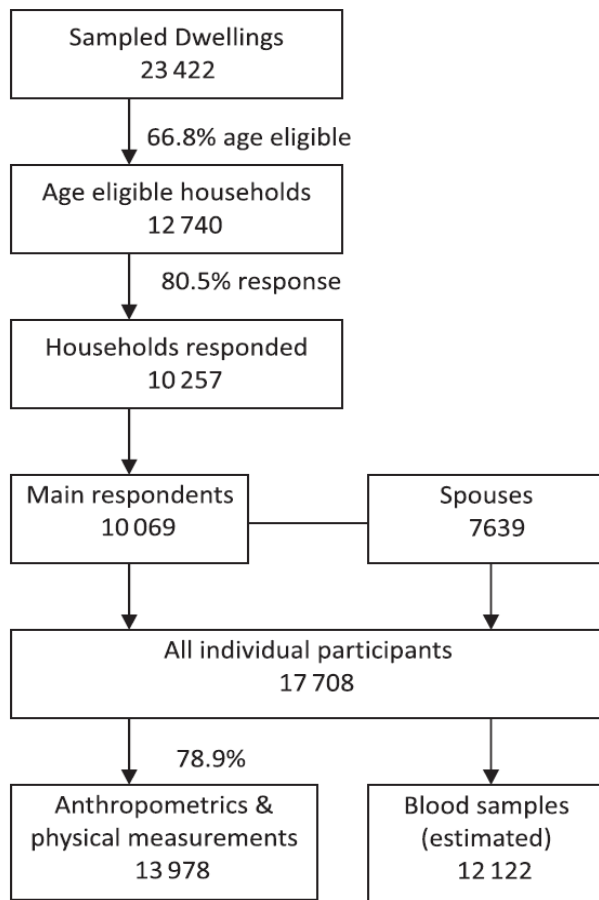


Figure 3.4 The response rate for CHARLS national baseline survey

(Source: Zhao Y, Hu Y, Smith JP, et al. Cohort profile: the China Health and Retirement Longitudinal Study. 2014.)

CHARLS is a comprehensive survey at the national level. Core contents of CHARLS questionnaires include demographics, family structure, general health status and functioning, physician-diagnosed chronic diseases, lifestyle and health-related behaviors (smoking, drinking, physical activities), mental health condition (depression), health vignettes, healthcare use and health insurance, employment/retirement, income and consumption, and assets (at the individual and household level) (**Table 3.1**). CHARLS has collected the information of non-blood bio-markers, including height, weight, blood pressure, pulse rate, lung peak flow rate, and balance measures. The local Centers for Disease Control and Prevention (CDC) laboratories conducted the complete blood count test. Besides, the venous blood samples have been collected and assayed for hsCRP, HbA1c, glucose, total cholesterol, triglycerides, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, creatinine, blood urea nitrogen, and

cystatin C [158]. (Further details are given in Appendix C: The baseline questionnaire of CHARLS.)

Table 3.1 Summary of data collected in baseline questionnaires of the China Health and Retirement Longitudinal Study

Demographic information (main respondent and spouse)	Cognition depression
Birth date and birth place	Health vignettes
Residence and migration	Health care and insurance
Hukou information	Current and past medical insurance
Education	Health care utilization: outpatient and inpatient care
Marital status and history	Health care costs and payment methods
Household roster (nonrespondent household members)	Work, retirement and pension
Sex, birth date, marital status	Current job status
Relationship with the main respondent	Work history
Hukou information ^a	Detailed information on current main job
Education	Unemployment and job search activities
Family	Most recent job (if currently not working)
All parents and children: demographics	Retirement
Education	Pension
Occupation	Income, expenditures and assets
For deceased: time of death	Household income and expenditures
Siblings: simple aggregate information	Household assets
Interactions of each family member:	Individual assets
Time spent caring for parents	Housing characteristics
Visits from children	Construction materials
Two-way financial exchanges with parents and children	Home facilities
Health status and functioning	Cleanliness and temperature
Self-reported general health	Interviewer observation
Doctor diagnosed chronic and infectious disease	Interference during interviews;
eye, hearing, oral health, pain	attitude and comprehensive ability of respondent
accidents, fall, fracture	
Lifestyle and life behavior including sleep, physical activity, social connectedness, diet, smoking and drinking	
Functional limitations and helpers	

(Source: Yaohui Zhao, et al., the CHARLS user's guide of national baseline, 2013.)

3.3.2 The China Family Panel Studies

This study also used the data from four rounds of the China Family Panel Studies (CFPS) conducted in 2010, 2012, 2014 and 2016, respectively, which are funded by 985

Program of Peking University and carried out by the Institute of Social Science Survey of Peking University. The CFPS survey consists of a nationally representative sample of Chinese adults aged 16 years and above; It aims to reflect the well-being of the Chinese people, covering substantive areas such as economic activities, educational attainment, family relationships, migration, and physical and mental health. The CFPS provides comprehensive data with high quality for academic research and public policy analysis as well [159].

The CFPS baseline survey gathered data across 25 provinces, municipalities, and autonomous regions in China by using the multistage PPS with implicit stratification. Administrative units and socio-economic status are used as the main stratification variables. Within the administrative unit, local Gross Domestic Product (GDP) per capita was used as the ordering index for SES. Each sub-sample in the CFPS is drawn through three stages: county level, then village level, then household stage [160]. The actual sample size was 19,986 households in the 2010 baseline survey. A total of 14,960 households, 33,600 adults and 8,990 youths were successfully interviewed with the response rate of 81.25% and 84.14%, at the household and individual level, respectively in 2010. All the CFPS families and members have been tracked through follow-up surveys in 2012, 2014 and 2016.

For questionnaire design, the CFPS 2010 data consists of data sets based on the community questionnaires, the family roster questionnaires, the family questionnaires, the adult questionnaires, and the child questionnaires. In CFPS, those younger than 16 are defined as children and those over 16 are defined as adults. The child questionnaire and the adult questionnaire are the two types of individual questionnaires designed for these two groups of people. The databases of an adult in different years are mainly used in this study. The main contents of the adult questionnaire are listed in table 3.2. (Further details are given in Appendix D: The family and adult questionnaire for CFPS.)

Table 3.2 The main content of the adult questionnaire of CFPS 2010

(Data source: China Family Panel Studies (2010) User's Manual.

Module	Content
Basic information	Date of birth, birth weight, birthplace, residence, ethnicity, family category, time spent living with parents before age 3 and between ages 4 and 12
Health	Height, weight, self-reported health, discomfort, chronic diseases, experiences

	of hospitalisation, medical expenses, coping with diseases, satisfaction with health care, traditional Chinese medicine, physical exercises, diet, P-ADL, smoking and drinking, sleeping, memory, depression scale, primary health caregiver
Basic tests	Literacy, arithmetic, physical activities
Educational history	Educational attainment, type of schools at different educational levels, time spent at school, when did school end, name of schools, graduated or not, subject and major, educational expectation
Schooling (shared)	The current level of education, type of the school, major, grades, extracurricular tutoring, student activities, subjective evaluations of study and school, educational expectation
Marriage	Current marital status (married/remarried/cohabitating/divorced/widowed), date of birth of the present/last/first spouse/cohabitation partner, time at marriage/cohabitation, pre-marital cohabitation, a channel of initial contact, the reason for the divorce of the last/first marriage
Work	Having a job currently, type of primary job
Personal income	Non-operating income, operating income, financial support from relatives and friends, government subsidies, life satisfaction
Time use	Life, work, study and training, leisure and social activities, commuting
Leisure	Leisure activities and frequencies, way of travel, overseas experiences
Social relations	Help-seeking, confiding troubles, self-reported social status
Subjective measurements	Values, social attitudes, achievement scale

<http://www.iss.edu.cn/cfps/EN/Documentation/js/236.html>)

3.4 Statistical analysis

3.4.1 Concentration curve and concentration index

The Concentration Curve (CC) and Concentration Index (CI) were measured to reflect socioeconomic-related inequalities in healthcare utilisation, financial protection and effective coverage. This study depicted the trends in inequalities in health care and health outcomes through plotting concentration curves at a different time on one graph [161]. The farther the CC lies from the equality line (45-degree line), the higher the degree of inequalities in health service utilisation and financial protection [161]. (Figure 3.5)

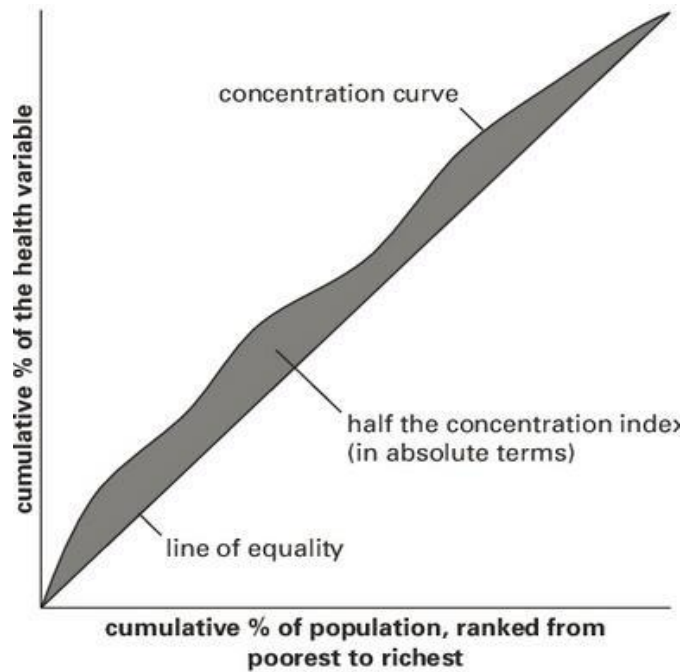


Figure 3.5 The concentration curve and concentration index

(Source: Adam Wagstaff et al. Health Equity and Financial Protection. World Bank.2011.)

This study also calculated CI to measure socio-economic inequalities in health care according to the following equation:

$$CI = 2 / \mu \text{cov}(h, r)$$

Where h refers to the variable in the health sector; μ is the mean of h ; and r refers to the fractional rank of people according to the living standard, from the poorest to richest. The positive CI value represents that health services use is pro-rich, and the negative CI value shows that poor people are more likely to use health services. The CI can quantitatively reflect the degree of equality. Zero indicates no socio-economic inequality in the health sector. Similar to the concentration curve, the higher the absolute value of CI , the worse for the people with lower socio-economic status [162].

3.4.2 Multivariable regression analysis

This doctoral research contains five sub-projects. In chapter 4 (the first sub-study), correlates of treatment coverage and effective coverage for hypertension were analysed by using multivariable logistic regression models. An ordinal logistic regression model

was applied to identify the correlates of effective coverage for hypertension.

In chapter 5 (the second sub-study), given that treatment adherence and the within-person blood pressure can easily change over time, fixed-effects models (FEM) were performed to measure the impact of medication treatment on the reduction of blood pressure among those individuals with hypertension by using linear regression analysis.

In chapter 6 (the third sub-study), for panel analysis based three waves of CHARLS datasets, random-effects logistic regression models were applied to examine the impact of regional factors on hypertension care.

In chapter 7 (the fourth sub-study), this research used random-effects logistic regressions to examine the associations between socio-economic status and the presence of multimorbidity, adjusting for confounding variables. Random-effects negative binomial regression models were performed to investigate the association between the number of NCDs and the frequency of outpatient visits and inpatient service use. The random-effects logistic regression model was applied to estimate the association between the number of NCDs and the incidence of CHE.

In chapter 8 (the fifth sub-study), this research applied multivariable logistic regression models to examine the impact of household NCD members on CHE and health impoverishment (binary outcome variables), based on the data from the CFPS survey in 2016. Several variables of the household head were also taken into account, including gender (female, male), age (<45, 46–60, 60+), marital status (married and partnered, single, and other), education (illiterate, primary school, middle school, college and above), employment status (yes, no), and having health insurance (yes, no).

Overall, for the logistic regression analysis, the study reported the odds ratios (OR), and for the linear regression and negative binomial regression analysis, the study reported the coefficients and 95% confidence intervals (CI). All the statistical analyses were conducted using STATA 15.0. P values less than 0.05 were considered statistically significant.

Chapter four: Effective coverage of NCDs treatment in China (Hypertension)

Summary

This study aimed to assess treatment coverage and effective treatment coverage for hypertension in China, using a nationally representative sample of Chinese adults. This research used the baseline and first follow-up surveys of the China Health and Retirement Longitudinal Study conducted between 2011 and 2013. Both effective treatment coverage and treatment coverage of hypertension care were calculated, and key determinants were identified by using multivariable logistic regression models. The findings suggested that the level of effective treatment coverage of hypertension in China was still very low. The Urban Employee Health Insurance Scheme played a significant role in improving the treatment coverage and effective coverage for hypertension care. In the process of China's health system reform, health and healthcare equality should be emphasised and enhanced by offering more equitable benefits packages across social health insurance schemes in China.

Title: Effective coverage for hypertension treatment among middle-aged adults and the older population in China, 2011 to 2013: a nationwide longitudinal study

Short title: Effective coverage for hypertension treatment in China

Authors: Yang Zhao^{1,2}, Ajay Singh Mahal¹, Shenglan Tang³, Tilahun Nigatu Haregu^{1,2}, Brian Oldenburg^{1,2}

¹ The Nossal Institute for Global Health, The University of Melbourne, Melbourne, Australia.

² WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs, Melbourne, Australia

³ Duke Global Health Institute, Duke University, Durham, North Carolina, USA.

Correspondence to:

Dr Yang Zhao

The Nossal Institute for Global Health, The University of Melbourne; WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs
Level 5, 333 Exhibition Street, Melbourne, Victoria 3010 Australia

E-mail address: zhaoyang001@hsc.pku.edu.cn

4.1 Introduction

In the context of sustainable development goals (SDG), advancing universal health coverage (UHC) represents the centrepiece of health policy in many countries [1]. A key goal is the reduction in premature mortality from non-communicable diseases (NCDs) by one-third by 2030, mainly through prevention and treatment [2]. Like most countries in the world, China has recently experienced a very rapid epidemiological transition from a preponderance of infectious disease to NCDs, including hypertension, diabetes, cardiovascular disease and cancers [3]. One illustration of the health challenges is the prevalence of hypertension having risen to around 44.7% among Chinese adults by 2017. In China, the number of people with hypertension has steadily increased over time [4]; however, only 35.7% of patients with hypertension were aware of their condition, and less than 18% of those people were effectively controlling their hypertension [5-7].

To cope with the challenges of NCDs in China, the National Public Health Initiative was instituted in 2009, promoting healthcare equity and strengthening access to primary public health services. It included improvements to disease screening and management of hypertensive individuals. The State Council of China also launched a comprehensive health system reform in 2009 to increase access to primary health care and to lower the financial burden of illness [8]. It resulted in a significant increase in health insurance coverage, with 95.7% of the Chinese population being covered by the three primary health insurance schemes in 2011 (that is, the Urban Employee Basic Medical Insurance (UEBMI), the Urban Resident Basic Medical Insurance scheme (URBMI), and the New Rural Cooperative Medical Scheme (NCMS)). Benefits packages and the degree of financial protection afforded to patients with NCDs varied across the three insurance schemes however [9].

Although previous studies have examined the prevalence, rates of awareness, treatment, and control of hypertension in China, most of them are based primarily on cross-sectional datasets [5, 11-12]. Cross-sectional data used to estimate the effectiveness of treatment for hypertension has limitations as it does not provide information on changes in blood pressure over time for the same individual. Cross-sectional studies therefore cannot identify those hypertensive individuals with partially-controlled blood pressure. Longitudinal data on the other hand could be used to account for sub-optimally treated

hypertensive patients with partial reductions in blood pressure over time, data which cannot be captured from cross-sectional analyses. In contrast to approaches that emphasise the sharp distinction between uncontrolled and controlled hypertensive cases, applying the metric of effective coverage has the advantage of estimating actual reductions in blood pressure due to intervention over time using longitudinal datasets, regardless of whether blood pressure reduction is below the well-controlled targets (for example, 90/140 mmHg).

The differential impacts of reformed health insurance schemes on the management of hypertension since 2009 are not well understood, with previous work on this subject having limitations due to cross-sectional analysis. This study applies the metric of effective coverage to capture actual health changes in patients treated with anti-hypertensive medication over time. It considers patients with blood pressure above the standard thresholds of well-controlled hypertension. Furthermore, it investigates the relationship between indicators of hypertension treatment and demographic characteristics, health service use, and health system factors, particularly the three health insurance schemes.

4.2 Methods

4.2.1 Sample and data

This research used the national baseline and first follow-up surveys of the China Health and Retirement Longitudinal Study (CHARLS) conducted in 2011 and 2013. The CHARLS collected data from a nationally-representative sample of the Chinese population aged 45 and above for research on the elderly and on health trends. It was purposely designed to be consistent with and comparable to the Health and Retirement Study (HRS) in the United States. Funding support for the CHARLS mainly came from Peking University, the Behavioral and Social Research Division of the National Institute on Aging and from the World Bank [13].

The CHARLS' questionnaire covered the following key domains: demographics, health status and functioning, health care and insurance, work, retirement and pensions, income and consumption, household assets, and several biomarkers including height, weight, blood pressure, pulse rate, lung peak flow rate, and balance measures. Each respondent's systolic blood pressure (SBP) and diastolic blood pressure (DBP) were

recorded three times by a trained nurse using a HEM-7112 electronic monitor. The average values for each participant were calculated but only given to the subjects once the interviews were completed. The interviewees were also asked if they had hypertension and whether they were receiving any form of antihypertensive treatment. To ensure sample representativeness, the CHARLS baseline survey covered 150 counties/districts and 450 villages/urban communities across 28 provinces using multistage stratified probability-proportionate-to-size (PPS) sampling methods. A total of 17,708 individuals in 10,257 households were interviewed in the baseline survey. The response rate was above 80% among eligible households. Follow-up surveys were conducted every two years. Further information on the methodology of the CHARLS is available from the online documentation [13].

After excluding cases with missing demographic information and blood pressure measurements, complete data were available for 13,702 individuals in 2011-12 and 12,897 individuals in 2013. A total of 5,262 hypertensive individuals were identified in the baseline study. 1,789 cases were excluded due to missing blood pressure values in the follow-up survey in 2013, and 126 cases excluded due to participant death. A total of 3,343 participants were finally included and used to assess the extent of effective coverage for hypertension treatment and to perform a multivariable logistic regression analysis for identifying key correlates of effective coverage for hypertension treatment.

4.2.2 Definition of hypertension and coverage indicators

In the current study, hypertension was defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg and/or being on medication for raised blood pressure [14]. Treatment coverage was defined as the percentage of hypertensive individuals who reported the use of antihypertensive medication.

Effective coverage is defined by the WHO as “the fraction of potential health gain that can be delivered to the population through a specific intervention or health system, given its capacity [15].” It can be measured for a single, or for multiple interventions, and/or for the whole health system [16]. In this study, we defined effective coverage of hypertension treatment (that is effective treatment coverage) as the fraction of actual blood pressure reduction achieved by taking antihypertensive medication from 2011 to 2013. The denominator was targeted reduction of blood pressure, namely the difference

between participants' blood pressure measured in 2011 and treatment targets (that is, 90/140 mmHg).

The three critical components of effective coverage were operationalized as follows: 1) **Need**, refers to individuals with SBP \geq 140 mmHg and/or DBP \geq 90 mmHg measured in 2011; 2) **Use**, refers to the self-reported use of antihypertensive medication; and 3) **Quality**, refers to actual reduction in systolic blood pressure and/or diastolic blood pressure through taking antihypertensive medication from 2011 to 2013 as measured in the CHARLS surveys. For those cases where blood pressure increased over time, this study calculated the quality of medication treatment to be zero; therefore, effective coverage for hypertension treatment was also calculated as zero.

At the individual level, effective coverage for hypertension treatment estimates the fraction of blood pressure reduction that is delivered to the population who take the antihypertensive medication, as shown in the following equation:

$$EC_i = (Q_i U_i | N_i = 1)$$

where EC_i is the effective coverage of individual i with medication use; Q_i is the expected quality of medication use as delivered to patient i ; U_i is the utilisation of antihypertensive medication among the population in need; and N_i is an indicator of whether individual i needs the antihypertensive medication. At the population level, the overall effective coverage for a given intervention can also be aggregated, using each individual's probability of effective coverage [15]. The conditional statement is important as it restricts U_i to the condition of individual i who truly needs the intervention.

4.2.3 Statistical analysis

Correlates of treatment coverage were analysed using multivariable logistic regression models, after controlling for demographic characteristics. An ordinal logistic regression model was applied to identify the correlates of effective coverage for hypertension. This study divided the values of effective treatment coverage into three categories (1=No change (effective coverage=0); 2=Some change (effective coverage was between 0 and 1); and 3= effective change (effective coverage=1)). The explanatory variables of interest were age, gender, household income per capita, level of education, marital

status, region, location of residence, outpatient visits, hospitalisation, and type of health insurance scheme. The adjusted odds ratio (OR) and 95% confidence intervals (CI) were reported. This study used STATA statistical software (Version 12.0) for data analysis. P values less than 0.05 were considered statistically significant.

4.3 Results

4.3.1 Sample characteristics

Table 4.1 shows the descriptive statistics based on the final study population of 3,343 respondents with complete data. The middle-aged and older population with hypertension contained a higher proportion of women (52 %) than men (48 %). In 2011, 96.81% of 3,343 middle-aged and older Chinese adults with hypertension were covered by health insurance schemes, most of them enrolling in the New Cooperative Medical Scheme. Nearly 42 % of those with hypertension were overweight or obese. **Table 4.2** shows that the mean SBP and DBP were 146.4mmHg and 84.4mmHg in 2011, and 143.6mmHg and 81.1mmHg in 2013, respectively. There were 39.78% of total hypertensive individuals with fully-controlled SBP, and 19.8% with partially-controlled SBP. Where reduction of DBP was required, 51.4% of hypertensive patients were fully-controlled, and 6.8% of patients were partially-controlled.

4.3.2 Health services for patients with hypertension

In relation to health service utilisation, **table 4.3** reveals that both outpatient and inpatient care among patients with hypertension increased between 2011 and 2013 in China. There was a similar trend in the proportion of physical examinations performed in the last year. Moreover, a larger proportion of hypertensive persons was given health education or advice by healthcare providers in 2013 than in 2011. Health education for hypertensive patients included weight control, exercise, healthy diet, and smoking control advice.

4.3.3 Treatment coverage and effective coverage for hypertension care

Table 4.4 shows that overall effective coverage for hypertension treatment among the middle-aged and older population in China between 2011 and 2013 was 22.40%. It was

much less than the overall treatment coverage of hypertension (55.86%). Hypertensive individuals who reported hypertension treatment in two survey rounds had higher effective coverage than those who only reported treatment in one survey round. Compared with patients younger than 65 years old, senior elders had a lower level of effective coverage. Female individuals with hypertension also had higher treatment coverage and effective coverage (62.42%, 24.16%) than male patients (48.68%, 20.48%).

Considerable variations in effective coverage for hypertension treatment were observed between patients without health insurance and those with insurance, ranging from 18.41% to 29.31%. Meanwhile, there were differences in treatment coverage across insurance schemes, ranging from 54.21% to 68.40%. Furthermore, patients with current smoking, alcohol use, and low body mass index (BMI) had relatively low effective coverage for hypertension treatment (**Table 4.4**).

4.3.4 Multivariable regression analysis

Table 4.5 reports the results of multivariable regression analysis, showing that both treatment coverage and effective coverage for hypertension were directly correlated with health insurance, outpatient visit, hospitalisation, gender and residence region. After adjustment for key covariables, effective treatment coverage was significantly higher among patients who were in the UEBMI scheme (OR, 1.903; 95% CI, 1.259-2.876), who visited the doctor or other health provider during the previous month (OR, 1.838; 95% CI, 1.503-2.249), who were hospitalised in the past year (OR, 1.572; 95% CI, 1.211-2.042), and who reported living in the eastern region (OR, 1.416; 95% CI, 1.159-1.729) or central region in China (OR, 1.551; 95% CI, 1.274-1.888).

4.3 Discussion

This paper applied the WHO concept of effective coverage to estimate the effectiveness of hypertension treatment in China, using a nationally representative sample of Chinese adults. This study also identified the variations in treatment coverage (defined as the percentage of individuals using antihypertensive medication) and effective treatment coverage (defined as the fraction of actual blood pressure reduction through taking antihypertensive medication) across different Chinese population groups. The findings

revealed a large gap between treatment coverage and effective treatment coverage among middle-aged and older people with hypertension in China. This study also identified significant differences in effective coverage for hypertension treatment across age groups, health insurance schemes, and patients' BMI levels.

4.3.1 Effective coverage for hypertension treatment

As China seeks to further improve the health system's effectiveness, the measurement of effective coverage of interventions/healthcare can serve as an essential performance indicator, a more useful indicator than the more usual estimation of treatment coverage (rate of medication treatment). This study revealed that there was relatively high treatment coverage in relation to the use of antihypertensive medications in China. The utilisation of outpatient services and inpatient care among hypertensive individuals also increased from 2011 to 2013. The new round of health system reform launched in 2009 played a significant role in promoting this trend via policies aimed at strengthening primary health care, improving access to essential medicines, and ensuring equitable utilisation of public health services; however, the findings also suggested that effective coverage for hypertension treatment was still quite low in China. This finding was similar to the estimate of effective treatment coverage of hypertension in Mexico between 2005 and 2006 [17].

4.3.2 Variations in treatment coverage and effective coverage

Large variations in both effective coverage and treatment coverage for hypertension exist across gender, age groups, health insurance schemes, and BMI levels of Chinese adults. Consistent with previous studies, this study showed that females with hypertension had a higher effective coverage and treatment coverage for antihypertensive medications than males. Previous research has also revealed that men have higher levels of hypertension and lower levels of hypertension awareness than women, and identified key factors (health care use, in particular) that contribute to these observed gender disparities. The findings thus suggest that regular medical visits are critical for improving hypertension awareness, treatment and control and reducing gender disparities in cardiovascular health.

Among the elderly, compared with the early older ages (45-64 years), senior elderly people (above 65 years) with hypertension were less likely to experience treatment coverage and controlled hypertension, despite similar treatment coverage. There might be physiological or age-related factors influencing the control of hypertension, such as arteriosclerosis, which is common among the elderly population [18].

Considerable variations in both treatment coverage and effective coverage for hypertension treatment also exist across the three public health insurance schemes, that is, the Urban Employee Basic Medical Insurance, the Urban Resident Basic Medical Insurance, and the New Rural Cooperative Medical Scheme. The differences in benefits packages and degree of financial protection across insurance schemes could lead to unequal utilisation of healthcare, and even to different health outcomes. Despite the achievement of having 95.7% of the Chinese population covered by insurance schemes in 2011 [9], the per capita annual fund contribution for UEBMI is approximately six times higher than that for URBMI, and seven times for NCMS [19]. The reimbursement rate is 10% lower, and healthcare coverage is also smaller for NCMS than for the other two insurance schemes [20]. This finding is consistent with several studies that suggested gradients in benefits packages associated with insurance schemes would lead to inequity in health services' provision and risk protection [21, 22], especially for people with NCDs [9].

4.3.3 Key correlates of treatment coverage and effective coverage

In terms of the potential correlates, there are several similarities and differences between the results of this study and the findings of previous studies. The findings of this research showed a positive association between health insurance scheme and both treatment coverage and effective coverage of hypertension care. Some longitudinal studies in both developing and developed countries have indicated positive effects of health insurance on awareness and control of hypertension [23, 24]. Consistent with large numbers of studies, there was a positive effect of health insurance on treatment coverage of hypertension [23, 25-29]; however, Liao and colleagues suggested that health insurance had little effect on control of hypertension, based on findings from the China Health and Nutrition Survey (CHNS), a repeated cross-sectional design study from 1991 to 2009 [29]. One of the limitations of CHNS is its high proportion of missing data related to health insurance. Another limitation is the lack of information

on measurement of participants' blood pressure, which might vary by survey waves and provinces. The conflicting results of CHARLS and the CHNS could also be due to the different metrics used. This study applied the indicator of effective coverage for hypertension rather than the rate of well-controlled hypertension, which may ignore patients with only partial reduction in blood pressure.

Since 2009, China's health system reform has focused on several aspects, including improvements in the primary healthcare delivery system, implementation of the National Public Health Initiative and the reform of public health insurance, which are directly linked to the management of NCDs (e.g. hypertension) in China. There were differential access to improved health services across three health insurance schemes in China, as the NCMS did not cover the cost of outpatient care [30]. This could be also the reason behind the differences in hypertension care between our findings and earlier studies before 2009.

There is no doubt that the current benefits packages are different across the three public health insurance schemes in China [14]. These differences could have an impact on health care utilisation, including the use of antihypertensive medication, blood pressure examination, and public health services provided by health professionals, such as health education in relation to physical exercise, healthy diet and smoking control. As shown by Xinglin Feng et al. [30], compared with other hypertensive individuals, people whose insurance schemes covered the costs of outpatient service are more likely to receive care and to be well-controlled. This is consistent with our findings, patients enrolled in NCMS have lower effective coverage of hypertension treatment than those people enrolled in UEBMI, in large part because the NCMS did not cover the cost of outpatient care [30].

Generally, most NCDs, including hypertension, require relatively long periods of outpatient care [29]. Previous studies indicate however that current benefits packages are limited, mainly focusing on the costs of inpatient care [31]. Outpatient care for patients with NCDs has low reimbursement levels, so the financial support received may be inadequate [32].

This study showed that outpatient and inpatient service use had a positive correlation with antihypertensive medication treatment and effective coverage of hypertension care. The utilisation of both outpatient and inpatient services increased for Chinese people

with hypertension over time. This pattern of healthcare utilisation in China is consistent with the expectations of policies implemented and reflects the intended outcomes of health system reform. Experiences from several developing countries have also demonstrated the relationship between effective treatment coverage and the availability, accessibility, acceptability, and quality of human resources for health [33]. Expansion of health service coverage results in increased use of antihypertensive medication and better control of blood pressure, particularly in places with a better supply of health professionals. Like China, access to hypertension care also varies by insurance status in Mexico. Hypertensive patients insured through Mexico's Seguro Popular have a high probability of receiving antihypertensive treatment and better blood pressure control [17].

The results have important policy and research implications for China and other developing countries. This study would expect that both treatment coverage and effective coverage of NCD care could be significantly improved through comprehensive health system reform, yet effective treatment coverage of hypertension has not improved as expected in China. Significant health disparities and unacceptably low effective coverage of hypertension care should be given more attention by China's central and local governments [34]. Reducing disparities in health service utilisation and health gain could be used as key indicators for assessing the performance of China's health insurance reform and the National Public Health Initiative. Alternatively, effective measures could be considered to promote universal health coverage via offering equitable benefits package and fair financial risk protection, including an equal level of fund contributions, the same reimbursement rates, and more services covered, in the integration process of the three public health insurance schemes in China.

A crucial step towards achieving the goal of UHC will be strengthening the stewardship role of the health sector through better information and more research to achieve effective regulation and introduce an ongoing evaluation process of the health system's performance, with a focus on healthcare quality. Analyses of effective coverage would provide a more useful and appropriate indicator in monitoring the performance of the healthcare system, encouraging decision-makers to focus on the quality of service provision rather than only on accessibility or availability of health services. With the imminent need to monitor UHC in the SDG era, further analysis of effective coverage of other NCDs' treatment and management should be a very critical area of future

research in China.

In terms of this study's limitations, first, data on hypertension treatment and health service use was self-reported. This may be subject to recall bias. Second, due to the CHARLS data being based on a middle-aged and older population, effective coverage for hypertension treatment among younger Chinese adults (< 45 years older) was not analysed. Third, around 20% of respondents had missing blood pressure values. This study conducted adjusted analysis by using the created weights provided by the CHARLS team to address the problem of non-response bias. Fourth, the relatively low proportion of hypertensive individuals without any health insurance able to serve as a comparison group may have affected the reliability of treatment effectiveness estimates for hypertension. Finally, the low-risk patients based on overall cardiovascular risk scoring, may be advised on lifestyle changes rather than treated with medications by general practitioners or doctors. The control of hypertension may be underestimated due to the metric for effective coverage based on measured blood pressure.

4.4 Conclusions

Given a steady increase in the number of individuals with hypertension in China, the level of effective coverage for hypertension treatment was very low at the time of data collection. As health insurance schemes play a significant role in improving effective treatment coverage of hypertension, China's insurance reforms need to give further attention to this public health challenge. Equity in service utilisation and healthcare outcomes should be emphasised and enhanced by offering more equitable benefits packages across the three health insurance schemes in China. Moreover, to encourage decision-makers to focus on the quality of service provision rather than only service accessibility, further studies about effective coverage of treatment for other chronic diseases are needed.

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Ethics: The Biomedical Ethics Review Committee of Peking University approved the CHARLS study, and all interviewees were required to provide informed consent. The ethical approval number was IRB00001052–11015.

Authorship contributions:

YZ and AM contributed to study design. BO, TS and TH contributed to data interpretation. YZ wrote the first draft of the paper, and all co-authors contributed to manuscript editing. All authors reviewed and had final approval of the submitted and published versions.

Competing interests: The authors declare no competing interests.

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Table 4.1. Demographic characteristics of the study population with hypertension

	Number	Unweighted %	Weighted %
Total	3343	-	-
Age (years)			
45-54	853	25.52	26.35
55-64	1,312	39.25	36.87
65-74	854	25.55	24.42
>75	324	9.69	12.36
Gender			
Male	1,572	47.02	48.00
Female	1,771	52.98	52.00
Marital status			
Married	2,844	85.07	83.26
Divorced/Widowed	473	14.15	15.77
Never married	26	0.78	0.97
Level of education			
Illiterate	1,021	30.54	28.34
Primary school	1,385	41.43	40.11
Junior high school	638	19.08	19.98
Senior high school	260	7.78	9.63
College and over	39	1.17	1.94
Household income per capita (RMB)			
<500	555	16.6	14.68
500-1500	418	12.5	10.78
1500-4500	684	20.46	17.87
>=4500	1,686	50.43	56.67
Health insurance			
None	106	3.17	3.19
UEBMI	358	10.71	16.33
URBMI	173	5.17	6.82
NCMS	2,633	78.76	71.13
Others	73	2.18	2.53
Residence location			
Rural	2,114	63.37	55.45
Urban	1,222	36.63	44.55
Household registration			
Agricultural	2,682	80.37	72.83
Non-agricultural	655	19.63	27.17
Region			
East	853	37.25	40.09
Central	906	39.56	37.53
West	531	23.19	22.39
BMI			
<18.5	192	5.74	5.34
18.5-25	1,851	55.37	52.87
25-30 (Overweight)	1,041	31.14	33.69

>=30 (Obese)	259	7.75	8.11
Smoking			
No	2,339	70.28	71.59
Yes	989	29.72	28.41
Alcohol use			
No	2,301	68.83	68.16
Yes	1,042	31.17	31.84

UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance and so on; BMI, Body mass index.

Table 4.2. Blood pressure and changes among hypertensive individuals in China, 2011-2013

Blood pressure	Unweighted		Weighted	
	Mean	S.E. ^a	Mean	S.E.
Systolic blood pressure				
SBP in the year 2011 ^b	146.50	21.48	146.40	0.48
SBP in the year 2013	142.71	21.97	143.55	0.91
Reduction of SBP 2011-13	-3.79	25.05	-3.23	0.60
% of fully controlled SBP	39.75	-	39.46	-
% of partially controlled SBP	19.26	-	19.77	-
Diastolic blood pressure				
DBP in the year 2011 ^c	84.62	14.56	84.42	0.33
DBP in the year 2013	80.79	12.31	81.13	0.49
Reduction of DBP 2011-13	-3.83	15.80	-3.57	0.35
% of fully controlled DBP (%)	52.44	-	51.42	-
% of partially controlled DBP (%)	5.98	-	6.75	-

a: S.E., standard error; b: SBP, systolic blood pressure; c: DBP, diastolic blood pressure.

Table 4.3 Health services for patients with hypertension in China between 2011 and 2013

Health services	Year 2011		Year 2013	
	Unweighted	Weighted	Unweighted	Weighted
Proportion of outpatient visit	19.55%	19.02%	23.57%	22.61%
Number of outpatient visit (Mean/S.E. ^a)	0.43(0.025)	0.43(0.035)	0.57(0.027)	0.56 (0.046)
Admission rate	10.44 %	10.08%	16.11%	14.68%
Days of hospital stay (Mean/S.E.)	0.14(0.008)	0.13(0.013)	0.26(0.014)	0.23(0.019)
Physical examination last year	25.10%	34.02%	35.19%	50.18%
Health education provided ^b	29.70%	41.79%	28.51%	45.99%

a: S.E., standard error; b: Health education includes weight control, exercise, healthy diet, and aspect of smoking control.

Table 4.4 Effective coverage and treatment coverage for hypertension between Chinese population groups, 2011- 2013

	Effective Coverage		Treatment Coverage	
	Unweighted	Weighted	Unweighted	Weighted
Overall	24.18%	22.40%	56.39%	55.86%
Age (years)				
45-54	26.58%	23.12%	52.64%	54.16%
55-64	27.94%	27.91%	61.13%	61.27%
65-74	18.97%	16.56%	54.45%	50.71%
>75	16.34%	16.70%	52.16%	54.78%
Gender				
Male	22.48%	20.48%	51.15%	48.68%
Female	25.69%	24.16%	61.04%	62.42%
Household registration				
Agricultural	23.74%	23.23%	55.15%	53.71%
Non-agricultural	25.90%	20.21%	61.22%	61.28%
Level of education				
Illiterate	23.11%	22.25%	55.83%	55.12%
Primary school	23.41%	20.78%	57.24%	54.33%
Junior high school	26.26%	27.92%	56.51%	57.73%
Senior high school	26.74%	22.65%	53.67%	50.99%
College and over	26.36%	10.47%	51.28%	79.48%
Household income per capita (RMB)				
<500	22.74%	21.09%	53.15%	49.47%
500-1500	21.75%	22.57%	53.35%	54.62%
1500-4500	25.12%	24.50%	60.23%	58.79%
>=4500	24.87%	22.04%	56.64%	56.81%
Health insurance ^a				
None	26.50%	18.41%	59.22%	56.99%
UEBMI	28.96%	29.31%	65.32%	68.40%
URBMI	23.48%	22.60%	55.53%	54.21%
NCMS	23.54%	24.04%	57.53%	63.77%
Others	26.36%	26.32%	52.83%	57.37%
Region				
East	25.17%	23.61%	70.81%	74.65%
Central	28.09%	27.07%	73.40%	71.35%
West	25.07%	23.94%	66.10%	63.94%
BMI				
<18.5	13.22%	10.50%	29.69%	33.39%
18.5-25	21.57%	20.80%	50.24%	48.52%
25-30(Overweight)	29.24%	25.05%	67.92%	66.95%
>=30(Obese)	30.59%	30.63%	73.75%	72.96%
Smoking				
No	25.83%	23.94%	60.15%	59.19%
Yes	20.18%	18.59%	47.52%	47.66%
Alcohol use				

No	25.60%	23.41%	59.71%	60.29%
Yes	21.03%	20.31%	49.04%	46.64%

UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance and so on; BMI, Body mass index.

Table 4.5 Multivariable logistic regression analysis, impact of health insurance schemes on effective coverage and treatment coverage for hypertension

	Effective Coverage ^a			Treatment Coverage		
	OR	95% CI		OR	95% CI	
Health insurance ^b (None)	1			1		
UEBMI	1.903**	1.259	2.876	2.301***	1.543	3.432
URBMI	1.332	0.845	2.099	1.658**	1.084	2.536
NCMS	1.433*	1.023	2.006	1.405*	1.032	1.912
Others	1.943**	1.113	3.391	1.944**	1.129	3.347
Outpatient visit last month (No)	1			1		
Yes	1.838***	1.503	2.249	2.390***	1.919	2.976
Hospitalization last year (No)	1			1		
Yes	1.572**	1.211	2.042	2.459***	1.830	3.305
Gender (Male)	1			1		
Female	1.189*	1.010	1.400	1.439***	1.229	1.686
Age (45-54)	1			1		
55-64	1.221	0.997	1.495	1.423***	1.170	1.729
65-74	1.103	0.877	1.386	1.202	0.965	1.498
>75	0.894	0.652	1.226	1.145	0.848	1.545
Household income per capita (<500)	1			1		
500-1500	0.884	0.729	1.071	0.957	0.797	1.149
1500-4500	1.143	0.928	1.408	1.192	0.970	1.464
>4500	1.055	0.841	1.323	1.169	0.938	1.458
Education (Illiterate)	1			1		
Primary school	1.210*	1.000	1.465	1.203*	1.002	1.443
Junior high school	1.444**	1.128	1.849	1.326**	1.041	1.689
Senior high school	1.063	0.753	1.502	1.190	0.855	1.656
College and over	1.225	0.646	2.323	1.124	0.594	2.128
Marital status (Never married)	1			1		
Married	0.842	0.346	2.046	1.497	0.605	3.705
Divorced/Widowed	0.847	0.340	2.108	1.371	0.542	3.469
Region (West)	1			1		
East	1.416**	1.159	1.729	1.520***	1.259	1.837
Central	1.551***	1.274	1.888	1.623***	1.346	1.958
Location (Rural)	1			1		
Urban	1.036	0.872	1.231	1.023	0.866	1.209

a: Results of the ordinal logistic regression model; b: UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance and so on. ***P<0.01, **P<0.05, *P<0.1 significance test.

Chapter five: Trends and inequalities in the health care and hypertension outcomes in China, 2011 to 2015

Summary

Hypertension is one of the most significant and common risk factors for cardiovascular disease, yet it remains poorly-controlled in China. This study aims to examine trends and socio-economic inequalities in the management of hypertension between 2011 and 2015 in China and to investigate the association between antihypertensive medication treatment and reduction of blood pressure, using nationally-representative data. This study used data from three waves of the China Health and Retirement Longitudinal Study (CHARLS) for 2011, 2013, and 2015. Concentration curve and concentration index were used to assess socio-economic-related inequalities in hypertension care and health service utilisation. Fixed-effects analysis was performed to measure the impact of medication treatment on reduction of blood pressure among people with hypertension by using linear regression models. Among hypertensive individuals, there were growing trends in the rates of awareness and treatment from 55.87% and 48.44% in 2011, to 68.31% and 61.97% in 2015 respectively. The proportion of hypertension control was still below 30%. The fixed-effects models indicated that medication treatment was statistically significant and associated with the patients' systolic blood pressure (β : -13.483; 95% CI: -15.672, -11.293) and diastolic blood pressure (β : -5.367; 95% CI: -6.390, -4.344). China has made good progress in the identification of people with hypertension, medication treatment, and coverage of health services over the last ten years; however, there is still considerable progress to be made in China in the prevention of hypertension, as well as in more effective treatment for its control.

5.1 Introduction

In the era of sustainable development goals (SDG), advancing universal health coverage (UHC) has become the centrepiece of health policy in many countries.¹ In this context, one of the key goals is to reduce premature mortality from non-communicable diseases (NCDs) by one-third by 2030, mainly through prevention and treatment.² Like most countries in the world, China has recently experienced a very rapid epidemiological transition from a preponderance of infectious diseases to NCDs, including hypertension, diabetes, cardiovascular disease and cancers.³ In an attempt at an effective response, and to achieve UHC, the central government in China launched comprehensive health reform in 2009 to increase the population's access to health services, and to lower the financial burden of illness.⁴

Previous studies reported the degree of diagnosis, treatment and control of hypertension in China, but most of them are cross-sectional in design, not well suited therefore to capturing changes in treatment adherence and blood pressure control over time. There are relatively few longitudinal studies assessing trends in hypertension management and health service utilisation over the last ten years, since health system reform in China. Very few studies employ fixed-effects models at the national level to examine the impact of hypertension treatment on blood pressure control. The fixed-effects model assumption is that the individual heterogeneity is correlated with the independent variables. Hausman test for this study shows that fixed-effects model is preferred over random-effects model. In this study, trends and inequalities were evaluated in healthcare and control of hypertension between 2011 and 2015 in China. Additionally, the association between antihypertensive medication treatment and reduction of blood pressure, using a nationally longitudinal dataset, was investigated, controlling for changes in treatment status for different periods.

5.2 Methods

5.2.1 Data source

Data from baseline and follow-up surveys in the China Health and Retirement Longitudinal Study (CHARLS) undertaken in 2011, 2013 and 2015 was utilised. This study aimed to collect a nationally-representative sample of Chinese residents aged 45

and over to inform scientific research on the elderly and to assess health trends. The CHARLS design, based on the Health and Retirement Study (HRS) and other related ageing surveys, has received funding support from Peking University, the Behavioural and Social Research Division of the National Institute on Aging, and the World Bank.⁵ The CHARLS' questionnaires cover the following domains: demographics, health status and functioning, healthcare and insurance, income and consumption, and several important bio-markers including height, weight, and blood pressure. In CHARLS, each respondent's systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded three times by a trained nurse using a HEM-7112 electronic monitor. The average value for each study participant was calculated, but only given to the subjects once the interviews were completed. The interviewees were asked if they had hypertension and whether they were receiving any form of antihypertensive treatment. Details on how blood pressure measurements were taken in the CHARLS survey can be found elsewhere.⁵

To ensure a representative sample, the CHARLS baseline survey covered 150 counties/districts and 450 villages/urban communities, across 28 provinces, by using multi-stage stratified probability-proportionate-to-size (PPS) sampling. A total of 17,708 individuals in 10,257 households were successfully interviewed for the baseline CHARLS survey. The response rate was over 80% in all age-eligible households. Ongoing follow-up surveys were conducted every two years.⁵

After excluding cases with missing demographic information and blood pressure measurements, complete data were available for 13,725 individuals in 2011, 10,893 individuals in 2013, and 11,675 individuals in 2015. The three rounds of the CHARLS datasets were used to calculate the prevalence of hypertension and healthcare indicators for the different years. To measure the impact of medication treatment on blood pressure (BP), this research also created a panel dataset including 8,486 hypertensive individuals who could be identified in all rounds of the CHARLS by excluding the loss to follow-up and the deceased in 2013 and 2015.

5.2.2 Indicators

In this study, hypertension was defined as survey participants having systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, and/or their being on antihypertensive medication treatment for raised blood pressure.⁶⁷ Among hypertensive

adults identified, those whose systolic blood pressure was less than 140 mmHg and those whose diastolic blood pressure was less than 90 mmHg were considered as effectively controlling their hypertension.⁸ The measure of health service utilisation included three variables: the number of outpatient visits, number of inpatient visits, and the number of education sessions provided by health professionals. The definition of prevalence, awareness, treatment, and control of hypertension, and the variables in health service use are listed in **Table 5.1**.

Measures	Definition
Prevalence	Systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg and/or self-reported antihypertensive medication use at the time of the investigation
Hypertension care	
Awareness	Hypertensive persons who reported the doctor's diagnosis of hypertension previously or current use of antihypertensive medication
Treatment	Identified hypertensive adults who reported current use of antihypertensive medication
Control	Identified hypertensive adults whose systolic blood pressure was < 140 mmHg and whose diastolic blood pressure was < 90 mmHg
Health service utilisation	
Outpatient visit	'In the last month have you visited a public hospital, private hospital, public health centre, clinic, or doctor's practice, or been visited by a doctor for outpatient care?'
Inpatient visit	'Have you received inpatient care in the past year?'
Health education	Health education provided by health professionals, which includes weight control, exercise, healthy diet, and aspects of smoking control

Note: In the calculation of hypertension prevalence, the denominator was the number of all respondents. In the calculation of the percentage of awareness, treatment and blood pressure control, the denominator was the number of all identified hypertensive patients

5.2.3 Statistical Analysis

The prevalence of hypertension and rates of awareness, treatment, and control amongst Chinese adults were calculated. The Chi-square trend test was used to evaluate the difference in trends in the prevalence of hypertension, healthcare utilisation, and blood pressure control from 2011 to 2015. Concentration Curve (CC) and Concentration Index (CI) were used to assess socio-economic-related inequalities in hypertension care and service use. The further the CC lies from the equality line (45-degree line), the higher the degree of inequality in health care and health service utilisation.⁹

The concentration index can quantitatively reflect the degree of equality. This study calculated CI to measure socio-economic inequalities in healthcare and control for

$$CI = 2 / \mu \text{cov}(h, r)$$

hypertension according to the following equation:

Where h refers to the variable in health care; μ is the mean of h ; and r refers to the fractional rank of people according to the per capita household consumption expenditure (PCE), from the poorest to richest. A positive CI value shows that healthcare or service use is more likely in those in a higher socio-economic group, and a negative CI value shows that underprivileged people are more likely to use health services or to be controlled well. Similar to the concentration curve, the higher the absolute value of CI , the worse for those with lower socio-economic status. Zero indicates no socio-economic inequality in hypertension care¹⁰

Given that treatment adherence and the within-person blood pressure can easily change over time, fixed-effects models (FEM) were performed to measure the impact of medication treatment on the reduction of blood pressure among those with hypertension by using linear regression analysis. The patients' SBP and DBP were included in regression models as outcome variables. The explanatory variables of interest were age, per capita household consumption expenditure, Body Mass Index (BMI), comorbidity, current smoking, and alcohol consumption. Correlates of hypertension treatment were analysed using the FEM, after controlling for demographic characteristics. In addition to estimating the main effects of the treatment on blood pressure, interaction effects were examined by introducing the interaction term of treatment and some core variables, including PCE, BMI, and comorbidity. All statistical analyses were conducted using STATA 14.0. *P values* less than 0.05 were considered statistically significant.

Patient and public involvement statement

Patients or the public were not involved in this study.

5.3 Results

5.3.1 Trends in hypertension prevalence and healthcare in China

Overall, the prevalence of hypertension among adults in China aged 45 and above was approximately 40.78% in 2011, 43.25% in 2013, and 41.81% in 2015, respectively (**Table 5.2**). Among patients who identified as having hypertension, there were growing trends in the rate of awareness and treatment from 55.87% and 48.44% in 2011 to 68.31%

and 61.97% in 2015, respectively. The level of hypertension control was still low in China during the years 2011 to 2015. Specifically, the hypertensive patients with complications were more likely to be aware of their hypertension status, receive antihypertensive medications, and to have achieved blood pressure control, compared to those without complications (**Table 5.2**).

Table 5.2 Prevalence and health care of hypertension among adults 45 years and above in China, from 2011 to 2015

	2011			2013			2015			P value
	N	Unweighted	Weighted	N	Unweighted	Weighted	N	Unweighted	Weighted	
Total population	13725	-	-	10893	-	-	11675	-	-	
Among all people										
Prevalence	5285	38.51%	40.78%	4666	42.83%	43.25%	4874	41.75%	41.81%	<0.001
Among people with hypertension										
Awareness	2976	56.31%	55.87%	2876	61.64%	60.04%	3316	68.03%	68.31%	<0.001
Without comorbidity	755	43.07%	42.19%	598	46.39%	44.48%	734	54.29%	55.80%	<0.001
With comorbidity	2221	62.88%	63.38%	2278	67.46%	66.77%	2582	73.31%	73.32%	<0.001
Medication treatment	2579	48.80%	48.44%	2485	53.26%	52.57%	2980	61.14%	61.97%	<0.001
Without comorbidity	638	36.39%	35.40%	473	36.70%	36.39%	645	47.71%	49.59%	<0.001
With comorbidity	1941	54.95%	55.60%	2012	59.58%	59.56%	2335	66.30%	66.93%	<0.001
Blood pressure control	1072	20.28%	19.34%	1064	22.80%	22.19%	1326	27.21%	28.57%	<0.001
Without comorbidity	250	14.26%	13.24%	189	14.66%	12.79%	268	19.82%	22.96%	<0.001
With comorbidity	822	23.27%	22.69%	875	25.91%	26.25%	1058	30.04%	30.81%	<0.001

Note: P values reported for intertemporal differences. In calculation of the percentage of awareness, treatment and BP control, denominator was the number of all identified hypertensive patients

For the utilisation of health services, **Table 5.3** shows that inpatient care use increased from 10.68% in 2011 to 17.41% in 2015 in China. There was a growing number of hypertensive individuals receiving health education from health professionals from 2011 (33.67%), to 2013 (36.55%) and 2015 (39.79%). Patients with complications were also using more health services, compared to those without any complications; however, we did not find a significant change in the number of outpatient visits by adults in China with hypertension between 2011 and 2015.

Table 5.3 Trends in the health service use among people with hypertension by comorbidity status in China, from 2011 to 2015

Health service use	2011			2013			2015			P value
	N	Unweighted	Weighted	N	Unweighted	Weighted	N	Unweighted	Weighted	
Proportion of outpatient visit	1029	19.72%	21.24%	1084	23.60%	23.38%	988	20.62%	20.60%	0.105
Without comorbidity	200	11.53%	13.65%	166	12.98%	13.16%	179	13.44%	14.21%	0.692
With comorbidity	829	23.81%	25.43%	918	27.70%	27.84%	809	23.39%	23.18%	0.226
Proportion of inpatient visit	577	10.93%	10.68%	754	16.19%	17.68%	861	17.72%	17.41%	<0.001
Without comorbidity	100	5.72%	5.62%	93	7.24%	14.73%	154	11.44%	11.82%	<0.001
With comorbidity	477	13.51%	13.45%	661	19.60%	18.95%	707	20.12%	19.66%	<0.001

Proportion of health education	1717	32.49%	33.67%	1713	36.71%	36.55%	1942	39.84%	39.79%	<0.001
Without comorbidity	388	22.13%	22.87%	280	21.72%	22.54%	413	30.55%	30.37%	<0.001
With comorbidity	1329	37.63%	39.59%	1433	42.43%	42.60%	1529	43.41%	43.57%	<0.001

Note: P values reported for intertemporal differences. Health education provided by health professionals, includes weight control, exercise, healthy diet and aspect of smoking control

5.3.2 Socio-economic inequalities in healthcare and outcomes

The results of socio-economic-related inequality analyses for healthcare among patients with hypertension are shown in **Table 5.4**. The proportions of medication treatment and control in the wealthiest quintile of people with hypertension were 1.16 times greater and 1.41 times greater than in the most deprived quintile in China in 2015. Meanwhile, the proportion of outpatient visits, inpatient visits, and health education sessions in the wealthiest quintile of hypertensive patients were 1.47, 2.91 and 1.36 times greater than in the most deprived quintile.

Table 5.4 Health care for hypertensive adults in China across wealth quintiles and the concentration indexes, 2015

Wealth group, PCE (Quintiles)	Medication		BP control	Outpatient visit	Inpatient visit	Health education
	Awareness	treatment				
1 st (Poorest)	64.82%	57.71%	24.28%	17.41%	8.01%	31.63%
2 nd (poor)	65.43%	59.88%	27.99%	21.41%	14.28%	41.68%
3 rd (Middle)	71.04%	63.52%	32.14%	17.84%	17.67%	46.70%
4 th (Rich)	74.42%	65.07%	30.86%	18.86%	19.08%	47.20%
5 th (Richest)	71.97%	66.66%	34.32%	25.65%	23.27%	42.95%
Ratio (richest/ poorest)	1.11	1.16	1.41	1.47	2.91	1.36
CI ^c	0.007	0.010	0.008	0.033	0.086***	-0.004

Note: PCE Per capita household annual consumption expenditure. Health education provided by health professionals, includes weight control, exercise, healthy diet and aspect of smoking control. ***P<0.001, **P<0.01, *P<0.05 significance test

The concentration curves for hypertension care were below the equality line, indicating that hypertension care and the use of health services were disproportionately higher among wealthy individuals in China in 2015. Compared with medication treatment, outpatient services, and health education access, the most unequal indicator was the inpatient visit, which was also more concentrated among wealthy individuals (**Figure 5.1, Figure 5.2**). The concentration index of inpatient visits was 0.086, the only indicator with a statistically significant difference. In terms of health education, there was a slight concentration among poorer individuals (**Table 5.4**).

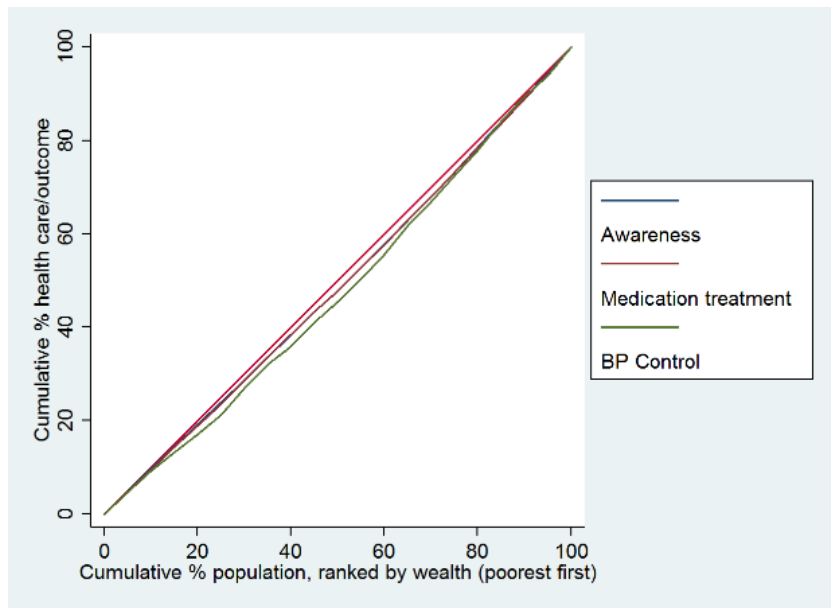


Figure 5.1 Concentration curves of health care for adults with hypertension in China in 2015

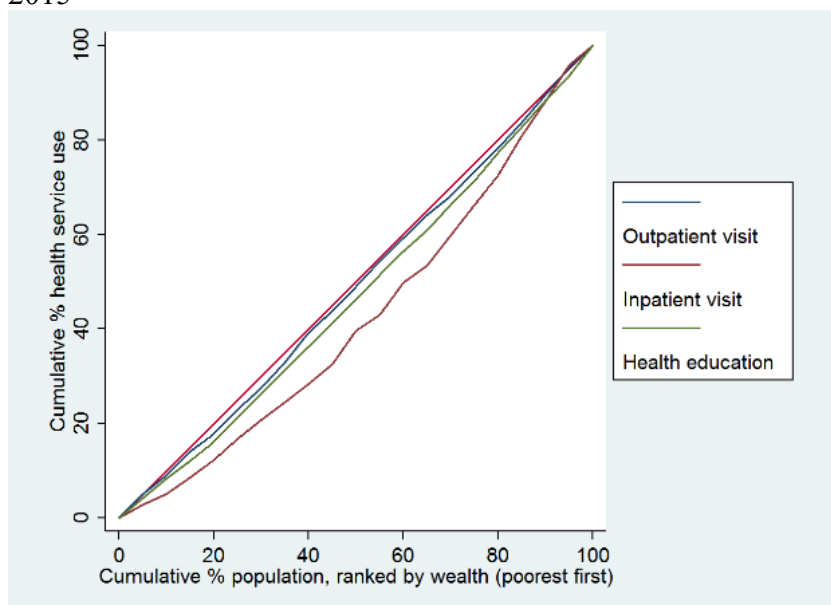


Figure 5.2 Concentration curves of health service use for adults with hypertension in China in 2015

5.3.3 Results of multivariable regression analysis

Table 5.5 shows the main results of the fixed-effects model analysis. The fixed-effects models indicated that medication treatment was statistically significant and associated with the patients' systolic blood pressure (β : -13.483; 95% CI: -15.672, -11.293) and diastolic blood pressure (β : -5.367; 95% CI: -6.390, -4.344), before introducing the interaction term of treatment and characteristic variables into these models. After

introducing the interaction terms of antihypertensive medication treatment with PCE, BMI and comorbidity, all fixed-effects models continued to show statistical significance. There was however no significant association between interaction terms and a reduction in patients' blood pressure, as model 2 showed.

Table 5.5 Fixed-effects analysis of relationship between antihypertensive medication treatment and reduction of blood pressure

Variable (reference)	SBP-Model 1		SBP-Model 2		DBP-Model 1		DBP-Model 2					
	β	95% CI	β	95% CI	β	95% CI	β	95% CI				
Main effects												
Treatment (no)	-13.483	-15.672	-11.293	-16.115	-28.382	-3.848	-5.367	-6.390	-4.344	-8.326	-14.048	-2.604
Age	-0.386	-0.674	-0.097	-0.388	-0.677	-0.100	-0.121	-0.255	0.013	-0.121	-0.255	0.013
Gender	-			-			-			-		
PCE, Quintile 1 st												
2 nd	-3.125	-5.419	-0.830	-1.736	-5.400	1.928	-0.508	-1.576	0.560	-0.002	-1.710	1.707
3 rd	0.025	-2.338	2.388	2.094	-1.664	5.853	-0.215	-1.316	0.885	0.150	-1.604	1.903
4 th	0.313	-2.179	2.806	2.757	-1.035	6.548	-0.231	-1.392	0.931	-0.441	-2.213	1.331
5 th	-2.066	-4.740	0.608	-0.190	-4.574	4.193	-0.197	-1.442	1.047	0.402	-1.642	2.446
BMI	0.126	-0.221	0.474	0.005	-0.448	0.457	0.175	0.013	0.336	0.084	-0.126	0.295
Comorbidity (no)	-1.353	-4.980	2.275	-1.400	-5.839	3.039	-1.853	-3.545	-0.162	-1.596	-3.673	0.481
Smoking (no)	3.492	-0.586	7.569	3.327	-0.759	7.413	0.130	-1.773	2.032	0.133	-1.773	2.040
Drinking (no)	1.527	-1.084	4.139	1.512	-1.101	4.125	0.980	-0.236	2.196	0.975	-0.242	2.192
Interaction effects												
Treatment* PCE												
Treatment*2 nd				-2.381	-7.080	2.318				-0.815	-3.006	1.376
Treatment*3 rd				-3.459	-8.169	1.251				-0.629	-2.824	1.566
Treatment*4 th				-4.090	-8.879	0.698				0.353	-1.882	2.587
Treatment*5 th				-3.078	-8.323	2.167				-0.885	-3.329	1.559
Treatment* BMI				0.204	-0.262	0.670				0.146	-0.072	0.363
Treatment* Comorbidity				0.134	-4.080	4.348				-0.423	-2.396	1.550
Constant	176.336	156.896	195.776	178.044	157.463	198.625	91.426	82.380	100.471	93.207	83.630	102.784

Note: SBP Systolic blood pressure, DBP Diastolic blood pressure, PCE Per capita household annual consumption expenditure; BMI body mass index, 95% CI 95% Confidence Interval. All models were adjusted for age, living standard, BMI, comorbidity, smoking and drinking alcohol. Models 1 included only main-effects terms for all variables. Models 2 included both main-effects terms and interaction-effects terms for treatment and household consumption expenditure, BMI and comorbidity

5.4 Discussion

The trends and socio-economic inequality in hypertension care among Chinese adults were estimated, and the impact of hypertension treatment on blood pressure reduction was further assessed in this study. To our knowledge, this is the first-panel study in China that has applied fixed-effects models to estimate the treatment effect on blood pressure reduction by considering changes in adherence to medication use. This study

demonstrates that the utilisation of primary healthcare services has improved for individuals with hypertension over time. This pattern reflects the successful implementation of recent policies, and the intended outcomes of new health system reform which aim to achieve universal health coverage with affordable and equitable primary health care.^{11 12} Since 2009, China's health system reform has focused on five major areas, including improvements in the primary healthcare delivery system, public health insurance schemes, the essential medicine system, implementation of the National Public Health Initiative (NPHI), and public hospital improvements (pilot reform in 16 cities). Several aspects of this comprehensive reform are directly linked to the management of NCDs in China.¹³

5.4.1 Trends in hypertension prevalence and treatment in China

Although the prevalence of hypertension among middle-aged and elderly Chinese adults is stable at a relatively high level, China has made impressive progress in hypertension management, particularly in the increased rates of awareness and adherence to medication treatments. Based on the new hypertension guidelines released by the American College of Cardiology in 2017, the lower diagnostic blood pressure thresholds (130/80 mmHg) would increase hypertension prevalence from around 10% to 20% the adult Chinese population. Obviously, the adoption of the 2017 ACC/AHA guideline will lead to a substantial increase in the number, prevalence of hypertension, costs as well as burdens of hypertension treatment in China.

In response to the growing challenge of chronic diseases, hypertension, diabetes and mental health disorders have been identified as the priority public health problems in the NPHI, in place since 2009. The NPHI aims at achieving equitable public health services for all Chinese people, including improvements to hypertension and diabetes screening, doctors' home-visiting and health education for Chinese adults aged 35 and above. To an extent, this initiative has helped to improve the level of hypertension diagnosis and coverage of essential public health services among people with NCDs in China during the last decade.

Throughout the reform implementation, the essential medicine system (EMS) was also rolled out across the country. This aims to improve medication access, quality, and appropriate use, so there may be a direct relationship to increased rates of medication treatment for most NCDs. Through the EMS, primary care facilities in townships and

counties in China have access to more than 400 essential medicines, including various antihypertensive drugs (such as beta-blockers and calcium channel blockers).¹⁴ Significantly, provision of these medicines is heavily subsidised by the Chinese Government through the implementation of zero-profit mark-up for essential medicines. The previously exploited 15% price mark-up was banned.¹⁵ With the development of the EMS, and with more medication being reimbursed under the insurance schemes in China, this reform could lead to substantial improvements in hypertension treatment in the near future.

5.4.2 Health service use among Chinese adults with hypertension

Overall, a substantial upward trend in health service utilisation was observed among Chinese adults with hypertension between 2011 and 2015. The new health system reform in China played a significant role in promoting this trend. The national programme of primary healthcare, for instance, spends around 6.3 billion US dollars every year on community healthcare providers who deliver a defined package of healthcare, including management of NCDs and essential primary healthcare.¹¹ They are responsible for establishing a health record and providing free health examinations and health education, including for people with hypertension.

Improvements in health insurance policies over the past few years have also played a positive role in hypertension management. The health system reform resulted in a significant increase in insurance coverage, with 95.7% of the Chinese population being covered by public health insurance schemes in 2011.¹⁶ Along with the expansion of benefits packages from public insurance schemes, financial risk protection has been improved in China. This may partially explain the findings of a growing trend in inpatient care. Utilisation of outpatient services, however, did not increase between 2011 and 2015, in large part because the New Rural Cooperative Medical Scheme, in which almost all rural residents in China were enrolled, did not cover the cost of outpatient care.¹³

The experiences of several developing and developed countries have demonstrated the relationship between insurance and health care.¹⁷⁻²⁵ Financial protection factors could play an important role in the improvement of health service utilisation for hypertension. Hypertensive patients insured through Mexico's Seguro Popular, for instance, are highly likely to receive antihypertensive treatment.¹⁷ Among American adults with

hypertension, those without health insurance had lower rates of blood pressure control between 2005 and 2008.²⁶ A large-scale trial in the United States also showed that demand-side reimbursement from health insurance could increase primary and preventive services use.²⁷

5.4.3 Low level of control for hypertension in China

This study revealed that the blood pressure of hypertensive patients was higher in people without medication than among those who reported the use of antihypertensive medication. Although the performance of hypertension management has been reported in China on several occasions,²⁸⁻³⁶ very few studies have conducted longitudinal analysis in the same sampling group, and none of them employed the fixed-effects models. The FEMs in this study suggested that medication treatment plays a vital role in blood pressure control among people with hypertension; however, the overall degree of controlled hypertension was universally low across three survey waves from 2011 to 2015. The rate of BP control among hypertensive Chinese adults was less than 20 per cent across the nation, compared with 48 per cent in the United States.²⁶

The reality of two-thirds of hypertensive patients experiencing uncontrolled blood pressure is likely to be the result of inadequate treatment or insufficient quality of health service provision. The NPHI was developed to ensure optimal management of hypertension and diabetes for Chinese adults aged 35 and above. Each year, at least four home-visiting services should be provided by health professionals. They should include health education related to lifestyle behaviour for patients with hypertension, but over 60% of Chinese adults with hypertension were still not receiving public health services in 2015, that is, health education, including advice on weight control, exercise, healthy diet, and smoking control. The monitoring and supervision of primary health care providers and public health workers at the community level are sub-optimal.¹³ The implementation of the NPHI in relation to prevention and management of NCDs is insufficient, partly because of the lack of human resources.

Major changes need to be made to the efficiency of service delivery for hypertension in China. In response to this challenge, the current primary care system in China needs to be strengthened and integrated with other reforms in public health service provision and the EMS. It would be effective if doctors' home visits and health education sessions were increased, access to affordable health services improved, and patients' adherence

to medication treatment also improved. Moreover, the scope of universal health coverage should go beyond essential health services and financial protection to include more aspects of effective health coverage, such as actual health gain and healthcare outcomes. With comprehensive and continuous efforts in reforming the healthcare system, a more efficient and equitable health system would result, ensuring further improvement in the management of chronic diseases in China.

5.4.4 Strengths and limitations

This is the first study in China to apply fixed-effects models in examining the impact of antihypertensive medication on reductions in blood pressure, considering the change of treatment status in different periods. This research will contribute to a deeper understanding of reform policies related to primary healthcare and public health services, and to further analysis of the effectiveness of NCDs treatment. This study only considered the middle-aged and older population in China however. The effectiveness of hypertension treatment for younger Chinese groups should be considered in future studies. Some 20% of respondents were missing information on blood pressure during the surveys from 2011 to 2015. To account for non-response bias, we adjusted the analysis by using the created weights for individuals. Moreover, the CI is derived from the Gini coefficient requires the health variable to be on the same scale as income (on a ratio-scaled measure without an upper bound). Rank dependent indices with the binary health variables in this study may lead to bias.

5.5 Conclusion

China has made good progress in the identification of people with hypertension, in medication treatment, and in coverage of health services over the last ten years. Between 2011 and 2015 China also saw a significant increase in use of inpatient care services and in access to health education related to lifestyle behaviours among hypertensive patients. This pattern reflects the implementation of recent policies. Despite these advances, fewer than a third of Chinese adults with hypertension were in control of their blood pressure. China still needs to make more progress with respect to prevention, and to ensure more effective treatment and control of hypertension.

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Contributors

All authors participated in the design of the study and were involved in the implementation of the study. AM and YZ designed the study; YZ and BO carried out the initial analysis and supervised data analysis. YZ wrote the first draft of the paper, while AM, BO, AK and TH provided advice on the first draft. All authors reviewed and gave final approval to the submitted and published versions.

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Competing interests None declared.

Patient consent for publication This study exclusively uses publicly available data and therefore does not require patient consent.

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Chapter six: Temporal trends and geographic disparity in hypertension care in China

Title: Temporal trends and geographic disparity in hypertension care in
China

Running title: Trends and geographic disparity in hypertension care

Yang Zhao^{1,2}, Brian Oldenburg^{1,2}, Siqu Zhao^{3,4}, Tilahun Nigatu Haregu¹, Luwen Zhang⁵

¹ Melbourne School of Population and Global Health, The University of Melbourne, Victoria, Australia.

² WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs, Victoria, Australia.

³ Yantaishan Hospital of Yantai, Yantai, Shandong, China.

⁴ Yantai Sino-French Friendship Hospital, Yantai, Shandong, China.

⁵ School of Health Services Management, Southern Medical University, Guangdong, China.

Corresponding author: Luwen Zhang

Mailing address: School of Health Services Management, Southern Medical University,
1023-1063 South Shatai Road, Guangzhou, Guangdong 500000 China

Telephone number: +86 13710709481

Fax number: +86 13710709481

E-mail address: 067094@smu.edu.cn

ABSTRACT

1 **Background:** This study examines trends and geographic disparities in the diagnosis,
2 treatment and control of hypertension in China, and investigates the association
3 between regional factors and hypertension care.

4 **Methods:** Blood pressure data and data relating to health care for hypertension were
5 used for this study. The data were sourced from baseline and follow-up surveys of the
6 China Health and Retirement Longitudinal Study conducted in 2011, 2013 and 2015.
7 To estimate the geographical disparities in diagnosis, treatment and control of
8 hypertension, random effects models were also applied after controlling for
9 sociodemographic characteristics.

10 **Results:** Among hypertensive individuals in China, the trends showed decreases in
11 undiagnosed, untreated, uncontrolled hypertension, 44.1%, 51.6%, and 80.7% in 2011,
13 40.0%, 47.4%, and 77.8% in 2013, and 31.7%, 38.0%, and 71.4% in 2015, respectively.
14 The number of undiagnosed, untreated, uncontrolled hypertensive residents living in
15 urban areas in 2015 was more than 10% lower than the number in rural areas and among
16 rural-to-urban immigrant individuals in China. The poorest socio-economic regions
17 across China were 8.5 times more likely to leave their residents undiagnosed, 2.8 times
18 more likely to leave them untreated, and 2.6 times more likely to leave hypertension
19 uncontrolled.

20 **Conclusions:** Although China has made impressive progress in addressing regional
21 inequalities in hypertension care over time, it needs to increase its effort to reduce
22 geographic disparities and to provide more effective treatments and higher quality care
23 for patients with hypertension.

24 **Key words:** trends; geographic disparities; hypertension care; China

6.1 Introduction

26 In an era of sustainable development goals, advancing universal health coverage is the
27 centrepiece of health policy in many countries.^{1,2} Like most countries in the world,
28 China has recently experienced a very rapid epidemiological transition from a
29 predominance of infectious disease to a predominance of chronic non-communicable
30 diseases (NCDs), including cardiovascular diseases, stroke, diabetes and cancers.³
31 Hypertension has been a leading risk factor for NCDs and disease burden in China.⁴⁻⁶
32 As an effective response, the government of China launched a new comprehensive
33 health reform initiative in 2009 aimed at increasing population access to health services,
34 reducing the financial burden of illness, and achieving universal health care (UHC).^{4 7}
35 As one of five major projects comprising the reform, the National Public Health Service
36 Equalisation (PHSE) Program sought to improve health equity and extend access to
37 primary public health services. It included improved services for the identification and
38 management of individuals with hypertension.

39 Previous cross-sectional studies have reported the extent of diagnosis, treatment and
40 control of hypertension;⁸⁻¹² however, there are very few longitudinal studies assessing
41 trends in the geographic distribution of hypertension management following the health
42 system reforms in China.¹³⁻¹⁴ This study examined trends and geographic variations in
43 the diagnosis, treatment and control of hypertension from 2011 to 2015 in China, based
44 on a national longitudinal dataset. Additionally, the association between geographic
45 correlates and hypertension care was investigated by applying random effects models
46 which could estimate the effects of those factors that do not change over time in the
47 longitudinal analysis or in panel studies.

6.2 Methods

6.2.1 Data source

48 This study used longitudinal data from three waves of the China Health and
49 Retirement Longitudinal Study (CHARLS) conducted in 2011, 2013 and 2015. This
50 study was designed to collect a high quality, nationally representative sample of

51 Chinese residents aged 45 and older, supporting the scientific research on the elderly
52 and on health trends. A detailed description of the survey objectives and methods can
53 be found elsewhere.¹⁵ The design of CHARLS was based on the Health and Retirement
54 Study (HRS)¹⁶ and related ageing surveys such as the English Longitudinal Study of
55 Aging (ELSA)¹⁷ and the Survey of Health, Aging and Retirement in Europe (SHARE)¹⁸.
56 Written informed consent was obtained from all participants. CHARLS received ethical
57 approval from the Peking University Biomedical Ethics Review Committee (Ref. no.
61 IRB00001052-11015) in 2011.¹⁵

62 The CHARLS questionnaire covers the following domains: demographics, health
63 status and functioning, health care and insurance, income and consumption, and a
64 number of important biomarkers, including height, weight, and blood pressure. In
65 CHARLS, each respondent's systolic blood pressure (SBP) and diastolic blood pressure
66 (DBP) were recorded three times by a trained nurse using a HEM-7112 electronic
67 monitor. The average values for each study participant were calculated but only given
68 to the subjects once the interviews were completed. The interviewees were asked if they
69 had hypertension and whether they were receiving any form of anti-hypertensive
70 treatment.¹⁵

71 To ensure sample representativeness, CHARLS' baseline survey covers 150
72 counties/districts and 450 villages/urban communities across 28 provinces, by using
73 multi-stage, stratified probability-proportionate-to-size (PPS) sampling. The survey
74 assigned 23,422 dwelling units to interviewers. After excluding empty or non-resident
75 dwellings, 12,740 dwelling units were age-eligible for CHARLS.¹⁵ A total of 17,708
76 individuals in 10,257 households were successfully interviewed in the baseline
77 CHARLS survey. The response rate was 80.5% in all age-eligible households in 2011,
78 85.8% in 2013 and 82.3% in 2015 among all baseline individuals. Ongoing follow-up
79 surveys were conducted every two years.

80 After excluding cases with missing demographic information and/or blood pressure

81 measurements, complete data were available for 13,725 individuals in 2011, 10,893
82 individuals in 2013, and 11,675 individuals in 2015. In order to estimate geographical
83 variation in the health care of hypertension, we also created a panel dataset which
84 included 8,486 hypertensive individuals who could be identified in all rounds of the
85 CHARLS. This excluded those unable to be followed-up and those who had died
86 between surveys. In this study, figure 1 shows that overall five classes within the region
87 were identified and ranked, based on their Gross Domestic Product (GDP) per capita at
88 the province level in China (Figure 1): Class 1, >12,000 US\$; Class 2, 12,000-10,000
89 US\$; Class 3, 10,000-7,000 US\$; Class 4, 7,000-6,000 US\$; and Class 5, <6,000 US\$.

6.2.2 Statistical analysis

90 The prevalence of hypertension, and the rates of undiagnosed, untreated and
91 uncontrolled hypertension among hypertensive individuals were calculated. In this
92 study, hypertension was defined as systolic blood pressure ≥ 140 mmHg and/or diastolic
93 blood pressure ≥ 90 mmHg and/or reported taking of medication for raised blood
94 pressure.¹⁹ Undiagnosed hypertension was defined as applying to those who were found
95 to be hypertensive at the time of physical examination but denied a previous doctor's
96 diagnosis of hypertension. Untreated hypertension was defined as applying to those
97 with hypertension who had declined anti-hypertensive medication or treatment for high
98 blood pressure over the past year. Uncontrolled hypertension was defined as applying
99 to those with hypertension whose examinations did not have mean systolic blood
100 pressure <140 mmHg and diastolic blood pressure <90 mmHg.

101 The variations in prevalence and in undiagnosed, untreated and uncontrolled rates of
102 hypertension across residential locations and regions of different socio-economic status
103 were analysed by the Chi-square test. The changes in prevalence, diagnosis, treatment
104 and control of hypertension across 5 years in each of the sampled 28 provinces were
105 shown in colour in geographic information system (GIS) maps to clearly demonstrate
106 those changes.

107 In terms of the multivariable analysis, random effects logistic regression models were

108 also applied to examine the geographical variations in hypertension care, after
109 controlling for demographic characteristics. The explanatory variables of interest were
110 different per capita GDP levels, location of residence (urban area, rural area or rural-
111 to-urban areas defined as applying to people with agricultural household registration
112 currently living in urban areas), and personal variables including age, gender, marital
113 status, education, body mass index (BMI), comorbidity, per capita household
114 consumption expenditure, and health insurance. The adjusted odds ratio (AOR) was
115 reported in this study. All statistical analyses were conducted using STATA 14.0. P
116 values less than 0.05 were considered statistically significant.

6.3 Results

6.3.1 Trends in hypertension prevalence and health care in China

117 Tables 1 shows the disparities of hypertension prevalence and management between
118 rural and urban areas. The prevalence of hypertension among Chinese adults aged 45
119 years and above was around 40% in 2011, 2013 and 2015. Among hypertensive
120 individuals, there were downward trends in undiagnosed, untreated, uncontrolled
121 hypertension over the study years, with rates of 44.1%, 51.6%, and 80.7% in 2011,
125 40.0%, 47.4%, and 77.8% in 2013, and 31.7%, 38.0%, and 71.4% in 2015, respectively.
126 The overall level of uncontrolled hypertension was still very high (above 70%) in China
127 in 2015. The prevalence for urban residents was higher than for rural residents during
128 the period 2011 to 2015. For hypertension management, however, the number of
129 undiagnosed, untreated and uncontrolled hypertensive residents living in urban areas in
130 2015 was more than 10% lower than the number of patients in rural areas and among
131 rural-to-urban immigrant individuals with hypertension in China (Table 1).

6.3.2 The geographic variation in hypertension management at the provincial level

132 Table 2 shows the disparities between hypertension prevalence and its management
133 in regions of different socio-economic status. The hypertension prevalence was not
134 statistically different across five regions ranked by GDP per capita in China, but the
135 undiagnosed and untreated rate was significantly higher in the regions with lower GDP

122 than in those with higher GDP over the 5 years (weighted undiagnosed: 50.9% vs 14.4%,
123 $P < 0.01$ in 2011, 42.3% vs 12.6%, $P = 0.017$ in 2013; weighted untreated, 60.2% vs
138 21.0%, $P < 0.001$ in 2011, 52.1% vs 22.3%, $P = 0.03$ in 2013; 41.1% vs 11.7%, $P = 0.014$
139 in 2015). This study also showed a high rate of uncontrolled hypertension, over 59.5%
140 in regions with the highest GDP, and 74.4% in regions with the lowest GDP in 2015,
141 indicating an urgent need for an effective hypertension management plan.

142 Figures 2 and 3 show the change in prevalence, and in undiagnosed, untreated and
143 uncontrolled rates of hypertension in all 28 sampled provinces across China. Significant
144 geographic variations in hypertension management could be found between south/north
145 and east/west. Generally, the provinces located in northern China showed a high
146 prevalence of hypertension, while the undiagnosed, untreated and uncontrolled rates
147 were higher in south-western, north-western and north-eastern areas. Decreasing trends
148 were noted in undiagnosed, treated and controlled rates of hypertension at the provincial
149 level in China between 2011 and 2015.

6.3.3 Variations in hypertension diagnosis, treatment and control across regions in China

150 Random effects models confirmed variations in hypertension diagnosis, treatment
151 and control across regions with different GDP levels in China. The Class 1 region (with
152 the highest GDP) reported much lower undiagnosed, untreated and uncontrolled rates
153 compared to the other 4 classes. Areas with the lowest socio-economic indicators were
154 8.5 times more likely to leave the residents undiagnosed, 2.8 times more likely to leave
155 them untreated and 2.6 times more likely to leave them uncontrolled. Table 3 also shows
156 that age, female sexuality, lower BMI, higher education, higher income, and insurance
157 coverage were protective factors for hypertension diagnosis, treatment and control.

6.4 Discussion

158 Hypertension has become the most important public health challenge in China. It
159 accounted for 2.043 million deaths in 2010 and for 6.61% of the 3.187 trillion RMB
160 spent on health care in 2013.²⁰ The Chinese government has produced a series of
161 resources and launched a number of intervention programs to deliver affordable,
162 standard hypertensive care in an attempt to stem the spread of hypertension since the

163 2009 healthcare system reform, including the National Essential Public Health Service
164 Equalisation Program (2009), family physician contracted services, mass health
165 education programs (2012), and provision of anti-hypertensive essential drugs with a
166 low co-payment in primary care facilities (2011). This research has found an
167 encouraging improvement in hypertension prevalence, and in undiagnosed, untreated
168 and uncontrolled rates of hypertension across urban/rural and regions of different socio-
169 economic status between 2011 and 2015, which is consistent with the previous
170 findings^{8-9,21-22} and indicates the efficacy of the current intervention measures taken by
171 the government.²³⁻²⁵

172 Despite these achievements, huge gaps still exist in the quality of hypertensive
173 management when compared to developed western countries. In Europe, Japan or North
174 America for example, more than 80% of hypertensive individuals are aware of their
175 hypertension; more than 80% are receiving anti-hypertensive treatment; and more
176 than 60% have their hypertension controlled well,²⁶⁻²⁸ but the rates in China found in
177 this research were only 68.3%, 62.0% and 28.6%, respectively. This quality gap may
178 be the result of weakness in the service delivery system; the split between preventive
179 care and primary care provision systems may hinder the continuity and coordination of
180 prevention, treatment and effective control of hypertension^{21, 29-30}. Unlike hypertensive
181 care patients in most developed countries, those in China are still receiving care from
182 different providers: clinical care is provided by primary care physicians, preventive care
183 and management by public health physicians, community-based intervention by
184 community health workers, and patient education by both primary care facilities and
185 the community.³¹⁻³² Efforts in health system strengthening should be focused on
186 bringing the different services together, offering hypertensive patients accessible,
187 continuous and coordinated care, and improving the quality of hypertension
188 management in China.

189 Variations in hypertension management were found among individuals in different
190 residential locations. Rural-to-urban migrants reported the highest undiagnosed,
191 untreated and uncontrolled rates; they were 2.115 times (1.494 times) less likely to be

192 treated (controlled) compared to urban residents. The disparities are believed to be
193 caused by the different levels of accessibility and service quality available to the three
194 sub-populations. Migrants face financial obstacles in accessing hypertensive care due
195 to insurance coverage limitations: the New Cooperative Medical Scheme does not cover
196 medical bills outside the pooling units, so when rural-to-urban migrants have
197 hypertensive care requirements outside the pooling units of their insurance they have
198 out-of-pocket medical costs. In most cases, they choose to neglect their conditions and
199 bear them until they cannot suffer any more.³³ This postponement of diagnosis and
200 treatment further damages their health, leading to a heavier disease burden.³⁴⁻³⁵ In
201 addition to such economic constraints, feelings of cultural isolation, low education
202 levels, lack of information, fear of seeing doctors, and malnutrition are all possible
203 factors preventing people from accessing hypertension care or participating in
204 hypertension management programs in urban areas.³⁶⁻³⁷ Measures were taken to rectify
205 these problems in the majority of population-inflowing cities after 2009, including
206 expanding local health insurance coverage to migrants, offering migrants discounted
207 hypertensive care services in primary care facilities, and strengthening health education
208 and community intervention for migrants.³⁸ Chronic condition management for
209 migrants is difficult internationally. More cost-effective technology-related
210 intervention models need to be developed to facilitate screening and follow-up.

211 Disparities in hypertension management are also found between provinces of
212 different socio-economic status. The Class 1 provinces (with the highest GDP per capita)
213 reported much lower undiagnosed, untreated and uncontrolled rates compared to the
214 other 4 classes. The random effects models found that patients in provinces with the
215 lowest socio-economic scores were 8.5 times more likely to be undiagnosed, 2.8
216 untreated and 2.6 uncontrolled, indicating the significant effect of socio-economic
217 status on hypertension management. Local governments play a key role in fundraising
218 for almost all hypertension management programs, especially for the National Essential
219 Public Health Service Equalization Program that offers standardised hypertension
220 management to all patients.³⁴ Poorer areas may be less able to successfully fundraise

221 for this purpose. The central government takes responsibility for fundraising for less
222 developed central and western provinces, earmarking central fiscal subsidies for
223 reimbursing 60% and 80% of the cost of their hypertension management programs to
224 ensure equitable service quality.³⁹ As for Class 1 provinces, the fiscal capacity of their
225 local governments means they can afford various pilot experiments and innovative
226 programs, offer enough incentives to encourage physician teams to promote health
227 education and behaviour intervention, and equip facilities with new health management
228 devices and medications, ensuring a higher quality of hypertension services than in
229 other provinces.

230 Provinces in different regions face different problems; they need to develop
231 specialised HP management plans.¹³ Yin et al divided 31 provinces into 5 groups based
232 on levels of HP prevalence, awareness, treatment and control rates. Their results were
233 consistent with the findings in this study.¹⁴ North and north-western China, in areas such as Hebei,
234 Inner Mongolia, Qinghai and Gansu, report a higher prevalence of hypertension, with
235 high diagnosis and treatment rates. Lifestyles in the north are a risk factor for high
236 prevalence, with local governments taking active measures to control them
237 successfully.¹⁰⁻¹¹ Some south-eastern provinces such as Hubei, Fujian and Guangdong
238 have a lower prevalence, but also have higher undiagnosed, untreated, and uncontrolled
239 rates.¹² This study assumes that this situation is not caused by local people's lifestyles but by
240 the presence of a large number of immigrants who have poor management outcome⁴⁰
241 because their access to free public services is poor. It also reflects the uneven service
242 quality in urban and rural areas.⁴¹ Some south-western provinces like Guizhou and
243 Yunnan report high prevalence and low diagnosis, treatment and control rates. These
244 are under-developed provinces that need more government investment to improve poor
245 health infrastructure, to address low educational levels and unhealthy lifestyles, and to
246 improve chronic disease prevention and control systems.⁴²⁻⁴³

247 This study also found that age, female sexuality, lower BMI, higher education, higher
248 income and insurance coverage are protective factors in relation to hypertension
249 diagnosis, treatment and control, consistent with the previous findings.⁴⁴⁻⁴⁵ Wang et al

250 conducted a national survey with 134,397 residents aged ≥ 60 years, finding that the
251 diagnosis and treatment of hypertension was higher in females than in males, and higher
252 in urban areas than in rural areas.⁴¹ Xinglin Feng found that those with insurance that
253 covered the cost of outpatient care were significantly more likely to have their
254 hypertension disorders diagnosed and controlled.²¹ Kjeldsen reviewed recently updated
255 national and international hypertension guidelines, all of which recommended health
256 behaviour intervention strategies, including sodium restriction, smoking cessation,
257 body weight reduction, alcohol consumption, and increase in physical activity.⁴⁶ The
258 “2010 Chinese Guideline for the Management of Hypertension” strongly recommended
259 that changed health behaviours should be encouraged to achieve the goals of
260 hypertension control and management.⁴⁷ It is clear that population interventions are
261 needed to control the risk factors in China, with health education and community
262 participation the most effective measures.

263 Though this study is one of the first to investigate the temporal and geographic
264 variations in hypertension management in China using nationally-representative
265 longitudinal data, it still has some limitations. CHARLS only includes those aged 45
266 and older, excluding the younger generation from the analysis. CHARLS was
267 conducted in only 28 provinces, with the data of 6 provinces missing. The average age
268 of the panel would have increased by roughly two years in each follow-up survey, the
269 same respondents being interviewed in all three rounds of the CHARLS survey; this
270 which may have had an impact on the estimation of hypertension prevalence. In
271 addition, about 20% of participants did not report their blood pressure readings in all
272 three survey rounds. To account for non-response bias, this study adjusted the analysis
273 by using the CHARLS created weights for individuals, which helped to address this issue.

6.5 Conclusion

274 This study provides an overview of the progress China made towards effective
275 hypertension management between 2011 and 2015. Hypertension prevalence in China
276 stabilised, but disparities in hypertension diagnosis, treatment and control rates still
277 exist between rural/urban residents and provinces with of different socio-economic

278 status. China is a large country with large domestic, economic and regional variations
279 such that hypertension control cannot be achieved by one intervention plan; it is too
280 complicated. Both a nationally-coordinated service delivery system and province-
281 specific intervention plans are needed to achieve the goal of standardised and high-
282 quality hypertension management.

283

284 **Authors' contributions:**

285 All authors participated in the design of the study and were involved in the
286 implementation of the study. YZ and LZ designed the study; YZ and SZ carried out the
287 initial analysis and supervised data analysis. YZ wrote the first draft of the paper, and
288 BO, LZ, SZ and TH provided advice on the first draft. All authors reviewed and had
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299

300 **Conflicts of interest:** None declared.

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Figure legends

Figure 1	Five classes of the region based on GDP per capita in China in 2015
Figure 2	Geographic variation in hypertension prevalence and diagnosis in 2011, 2013, 2015
Figure 3	Geographic variation in treatment and control of hypertension in 2011, 2013, 2015

Accepted Version

Table 1. Hypertension prevalence and health care among Chinese adults from 2011 to 2015, by place of residence

	2011				2013				2015			
	N	Unweighted	Weighted	P value	N	Unweighted	Weighted	P value	N	Unweighted	Weighted	P value
Sample size	13725	-	-		10893	-	-		11675	-	-	
Prevalence												
Urban	1,070	45.6	46.3	0.012	911	48.9	50.1	0.009	828	45.8	45.0	0.053
Rural	3,122	36.1	36.9		2,889	41.0	41.0		3,104	40.5	40.2	
Rural-to-urban	1,093	40.0	43.1		866	43.5	40.4		942	42.8	42.5	
All	5,285	38.5	40.8		4,666	42.8	43.3		4,874	41.8	41.8	
Undiagnosed												
Urban	354	33.1	35.3	0.005	306	33.6	35.9	0.216	205	24.8	23.8	<0.001
Rural	1,439	46.1	46.2		1,133	39.2	39.9		1,036	33.4	34.1	
Rural-to-urban	516	47.2	50.7		351	40.5	46.5		317	33.7	35.3	
All	2,309	43.7	44.1		1,790	38.4	40.0		1,558	32.0	31.7	
Untreated												
Urban	411	38.4	42.0	0.003	375	41.2	42.4	0.114	264	31.9	29.9	<0.001
Rural	1,685	54.0	53.6		1,382	47.8	48.0		1,239	39.9	40.6	
Rural-to-urban	610	55.8	59.2		424	49.0	53.8		391	41.5	41.7	
All	2,706	51.2	51.6		2,181	46.7	47.4		1,894	38.9	38.0	
Uncontrolled												
Urban	773	72.2	75.6	0.003	685	75.2	77.0	0.504	537	64.9	63.6	<0.001
Rural	2,529	81.0	80.6		2,234	77.3	77.0		2,299	74.1	73.8	
Rural-to-urban	911	83.4	86.7		683	78.9	81.1		712	75.6	75.1	
All	4,213	79.7	80.7		3,602	77.2	77.8		3,548	72.8	71.4	

Table 2. Prevalence, undiagnosed, untreated and uncontrolled hypertension in China from 2011 to 2015, by region based on economic status ^a

	2011				2013				2015			
	N	Unweighted	Weighted	P value	N	Unweighted	Weighted	P value	N	Unweighted	Weighted	P value
Prevalence												
Class 1	120	46.7	54.3	0.052	69	51.9	56.0	0.105	58	53.7	52.1	0.266
Class 2	1614	40.6	43.2		1420	43.7	41.5		1519	43.4	41.5	
Class 3	702	36.8	40.9		604	42.1	43.9		601	40.3	42.2	
Class 4	2052	36.7	37.5		1929	42.8	43.8		1966	40.9	41.6	
Class 5	797	39.9	40.8		644	41.1	42.9		730	41.2	41.3	
Undiagnosed												
Class 1	24	20.0	14.4	<0.001	18	26.1	12.6	0.017	9	15.5	11.1	0.068
Class 2	707	43.8	47.7		528	37.2	42.2		507	33.4	33.4	
Class 3	306	43.6	40.0		248	41.1	38.4		193	32.1	33.1	
Class 4	867	42.3	42.3		744	38.6	40.4		596	30.3	30.2	
Class 5	405	50.8	50.9		252	39.1	42.3		253	34.7	34.8	
Untreated												
Class 1	31	25.8	21.0	<0.001	21	30.4	22.3	0.030	10	17.2	11.7	0.014
Class 2	801	49.6	53.7		640	45.1	48.5		628	41.3	40.7	
Class 3	357	50.9	46.4		302	50.0	47.2		227	37.8	39.2	
Class 4	1044	50.9	51.0		899	46.6	47.3		729	37.1	36.2	
Class 5	473	59.4	60.2		319	49.5	52.1		300	41.1	41.1	
Uncontrolled												
Class 1	75	62.5	75.0	0.260	43	62.3	56.2	0.062	38	65.5	59.5	0.335
Class 2	1274	78.9	82.1		1079	76.0	79.3		1112	73.2	71.3	
Class 3	575	81.9	79.1		487	80.6	79.9		440	73.2	72.6	
Class 4	1617	78.8	78.4		1480	76.7	76.4		1416	72.0	71.0	
Class 5	672	84.3	85.1		513	79.7	81.9		542	74.3	74.4	

^a Class 1 is the richest region and Class 5 the poorest region.

Table 3. The random effects of region development on hypertension care in China from 2011 to 2015

Variable (reference)	Undiagnosed			Untreated			Uncontrolled		
	AOR ^a	95% CI		AOR	95% CI		AOR	95% CI	
Region ^b (Class 1)									
Class 2	6.975***	3.266	14.895	2.384***	1.608	3.535	2.228***	1.700	2.920
Class 3	6.651***	2.838	15.585	2.542***	1.652	3.911	2.651***	1.962	3.582
Class 4	3.917***	1.951	7.866	2.072***	1.436	2.988	1.812***	1.414	2.320
Class 5	8.489***	3.630	19.854	2.799***	1.827	4.290	2.559***	1.899	3.450
Residence place (urban)									
Rural	1.030	0.541	1.960	1.354	0.972	1.885	1.068	0.840	1.359
Rural-to-urban	1.684	0.813	3.491	2.115***	1.448	3.088	1.494**	1.133	1.970
Age (45-60 years)									
60-70	0.247***	0.165	0.371	0.467***	0.376	0.580	0.868	0.740	1.017
70-80	0.198***	0.114	0.345	0.456***	0.341	0.610	1.272*	1.024	1.580
80 & above	0.106***	0.041	0.275	0.487**	0.296	0.804	1.420	0.948	2.125
Gender (male)	0.390***	0.249	0.612	0.567***	0.454	0.707	0.777**	0.664	0.908
BMI	0.666***	0.631	0.704	0.818***	0.796	0.841	0.951***	0.934	0.967
Marital status (married)	1.361	0.786	2.357	1.183	0.893	1.569	1.237	0.998	1.534
Education (Illiterate)									
Primary school	0.819	0.481	1.395	0.903	0.696	1.170	0.752**	0.623	0.908
Middle school & above	0.517**	0.276	0.969	0.785	0.574	1.073	0.731**	0.584	0.915
Comorbidity (no)	0.040***	0.025	0.064	0.234***	0.188	0.293	0.437***	0.370	0.515
PCE, (<10000 RMB)	0.357***	0.261	0.490	0.573***	0.476	0.689	0.717***	0.622	0.827
Health insurance ^c (none)									
UEBMI	0.321**	0.139	0.737	0.713	0.444	1.144	0.611*	0.420	0.890
URBMI	0.212**	0.087	0.517	0.635	0.383	1.055	0.619*	0.413	0.928
NCMS	0.471*	0.255	0.869	0.647*	0.451	0.928	0.673*	0.494	0.918
Others	0.705	0.239	2.084	0.738	0.388	1.405	0.696	0.416	1.165

AOR, Adjusted odds ratio; BMI, Body mass index; PCE, Per capita household annual consumption expenditure; UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme.

^a ***P<0.001, **P<0.01, *P<0.05 significance test.

^b Class 1 is the richest region and Class 5 the poorest region.

^c Others Government health care, private medical insurance and so on.

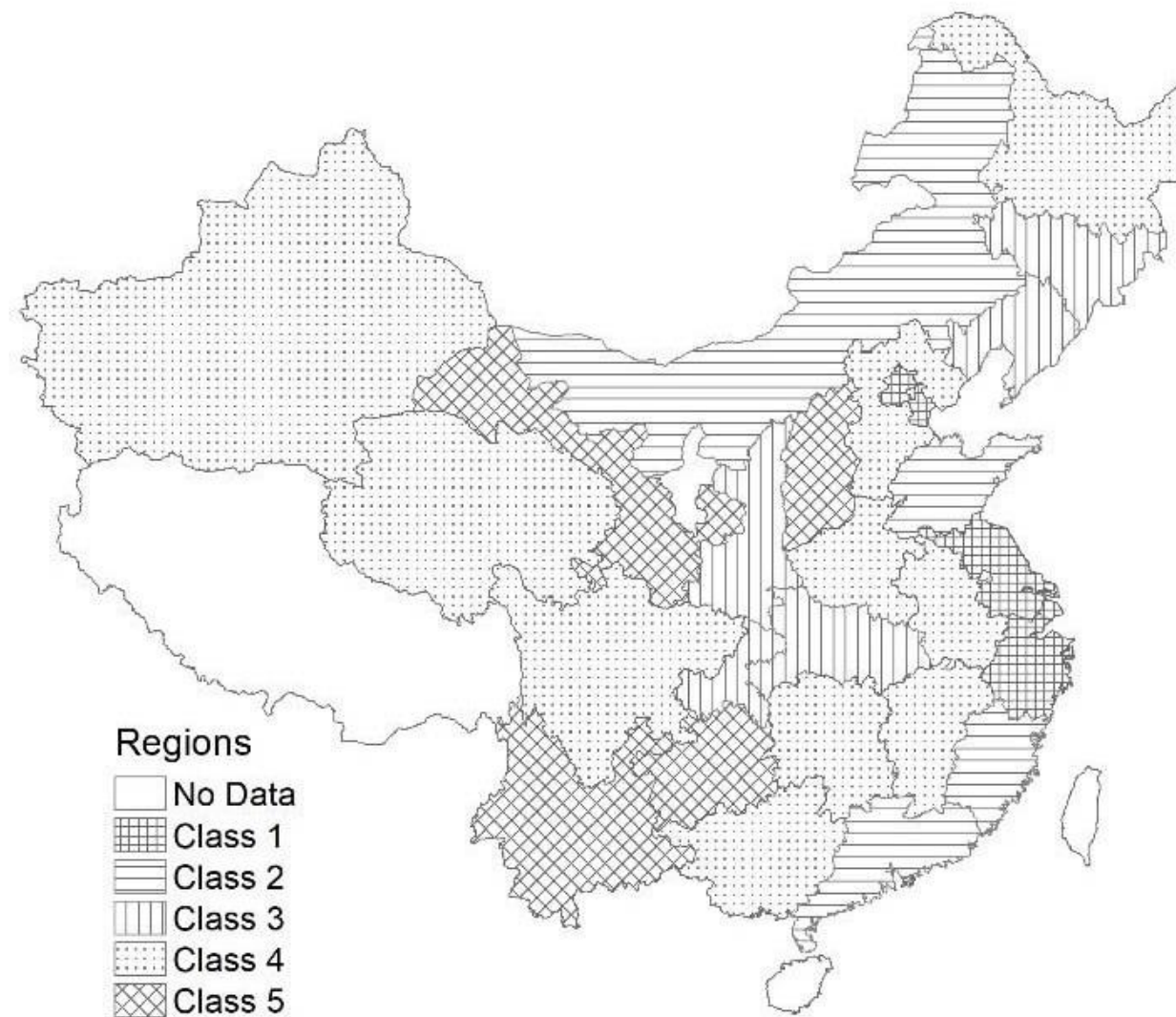
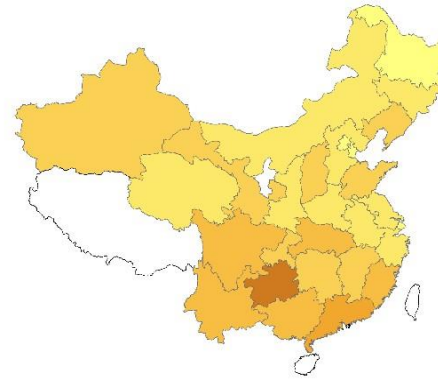


Figure 1

(A) Prevalence 2011



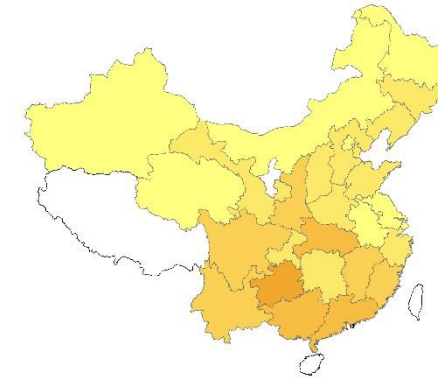
(D) Undiagnosed 2011



(B) Prevalence 2013



(E) Undiagnosed 2013



(C) Prevalence 2015



(F) Undiagnosed 2015

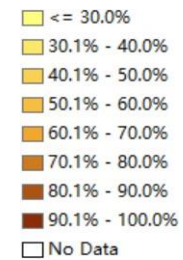
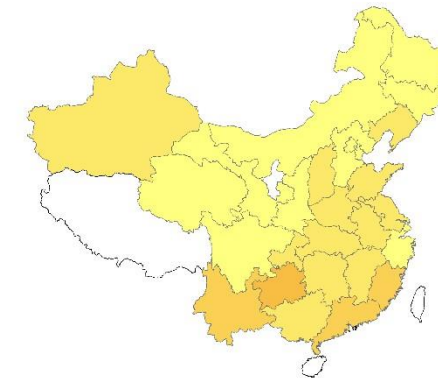


Figure 2

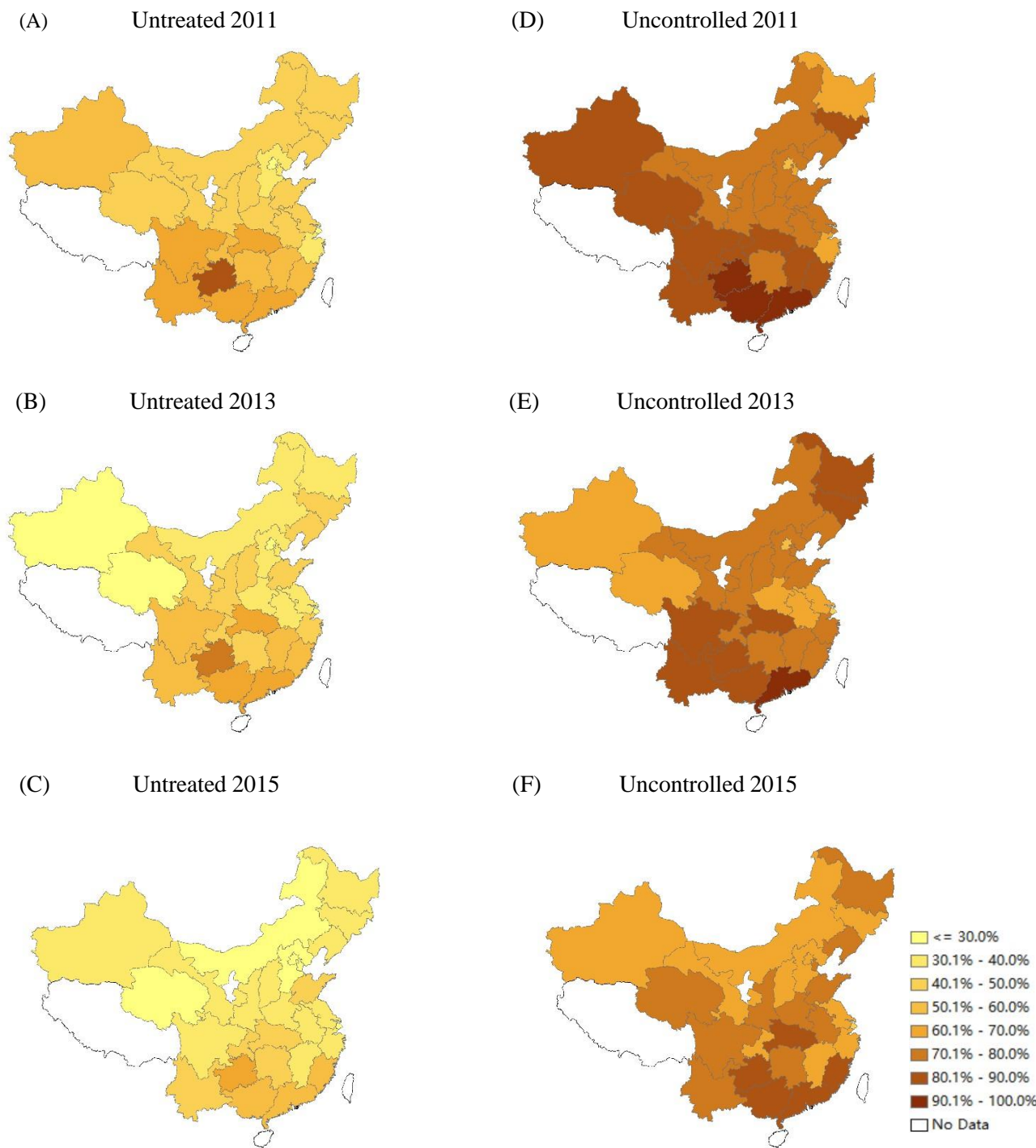


Figure 3

Chapter seven: Physical multimorbidity, health service use, and catastrophic health expenditure by socioeconomic groups in China: an analysis of population-based panel data

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Title: Physical multimorbidity, health service use, and catastrophic health expenditure by socioeconomic groups in China: an analysis of population-based panel data

Authors: Yang Zhao, Rifat Atun, Brian Oldenburg, Barbara McPake, Shenglan Tang, Stewart Mercer, Thomas E Cowling, Grace Sum, Vicky Mengqi Qin, John Tayu Lee

The Nossal Institute for Global Health, The University of Melbourne, Melbourne, VIC, Australia (Y Zhao MPH, Prof B Oldenburg PhD, Prof B McPake PhD, J Lee PhD); WHO Collaborating Centre on Implementation Research for Prevention and Control of Noncommunicable Diseases, Melbourne, VIC, Australia (Y Zhao MPH, Prof B Oldenburg PhD); Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Harvard University, Boston, Massachusetts, USA (Prof R Atun FRCP); Department of Global Health and Social Medicine, Harvard Medical School, Harvard University, Boston, Massachusetts, USA. (Prof R Atun FRCP); Duke Global Health Institute, Duke University, Durham, North Carolina, USA (Prof S Tang PhD); Usher Institute of Population Health Sciences and Informatics, College of Medicine and Veterinary Medicine, University of Edinburgh, Edinburgh, UK (Prof S Mercer PhD); Department of Health Services Research and Policy, London School of Hygiene and Tropical Medicine, London, UK (T Cowling PhD); Saw Swee Hock School of Public Health, National University of Singapore, Singapore (G Sum PhD, V Qin PhD); and Public Health Policy Evaluation Unit, Department of Primary Care and Public Health, School of Public Health, Imperial College London, London, UK (J Lee PhD)

Correspondence to: Mr Yang Zhao

The Nossal Institute for Global Health, The University of Melbourne; WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs
Level 5, 333 Exhibition Street, Melbourne, Victoria 3010 Australia

E-mail address: zhaoyang001@hsc.pku.edu.cn

Summary

Background Multimorbidity, the presence of two or more mental or physical chronic non-communicable diseases, is a major challenge for the health system in China, which faces unprecedented ageing of its population. Here we examined the distribution of physical multimorbidity in relation to socioeconomic status; the association between physical multimorbidity, health-care service use, and catastrophic health expenditures; and whether these associations varied by socioeconomic group and social health insurance schemes.

Methods In this population-based, panel data analysis, we used data from three waves of the nationally-representative China Health and Retirement Longitudinal Study (CHARLS) for 2011, 2013, and 2015. We included participants aged 50 years and older, who had complete follow-up for the three waves. We used 11 physical non-communicable diseases to measure physical multimorbidity and annual per-capita household consumption spending as a proxy for socioeconomic status.

Findings Overall, 62% of participants had multimorbidity in China in 2015. The onset of multimorbidity occurred 5 to 10 years earlier in people belonging to the wealthiest socio-economic quartile group compared with the lowest. A higher number of chronic diseases was associated with more frequent health service use for both outpatient visits (Coefficient=0.25, 95% CI=0.24, 0.27) and days of hospitalisation (Coefficient=0.32, 95% CI=0.30, 0.34). There were similar effects from different socioeconomic groups and among those covered by different social health insurance programmes. Overall, multimorbidity was associated with a substantially higher likelihood of experiencing CHE (Adjusted OR=1.29 for the overall population, 95% CI=1.26, 1.32). The effect of multimorbidity on CHE persisted even among the most affluent population and those with the more generous health insurance coverage.

Interpretation Concerted efforts are needed to reduce health inequalities that are due to physical multimorbidity, and its adverse economic effect in population groups in China. Social health insurance reforms must place emphasis on reducing out-of-pocket spending for patients with multimorbidity to provide greater financial risk protection.

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7.1 Introduction

Chronic conditions are a major contributor to inequalities in healthcare outcomes and economic burden in China.^{1,2} With an ageing population and an increased exposure to risk factors for non-communicable diseases (NCDs), the prevalence of multimorbidity, defined as two or more co-existing chronic conditions³, is likely to increase rapidly.⁴ Despite the growing prevalence of multimorbidity, little attention has been given to the implications of multimorbidity for individuals, households, and health systems.⁵

The Chinese government, via its Healthy China 2030 Plan^{6,7} and through a series of far-reaching health reforms, has set a bold vision for achieving universal health coverage and reducing premature mortality due to NCDs by 25% by the year 2030. Almost the entire Chinese population (around 1.2 billion, more than 95% of total) is currently covered by one of the three major social health insurance programmes (the Urban Employee Basic Medical Insurance (UEBMI) scheme, the Urban Resident Basic Medical Insurance (URBMI) scheme, and the New Rural Cooperative Medical Scheme (NCMS)).^{8,9} However, low levels of service coverage for some beneficiaries and high levels of patient cost-sharing (out-of-pocket fees) have raised concerns about the lack of adequate financial protection for patients with chronic conditions.⁹

The economic impact of multimorbidity and its implications for financial stress is an emerging area of research inquiry.¹⁰ To date, the evidence on the economic burden of multimorbidity is mostly from high-income countries (HICs). The evidence from HICs suggests that multimorbidity imposes high economic costs on individuals and households.¹¹ Patients with multiple chronic diseases incur significant medical expenditures to address the conditions^{12,13} and are also more likely to be absent from work, and be less productive, with adverse economic consequences^{11,14}. However, the relationship between multimorbidity, health service utilisation and levels of financial by population groups has not been examined.

Similarly, the evidence on the economic impact of multimorbidity on individuals and the health system in China is lacking. In China, research on multimorbidity has focused on regional- or district-level populations and used cross-sectional study design.¹⁵⁻¹⁹ There are no studies that have used nationally-representative panel data. The author presents the first study that uses population-level nationally-representative panel data for the period 2011-2015 to examine multimorbidity levels, its relation to economic status, and its impact on health service use and catastrophic health expenditures. The data is representative of the largest middle-aged and older population (people aged 50 years and above) in the world amounting to more than 337 million people.^{20,21}

Panel 1: Research in context

Systematic review

The burden of NCDs has grown rapidly worldwide over the last 20 years^{1,2}. While there have been many studies conducted in HICs on the burden and causes of multimorbidity, this topic is still an emerging area of research inquiry in low-to-middle income countries (LMICs), where the fragile health systems face the dual burden of NCDs and infectious diseases.^{4,12-14, 22-26} The implications of multimorbidity

on the attainment of universal health coverage (UHC) in LMICs, including access to healthcare and financial protection, especially for the poor, has not been examined.^{13,23,26}

The author conducted a literature review with the keywords “multimorbidity” “multiple chronic diseases” “healthcare utilisation” “economic burden” “health expenditure” and “China”. This research identified very few studies which examined this issue in China.^{15,16} One of these studies examined the association between multimorbidity and healthcare utilisation amongst 162 464 subjects in Guangdong province.¹⁵ However, the author identified no national-level studies using panel analysis. Furthermore, there is a dearth of evidence on the impact of multimorbidity on health service use and financial protection by socioeconomic groups and populations covered by various social health insurance schemes in China. Research is urgently required to generate better evidence to improve healthcare delivery, patient outcomes and financial protection for people with multimorbidity.

Added value of this study

To our knowledge, this study is the first longitudinal analysis to examine socioeconomic group differences in the prevalence of physical multimorbidity in China, and its effect on healthcare use and catastrophic health expenditures. Our findings indicate that physical multimorbidity is common among Chinese adults aged 50 years and older. Individuals in higher socioeconomic groups have more physical multimorbidity than those in lower socioeconomic groups.

Implications of all the available evidence

Our findings differ from the evidence from high-income countries, where the prevalence of physical multimorbidity is higher among lower-income groups than in higher-income groups, but this difference might be due to limitations in the current study data, which excluded mental health conditions and relied mainly on self-report. Further studies examining the effect of multimorbidity due to other common chronic conditions (eg, Alzheimer’s disease, depression, asthma) as well as infectious diseases (eg, tuberculosis, AIDS, coronavirus disease 2019) are also warranted.

Panel 2: China’s main social health insurance schemes

The China New Health System Reform, introduced in 2011, has expanded health insurance coverage, to 95·7% of the Chinese population through one of the three primary health insurance schemes.⁵

Urban workers are covered by the Urban Employee Basic Medical Insurance (UEBMI) scheme, which was launched by the Chinese State Council in 1998. All urban employees are required to join. Roughly 283 million were enrolled in UEBMI in 2014.²⁷ This scheme consists of a pooled fund for inpatient stays and individual medical savings accounts for outpatient visits. It is financed by payroll income from employees (2%) and employers (6%).²⁸ The per capita fund of UEBMI is US\$424·7.²⁹

The Urban Resident Basic Medical Insurance scheme (URBMI) aims to insure the rest of the urban population, including children, students, and other unemployed

urban residents, who were not previously covered by the UEBMI. In 2014, 315 million people were covered by the URBMI. The scheme is funded by a government subsidy (70%) and individual contributions (30 %).³⁰ The per capita fund of this scheme is US\$66.2.²⁹

For the rural population, the Chinese government has launched the new rural cooperative medical scheme (NCMS) in 2003, which was expanded rapidly to cover about 802 million rural residents by 2013.³¹ NCMS funds are pooled at the county level. NCMS scheme is financed by enrollees' premiums (about 20%) and generous subsidies from both central and local governments (about 80 %). Annual government subsidies per enrollee increased from 20 Chinese yuan (US\$2.9) in 2003 to 380 Chinese yuan (US\$55.2) in 2015. The per capita funding for NCMS is US\$61.2.³⁰

China has also established a medical assistance programme for poor people, jointly funded by the central and local governments. At the end of 2015, the Chinese government announced the decision to integrate URBMI and NCMS as the urban-rural resident medical insurance (URRMI),³² to achieve UHC.³³ This integration enabled a further extension of funding pools and narrowing in the disparities in access to healthcare services and medications which existed between different insurance schemes.

7.2 Methods

7.2.1 Data sources

This study used longitudinal data from the three waves of the China Health and Retirement Longitudinal Study (CHARLS) conducted in 2011, 2013 and 2015. In brief, CHARLS collects high-quality data, from a nationally representative sample of Chinese residents aged 45 and older, using multi-stage stratified probability-proportionate-to-size sampling. The overall response rate to CHARLS was 80.5%. The total sample size of the CHARLS baseline survey was 17 708 individual respondents. The data included individual weighting variables to ensure that the survey sample was nationally representative. Ongoing follow-up surveys were conducted once every two years. A detailed description of the survey objectives and methods has been reported elsewhere.³⁴

This research identified 13 565 respondents without loss-to-follow-up. After removing respondents aged below 50 years and those individuals with missing values of dependent or independent variables, the final sample consisted of 11 817 respondents accounting for 87.1% of those without loss-to-follow-up.

In this study, multimorbidity was defined as the presence of two or more chronic NCDs.^{4,12,23-26} A total of eleven NCDs were used to measure multimorbidity, including diagnosed hypertension and ten self-reported diagnosed chronic diseases (diabetes, dyslipidaemia, heart disease, stroke, cancer, chronic lung disease, digestive disease, liver disease, kidney disease and arthritis). This study counted the number of NCDs for each participant to identify those with multimorbidity.

In CHARLS, each respondent's systolic blood pressure (SBP) and diastolic blood pressure (DBP) was recorded three times by a trained nurse using a HEM-7112 electronic monitor. Diagnosed hypertension was defined as SBP \geq 140 mmHg and/or DBP \geq 90 mmHg, and/or being on anti-hypertensive medication for raised blood pressure.^{35,36}

Respondents were asked about their utilisation of outpatient and inpatient services: "How many times did you visit a general hospital, specialised hospital, clinic or other medical facilities for outpatient care in the past month? and How many days did you stay in hospital over the past year?" CHARLS collected information on how much respondents paid in total and how much out-of-pocket (deducting the reimbursed expenses) for their outpatient visits during the last month and inpatients visit during the last year. The same information was also collected on spouses of all participants.

This study defined a household as incurring catastrophic health expenditures when out-of-pocket expenditure on health equalled or exceeded 40% of a household's capacity to pay.³⁷ In this study, the capacity to pay was defined as the non-food household consumption expenditure. This expenditure level was considered the denominator. The numerator was the sum of respondents and their spouses' out-of-pocket expenditure for outpatient- and inpatient-care in the past year. A binary variable was defined, which indicated whether the household of participants experienced catastrophic health expenditures or not.

For the analysis of socio-economic group differences, yearly per-capita household consumption expenditure was used as a proxy for socio-economic status. This study

defined four socio-economic groups based on quartiles of per capita household consumption expenditure.

This study included the following variables as covariates: age, gender, marital status (married and partnered, unmarried and others), education (primary school and below, secondary school, college and above), residence (rural, urban, and rural-to-urban, defined as people with agricultural household registration but currently living in urban areas), socio-economic status quartiles, health insurance (UEBMI, URBMI, NCMS, other insurance, without insurance), and geographical region (five regional classes). Overall, five classes within the region were identified and ranked, based on their 2015 Gross Domestic Product (GDP) per capita income at the province level in China: Class 1, >12 000 US\$; Class 2, 12 000-10 000 US\$; Class 3, 10 000-7 000 US\$; Class 4, 7 000-6 000 US\$; and Class 5, <6 000 US\$.

7.2.2 Statistical analysis

This study used random-effects logistic regression to examine the associations between socio-economic status and the presence of multimorbidity, adjusting for confounding variables. Random-effects negative binomial regression models were performed to investigate the association between the number of NCDs and the frequency of outpatient visits and inpatient service use. The random-effects logistic regression model was applied to estimate the association between the number of NCDs and the incidence of catastrophic health expenditures.

To explore the differential effect in population groups, this study conducted subgroup analyses, stratified according to socio-economic status and insurance schemes using the same regression analysis, with the stratification variable dropped. For the logistic regression analysis, this research used the adjusted odds ratio, and for the negative binomial regression analysis, this study used the coefficient and 95% confidence intervals (CI).

Descriptive analysis of socio-demographic characteristics and prevalence of multimorbidity was weighted to account for the multi-stage probability-proportionate-to-size sampling design of CHARLS and loss to follow-up. All statistical analyses were conducted using STATA 15.0. P values less than 0.05 were considered as statistically significant.

7.3 Results

This study analysed data from 11 817 respondents. **Table 7.S1** presents the respondents' socio-economic and demographic characteristics. The median age of the respondents was 63 years in 2015. There was roughly an equivalent proportion of female and male respondents, of which 84.5% were married or partnered. 65.8% of the respondents had educational attainment of primary school completed or less, and 55.4% were residing in rural areas. More than 92% of respondents had at least one kind of health insurance, with 67.6% enrolled in the New Rural Cooperative Medical Scheme.

7.3.1 Prevalence of multimorbidity by socio-economic status

The proportion of people with multimorbidity increased substantially with age. In 2015, while the overall prevalence of multimorbidity was 61.7%, the prevalence of multimorbidity increased from 50.9% in those aged 50-54 years to 71.1% for those aged 75 years and above.

The prevalence of multimorbidity increased with rising economic status. For example, for people aged between 50 and 54 years, it was 47.2% in the lowest income group versus 53.7% in the highest group) (**Figure 7.1**). Overall, the onset of multimorbidity occurred 5 to 10 years earlier among people in the highest economic quartile group compared with those of lower socio-economic status in China.

Table 7.1 shows that people in the wealthiest economic quartile were more likely to report multimorbidity, compared with the quartile with the lowest economic status (AOR = 1.48, 95% CI = 1.22, 1.80). Additionally, the prevalence of NCD multimorbidity was higher in females than males (AOR = 2.67, 95% CI = 2.03, 3.52). The presence of multimorbidity was also associated with other socio-demographic characteristics. For example, unmarried persons, those with a high education level, and those living in less-developed regions were more likely to experience multimorbidity.

7.3.2 Impacts of multimorbidity healthcare and health spending

Table 7.2 shows that a higher number of chronic conditions is associated with a higher number of outpatient visits (Coefficient=0.25, 95% CI=0.24, 0.27) and higher days of hospitalization (Coefficient=0.32, 95% CI=0.30, 0.34). Overall, the associations between multimorbidity and health service use were comparable across economic groups. Moreover, socio-economic group differences in the relationship between multimorbidity and outpatient visits were consistent across health insurance schemes (**Figure 7.2**, **Figure 7.3**). A similar pattern of inpatient visits was also shown among subjects without insurance.

Multimorbidity was associated with a substantially higher likelihood of experiencing CHE (Adjusted OR=1.29 for the overall population, 95% CI=1.26, 1.32) (Table 2). The effect of multimorbidity on CHE persisted even among the quartile with the highest income (AOR=1.30, CI=1.24, 1.36) and those with more generous health insurance coverage (AOR=1.31, CI=1.21-1.41) (**Figure 7.4**).

7.4 Discussion

This study is the first analysis of a nationally-representative longitudinal survey of the middle-aged and older Chinese population which has examined socio-economic group differences for the prevalence of multimorbidity, and the impact of these differences on healthcare utilisation and catastrophic health expenditures.³⁸⁻⁴⁰ The data used represents a population of more than 300 million people in China.^{20,21} By population size represented, this study is the largest—far larger than other published studies representing smaller populations (e.g. a widely cited Scottish study with 1.75 million people).⁴

7.4.1 Summary of principal findings

The findings of this research indicate that multimorbidity is common among middle-aged and elderly Chinese adults, with the highest income groups having higher levels of multimorbidity. Multimorbidity occurs 5 to 10 years earlier among people in the highest income quartile compared to those in the lowest income quartile.

The number of chronic conditions is positively associated with higher levels of healthcare utilisation for both outpatient and inpatient care. This association appears to be similar across socio-economic groups and health insurance schemes. Multimorbidity was associated with a substantially higher likelihood of experiencing CHE (Adjusted OR=1.29 for the overall population, 95% CI=1.26, 1.32), with the comparable impact between the highest and lowest income groups. Considering the similar effects of multimorbidity on health service use, the results suggested that the rich may have more intensive treatment or use more expensive healthcare compared to the poor.

The findings on socio-economic group differences in multimorbidity prevalence are consistent with other province-level studies in China¹⁵ (e.g. the study in Guangdong province). Consistent with two earlier published studies,^{15,41} we found that the onset of multimorbidity occurred 5 to 10 years earlier among people in the highest income quartile than those in the lowest income quartile. This finding could be partly explained by a better diagnosis of NCDs in the higher-income groups who have better access to healthcare services and better health literacy.⁴⁰⁻⁴²

The findings need to be interpreted with caution, as the presence of chronic conditions is reported only where a diagnosis has been achieved. Hence they combine underlying prevalence with measures of access to health care and its timing. There is, therefore, the bias in favour of reporting the presence of chronic conditions among those with better healthcare access. The pattern of multimorbidity distribution in China is explained by the fact that the risk behaviours for chronic diseases, such as sedentary lifestyle^{43,44} and the consumption of highly processed food⁴⁵, have increased only recently for most of China's population, and were adopted first by the more prosperous and urban populations.^{46,47}

The curves representing levels of multimorbidity for each quartile are upward sloping. For any individual, given that a chronic condition is rarely reversed, the curve typically slopes upwards as an individual becomes older. Hence, the dip in the quartile 1 curve from the 70-74 age-group to the 75+ age-group might indicate a cohort effect, suggesting that the cohort aged 75+ years was less exposed to relevant risk factors than the younger cohorts. This finding is consistent with an explanation of growing exposure to risk factors over time⁴⁸, growing accumulation of chronic conditions over an

individual's lifespan and differentiation of exposure according to socio-economic status, with the adoption of lifestyles associated with risk factors accruing more recently in the lowest socio-economic group.⁴⁹

The findings of this study are also consistent with other published studies that have examined multimorbidity in populations living in LMICs (e.g. India and Bangladesh).^{41,50,51} However, the findings contrast with evidence from high-income countries which show a higher prevalence of multimorbidity in populations with lower income.⁵²⁻⁵⁴ For instance, a study of 16 European countries, found that individuals in the highest income quintile and those with higher levels of education were less likely to have multimorbidity than those with low levels of income and education.⁵³

Earlier studies have demonstrated that multimorbidity is associated with substantially higher healthcare utilisation, and this association has been well-documented in HICs,^{15,23,41,53,55-57} and other studies in China^{15,55}. However, to date, there have been no studies exploring the differences in this association due to socio-economic group and health insurance schemes in China. This study provides new evidence on the association between multimorbidity and utilisation of health services across socio-economic groups that were enrolled in different insurance schemes. We found no significantly different impact of multimorbidity on healthcare use in groups with different types of insurance.

Consistent with earlier published studies, the presence of a higher number of chronic conditions was associated with higher levels of catastrophic health expenditures.^{26,41,55,58-60} While this association appeared to be similar across socio-economic groups in this study, this research also reveals that the impact of multimorbidity on catastrophic health expenditures was greater for individuals with lower levels of income within the population covered by URBMI. It seems likely that less financial risk protection was available to the lowest income quartile enrolled in URBMI and NCMS due to limited benefits packages and a lack of coverage for some medications and inpatient services. This has likely led to a high incidence of catastrophic health expenditures. The cost of healthcare in urban health facilities is higher than that of rural health facilities. This difference could explain why lower-income groups covered by URBMI had more CHE than those covered by the NCMS and UEBMI. A study from the World Bank has indicated that the per capita annual fund contribution for UEBMI was about six times higher than that for URBMI⁶¹, suggesting that beneficiaries of UEBMI are likely to have smaller out of pocket costs, compared with the individuals enrolled in URBMI.^{28,30}

This research is the first to examine socio-economic variables and multimorbidity in China, although several studies have examined the impact of health insurance on disparities in access to healthcare in China.^{15,55-57 62-64} Although similar studies have been conducted in HICs such as Canada and Australia,^{29,65} the author has not identified similar studies from LMICs. To our knowledge, this is also the first study using nationally-representative longitudinal data of middle-aged-and-the-elderly individuals to examine the prevalence, correlates and impacts of multimorbidity.

There are several limitations to this study. First, the use of self-reported measures of chronic disease and healthcare utilisation may underestimate their prevalence, particularly for older persons and those from lower socio-economic and educational backgrounds who may be more likely to under-report.^{24,66} Second, the CHARLS questionnaire did not ask about all chronic diseases typically included in clinical

database studies.⁶⁷ Further studies examining the effect of multimorbidity due to other common chronic conditions (eg, Alzheimer’s disease, depression, asthma) as well as infectious diseases (eg, tuberculosis, AIDS, coronavirus disease 2019) are also warranted. Finally, this study only included people from China aged 50 years and older in 2015. The prevalence of multimorbidity and its effect among younger populations should be considered in future studies.

7.4.2 Clinical and policy implications

The findings of this study provide new evidence to inform the development of targeted policies and interventions to tackle the growing burden of multimorbidity in China. Health systems, need to shift from single-disease models to new financing and service delivery models to more effectively manage multimorbidity.⁶⁸ A strong primary health care system, led by generalist physicians (trained family doctors) working with multi-disciplinary teams, is essential for cost-effective management of multimorbidity.^{4,69} China has recently begun to rebuild its primary health care level by developing community health centres, though progress has been mixed.⁷⁰ A trial in China that is testing the roll-out of the ‘people-centred integrated care’ program (the ‘Luohu model’), which incentivises general practices to manage chronic disease patients holistically, is an example of such a new approach.^{70,71}

Disease-specific guidelines are often not appropriate for the management of individuals with multimorbidity and clinical guidelines for multimorbidity are needed. Countries such as the United Kingdom and Sri Lanka, have developed clinical guidelines for multimorbidity which emphasise integration and patient-centred healthcare delivery.⁷²

The findings also provide new evidence on the growing financial burden of multimorbidity in China. Multimorbidity is costly to health systems and individuals. Out-of-pocket health expenditures on medicines can severely compromise financial risk protection.^{23,31,55} A recently published systematic review showed that as the number of chronic diseases increased from one to two and from two to three, the annual out-of-pocket health expenditures grew by an average of 5·2 and 10·1 times, respectively.³¹

Multimorbidity is a major unaddressed challenge to individuals and health systems in China and other low-income and middle-income countries. Universal health coverage should ensure the provision of financial protection for individuals with multimorbidity.⁶⁹ In China, while multimorbidity levels are greater in higher-income groups, the levels will rise rapidly in lower-income groups.

7.5 Conclusion

Concerted efforts are needed in LMICs with ageing populations to reduce inequalities due to multimorbidity, and its adverse impact on financial risk protection. China, with the largest ageing population in the world, should develop targeted policies to ensure provision of financial risk protection to individuals with multimorbidity, particularly low-income groups who are at greater risk of catastrophic expenditures.

Contributors

YZ and JL conceived and designed the study. YZ and BO carried out the initial analysis. RA, TC and BM interpreted the data. VQ and YZ analysed the literature. YZ wrote the first draft of the paper. RA, BO, BM, ST, SM, TC, GS, VQ and JL provided advice on the first draft and revised the article critically for important intellectual content. All authors reviewed and had final approval of the submitted and published versions.

Declaration of interests

We declare no competing interests.

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Ethical approval

The Biomedical Ethics Review Committee of Peking University approved the CHARLS study, and all interviewees were required to provide informed consent. The ethical approval number was IRB00001052–11015.

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Table 7.1: Longitudinal analysis of determinants of multimorbidity

Covariates (reference)	Adjusted OR ^a	95% CI		P value
PCE^b, quartile (Q1, the lowest)				
Q2	1.12	0.95	1.33	0.180
Q3	1.25	1.04	1.50	0.019
Q4 (the highest)	1.48	1.22	1.80	<0.001
Age, per five years				
	2.96	2.72	3.21	<0.001
Gender (male)				
Female	2.67	2.03	3.52	<0.001
Marital status (married)				
Unmarried and others	1.07	0.78	1.45	0.681
Education (Primary school and below)				
Secondary school	18.45	11.83	28.75	<0.001
College and above	9.51	4.92	18.39	<0.001
Residence status (urban)				
Rural	0.86	0.58	1.29	0.467
Rural-to-urban	1.03	0.69	1.53	0.902
Region (Class 1, the most affluent)				
Class 2	3.22	1.63	6.35	0.001
Class 3	3.48	2.03	5.97	<0.001
Class 4	3.08	1.94	4.88	<0.001
Class 5 (the most deprived)	3.36	1.98	5.71	<0.001
Health insurance^c (none)				
UEBMI	0.85	0.57	1.27	0.437
URBMI	0.87	0.60	1.27	0.473
NCMS	0.81	0.62	1.05	0.109
Others	0.75	0.46	1.22	0.244

Notes: Multimorbidity is defined as two or more non-communicable diseases in the same individual. Weighted results are adjusted for survey design including individual weight with household and individual non-response, and primary sample unit.

^a: The regression model is adjusted for all socio-demographic covariates. AOR, Adjusted odds ratio; CI, confidence interval.

^b: PCE, Per capita household consumption expenditure.

^c: UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance and so on.

Table 7.2: Multivariable analysis of the association between the number of NCDs and health service utilisation and spending in China

Covariates (reference)	Times of outpatient visits			Days of hospitalisation			Catastrophic health expenditure					
	β	95% CI	P value	β	95% CI	P value	β	95% CI	P value			
Number of NCD^a	0.25	0.24	0.27	<0.001	0.32	0.30	0.34	<0.001	1.29	1.26	1.32	<0.001
Age, per five years	0.002	-0.02	0.02	0.827	0.16	0.14	0.19	<0.001	1.14	1.12	1.17	<0.001
Gender (male)												
Female	0.22	0.17	0.28	<0.001	-0.07	-0.15	0.01	0.068	0.97	0.90	1.05	0.444
Marital status (married)												
Unmarried and others	0.03	-0.05	0.12	0.422	-0.04	-0.14	0.07	0.516	0.40	0.35	0.46	<0.001
Education (Primary school and below)												
Secondary school	-0.02	-0.09	0.06	0.698	-0.03	-0.13	0.08	0.596	1.01	0.92	1.12	0.781
College and above	-0.003	-0.11	0.10	0.961	-0.16	-0.30	-0.02	0.023	0.91	0.79	1.04	0.152
Residence status (urban)												
Rural	0.26	0.14	0.37	<0.001	0.03	-0.12	0.17	0.73	1.28	1.11	1.48	0.001
Rural-to-urban	0.22	0.09	0.34	0.001	0.16	0.00	0.31	0.045	1.12	0.95	1.31	0.166
Region (Class 1, most development)												
Class 2	0.07	-0.04	0.18	0.235	0.18	0.03	0.34	0.021	1.22	1.06	1.41	0.007
Class 3	-0.04	-0.16	0.08	0.545	0.42	0.26	0.59	<0.001	1.23	1.05	1.44	0.01
Class 4	0.24	0.14	0.34	<0.001	0.42	0.28	0.56	<0.001	1.32	1.15	1.51	<0.001
Class 5 (least development)	0.01	-0.11	0.13	0.894	0.54	0.38	0.70	<0.001	1.04	0.89	1.21	0.644
PCE^b, quartile (Q1, the lowest)												
Q2	0.10	0.03	0.17	0.007	0.14	0.04	0.24	0.005	0.97	0.88	1.06	0.461
Q3	0.09	0.01	0.16	0.024	0.40	0.30	0.49	<0.001	1.01	0.92	1.11	0.807
Q4 (the highest)	0.18	0.11	0.26	<0.001	0.58	0.48	0.68	<0.001	0.99	0.90	1.09	0.826
Health insurance^c (none)												
UEBMI	0.28	0.12	0.45	0.001	0.44	0.23	0.64	<0.001	0.98	0.79	1.21	0.841
URBMI	0.20	0.02	0.37	0.026	0.29	0.08	0.51	0.008	1.11	0.89	1.38	0.374
NCMS	0.33	0.20	0.45	<0.001	0.30	0.14	0.47	<0.001	1.33	1.14	1.56	<0.001
Others	0.31	0.09	0.52	0.006	0.19	-0.09	0.46	0.18	0.87	0.65	1.16	0.342

Notes: Negative binomial models are used to estimate the association between the numbers of NCDs and outpatient visits or days of hospitalisation. A logistic regression model is used to assess the outcome of whether households of respondents suffered catastrophic health expenditure. The regression models are adjusted for all socio-demographic covariates. AOR, Adjusted odds ratio; CI, confidence interval.

^a: No. of NCD, number of non-communicable diseases.

^b: PCE, Per capita household consumption expenditure.

^c: UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance, and so on.

Supplementary Material

Table 7.S1: Socio-demographic characteristics and multimorbidity of all study participants, 2015

Characteristics	Unweighted results			Weighted results			
	n	% of all	95% CI		% of all	95% CI	
Multimorbidity							
No	4 497	38.06	37.18	38.93	38.34	36.98	39.71
Yes	7 320	61.94	61.07	62.82	61.66	60.29	63.02
Age (years)							
50-54	2 339	19.79	19.08	20.52	21.16	19.95	22.43
55-59	2 139	18.10	17.42	18.81	18.22	17.11	19.38
60-64	2 668	22.58	21.83	23.34	21.26	20.26	22.30
65-69	1 956	16.55	15.89	17.23	15.90	14.88	16.98
70-74	1 288	10.90	10.35	11.47	10.10	9.40	10.83
75 and above	1 427	12.08	11.50	12.68	13.36	12.44	14.33
Gender							
Male	5 766	48.79	47.89	49.70	48.89	47.49	50.28
Female	6 051	51.21	50.30	52.11	51.11	49.72	52.51
Marital status							
Married and partnered	10 036	84.93	84.27	85.56	84.45	83.58	85.28
Unmarried and Others	1 781	15.07	14.44	15.73	15.55	14.72	16.42
Education level							
Primary school and below	8 144	68.92	68.08	69.75	65.77	64.38	67.14
Secondary school	2 381	20.15	19.44	20.88	20.89	19.81	22.01
College and above	1 292	10.93	10.38	11.51	13.34	12.22	14.54
Residence status							
Urban	1 799	15.44	14.80	16.11	23.19	21.74	24.72
Rural	7 650	65.67	64.80	66.53	55.35	53.85	56.84
Rural-to-urban	2 200	18.89	18.19	19.61	21.45	20.09	22.88
Region							
Class 1 (the most affluent)	1 201	10.16	9.63	10.72	12.42	11.51	13.39
Class 2	2 565	21.71	20.97	22.46	23.47	21.90	25.12
Class 3	1 558	13.18	12.59	13.81	13.28	12.49	14.11
Class 4	4 826	40.84	39.96	41.73	37.06	35.87	38.28
Class 5 (the most deprived)	1 667	14.11	13.49	14.75	13.77	13.06	14.51
Health insurance							
None	884	7.48	7.02	7.97	7.61	6.94	8.34
UEBMI	1 251	10.59	10.04	11.15	14.97	13.89	16.11
URBMI	612	5.18	4.79	5.59	6.25	5.57	7.00
NCMS	8 808	74.54	73.74	75.31	67.61	66.18	69.02
Others	262	2.22	1.97	2.50	3.56	2.78	4.56

Notes: Multimorbidity is defined as two or more non-communicable diseases in the same individual. Weighted results are adjusted for survey design, including individual weight with household and individual non-response, and primary sample unit. CI, confidence interval. UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance, and so on.

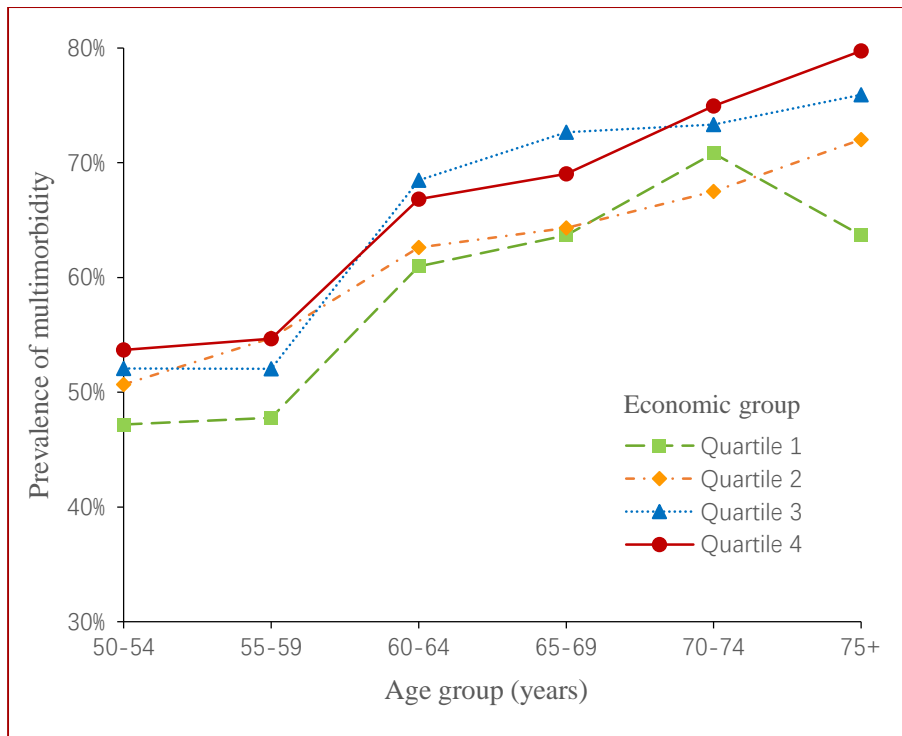


Figure 7.1: Prevalence of multimorbidity in China in 2015 by age and economic status
Note: PCE, per capita household consumption expenditure; On the economic status scale, Q1= the lowest quartile and Q4= the highest quartile.

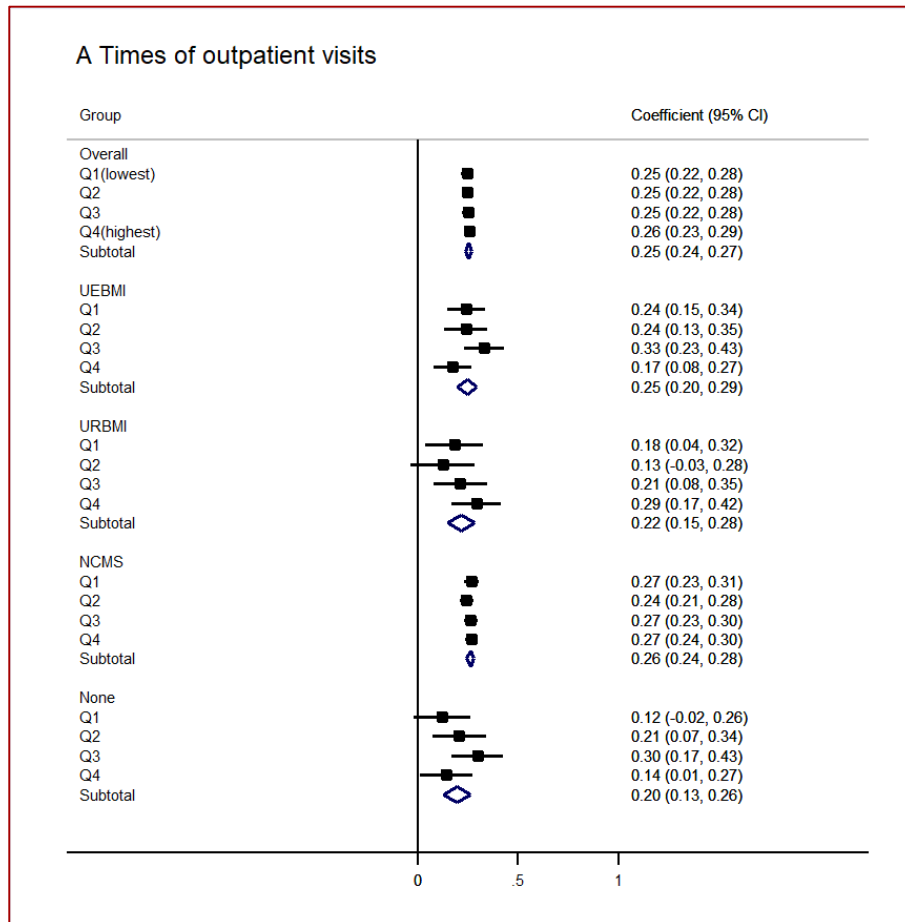


Figure 7.2: Association between the number of NCDs and outpatient visits by health insurance scheme and economic status

Notes: PCE, per capita household consumption expenditure; On the economic status scale, Q1= the lowest quartile and Q4= the highest quartile. UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance, and so on.

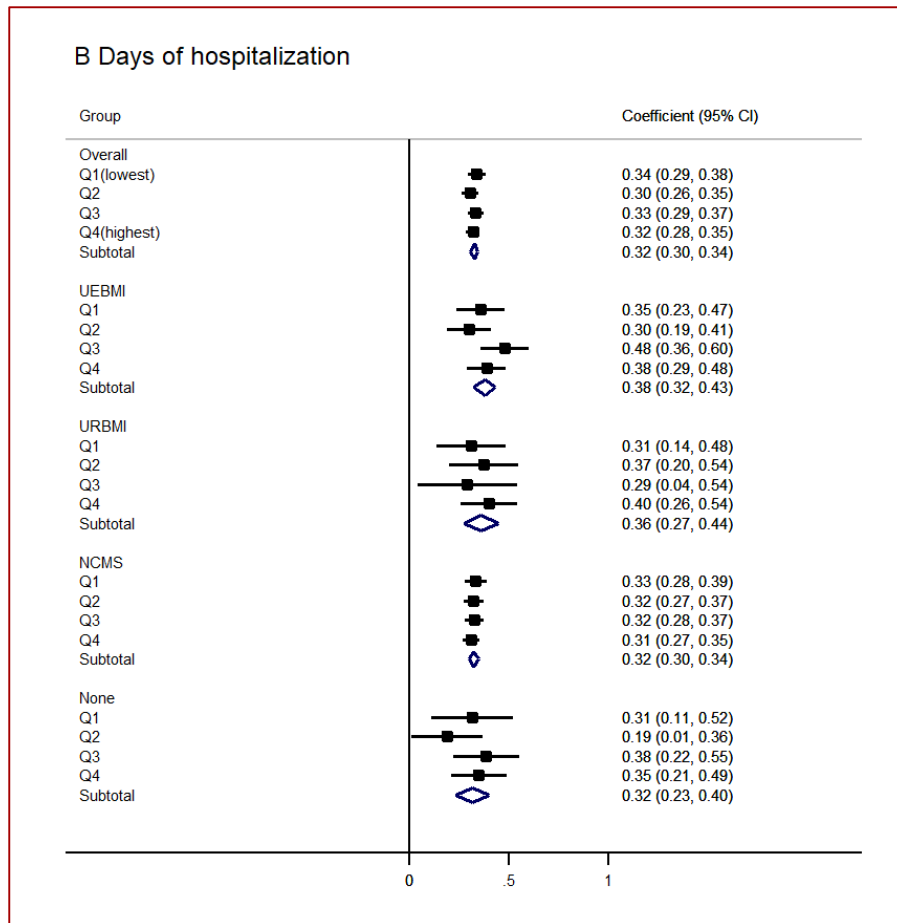


Figure 7.3: Association between the number of NCDs and inpatient visits by health insurance scheme and economic status

Notes: PCE, per capita household consumption expenditure; On the economic status scale, Q1= the lowest quartile and Q4= the highest quartile. On the economic status scale, Q1= the lowest quartile and Q4= the highest quartile. UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance, and so on.

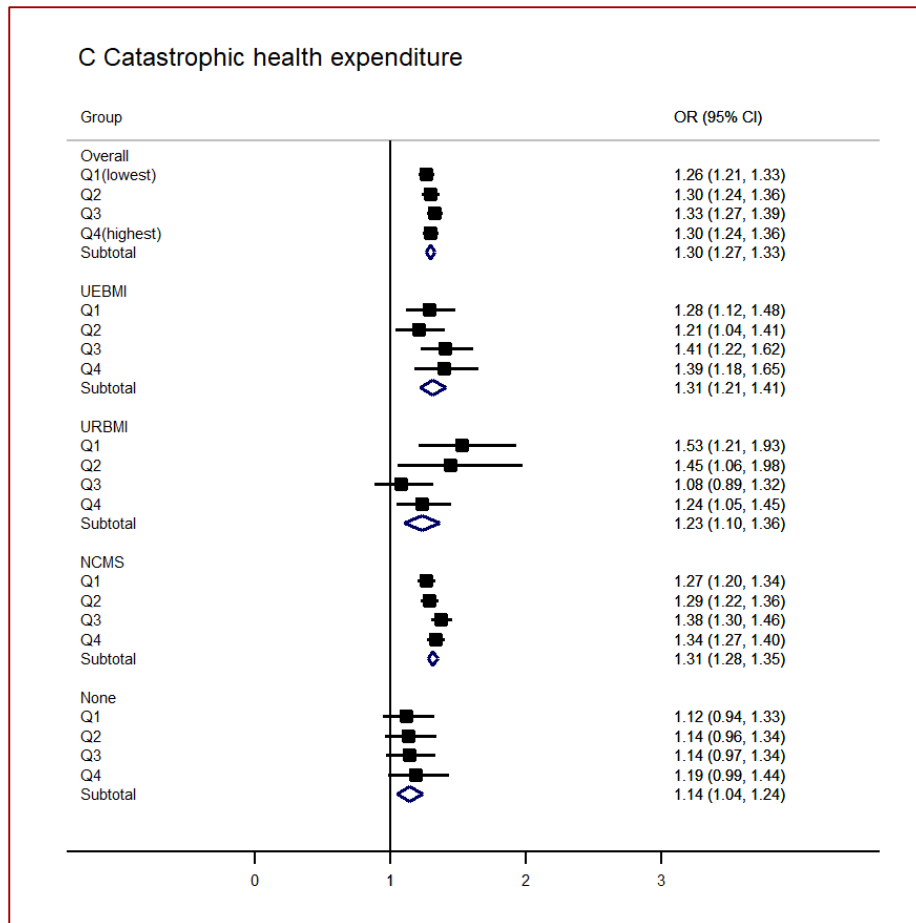


Figure 7.4: Association between the number of NCDs and financial protection by health insurance scheme and economic status

Notes: PCE, per capita household consumption expenditure; On the economic status scale, Q1= the lowest quartile and Q4= the highest quartile. UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NCMS, New Rural Cooperative Medical Scheme; Others, government health care, private medical insurance, and so on.

Chapter eight: Trends and socioeconomic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016

Tropical Medicine & International Health
Trends and socioeconomic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016

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Corresponding Author:	Xiaoyun Liu, Ph.D. Peking University Health Science Centre Beijing, Beijing CHINA
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	Peking University Health Science Centre
Corresponding Author's Secondary Institution:	
First Author:	Yang Zhao, MPH
First Author Secondary Information:	
Order of Authors:	Yang Zhao, MPH Brian Oldenburg, Ph.D Ajay Mahal, Ph.D Yaqi Lin, MPH Shenglan Tang, Ph.D Xiaoyun Liu, Ph.D
Order of Authors Secondary Information:	
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Title: Trends and socioeconomic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016

Short title: Catastrophic health expenditure and health impoverishment in China

Authors: Yang Zhao^{1,2}, Brian Oldenburg^{1,2}, Ajay Mahal¹, Yaqi Lin¹, Shenglan Tang³, Xiaoyun Liu⁴

1 Melbourne School of Population and Global Health, The University of Melbourne, Australia.

2 WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs, Melbourne, Australia

3 Duke Global Health Institute, Duke University, Durham, North Carolina, USA.

4 China Centre for Health Development Studies, Peking University, Beijing, China.

*Corresponding author:

Professor Xiaoyun Liu

China Centre for Health Development Studies, Peking University

38 Xueyuan Road, Haidian District, Beijing, 100191, P. R. China

Tel: +86 10 8280 5697

Fax: +86 10 8280 5695

E-mail address: xiaoyunliu@pku.edu.cn

Abstract

OBJECTIVES To investigate trends and socioeconomic disparities in the Catastrophic Health Expenditure (CHE) and health impoverishment in China after major reform of the health system.

METHODS This research obtained data from four rounds of the China Family Panel Studies 2010-2016, with a sample size of 14,960 households. This study defined CHE as the point at which annual household health payments exceeded 40% of annual capacity to pay. Impoverishment is measured by the \$1.90 per day poverty line. Multivariable logistic regression models were performed to identify impacts of the family member with chronic disease on CHE and impoverishment.

RESULTS Between 2010 and 2016, the incidence of CHE in China decreased from 19.37% to 15.11%, and from 7.34% to 5.14% for health impoverishment; however, the decrease in level of impoverishment less in rural areas (from 8.46% down to 7.81%) than in urban areas (from 6.16% down to 3.03%). The gap between impoverishment rates across the income quartiles is growing. Multivariable analysis showed that households with two or more members suffering chronic diseases were significantly more likely to incur CHE (aOR: 2.46, 95% CI: 1.93-3.13) and impoverishment (aOR: 2.66, 95% CI: 1.87-3.78) compared to households with no members suffering chronic diseases, after adjusting for sociodemographic covariates.

CONCLUSIONS Important advances have been made in achieving greater financial protection for Chinese citizens. Nevertheless, greater attention to the poor households with chronic disease members is needed. Policy-makers in China should focus on optimising integrated rural-urban health insurance by expanding the current benefits packages and strengthening poverty alleviation efforts.

Keywords catastrophic health expenditure, health impoverishment, socioeconomic disparity, China

8.1 Introduction

Under the sustainable development goals (SDG) agenda, advancing universal health coverage (UHC) is the centrepiece of health policy in many countries [1]. To achieve UHC, some developing countries have conducted a series of health system reforms in order to increase access to primary healthcare and to lower the financial burden of illness [2]. China officially launched a New Health System Reform (NHSR) in 2009, aiming to provide every Chinese citizen with access to healthcare at an affordable cost by establishing basic universal provision of safe, effective, convenient, and low-cost services. This comprehensive reform resulted in a significant increase in health insurance coverage, with 95.7% of the Chinese population being covered by three main social health insurance schemes in 2011: the Urban Employee-Based Medical Insurance (UEBMI) program, the Urban Resident-Based Medical Insurance (URBMI) program, and New Rural Cooperative Medical Scheme (NCMS) [3]. However, strong performance in one aspect of UHC (proportion of the population covered) did not guarantee strong performance on the other (depth of financial protection). The benefits packages and degree of financial protection still vary across public insurance schemes in China, especially for people with non-communicable diseases (NCDs) [3].

The key feature of UHC, financial risk protection, needs to be further examined. It can be captured by two indicators, namely catastrophic health expenditure (CHE) and impoverishment due to health spending [4, 5]. CHE is the official indicator for monitoring of UHC financial protection. A low incidence of CHE means people getting the care they need are protected from out-of-pocket payments. The second widely-used indicator of financial protection is impoverishment due to health costs. Although impoverishment is not an official SDG indicator, it supplements the catastrophic payment indicator by emphasising the poverty implications of higher health expenditures [6].

Most previous studies in China have focused on socioeconomic inequality in healthcare utilisation among the general population or among people with chronic diseases [7-10]. Some studies have also examined the degree of CHE or health impoverishment at the sub-national level or in rural areas in China [11-14]. Since 2011, only three studies have focused on the trends in financial protection in China at the national level; they are all cross-sectional in design [15-17]. The changes over the last decade in socio-economic disparity in financial protection in China, and their extent,

is still unclear.

This study aims to investigate trends in the financial protection in China following the health system reform and to assess the extent of disparities in financial protection across household groups with one or more members having an NCD diagnosis. Relieving the household economic burden of NCDs would be a key step in efforts to alleviate global poverty and achieve the SDGs. Here we reported on most up-to-date evidence of recent trends and socioeconomic disparities catastrophic health expenditure and health impoverishment using data from nationwide household surveys. Identifying population groups at risk of catastrophic health expenditure and impoverishment is important for targeting interventions involving integrated health insurance or poverty alleviation projects.

8.2 Methods

8.2.1 Data and Methods

The analyses in this paper are based on four rounds of the China Family Panel Studies (CFPS) conducted in 2010, 2012, 2014 and 2016, respectively. These studies were funded by the 985 Program at Peking University and carried out by the Institute of Social Science Survey at Peking University. The CFPS survey consists of a nationally-representative sample of Chinese adults aged 16 and above, and aims to identify China's social, economic, demographic, and health changes [18]. The CFPS baseline survey gathered data across 25 provinces in China, using a multistage probability sampling approach. The sample for the 2010 CFPS baseline survey through a multi-stage probability was drawn with implicit stratification. Each sub-sample in the CFPS was drawn at three levels: county level, village level, then at the household level [19].

For the baseline survey of CFPS, a total of 14,960 households were interviewed, eliciting a response rate of 78.5% at the household level in 2010. All the CFPS families and members have been tracked through follow-up surveys every two years. After excluding cases with missing demographic information, those with missing socioeconomic information, those offering no response, and/or those with deceased family members, the numbers of households with complete data for analyses amounted to 12,982 in 2010, 11,537 in 2012, 12,199 in 2014, and 13,590 in 2016.

Household annual consumption expenditure includes the amount spent on disease

treatment or healthcare, food, clothing, housing, family equipment and daily necessities, communication and transportation, and on education and entertainment, as well as other consumption spending. The household income and consumption expenditure in Chinese Yuan (CNY) are expressed in 2010 prices using gross domestic product deflators and then converted into US\$ using the average 2010 exchange rate (i.e. 1 US\$ = 6.62CNY) [20]. We calculate household health spending as a percentage of total household expenditure, which is more informative than simply examining raw medical expenditure.

8.2.2 Financial protection indicators

Financial risk protection is measured by CHE and health impoverishment. This study measured CHE by using the indicators suggested by Wagstaff et al. [5]. Although there is no consensus on the threshold value, this study estimates CHE by applying the threshold of 40%. In this study, the capacity to pay used non-food household consumption expenditure as the denominator. Catastrophic health expenditure occurs when out-of-pocket health expenditure equals or exceeds 40% of non-food household consumption expenditure [5].

This study calculated the proportion of households impoverished due to large healthcare payments. Impoverishment due to healthcare payments means that a non-poor household becomes impoverished after paying for healthcare. It is also defined as a binary variable, taking the value of one when household consumption expenditure per capita is equal to or higher than the poverty line, but lower than this line after subtracting per capita household health spending. In order to examine the poverty level of the entire population of China and better compare with other countries, this study used the international 1.90 US\$ (12.86 CNY in 2010) per day poverty line of consumption expenditure as defined by the World Bank and often referred to as the extreme poverty line. It is an update on the old \$1.25 per day poverty line and underlies the SDG target of 1.1 [21]. After adjustment of the 2010 exchange rate, this poverty line is equal to 4694.65 CNYs per year on 2010 prices [22]. The poverty level estimated by using the international poverty line would be higher than the level of using the China national poverty line (annual income of 2,300 CNY (around \$365) for residents in rural areas).

A person with non-communicable diseases was defined as an individual self-reported

to have been diagnosed with diabetes, hypertension, heart disease, malignant tumour, rheumatic arthritis, stroke, digestive disease, liver disease, kidney disease and/or other NCDs during the last six months. These conditions cover the vast majority of people with chronic diseases in China. The number of household members suffering from NCDs was divided into three groups: none, one, and two or more members.

8.2.3 Statistical analysis

A chi-square test was used to estimate the difference in catastrophic health expenditure and impoverishment due to health spending across household location groups and NCD family groups. This study applied multivariable logistic regression models to examine the impact of household NCD members on CHE and health impoverishment (binary outcome variables), based on the data from the CFPS survey in 2016. The main covariates included: the number of household member with NCDs (that is, any member had doctor-diagnosed NCDs in the past six months); household location (rural or urban); income quartiles (per-capita household annual income); geographical region (east, central and west); household size (1-2, 3-4, and over 5 family members); having children (that is, individuals younger than 15 years in the household); and having older people (that is, individuals aged 60 or older in the household). Households were ranked according to family income per capita and grouped into four quartiles.

Several variables of the household head were also taken into account, including gender (female, male), age (<45, 46–60, 60+), marital status (married and partnered, single, and other), education (illiterate, primary school, middle school, college and above), employment status (yes, no), and having health insurance (yes, no). This study presented the adjusted odds ratio (aOR) and 95% confidence intervals (CI) for results in logistic regression analysis. All statistics were weighted to account for the multistage sample design of the CFPS survey and non-responsive families. All statistical analyses were conducted using STATA 15.0. P-values less than 0.05 are used as statistically significant.

8.3 Results

8.3.1 Descriptive characteristics

Table 8.1 shows the basic characteristics of households interviewed in 2010, 2012,

2014, and 2016. From 2010 to 2016 the proportion of households in the rural area slightly decreased from 51.12% to 44.05%. The eastern region contained the most surveyed households, accounting for around 40% of households across the four surveys, followed by the central region (around 35%) and western region (around 22%). The proportion of households interviewed that contained only one or two members increased from 22.95% in 2010 to 30.62% in 2016. The proportion of households with at least one member suffering from chronic diseases increased after 2012, and was over 28% in 2016. Overall, total annual household income in China grew steadily, from 4,960\$ to 8,735\$, between 2010 and 2016. Most noticeably, total household consumption expenditure and health spending increased by 2.47 times and 1.91 times throughout the seven-year period (**Table 8.1**).

8.3.2 Trends in financial risk protection

Table 8.2 shows that household health spending as a percentage of total household consumption expenditure decreased from 12.75% in 2010 to 10.85% in 2014, but it then increased slightly up to 11.21% in 2016. Similarly, the incidence of catastrophic health expenditure declined from 2010 to 2014, and then increased up to 15.11% in 2016, when a threshold of 40% of the non-food consumption expenditure is adopted. Households in rural areas suffered a higher proportion of catastrophic health expenditure (17.70% in 2016) than those in urban areas (13.06% in 2016). Families with members suffering from NCDs were more likely to incur CHE than healthy households.

In this study, based on the World Bank poverty line (\$1.90 per day), a total of 966 of 12,982 households in 2010 were forced into poverty due to paying for healthcare. This study found that the impoverishment rate steadily decreased from 7.39% of households to 5.14 % of households between 2010 and 2016. Similarly, families in rural areas and those with a member having NCDs had higher impoverishment rates than households in urban areas and than those without NCD members (**Table 8.2**).

8.3.3 The socioeconomic disparity in financial protection

Figure 8.1 shows the disparities in catastrophic health expenditure and impoverishment due to health spending across household groups between 2010 and 2016. Figure 8.1A indicates that while the incidence of CHE among rural households with members

having chronic diseases declined between 2010 and 2016, those rural households with chronic disease members experienced the highest proportion of CHE and impoverishment. The rural-urban disparity in CHE and impoverishment remained constant for both healthy families and those with members suffering from chronic diseases.

In terms of income inequality, a large reduction in CHE incidence occurred among the poorest (quartile 1) households from 2010 to 2014 followed by an increase in 2016; however, the gap between the poor (quartile 1 and quartile 2) and the wealthy (quartile 3 and quartile 4) persisted throughout the seven years, with little progress being made (Figure 8.1C). The difference in the incidence of impoverishment across the income quartiles was growing, with a decreasing trend for the rich (quartile 3 and quartile 4) but an increasing trend for the poorest (quartile 1) households from 2010 to 2016 (Figure 8.1D).

8.3.4 Determinants

The multivariable analysis shows, after adjusting for other covariates, that the odds of catastrophic health expenditure in a household having one member with NCDs and having two or more members with NCDs compared to a household without NCD members was 1.88 (95% CI: 1.63-2.17) and 2.46 (95% CI: 1.93-3.13), respectively (**Table 8.3**). Households with one member reporting an NCD (aOR: 1.76, 95% CI: 1.42-2.19) and with at least two NCD members (aOR: 2.66, 95% CI: 1.87-3.78) were significantly more likely to experience medical impoverishment compared to households without NCD members (**Table 8.4**).

Households in rural areas were at higher risk of experiencing catastrophic health expenditure (aOR: 1.26, 95% CI: 1.09-1.45) and impoverishment because of health spending (aOR: 1.57, 95% CI: 1.24-2.00). The risk of CHE and impoverishment were also increased among households with an older head or unemployed head; however, households with more family members, and those belonging to the rich quartile and with a high education level head were significantly associated with decreased catastrophic health expenditure and decreased medical impoverishment (**Table 8.3 and Table 8.4**).

8.4 Discussion

This study uses the dataset of the China Family Panel Studies which were collected after the New Health System Reform in 2009. This study provides new evidence on nationwide trends in the incidence of catastrophic health expenditure and impoverishment due to health spending in China following the healthcare reform of 2009. Important progress has been made in achieving increased financial protection in China, with healthcare spending continuing to rise after 2010. In this study, at the threshold of 40% of non-food consumption expenditure, the estimated proportion of households experiencing CHE decreased from 19.37% in 2010 to 15.11% in 2016. In relation to the international poverty line (\$1.90 per day), the impoverishment rate dropped steadily from 7.39% of households to 5.14 % of households across the seven years. Such rates are consistent with previous research findings in China. According to a cross-sectional study conducted by Meng, et al. (2012), about 12.9% of the families in China suffered from CHE in 2011 [15]. A study, using data from the Fourth National Health Service Survey 2008, found that 7.5% of non-poor households became poor as a consequence of out-of-pocket payments for healthcare [23]. Findings from the World Health Organisation's Study on Global Ageing and Adult Health (WHO-SAGE) also showed that 7.4% of the population fall below the poverty line due to OOP health expenditure in China [24].

Following the reform, there was a significant increase in insurance coverage, with 95.7% of the Chinese population being covered by social health insurance schemes by 2011 [15]. Alongside the expansion of benefit packages from public insurance schemes, the effectiveness of financial protection has been improved in China [3]. Furthermore, reduction in impoverishment is consistent with the pattern of the National Poverty Alleviation Project and health system reform launched by China's central government. Since 2012, China has tailored more effective measures to individuals and households to ensure that targeted poorer populations, including people with serious diseases, received the assistance they needed. Increased poverty alleviation efforts continue through the development of severe disease health insurance and the Medical Assistance System for the poor.

Compared with other developing countries, China generally encounters higher CHE incidence and impoverishment from medical expenditure [25-32], while the occurrence of CHE and health impoverishment is slightly less than the rates in India: 18.2% in 2012

and 8.0% in 2010, respectively [32]. A cross-sectional survey in Nepal showed that about 14% of households faced catastrophic health expenditure when the threshold is 40 % of the capacity to pay [29]. A study in the West of Iran indicated that the rate of households facing CHE was 4.8% after the implementation of its Health Sector Evolution Plan (HSEP) in 2014 [30].

This study compared the degree of financial risk protection among urban and rural households. Rural households were at greater risk of experiencing catastrophic health expenditure and impoverishment than were urban households. Although there was a declining trend both in the rural areas and urban areas from 2010, the rural CHE rate was 1.36 times higher than the rate in urban areas and the rate of impoverishment was about 2.58 times higher. Meng et al. (2012), using data from the National Health Services Survey, also observed that rural households (13.8%) experienced CHE more often than urban households (10.9%), at the 40%-threshold [30]. With the data obtained from the National Health Services Survey (NHSS) in Shaanxi Province, Xu et al. (2018) concluded that the overall level of CHE occurrence in households with chronic disease patients remained stable between 2008 and 2013 at about 24% [33]. Specifically, the incidence of CHE in rural areas declined from 29% to 24% [33].

For the income disparity, this research found that the occurrence of CHE and impoverishment from health spending was more common in the poorest population quartile. With respect to income-related inequality, some studies in China [15, 23, 33] and other countries, such as Vietnam, Nepal, Kenya and Georgia, showed similar results to this study [34]. In this study, the income disparity of CHE incidence was alleviated dramatically between 2010 and 2012, then stayed at a stable level. The trend of impoverishment in the richest and middle-income groups experienced a decline from 2010 to 2016, while the rate for the poorest groups exhibited growth over the same period. Consequently, a growing disparity in impoverishment between the poor and the rich was apparent during this period. Because of the great impetus from China's health system reform, the risk of CHE and impoverishment was reduced to some extent; however, it appears that the 2009 reforms mostly benefitted middle-and-high income households, while even some reverse effects were experienced by the poorest income households. In other words, the improvement of NCMS played a limited role in the reduction of economic burdens from NCDs for the poorest families this period. The continuous growth in health spending and high rates of CHE in China also suggest that

the support provided by benefits packages from health insurances may have been outweighed by increased utilisation of healthcare and by higher charges.

The multivariable analysis shows that the number of NCD members in a household is a key determinant of catastrophic health expenditure, after adjusting for other covariates. Households with one and two or more NCD members are 1.76 and 2.66 times more likely to suffer catastrophic health expenditure. The impoverishment risk for families having one NCD member and two or more members is 1.88 and 2.46 times higher respectively than for those with no NCD members. This finding is also consistent with a China study which concluded that CHE risk is associated with the number of family members with chronic disease and their utilisation of medical treatment and healthcare expenditure [35]. Hwang et al also supported this conclusion, as well as revealing the persistence of an almost linear relationship between OOP payments and chronic diseases [36]. The risks of CHE and impoverishment are closely linked with households' economic status. Households in rich quartiles are at less risk of suffering CHE and impoverishment, a finding consistent with other studies. [37, 38] Moreover, logistic regression models show that demographic factors such as household size, residence location, age, education, and employment status of the household head exert an influence on financial protection, as reported in other studies [39, 40]. Rural households and those with an older or unemployed head were significantly more likely to experience CHE and impoverishment.

Optimising a health insurance system plays an extremely important role in improved financial risk protection. At the end of 2015, China had officially announced the merger of the UEBMI and the NCMS [41], representing a commendable milestone towards universal health coverage [42]. However, the current health insurance system still leaves much financial risk for households to bear, and a high incidence of impoverishment. In the implementation of this integration, the most critical element was the further extension of funding pools and narrowing of disparities in covered services and medications between the Unified Resident Health Insurance and UEBMI [3]. This new phase in China's reform needs special attention devoted to disadvantaged groups, particularly the poor and households with members suffering NCDs. Extending insurance coverage to include long-term care for chronically ill patients, outpatient services, essential medications, and rehabilitation services should be a priority. The reform of the Public Medical Assistance System could be deeply integrated with

National Poverty Alleviation Projects, giving priority to a comprehensive benefits package with services and cost-sharing mechanisms for poor households and those with two or more NCD members.

This study had important strengths. Unlike previous studies in China, this one analysed the panel data at the national level, assessing catastrophic health expenditure and medical impoverishment at the same time. This study provided a more complete understanding of the trends in financial protection following the NHR in China by using the international definition of CHE and the 1.90\$ per day poverty line. It will contribute to a deeper understanding of reform policies related to universal healthcare coverage in China while offering further analysis of the economic burden of NCDs in developing countries. The major limitation of this study is that it is based on repeated cross-sectional data. Ideally, longitudinal or panel studies would be conducted to estimate the causal effect of financial risk resulting from family members with NCDs. Additionally, about 25% of families were missing income-related information between the 2010 and 2016 surveys. To account for non-response bias and loss of follow-up, this study adjusted the analysis by using the created weights for households.

8.5 Conclusion

While important advances have been made in achieving increased financial protection in China, the protection of vulnerable groups from the experience of CHE and health-related impoverishment remains a challenge. Programs should specifically target susceptible populations, such as the poor, people in rural areas, and families having members with chronic diseases. Policymakers in China should focus on developing more effective expenditure control strategies by payment system reform and by optimising the integrated Rural-Urban Resident Health Insurance scheme to improve its effectiveness.

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Table 8.1 Characteristics of survey households from the China Family Panel Studies, China, 2010-2016

Variable	2010			2012			2014			2016		
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
Household	12,982			11,537			12,199			13,590		
Location												
Rural	6,729	51.12	44.82 57.38	6,253	49.05	43.35 54.77	6,460	49.47	44.67 54.28	6,746	44.05	39.46 48.75
Urban	6,253	48.88	42.62 55.18	5,284	50.95	45.23 56.65	5,739	50.53	45.72 55.33	6,844	55.95	51.25 60.54
Region												
East	5,908	39.66	30.97 49.05	5,142	40.56	31.77 50.00	5,517	43.53	35.20 52.25	6,148	44.80	36.61 53.28
Central	3,810	36.37	27.66 46.07	3,442	36.25	27.65 45.84	3,646	33.93	26.10 42.75	3,957	33.23	25.59 41.86
West	3,264	23.97	16.55 33.38	2,953	23.19	15.88 32.57	3,036	22.54	15.64 31.35	3,485	21.97	15.23 30.62
Family size												
One-two	2,901	22.95	20.85 25.19	2,745	25.56	23.23 28.05	3,419	27.17	24.86 29.61	4,051	30.62	28.50 32.83
Three-four	6,198	49.57	47.75 51.40	5,212	46.16	44.20 48.13	5,129	43.11	41.30 44.94	5,388	40.88	39.39 42.38
≥ Five	3,883	27.48	24.59 30.57	3,580	28.28	25.47 31.26	3,651	29.72	26.92 32.68	4,151	28.50	26.00 31.15
Having children												
No	7,415	56.86	54.07 59.60	6,401	57.02	54.21 59.79	6,979	56.41	53.82 58.97	8,047	60.50	58.08 62.86
Yes	5,567	43.14	40.40 45.93	5,136	42.98	40.21 45.79	5,220	43.59	41.03 46.18	5,543	39.50	37.14 41.92
Having elderly members												
No	10,100	78.89	77.54 80.18	8,597	74.07	72.34 75.73	8,567	70.96	69.33 72.54	9,263	68.43	66.90 69.92
Yes	2,882	21.11	19.82 22.46	2,940	25.93	24.27 27.66	3,632	29.04	27.46 30.67	4,327	31.57	30.08 33.10
Number of NCD members												
None	9,872	77.76	75.83 79.58	8,905	78.58	76.80 80.25	8,632	72.69	70.55 74.73	9,626	71.93	70.12 73.67
One	2,539	18.50	17.04 20.05	2,219	18.19	16.88 19.56	2,939	22.48	20.88 24.16	3,253	23.14	21.69 24.66
≥ Two	571	3.74	3.16 4.43	413	3.24	2.62 3.99	628	4.83	4.13 5.65	711	4.93	4.36 5.57
Income and expenditure, (US\$), mean, 95CI												
THI	-	4960	4503 5447	-	5935	5534 6335	-	6810	6308 7312	-	8735	7606 8756
THE	-	3760	3495 4048	-	5724	5297 6151	-	7061	6562 7559	-	9284	8081 9309
Food	-	1264	1186 1349	-	2179	2043 2314	-	2422	2236 2608	-	2928	2565 2919
Health	-	490	449 534	-	571	520 621	-	706	638 774	-	935	805 946

CI, confidence interval; THI, total annual household income; THE, total household annual consumption expenditure.

Table 8.2 Trends towards financial protection by the household location and NCD member group, China, 2010-2016

Variable	2010			2012			2014			2016			Annual change				
	%	95% CI	P value	%	95% CI	P value	%	95% CI	P value	%	95% CI	P value					
Health spending as a share of THE																	
All	12.75	11.89	13.61	10.97	10.24	11.70	10.85	10.23	11.46	11.21	10.68	11.74	-0.26				
Rural	14.21	12.87	15.55	<0.001	11.91	10.77	13.04	<0.001	12.67	11.80	13.53	<0.001	12.96	12.20	13.72	<0.001	-0.21
Urban	11.22	10.41	12.04		10.07	9.37	10.77		9.07	8.46	9.67		9.83	9.29	10.38		-0.23
None NCD	11.15	10.30	12.00	<0.001	9.72	8.96	10.49	<0.001	8.89	8.32	9.47	<0.001	9.10	8.59	9.60	<0.001	-0.34
One NCD	17.42	15.96	18.88		15.12	14.01	16.22		15.44	14.41	16.46		15.80	14.91	16.69		-0.27
≥ Two NCDs	22.81	20.27	25.36		17.95	15.20	20.70		18.89	16.75	21.03		20.57	18.08	23.05		-0.37
Catastrophic health expenditure																	
All	19.37	17.81	20.93		16.28	14.82	17.74		14.35	13.16	15.55		15.11	14.09	16.12		-0.71
Rural	22.13	19.95	24.31	<0.001	18.61	16.32	20.89	<0.001	17.14	15.32	18.96	<0.001	17.70	16.27	19.13	<0.001	-0.74
Urban	16.48	14.62	18.34		14.03	12.44	15.63		11.62	10.38	12.86		13.06	11.84	14.29		-0.57
None NCD	16.70	15.09	18.31	<0.001	13.65	12.22	15.08	<0.001	10.92	9.74	12.11	<0.001	11.48	10.54	12.43	<0.001	-0.87
One NCD	27.25	24.42	30.07		25.49	22.41	28.57		22.39	20.24	24.53		23.08	21.13	25.02		-0.70
≥ Two NCDs	35.79	30.46	41.11		28.28	22.35	34.21		28.53	22.66	34.41		30.58	25.75	35.41		-0.87
Impoverishment due to health spending, 1.9 US\$/day																	
All	7.34	6.54	8.14		6.78	5.91	7.65		5.54	4.83	6.24		5.14	4.53	5.74		-0.37
Rural	8.46	7.31	9.62	0.004	8.60	7.56	9.64	<0.001	7.87	6.89	8.86	<0.001	7.81	6.91	8.71	<0.001	-0.11
Urban	6.16	5.12	7.21		5.03	4.01	6.04		3.25	2.54	3.96		3.03	2.38	3.69		-0.52
None NCD	6.40	5.61	7.19	<0.001	5.97	5.17	6.78	<0.001	4.54	3.87	5.21	<0.001	3.82	3.29	4.36	<0.001	-0.43
One NCD	9.84	8.18	11.50		9.96	7.83	12.09		7.86	6.60	9.13		7.83	6.45	9.21		-0.34
≥ Two NCDs	14.53	10.28	18.77		8.44	4.76	12.11		9.67	6.10	13.23		11.72	8.66	14.79		-0.47

CI, confidence interval; THE, total household annual consumption expenditure.

P values reported for family group differences. Annual change, Absolute annual proportion of change between 2010 and 2016. Chi-square test for catastrophic health expenditure and impoverishment due to health spending across household groups.

Table 8.3 Association between the number of NCD members and catastrophic health expenditure, by multivariable analysis

Covariates, reference	Unadjusted OR	95% CI		P value	Adjusted OR	95% CI		P value
Number of NCD members, none								
One	2.33	2.05	2.67	<0.001	1.88	1.63	2.17	<0.001
≥ Two	3.38	2.69	4.23	<0.001	2.46	1.93	3.13	<0.001
Location, urban	1.38	1.22	1.56	<0.001	1.26	1.09	1.45	0.002
Region, east								
Central	1.00	0.87	1.14	0.961	0.91	0.78	1.05	0.187
West	0.87	0.74	1.03	0.105	0.87	0.73	1.04	0.131
Family size, one-two								
Three-four	0.34	0.30	0.40	<0.001	0.53	0.44	0.63	<0.001
≥ Five	0.40	0.34	0.47	<0.001	0.48	0.38	0.59	<0.001
Having children, no	0.42	0.37	0.48	<0.001	0.75	0.62	0.90	0.002
Having elderly members, no	3.06	2.71	3.47	<0.001	1.73	1.46	2.04	<0.001
Household income per capita, quartile 1								
Quartile 2	0.71	0.60	0.83	<0.001	0.96	0.80	1.14	0.617
Quartile 3	0.52	0.44	0.62	<0.001	0.71	0.59	0.86	<0.001
Quartile 4 (richest)	0.51	0.43	0.61	<0.001	0.62	0.50	0.77	<0.001
Age of household head, <45 years								
46-60 years	2.31	1.92	2.79	<0.001	1.72	1.40	2.11	<0.001
≥60 years	5.99	5.02	7.15	<0.001	1.90	1.52	2.39	<0.001
Gender of household head, female	1.04	0.92	1.17	0.562	0.97	0.85	1.11	0.674
Marital status, married & partnered	1.24	1.06	1.46	0.007	0.74	0.62	0.89	0.002
Education of household head, illiterate								
Primary school	0.64	0.55	0.75	<0.001	0.88	0.74	1.04	0.137
Middle school	0.40	0.34	0.46	<0.001	0.70	0.59	0.83	<0.001
College & above	0.25	0.19	0.34	<0.001	0.73	0.51	1.05	0.085
Household head employed, Yes	2.50	2.21	2.84	<0.001	1.72	1.48	2.02	<0.001
Having health insurance, No	1.02	0.80	1.30	0.861	1.00	0.78	1.30	0.975

CI, confidence interval; OR, odds ratio; AOR, the adjusted odds ratio - adjusted for place of residence, region, family size, having children, having elderly members, household annual income, and the age, gender, marital status, education level, employment and health insurance of household head.

Table 8.4 Association between the number of NCD members and impoverishment due to health spending, by multivariable analysis

Covariates, reference	Unadjusted OR	95% CI		P value	Adjusted OR	95% CI		P value
Number of NCD members, none								
One	2.17	1.77	2.67	<0.001	1.76	1.42	2.19	<0.001
≥ Two	3.53	2.55	4.89	<0.001	2.66	1.87	3.78	<0.001
Location, urban	2.52	2.05	3.09	<0.001	1.57	1.24	2.00	<0.001
Region, east								
Central	1.20	0.96	1.49	0.103	1.05	0.84	1.32	0.652
West	1.16	0.91	1.49	0.239	0.90	0.70	1.17	0.453
Family size, one-two								
Three-four	0.44	0.35	0.56	<0.001	0.59	0.44	0.78	<0.001
≥ Five	0.78	0.62	0.98	0.030	0.69	0.51	0.94	0.019
Having children, no	0.78	0.64	0.95	0.013	1.02	0.78	1.32	0.898
Having elderly members, no	2.25	1.86	2.72	<0.001	1.16	0.91	1.47	0.234
Household income per capita, quartile 1								
Quartile 2	0.68	0.54	0.84	0.001	0.85	0.67	1.07	0.170
Quartile 3	0.34	0.26	0.44	<0.001	0.48	0.36	0.63	<0.001
Quartile 4 (richest)	0.08	0.05	0.12	<0.001	0.13	0.08	0.22	<0.001
Age of household head, <45 years								
46-60 years	2.07	1.56	2.76	<0.001	1.45	1.08	1.94	0.014
≥60 years	4.27	3.25	5.60	<0.001	1.68	1.20	2.36	0.002
Gender of household head, female	1.12	0.93	1.36	0.227	1.07	0.87	1.32	0.494
Marital status, married & partnered	1.04	0.80	1.35	0.761	0.83	0.61	1.11	0.210
Education of household head, illiterate								
Primary school	0.65	0.51	0.82	<0.001	0.85	0.66	1.08	0.186
Middle school	0.32	0.25	0.40	<0.001	0.62	0.47	0.80	<0.001
College & above	0.03	0.01	0.11	<0.001	0.16	0.04	0.66	0.011
Household head employed, Yes	1.50	1.22	1.84	<0.001	1.38	1.07	1.78	0.014
Having health insurance, No	1.73	1.09	2.73	0.020	1.52	0.93	2.50	0.097

OR: odds ratio; AOR: the adjusted odds ratio - adjusted for place of residence, region, family size, having children, having elderly members, household annual income, and the age, gender, marital status, education level, employment and health insurance of household head.

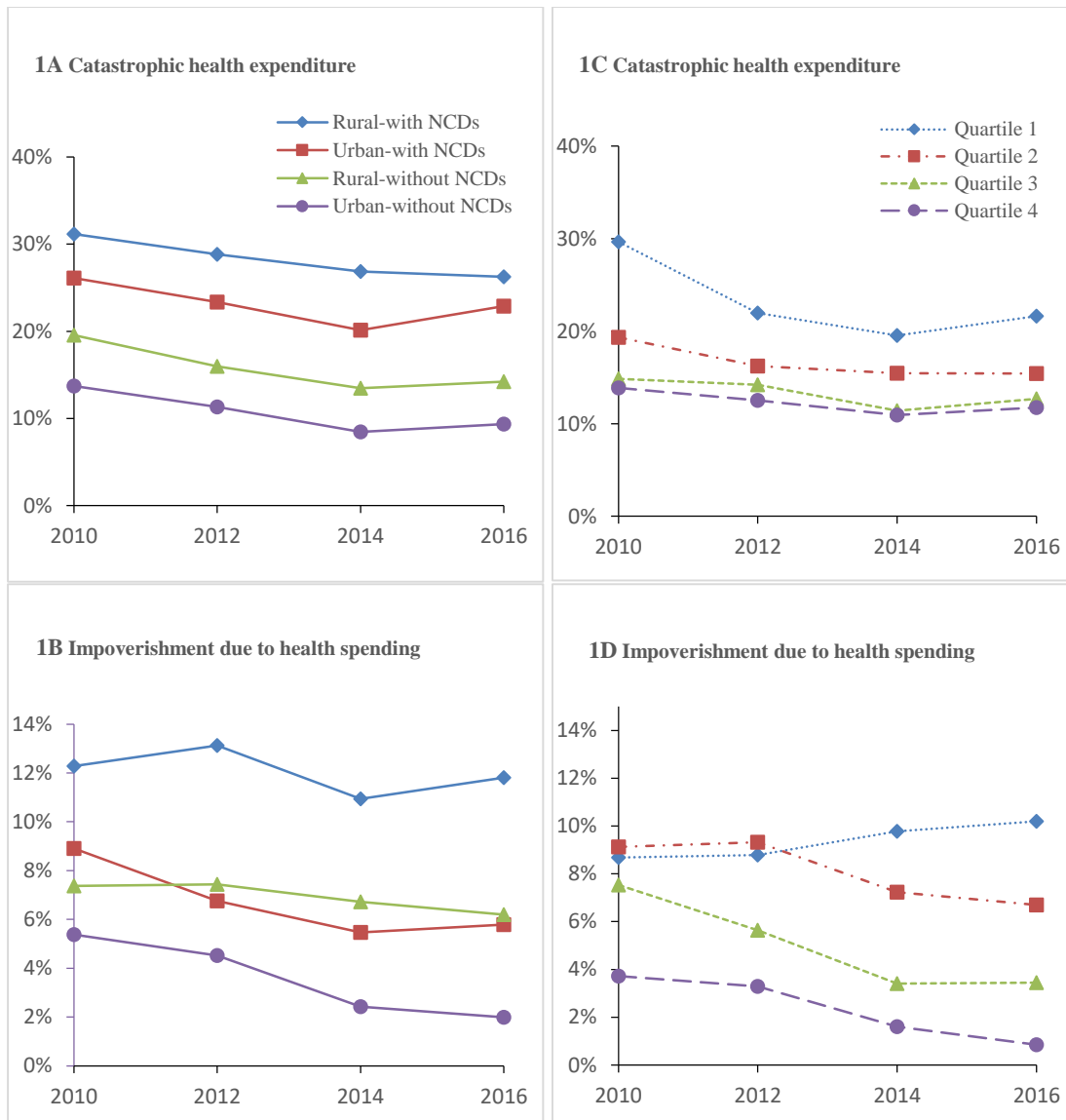


Figure 8.1 Trends and disparities in catastrophic health expenditure and impoverishment due to health spending across household groups, 2010-2016

Notes: 1A, incidence of catastrophic health expenditure between households with NCD members and those without NCD members within rural and urban areas. 1B, incidence of impoverishment due to health spending between households with NCD members and those without NCD members within rural and urban areas. 1C, incidence of catastrophic health expenditure across per capita household income quartile. 1D, incidence of impoverishment due to health spending across per capita household income quartile.

Chapter nine: General discussion

Summary

Firstly, in this chapter, the principal findings of the thesis are summarised; and the policy implications of the findings are discussed along with the recommendations. Secondly, the strengths and limitations of my research and the two datasets (CHARLS and CFPS) are discussed. Thirdly, future directions for research in this field are suggested, followed by overall conclusions.

9.1 Summary of findings

Under the sustainable development goals agenda, advancing universal coverage is the centrepiece of health policy in many countries [9, 10]. To achieve UHC, some developing countries have introduced a series of health system reforms to increase access to primary healthcare and to lower the financial burden of illness [11]. To address the burden of NCDs and achieve UHC, China officially launched the new health system reform in 2009, which resulted in a significant increase in health insurance coverage [12]. Following China's health system reform, however, the changes in, and the extent of, socioeconomic disparities in healthcare and financial protection in NCD population are still unclear. Additionally, there is little evidence on the impact of NCD multimorbidity on health service use, out-of-pocket spending, and CHE by various social health insurance schemes in China. This thesis investigates trends and socioeconomic inequalities in health service utilisation and financial risk protection among individuals with NCDs in China, using five sub-projects.

Based on the nationwide longitudinal data from CHARLS and CFPS, my doctoral research has examined: (1) the level of effective coverage of hypertension treatment; (2) socio-economic and regional disparities in healthcare for hypertension; (3) the relationships between multiple chronic diseases, health service utilisation, and financial burden by population groups; and (3) the trends in CHE and health impoverishment in China from 2010 to 2016. Overall, these findings suggest that China has made some good progress in the provision of, access to, and uptake of healthcare service as well as some improvements in financial risk protection for Chinese citizens over the last 10

years. However, more effort is required to reduce socioeconomic health inequalities by providing more effective treatments and greater financial protection for patients with NCDs, particularly people with multiple health conditions.

The first study (**chapter 4**) applied the WHO concept of effective coverage to estimate the effectiveness of hypertension treatment in China, considering sub-optimally treated hypertensive patients (that is, those patients who are not fully controlled but with partial reductions in blood pressure). These findings revealed a large gap between treatment coverage and effective coverage for hypertension care among Chinese adults. The level of effective coverage of hypertension treatment in China was still very low. Considerable variations in effective coverage of hypertension treatment were observed between patients without health insurance and those with it. This research also identified significant differences in treatment coverage for hypertensive individuals across social health insurance schemes. Social health insurance schemes, particularly the UEBMI, play a significant role in improving both treatment coverage and effective coverage for hypertension care. However, patients enrolled in NCMS have lower effective coverage of hypertension treatment than those people enrolled in UEBMI, in large part because the NCMS did not cover the cost of outpatient care.

In the second study (**chapter 5**), the findings indicated that hypertension care and the use of health services were disproportionately higher among wealthy individuals in China in 2015. Compared with medication treatment, outpatient service, and health education, the most unequal indicator was inpatient care, also more heavily utilised by wealthy individuals. The third study (**chapter 6**) suggested China also needs to make more effort to reduce geographic disparities and provide more effective treatments and higher quality care for patients with hypertension, even though it has made impressive progress in the improvement of regional inequalities in hypertension care over time.

The fourth study (**chapter 7**) indicated that chronic disease multimorbidity was common among middle-aged and elderly Chinese adults from 2011 to 2015. The more affluent might be reporting more multimorbidity than their more deprived counterparts because they have better access to health services and are more likely to have other conditions identified. In China, multimorbidity is associated with higher levels of health service use and a greater financial burden, even among the most affluent and those covered by more generous social health insurance schemes. Concerted efforts are

needed to reduce health inequalities due to multimorbidity, and its adverse economic impact on financial risk protection in population groups in China. Social health insurance reforms must place greater emphasis on reducing out-of-pocket spending for patients with multiple chronic diseases to provide greater financial risk protection to those at risk of high out-of-pocket spending due to multimorbidity.

In the fifth study (**chapter 8**), the findings suggested that important advances have been made in achieving greater financial protection for Chinese citizens since the new health system reforms in 2009. Between 2010 and 2016, the incidence of CHE and health impoverishment in China decreased; however, the decrease in level of impoverishment was less in rural areas than in urban areas. The gap between impoverishment rates across income quartiles was growing. This study showed that households with two or more members suffering NCDs were significantly more likely to incur CHE and impoverishment compared to households with no members suffering.

The results from this thesis confirm that the overall burden of NCD is high in the Chinese population. People with NCD multimorbidity experience higher healthcare utilisation and greater financial risk. Optimising a health insurance system plays an extremely important role in improving financial risk protection. However, the current health insurance system still leaves much financial risk for households to bear, and a high incidence of impoverishment. In China, the protection of vulnerable groups from the experience of CHE and health-related impoverishment remains a challenge.

At the end of 2015, China had officially announced the merger of the UEBMI and the NCMS [94], representing a commendable milestone towards universal health coverage [95]. In the implementation of this integration, the most critical element was the further extension of funding pools and narrowing of disparities in covered services and medications between the URHI and UEBMI [9]. This new phase in China's reform needs special attention devoted to disadvantaged groups, particularly the poor and households with members suffering NCDs. Extending insurance coverage to include long-term care for chronically ill patients, outpatient services, essential medications, and rehabilitation services should be a priority. As discussed in chapter 7 and 8, the reform of social health insurance system could be deeply integrated with National Poverty Alleviation Projects (NPAP), giving priority to a comprehensive benefits package with services and cost-sharing mechanisms for poor households and those with

two or more NCD members. Programs should also specifically target susceptible populations, such as individuals with multimorbidity and people living in rural and remote areas.

9.2 Strengths and limitations

9.2.1 Strengths of research

This study and the datasets used in this thesis have several strengths.

Firstly, the sub-project (chapter 4) is the first China study to apply the metric of effective coverage to estimate the effectiveness of hypertension treatment, using a nationally representative longitudinal dataset. It is difficult to identify hypertensive individuals with partially controlled blood pressure using previous cross-sectional studies, but the longitudinal data is able to account for sub-optimally-treated hypertensive patients with partial reductions of blood pressure over time. In contrast to approaches that only calculate the rate of uncontrolled and well-controlled hypertensive cases, applying the metric of effective coverage (healthcare for hypertension or other NCDs) has the advantage of estimating actual health gain due to intervention over time using longitudinal datasets, regardless of whether some biomarkers are below/above the expected targets in clinical guidelines (for example, 90/140 mmHg for hypertension treatment). The usefulness of the effective coverage metric is that it can contribute to a deeper understanding of reform policies related to primary care and public health services for people with NCDs in China and other developing countries.

Secondly, in chapter 5, trends and socioeconomic inequalities were evaluated in healthcare and control of hypertension between 2011 and 2015 in China. This research will contribute to a deeper understanding of policy reforms policies related to primary health care and public health services. However, there are very few longitudinal studies from China assessing the geographic distribution of hypertension management following the health system reforms. The third sub-project (chapter 6) examined trends and geographic variations in the diagnosis, treatment and control of hypertension in China. The association of geographic correlates with hypertension care was investigated by applying random-effects models which could estimate the effects of those factors that do not change over time in the longitudinal analysis or in panel studies.

Additionally, the impact of antihypertensive medication treatment on reduction of blood pressure, was also investigated, by using panel analysis and controlling for changes in treatment status for different periods.

Thirdly, although there are several studies from developed countries exploring the burden and causes of multimorbidity, this topic is still an emerging area of research inquiry in developing countries [30-33, 86-90]. There is a lack of evidence on the impacts of multimorbidity on health service use and financial protection in China [86, 89]. No national-level studies performed panel analysis. The sub-project (chapter 7) is the first longitudinal analysis to examine socio-economic group differences in the prevalence of multimorbidity in China, and to consider the impact of those differences on healthcare utilisation and catastrophic health expenditure. Such knowledge gaps limit the capacity to identify populations at particular risk of multiple chronic conditions and to develop specific interventions to prevent multimorbidity. Further research in this field is therefore urgently required to generate better evidence to improve healthcare delivery and patient outcomes, and ensure financial protection for people with multimorbidity (as described in the following section 9.3).

Finally, most previous studies have focused on socioeconomic inequality in healthcare utilisation among the general population or among people with chronic diseases [14-17]. Some local studies have also examined the degree of CHE or health impoverishment at the provincial level or in rural areas in China [18-21]. However, the changes over the last decade in socio-economic disparity in financial protection in China and their extent are still unclear. This thesis reported on the most up-to-date evidence of recent trends and socio-economic disparities in CHE and health impoverishment using data from a nationwide household survey. Based on findings from the panel analysis, this study can provide a complete understanding of the trends in financial risk protection after 2009, and contribute to a deeper understanding of reform policies related to health insurance and to China's poverty alleviation projects.

9.2.2 Limitations of research

Firstly, the CHARLS used by this study only considered the middle-aged and older population in China. The effective coverage of hypertension treatment and the prevalence of NCD multimorbidity in younger Chinese adults and in the whole

population need to be investigated in future studies, using relevant datasets from other data sources.

Secondly, around 20% of participants have missing values for anthropometric and physical measurements (including blood pressures) for the CHARLS survey period, 2011 to 2015. Additionally, around 25% of families are missing income-related information in the survey of CFPS between 2010 and 2016. In the results, I reported both weighted and unweighted results, while imputation methods could not be used due to a relatively high proportion of missing values for the outcome variables. The weights provided by CHARLS and CFPS teams take account of the national representativeness of the results and the missing anthropometric measurements. To account for non-response bias and loss of follow-up, this study adjusted all analyses by using the created weights at the individual level and household level. There is a close similarity between the weighted and unweighted results, which indicates that the sampling procedures used in both CHARLS and CFPS reflect good representativeness at the national level.

Thirdly, due to a high and growing coverage of health insurance in China after the reform, there is a low proportion (less than 10%) of participants without health insurance in both CHARLS and CFPS, meaning there is comparison group that might affect the reliability of the estimate of effectiveness for health insurance schemes on healthcare utilisation and financial risk protection among individuals with hypertension or multimorbidity.

Furthermore, in the study of multimorbidity, hypertension was identified by measurement of individuals' blood pressure, which partially reduced the recall bias of self-reported diagnosis. The use of self-reported measures of NCDs (except hypertension) and healthcare utilisation, however, may underestimate their prevalence, particularly for older persons and those from lower socio-economic and educational backgrounds who may be more likely to under-report. The CHARLS questionnaire did not ask about all chronic diseases typically included in clinical database studies. Outpatient visits were not specific for NCDs and might include unrelated visits for other conditions. As mentioned, this study only included middle-aged and older populations in China.

9.3 Future research directions

Future research in this field in China and other countries should consider the following

I). This thesis demonstrated the usage of effective coverage as a metric to monitor effectiveness of healthcare for hypertension. Findings showing large differences in results comparing crude coverage (treatment coverage) and effective coverage. The usage of effective coverage should be expanded to other chronic health conditions, including healthcare for cardiovascular diseases, diabetes, stroke, cancer and mental illness. At the health system level, identifying an indicator that can adequately capture the multiple factors underlying the UHC initiative is a big challenge [145]. Based on high-quality data, this concept and metric can be readily applied in monitoring the progress towards UHC and health system performance at the national level, which unites individual and intervention characteristics into a single metric.

The effective coverage metric for NCDs treatment that is used in this thesis can also be adopted in other similar datasets, such as the Health and Retirement Study (HRS), the English Longitudinal Study of Aging (ELSA), the Survey of Health, Aging and Retirement in Europe (SHARE), and the WHO Study on Global AGEing and Adult Health (SAGE). Trends analyses within countries and international comparison studies in this field are required.

II). This thesis found substantial variations in healthcare service use and trends in financial risk protection for Chinese populations between 2010 and 2016. The new rounds of health system reform are ongoing in China, especially the public health insurance reform with its changing and expanding benefits packages for individuals with chronic diseases. But this study is only looking at a short period following the reform. There have been new policies and programmes implemented since then. It is warranted to look at the impact of these reformed policies on socioeconomic or geographic inequalities in NCD prevention and control. In the near future, four waves of data from CHARLS (2011 to 2018) and five rounds of data from CFPS (2010 to 2018) will be available. For instance, some trend studies, performing the before-and-after analysis, can then be conducted to examine whether the Unified Rural-Urban Residents Insurance scheme has been effective in improving access to primary care, provider choice, financial protection, and health outcomes among those with NCDs in

China. Further studies in panel/longitudinal designs should answer the following research questions, namely: 1. Is there a positive association between a household's poverty shortfall and its health out-of-pocket budget share? 2. Is there a double burden of physical and mental multimorbidity in China? 3. Does an increase in coverage of a health insurance scheme always result in a reduction of the prevalence of catastrophic expenditures?

III). The findings of this study filled an important gap of the economic burden of multimorbidity in China. However, a large proportion of the economic burden of chronic disease actually lies outside the health system, and on the society. There is a growing interest in exploring this issue in developed countries (the UK, USA, and Australia, for instance) [40, 163-165]. One study in Australia found a positive association between multimorbidity and productivity loss, with significant differences in lost productive time between men and women with multimorbidity [163]. Future research is needed into the broader social impact of multimorbidity (including productivity loss, damage to social relationships, and claims for social benefits), and into the prioritising of prevention strategies to improve health outcomes and reduce the financial burden on patients with multiple chronic conditions or on families with multimorbidity members.

There remains a lack of evidence on the impact of multimorbidity patterns/clusters on healthcare utilisation and costs. A potential fruitful research program could explore the interaction between physical multimorbidity and mental health morbidity, and compare it to the impact of a single disease. It also needs to determine any additional effect of mental health multimorbidity on clinical outcomes and quality of life by conducting a longitudinal analysis.

9.4 Conclusion

To conclude, this thesis presents some research findings on effective coverage for hypertension care and socioeconomic disparities in healthcare services use among Chinese individuals with hypertension. The research is the first panel analysis in China to assess socioeconomic group differences in the impact of multimorbidity on healthcare utilisation and catastrophic health expenditure. The thesis also provides a complete understanding of the trends in financial risk protection following the China health system reform. The findings are helpful in informing the development of an

equitable health policy that can more effectively provide healthcare services and financial risk protection to the growing number of people with NCDs and multimorbidity in China and in other developing countries. Furthermore, this study contributes to a deeper understanding of reformed policies related to health insurance and universal coverage in China. With ongoing reforms of health insurance system, it is essential therefore to further evaluate the impact of reformed policies on main aspects of UHC (the distribution of population covered, health services and costs covered) and on the health outcomes in Chinese populations with NCDs.

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Appendix A-1: The ethical approval document of CFPS

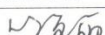
For the China Family Panel Studies, the ethics approval was provided by the Peking University Biomedical Ethics Review Committee. The approval number is IRB00001052-14010.

伦理审查批件

PKU IRB_OF 13_1.1 (2013-8-1)

北京大学生物医学伦理委员会 伦理审查批件

伦理审查批件号: IRB00001052-14010

受理号	2014025 (北大社科中心)		
项目名称	中国家庭追踪调查 (China Family Panel Studies)		
项目负责人	李强		
项目负责人所在单位	北京大学中国社会科学调查中心		
资金来源	教育部 985 工程		
审查类别	初审	审查方式	非会审
审查文件	1、初始审查申请 (签字、签署日期、盖章) 2、研究方案 (版本号: pku-CFPS-F-01 版本日期: 2013 年 6 月 1 日) 3、知情同意书 (版本号: pku-CFPS-F-01 版本日期: 2013 年 6 月 1 日) 4、病例报告表 (版本号: pku-CFPS-Q-01 版本日期: 2013 年 11 月 25 日) 5、项目负责人专业履历 (签名、签署日期)		
审查意见:	<p>依据《中华人民共和国执业医师法》、《医疗机构管理条例》、《药物临床试验质量管理规范》、《涉及人体的生物医学研究伦理审查办法 (试行)》、《药物临床试验伦理审查工作指导原则》、世界医学会《赫尔辛基宣言》、世界卫生组织《生物医学研究审查伦理委员会操作指南》、国际医学科学组织委员会《涉及人的生物医学研究国际伦理准则》等法律、法规、规章、规范性文件和国际准则, 经本伦理委员会审查, 同意按研究方案开展本研究。</p> <p>请遵循伦理委员会批准的方案开展研究, 保护受试者的健康与权益。</p> <ol style="list-style-type: none"> 研究过程中若变更项目负责人, 对研究方案、知情同意书、招募材料等的任何修改, 请提交修正案审查申请; 发生严重不良事件, 请在获知后的 7 个工作日内提交严重不良事件报告; 请按照伦理委员会规定的持续审查频率, 在截止日期前 1 个月提交研究进展报告; 当出现任何可能显著影响试验进行、或增加受试者危险的情况时, 请立即向伦理委员会提交书面报告; 研究者没有遵从方案开展研究, 可能对受试者的权益/健康、以及研究的科学性造成不良影响, 请提交违规事件报告; 申请人暂停或提前终止临床研究, 请及时提交暂停/中止研究报告; 研究结束时, 请提交结题报告。 本批件自批准之日起一年内有效。 		
批准日期	2014-4-17	持续审查日期	2015-4-16
主任委员签字		签署日期	2014.4.17

北京大学生物医学伦理委员会办公室: 北京大学医学部逸夫教学楼 501 室 (海淀区学院路 38 号)
电话: 010-82805751 Email: llwyh@bjmu.edu.cn


Appendix A-2: The ethical approval document of CHARLS

For the China Health and Retirement Longitudinal Study, the ethics approval was provided by the Peking University Biomedical Ethics Review Committee. The approval number is IRB00001052-11015.

北京大学生物医学伦理委员会

伦理审查批准书

批准号: IRB00001052-11015

项目名称: 中国健康与养老追踪调查		
项目负责人: 赵耀辉	职称: 教授	联系人: 胡以松
主要研究单位: 北京大学国家发展研究院		联系电话: 62767045
研究项目来源: <input type="checkbox"/> 政府 <input type="checkbox"/> 基金会 <input type="checkbox"/> 公司 <input type="checkbox"/> 国际组织 <input type="checkbox"/> 自主 <input type="checkbox"/> 其它		
研究经费资助者:		
请求审查类型: <input type="checkbox"/> 新申请项目 <input checked="" type="checkbox"/> 修订后项目 <input type="checkbox"/> 延续审查课题		
审查意见: <p><u>中国健康与养老追踪调查</u> 的研究方案和知情同意书经伦理委员会审查:</p> <p><input checked="" type="checkbox"/>符合伦理学要求, 同意按照此方案进行试验。 <input type="checkbox"/>实验方案、<input type="checkbox"/>知情同意书 <input type="checkbox"/>修改后, 伦理委员会同意开始试验。 <input type="checkbox"/>不符合伦理要求或<input type="checkbox"/>补充资料, 修改后报伦理委员会再审查。 <input type="checkbox"/>终止<input type="checkbox"/>暂停已批准的试验</p> <p style="text-align: right;">北京大学生物医学伦理委员会 主任委员:  2011年1月20日</p>		

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Appendix B-1: Accepted abstract 1 for The Lancet

Trends and socioeconomic disparities in financial risk protection in China 2010–16: a repeated cross-sectional analysis

Yang Zhao, Brian Oldenburg, Ajay Mahal, Shenglan Tang, Xiaoyun Liu

The Nossal Institute for Global Health, University of Melbourne, VIC, Australia (Y Zhao MPH, Prof B Oldenburg PhD, Prof A Mahal PhD); **WHO Collaborating Centre on Implementation Research for Prevention & Control of NCDs, Melbourne, VIC, Australia** (Y Zhao, B Oldenburg); **Duke Global Health Institute, Duke University, Durham, NC, USA** (Prof S Tang PhD); and **China Centre for Health Development Studies, Peking University, Beijing, China** (Prof X Liu PhD)

Correspondence to:

Prof Xiaoyun Liu, China Centre for Health Development Studies, Peking University

Beijing 100191, China

xiaoyunliu@pku.edu.cn

Abstract

Background In 2009, China launched a new health system reform with the goal of achieving universal health coverage by 2020. This study aimed to assess the trends and socioeconomic disparities in financial risk protection in China, and to explore the influence of chronic diseases on catastrophic health expenditure and impoverishment due to health payments.

Methods We used data from the China Family Panel Studies 2010–16, with a sample size of 14 960 households. We defined catastrophic health expenditure as the point at which annual household health payments exceeded 40% of annual capacity to pay. Impoverishment was defined as earnings below the poverty line of \$1.90 per day. We used multivariable logistic regression models to identify the effects of the costs incurred by a family member with chronic disease on catastrophic health expenditure and impoverishment. Ethics permission and approval were obtained from the Peking University Biomedical Ethics Review Committee (IRB00001052-14010).

Findings Between August 13, 2010 and June 28, the incidence of catastrophic health expenditure in China decreased from 19.37% (95% CI 17.91%–20.93%) to 15.11% (14.09%–16.12%), and from 7.34% (6.54%–8.14%) to 5.14% (4.53%–5.74%) for health impoverishment; however, the decrease in impoverishment was less in rural areas (from 8.46% to 7.81%) than

in urban areas (from 6.16% to 3.03%) in 2010-2016 ($p < 0.0001$). The gap between the prevalence of impoverishment across the income quartiles has grown. Multivariable analysis showed that households with two or more people with chronic diseases were significantly more likely to incur catastrophic health expenditure (odds ratio 2.46 [95% CI 1.93–3.13]) and impoverishment (2.66 [1.87–3.78]) compared with households with no people with chronic diseases, after adjusting for sociodemographic covariates.

Interpretation Important advances have been made in improving financial protection for Chinese citizens. Nevertheless, increased attention to poor and rural households with people with chronic diseases is needed. Policymakers in China should focus on optimising integrated rural–urban health insurance by expanding the existing benefit packages. Moreover, increased efforts to alleviate poverty should be continued through further development of China’s medical assistance system for poor people.

Funding None.

Contributors

All authors participated in the design of the study and were involved in the implementation of the study. YZ and XY designed the study; YZ and BO did the initial analysis and supervised data analysis; YZ wrote the first draft of the paper; and BO, XL, AM and ST provided advice on the first draft. All authors reviewed and had final approval of the submitted and published versions.

Declaration of interests

We declare no competing interests.

Acknowledgements

We gratefully acknowledge the China Family Panel Studies team for providing data and training in using the datasets. We are grateful for the cooperation of the students who participated in the survey. We thank all volunteers and staff involved in this research.

Appendix B-2: Accepted abstract 2 for The Lancet

Impact of multimorbidity on health service use and catastrophic health expenditure in China: an analysis of data from a nationwide longitudinal survey

Yang Zhao, Lin Zhang, Siqi Zhao, Luwen Zhang

The Nossal Institute for Global Health, The University of Melbourne, Melbourne, VIC, Australia (Y Zhao MPH); WHO Collaborating Centre on Implementation Research for Prevention and Control of Noncommunicable Diseases, Melbourne, VIC, Australia (Y Zhao); Peking Union Medical College School of Public Health, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China (Li Zhang PhD); Yantai Hospital of Yantai, Yantai, Shandong, China (S Zhao MSc); and School of Health Services Management, Southern Medical University, Guangzhou, Guangdong, China (Lu Zhang PhD)

Correspondence to:

Mr Yang Zhao, The Nossal Institute for Global Health, The University of Melbourne, Melbourne, VIC 3010, Australia

zhaoyang001@hsc.pku.edu.cn

Abstract

Background Multimorbidity (the presence of two or more chronic conditions) is a significant contributor to inequalities in health care and has become the major unaddressed challenge for the health system in China. We assessed the distribution of multimorbidity in relation to economic status and the relationships between multimorbidity, health-care use, and catastrophic health expenditure.

Methods We conducted a longitudinal study using three waves of data (in 2011, 2013 and 2015) from the China Health and Retirement Longitudinal Study (CHARLS), including 12 096 participants aged 45 years and older. Random effects logistic regression models were used to determine the sociodemographic correlates of multimorbidity, including age, gender, marital status, education, residence location, socio-economic status quartiles (yearly per-capita household consumption), health insurance, and geographical region. Negative binomial regression models were used to assess the relationship between multimorbidity and outpatient visits as well as days of hospitalisation. Multivariable logistic regression models were used to estimate the effect of multimorbidity on catastrophic health expenditure defined as the point at which annual household health payments exceeded 40% of non-food household consumption expenditure. The Biomedical Ethics Review Committee of Peking

University approved the CHARLS study, and all interviewees were required to provide informed consent. The ethical approval number was IRB00001052–11015.

Findings Overall, 5 566 (46·0%) in 2011, 6 069 (50·2%) in 2013, and 7 399 (61·2%) in 2015 of 12 096 participants had chronic disease multimorbidity in China. The onset of multimorbidity occurred 5–10 years earlier in people in the highest economic quartile group than in the lowest group. Multimorbidity was positively associated with health service use, including outpatient visits (coefficient 0·25, 95% CI 0·24–0·27) and days of hospitalisation (0·31, 0·31–0·35). Multimorbidity is associated with an increased likelihood of experiencing catastrophic health expenditure (odds ratio 1·30, 95% CI 1·27–1·33). These associations appear to be similar among people covered by health insurance across economic groups. By contrast, income-related disparities in the association between multimorbidity and health service use are more pronounced in the population without than with health insurance.

Interpretation Multimorbidity is associated with higher levels of health service use and a greater financial burden to individuals in China. Acceleration of progress to achieve universal health insurance coverage could improve disparities in access to health care among economic groups. Health-care reforms in China should place greater emphasis on reducing out-of-pocket spending for patients with multimorbidity.

Funding None.

Contributors

YZ and SZ conceived and designed the study. YZ and LuZ did the initial analysis and supervised data analysis. YZ wrote the first draft of the Abstract, and SZ and LiZ critically revised the first draft. All authors reviewed and approved the final version of the Abstract submitted for publication.

Acknowledgments

We thank the China Health and Retirement Longitudinal Study (CHARLS) team for providing data and training in using the datasets. We are grateful for the cooperation of the students who participated in the survey. We thank all volunteers and staff involved in this research.

Conflict of interest

The authors have declared that no competing interests exist.

Statement of independence of researchers from funders

Not applicable.

Patient involvement

No patients were involved in the design or analysis of this study.

Data sharing statement

Not applicable.

Appendix C-1: The baseline questionnaire of CHARLS (Part D & E)

CHINA HEALTH AND RETIREMENT LONGITUDINAL STUDY – BASELINE QUESTIONNAIRE

中国健康与养老追踪调查
全国问卷

August 2011

北京大学

中国经济研究中心
CHINA CENTER FOR ECONOMIC RESEARCH
PEKING UNIVERSITY

For more details: <http://charls.pku.edu.cn/en/page/about/CHARLS>

The researchers can visit CHARLS official data platform to download the newest public data <http://charls.pku.edu.cn/en/page/data/2011-charls-wave1>

D HEALTH STATUS AND FUNCTIONING 健康状况和功能

DA HEALTH STATUS 健康状况

SKIP PATTERN CHECKPOINT: SELF-REPORTED HEALTH STATUS

TWO SCALES ARE USED TO MEASURE SELF-REPORTED HEALTH STATUS. R WILL BE ASKED TO RATE THEIR HEALTH STATUS TWICE, ONCE AT THE BEGINNING OF THIS SECTION AND AGAIN AT THE END OF THE SECTION. QUESTION ORDER WILL BE ASSIGNED RANDOMLY.

IF R IS RANDOMLY ASSIGNED TO ORDER 1(SEC_DA_LIST=1), SKIP TO DA001

IF R IS RANDOMLY ASSIGNED TO ORDER 2(SEC_DA_LIST=2), SKIP TO DA002

跳转检查：自我报告健康状况

在这个部分中，我们将要求受访者完成两次自我健康状况评价。第一次是在这个部分的开头；第二次则放在这个部分的结尾处。在问卷中自我评价的问题以随机的形式出现。

如果受访者被随机分在第一组（DA部分=1），跳至 DA001

如果受访者被随机分在第二组（DA部分=2），跳至 DA002

PART I: GENERAL HEALTH STATUS AND DISEASE HISTORY 第一部分：一般健康状况和疾病史

DA001. Next, I have some questions about your health. Would you say your health is excellent, very good, good, fair, or poor? 接下来我们问一些与您健康状况相关的问题。您觉得您的健康状况怎么样？是极好，很好，好，一般，还是不好？

[IWER: Interviewer should read all the following options 访员注意：必须读出所有的选项]

- (1) Excellent 极好
- (2) Very good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

DA002. Next, I have some questions about your health. Would you say your health is very good, good, fair, poor or very poor? 下面我将问到一些关于您的健康状况的问题。您认为您的健康状况怎样？是很好，好，一般，不好，还是很不好？

[IWER: Interviewer should read all the following options 访员注意：必须读出所有的选项]

- (1) Very good 很好
- (2) Good 好
- (3) Fair 一般
- (4) Poor 不好
- (5) Very poor 很不好

[IWER: Please do not ask proxy the following questions from CA005-CA006. 访员注意：DA003 -DA004 题不允许请代理人回答。]

DA003. Do you ever feel pain on the left side of your chest? 您左侧胸部曾感到过疼痛吗？

- (1) Yes 是
- (2) No 否

DA004. Do you ever feel chest pains when climbing stairs/uphill or walking quickly? 当您爬楼梯、登山或快速走的时候，曾感到过胸部疼痛吗？

- (1) Yes 是
- (2) No 否
- (3) Not applicable 不适用

DA005. Do you have one of the following disabilities? 您是否有下列残疾问题？

- (1) Physical disabilities 躯体残疾
- (2) Brain damage/mental retardation 大脑受损/智力缺陷
- (3) Vision problem 失明或半失明
- (4) Hearing problem 聋或半聋
- (5) Speech impediment 哑或严重口吃

[Skip pattern: If respondent says “no” to all of the above, skip to DA007 跳转检查点：如果没有任何问题，请跳至DA007]

DA006. In what year did you become disabled? 您是什么时候开始患有[preload DA005 answer]? _____

1900..2011 Year 年

[WER: Mark the year using four digits. 访员注意：用4位数表示年]

[Show Card 出示卡片 7]

DA007. Have you been diagnosed with [conditions listed below, read one by one] by a doctor? 是否有医生曾经告诉过您有以下这些慢性病？

[WER: Read one by one. 1=yes, 2=no. 访员注意：请逐项读出以下答案，并让受访者逐一回答，1=是，2=否。]

- (1) Hypertension 高血压病
- (2) Dyslipidemia (elevation of low density lipoprotein, triglycerides (TGs), and total cholesterol, or a low high density lipoprotein level) 血脂异常 (包括低密度脂蛋白、甘油三酯、总胆固醇的升高或(和)高密度脂蛋白的下降)
- (3) Diabetes or high blood sugar 糖尿病或血糖升高 (包括糖耐量异常和空腹血糖升高)
- (4) Cancer or malignant tumor (excluding minor skin cancers) 癌症等恶性肿瘤 (不包括轻度皮肤癌)
- (5) Chronic lung diseases, such as chronic bronchitis, emphysema (excluding tumors, or cancer) 慢性肺部疾患如慢性支气管炎或肺气肿、肺心病 (不包括肿瘤或癌)
- (6) Liver disease (except fatty liver, tumors, and cancer) 肝脏疾病 (除脂肪肝、肿瘤或癌外)
- (7) Heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems 心脏病 (如心肌梗塞、冠心病、心绞痛、充血性心力衰竭和其他心脏疾病)
- (8) Stroke 中风
- (9) Kidney disease (except for tumor or cancer) 肾脏疾病 (不包括肿瘤或癌)
- (10) Stomach or other digestive disease (except for tumor or cancer) 胃部疾病或消化系统疾病 (不包括肿瘤或癌)
- (11) Emotional, nervous, or psychiatric problems 情感及精神方面问题
- (12) Memory-related disease 与记忆相关的疾病 (如老年痴呆症、脑萎缩、帕金森症)
- (13) Arthritis or rheumatism 关节炎或风湿病
- (14) Asthma 哮喘

[RPROGRAM: Ask DA008 only if CA010 = 1, 5, 11, and CA010 = no.] [程序: 对于每个DA007 的第1,5, 11项中回答否的选项,问DA008.]

DA008. Do you know if you have [preload the current choice in DA007]? 您是否知道自己患有? [依次显示所有DA007 中第1,5, 11项中回答否的选项的疾病名称]

- (1) Yes 是
- (2) No 否

CAPI: If diagnosed or known by R: 如果医生诊断或者自己知道患有:

Ask the following 2 questions for each condition (item 1- 14 in DA007) he/she named. Do not allow anser to these questions if no disease named in DA007

对于他/她患的 DA007 中1-14的每种疾病, 重复询问以下两个问题。如果他/她没有DA007 中提到的疾病, 那么不需要让他/她回答以下两个问题。

DA009. When was the condition first diagnosed or known by yourself? 第一次诊断出或者自己知道患有[...]在 _____ (DA009_1) 1900..2011Year年或 _____ (DA009_2) 1..120Age岁?

[IWER: Mark the year using four digits. 访员注意: 用4位数记录年份]

[PROCEDURE: Answer DA010 if DA007 = 2, 5, 6, 7, 9, 10, 12, 13 or DA008=1,5,11.]

[程序: 如果DA007 =2, 5, 6, 7, 9, 10, 12, 13或者DA008=1,5,11回答DA010.]

DA010. Are you now taking any of the following treatments to treat [...] or its complications (Check all that apply)? Taking Chinese traditional medicine, taking Western modern medicine, other treatments? 您目前有正在采用以下方式来治疗[...]及其并发症(选择所有采用的方式)? 服用中药, 服用西药, 吃药以外的其他治疗方法? (可多选)

[IWER: Read one by one. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答。]

- (1) Taking Chinese traditional medicine 服用中药(DA010_1)
- (2) Taking Western morden medicine 服用西药(DA010_2)
- (3) Other treatments 吃药以外的其他治疗方法(DA010_3)
- (4) None of the above 以上都没有(DA010_4)

[ROCEDURE: If DA007 =1 then answerDA011.] [如果 DA007 =1, 回答 DA011.]

DA011. Are you now taking any of the following treatments to treat or control your hypertension?(Check all that apply) Taking Chinese traditional medicine, taking Western modern medicine?您目前有没有正在采用以下方式来治疗控制高血压? 服用中药, 服用西药? (可多选)

[IWER: Read one by one. 1=yes,2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Taking Chinese traditional medicine 服用中药
- (2) Taking Western morden medicine 服用西药
- (3) None of the above 以上都没有

DA012. During last year (last 12 months), how many times have you had blood pressure examination? 在过去一年(12个月)中, 您检查过几次血压?

□□□□ 0...999Times 次

DA013. Have your care providers ever given you health education/advice on the following (check all that apply)? Weight control, exercise, diet and/or smoking control? 有没有医生建议您注意以下问题? (可多选) 控制体重, 身体锻炼, 饮食调理, 控烟?

[WEP: Read one by one. 1=yes, 2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Weight control 控制体重
- (2) Exercise 身体锻炼
- (3) Diet 饮食调理
- (4) Smoking control 控烟
- (5) None of the above 以上都没有

[PROCEDURE: If DA007 =3 then answer DA014. 如果 DA007 =3, 回答 DA014]

DA014. Are you now taking any of the following treatments to treat or control your diabetes?(Check all that apply) Taking Chinese traditional medicine, taking Western modern medicine, taking insulin injections? 您目前有没有正在采用以下方式来治疗控制糖尿病? 服用中药, 服用西药, 注射胰岛素? (可多选)

[WEP: Read one by one. 1=yes, 2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Taking Chinese traditional medicine 服用中药
- (2) Taking Western modern medicine 服用西药
- (3) Taking insulin injections 注射胰岛素
- (4) None of the above 以上都没有

DA015. During last year (last 12 months), how many times have you had the following? 过去一年 (12 个月) 中, 下列各种检测您分别做了几次?

- (1) Blood glucose test 血糖检测 (DA015_1) 0..999 Times 次
- (2) Urine glucose test 尿糖检测 (DA015_2) 0..99 Times 次
- (3) fundus examination 眼底检查 (DA015_3) 0..99 Times 次
- (4) micro-albuminuria test 微蛋白尿检查 (DA015_4) 0..99 Times 次
- (5) None of the above 以上都没有

DA016. Have your care providers ever given you health education/advice on the following? (check all that apply) 有没有医生建议您注意以下问题? 控制体重, 身体锻炼, 饮食调理, 控烟, 足部自我护理? (可多选)

[WEP: Read one by one. 1=yes, 2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Weight control 控制体重
- (2) Exercise 身体锻炼
- (3) Diet 饮食调理
- (4) Smoking control 控烟
- (5) Foot self-care 足部自我护理
- (6) None of the above 以上都没有

[PROCEDURE: If DA007 =4 "Cancer or a malignant tumor, excluding minor skin cancers" then answer DA018.] [程序: 如果"DA007 =4 癌症或恶性肿瘤 (不包括轻度皮肤癌)", 回答 DA017 及 DA018.]

[Show Card 出示卡片 8]

DA017. In which organ or part of your body do you have cancer? Including the origins and metastasis of tumor. (circle all that apply) 身体的哪个器官或部位患有或曾经患有癌症? 包括原发和已转移的肿瘤。(可多选)

[IWER: Read one by one. We should still ask R even if he/she has already been cured. 访员注意: 依次读出所有选项, 若受访者所患癌症已痊愈, 仍需记录。]

- (1) Brain 大脑
- (2) Oral cavity 口腔
- (3) Larynx 喉
- (4) Other pharynx 咽
- (5) Thyroid 甲状腺
- (6) Lung 肺
- (7) Breast 乳房
- (8) Oesophagus 食管
- (9) Stomach 胃
- (10) Liver 肝脏
- (11) Pancreas 胰腺
- (12) Kidney 肾脏
- (13) Prostate 前列腺
- (14) Testicle 睾丸
- (15) Ovary 卵巢
- (16) Cervix 子宫颈
- (17) Endometrium 子宫内膜
- (18) Colon or rectum 结肠或直肠
- (19) Bladder 膀胱
- (20) Skin 皮肤
- (21) Non-Hodgkin lymphoma 非何杰金淋巴瘤 (非霍奇金淋巴瘤)
- (22) Leukemia 白血病
- (23) Other organ 其他器官(DA017_1)

DA018. Have you taken any of the following treatments to treat your cancer or relieve its/their symptoms (e.g., pain, nausea, etc.) in the past two years? (Check all that apply) Taking Chinese traditional medicine ,taking Western modern medicine ,chemotherapy ,surgery ,radiation therapy? 在过去的两年中, 您有没有采用以下方式治疗肿瘤或缓解肿瘤所引起的疼痛、恶心等症状(可多选)? 服用中药, 服用西药, 化学疗法, 手术治疗, 放射疗法?

[IWER: Read one by one. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答。]

- (1) Taking Chinese traditional medicine 服用中药
- (2) Taking Western modern medicine 服用西药
- (3) Chemotherapy 化学疗法
- (4) Surgery 手术治疗
- (5) Radiation therapy 放射疗法
- (6) None of the above 以上都没有

F1: (1) "化学疗法"指用化学合成药物治疗疾病的方法。化学药物治疗(简称化疗)是目前治疗肿瘤及某些身免疫性疾病的主要手段之一。

(2) "手术治疗"是最早应用的治疗癌症的方法, 也是目前许多早期癌症治疗的首选疗法。

(3) “放射治疗”是用各种不同能量的射线照射肿瘤，以抑制和杀灭癌细胞的一种治疗方法。

PROCEDURE: If DA007 =8, then answer DA019. 如果 DA007 =8, 回答 DA019.

DA019. Are you now taking any of the following treatments because of your stroke?(Check all that apply) Taking Chinese traditional medicine ,taking Western modern medicine , physical therapy, acupuncture and moxibustion , occupational therapy?您目前有没有正在采用以下方式治疗或控制由于中风引起的痉挛或者其它并发症?服用中药,服用西药,物理治疗,针灸治疗,职业治疗?(可多选)

[IWER: Read one by one. 1=yes, 2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Taking Chinese traditional medicine 服用中药
- (2) Taking Western modern medicine 服用西药
- (3) Physical therapy 物理治疗
- (4) Acupuncture and moxibustion 针灸治疗
- (5) Occupational therapy 职业治疗
- (6) None of the above 以上都没有

F1: (1) “物理治疗”指主要借着自然界中的物理因子(声光水冷热电热力)、运用人体生理学原理法则等,针对人体局部或全身性的功能障碍或病变,施予适当的非侵入性、非药物性治疗来处理患者身体不适和病痛治疗方式,使其尽可能地恢复其原有的生理功能。

(2) “针灸治疗”指针灸法和灸法的合称。针法是把毫针刺入患者体内,运用捻转与提插等针刺手法来治疗疾病。灸法是把燃烧着的艾绒按一定穴位熏灼皮肤,利用热的刺激来治疗疾病。

(3) “职业治疗”指透过悉心选择而适用于病者的康复活动,帮助在精神、情绪、体能或智能上有障碍的人恢复/增强身体及心智功能,阻止/减轻伤残所带来的影响,使他们能适应工作,社会及家庭上的要求,达至正常和独立的生活。

PROCEDURE: If DA007 =11 or DA008 =11 then answer DA020 如果 DA007 =11 或 DA008=11, 回答 DA020.

DA020. Are you now taking any of the following treatments for your emotional, nervous, or psychiatric problems?(Check all that apply) Receiving psychiatric or psychological treatment, taking anti depressants ,taking tranquilizers or sleeping pills?您目前有没有正在采用以下方式治疗精神、心理和情感方面的疾病?(可多选)

接受精神科治疗或心理治疗,服用抗抑郁药物,服用镇静或安眠药物?

[IWER: Read one by one. 1=yes, 2=no. 访问员注意: 请逐项读出以下答案, 并让受访者逐一回答, 1=是, 2=否。]

- (1) Receiving psychiatric or psychological treatment 接受精神科治疗或心理治疗
- (2) Taking anti depressants 服用抗抑郁药物
- (3) Taking tranquilizers or sleeping pills 服用镇静或安眠药物
- (4) None of the above 以上都没有

[IWER: Please do not ask proxy the following questions from DA021 -DA078 . 访员注意: DA021 -DA078 题不允许请代理人回答。]

DA021. Have you ever been in a traffic accident or any other kind of major accidental injury and received medical treatment? 您是否经历过交通事故, 或任何的重大意外伤害, 并接受了治疗?

- (1) Yes 是
(2) No 否 → Skip to DA023 跳至DA023

DA022. Does your injury caused by the accident limit your daily activities? 事故导致的伤害是否影响您现在的日常活动?

- (1) Yes 是
(2) No 否

DA023. Have you fallen down in the last two years? 您过去两年有没有摔倒?

- (1) Yes 有
(2) No 没有 → Skip to DA025 跳至DA025

F1: "过去两年"指从被访日起往前推24个月到受访日这段时间。

DA024. How many times have you fallen down in the last two years seriously enough to need medical treatment?? 您过去两年中有多少次摔倒受伤严重到需要接受治疗? _____ times 次

F1: "过去两年"指从被访日起往前推24个月到受访日这段时间。

DA025. Have you ever fractured your hip? 您有没有过髋骨骨折?

- (1) Yes 有
(2) No 没有

F1: "髋骨"指人体腰部的骨骼, 共左右两块。幼年时, 髋骨分为髌骨, 坐骨和耻骨以及软骨连接。成年后, 它们之间的软骨会骨化, 成为一个整体, 即髋骨。

SKIP PATTERN CHECKPOINT: PROSTATE ILLNESS/INCONTINENCE 跳转格式检查: 前列腺疾病/大小便失禁

IF R IS MALE, SKIP TO DA029. 男性跳至DA029

DA026. When did you begin the menarche? 您什么时候开始来月经的?

____ 1900..2011 (DA026_1)Year年 [IWER: Mark the year using four digits. [访员注意: 用4位数表示年。]
Or 或Age年龄 _____ 1...120 (DA026_2) Years岁

DA027. Have you started menopause? 您绝经了吗?

- (1) Yes 是
(2) No 否 →Skip to DA032 跳至DA032

DA028. When did you begin the menopause? 您什么时候开始绝经的?

____ 1900..2011 (DA028_1)Year年; [IWER: Mark the year using four digits. 访员注意: 用4位数表示年。]
Or 或Age年龄 _____ 1...120 (DA028_2) Years岁 →Skip to DA032 跳至DA032

DA029. Have you ever been diagnosed with a prostate illness, such as prostate hyperplasia (excluding prostatic cancer)? 有没有医生诊断您得了前列腺疾病如前列腺增生(排除前列腺癌)?

- (3) Yes 是
(4) No 否 →Skip to DA032 跳至DA032

F1: "前列腺增生"主要症状有排尿困难, 轻者夜里起床小便次数增多, 有尿不净或尿完后还有少量排出的现象;

严重者出现尿流变细，甚或排不出的现象；同时常伴有腰酸腰痛、四肢无力、遗精等症状。

DA030. When was the condition first diagnosed? 第一次诊断出您有前列腺疾病是在什么时候？

_____ 1900.. 2011 (DA030_1) Year年: [IWER: Mark the year using four digits. 访员注意: 用4位数表示年。]

Or 或Age年龄 _____ 1... 120 (DA030_2) Years岁

DA031. Are you now taking medication or other treatment for your prostate illness? 您目前是否正在服药或以其他方式治疗前列腺疾病？

- (1) Yes 是
- (2) No 否

DA032. Now I have some questions about your eyesight. Do you usually wear glasses or corrective lenses? 下面问您一些关于视力的问题。您通常是否戴眼镜（包括矫正视力镜片）？

- (1) Yes 是
- (2) Legally blind 失明 → Skip to DA038 跳至DA038
- (3) No 否

DA033. How good is your eyesight for seeing things at a distance, like recognizing a friend from across the street (with glasses or corrective lenses if you wear them)? Would you say your eyesight for seeing things at a distance is excellent, very good, good, fair, or poor? 您看远处的东西怎么样？比如说能不能隔着马路认出朋友（包括戴着眼镜）。是极好，很好，好，一般还是不好？

- (1) Excellent 极好
- (2) Very good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

DA034. How good is your eyesight for seeing things up close, like reading ordinary newspaper print (with glasses or corrective lenses if you wear them)? Would you say your eyesight for seeing things up close is excellent, very good, good, fair, or poor? 您看近处的东西怎么样？比如说戴着眼镜能不能看报纸？是极好，很好，好，一般还是不好？

- (1) Excellent 极好
- (2) Very good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

DA035. Have you ever had cataract surgery? 您是否做过白内障手术？

- (1) Yes 是
- (2) No 否 → Skip to DA037 跳至DA037

DA036. Have you had cataract surgery on both eyes or just one? 白内障手术是做的一只眼还是两只眼？

- (1) One eye only 一只眼
- (2) Both eyes 两只眼

DA037. Has a doctor/nurse/paramedical/ doctor of traditional Chinese medicine doctor ever treated you for glaucoma? 是否有医生诊断过您得了青光眼？

- (1) Yes 是
- (2) No 否

DA038. Now I have some questions about your hearing. Do you ever wear a hearing aid? 现在有几个关于听力的问题。您有没有戴过助听器？

- (1) Yes 是
- (2) No 否

DA039. Is your hearing very good, good, fair, poor, or very poor (with a hearing aid if you normally use it and without if you normally don't)? Would you say your hearing is excellent, very good, good, fair, or poor? 您的听力如何？(如果您经常戴助听器，那么戴助听器时听力如何？如果您不经常戴助听器，那么不戴助听器时听力如何？)是极好，很好，好，一般还是不好？

- (1) Excellent 极好
- (2) Very good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

DA040. Have you lost all of your teeth? 您的牙齿是否已经掉光？

- (1) Yes 是
- (2) No 否

DA041. Are you often troubled with any body pains? 您经常为身体疼痛而感到苦恼吗？

- (1) Yes 有
- (2) No 没有 skip to DA044 请跳至DA044

[Show Card 出示卡片 9]

DA042. On what part of your body do you feel pain? Please list all parts of body you are currently feeling pain. 身体哪些部位感到疼痛？请列出所有部位。

- (1) Head (Headache) 头
- (2) Shoulder 肩膀
- (3) Arm 胳膊
- (4) Wrist 手腕
- (5) Fingers 手指
- (6) Chest 胸
- (7) Stomach (Stomachache) 胃
- (8) Back 背
- (9) Waist 腰
- (10) Buttocks 臀部
- (11) Leg 腿
- (12) Knees 膝盖
- (13) Ankle 脚踝
- (14) Toes 脚趾
- (15) Neck 脖子

DA043. How bad is your pain (if more than one type of pain, ask about the most severe one among them)?

Mild, Moderate or Severe? 疼痛程度（如果有多于一种类型的疼痛，回答最严重的疼痛程度）轻微，中度，严重？

- (1) Mild 轻微
- (2) Moderate 中度
- (3) Severe 严重

[Show Card 出示卡片 10]

DA044. Have you been diagnosed with any of the following infectious diseases? 是否有医生曾经告诉过您得过以下传染病?

- (1) Tuberculosis 结核病
- (2) hepatitis B 乙型肝炎
- (3) Malaria 疟疾
- (4) Influenza 流感
- (5) Rabies 狂犬病
- (6) Schistosomiasis 血吸虫病
- (7) AIDS patients and infectious ones 艾滋病患者及感染者
- (8) Encephalitis B 乙型脑炎
- (9) Dysentery 痢疾
- (10) Measles 麻疹
- (11) Brucellosis 布氏杆菌病
- (12) Gonorrhea 淋病
- (13) Syphilis 梅毒
- (14) Others 其他 Pls specify 请说明(DA044_1)
- (15) None 一个都没有

DA045. Are there any other medical diseases or conditions that are important to your health now that we have not talked about? 是否还有其他严重的疾病或身体不适我没问到?

- (1) Yes 是 →Skip to DA046 跳至DA046
- (2) No 否 →Skip to DA047 跳至DA047

DA046. What illness is that? 这些疾病是什么? _____

DA047. Have you gained or lost 5 or more kilograms in the last year? (excluding pregnancy) 过去一年有没有增重10斤以上, 或减轻10斤以上? (怀孕除外)

- (1) Yes, I only gained weight 是, 只增重。
- (2) Yes, I only lost weight 是, 只减轻。
- (3) Yes, I first gained and then lost weight 是, 先增重再减轻。
- (4) Yes, I first lost and then gained weight 是, 先减轻再增重。
- (5) No 没有
- (6) I don't know 我不知道

DA048. How would you evaluate your health during childhood, up to and including age 15? Excellent, very good, good, fair, poor? 您 15 岁之前 (包括 15 岁) 的身体状况怎么样? 极好, 很好, 好, 一般, 不好?

- (1) Excellent 极好
- (2) Very Good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

PART II: LIFESTYLE AND HEALTH BEHAVIORS 第二部分：生活方式和健康行为

DA049. During the past month, how many hours of *actual sleep* did you get at night (average hours for one night)? (This may be shorter than the number of hours you spend in bed.) 过去一个月内，您平均每天晚上真正睡着的时间大约是几小时？（可能短于您在床上躺着的时间）_____ **0.00..24.00**hours 小时

DA050. During the past month, how long did you take a nap after lunch? 过去一个月内，您通常午睡多长时间？_____ minutes 分钟

[IWER: If R didn't take a nap, please record for "0". 访员注意：如果受访者不午睡，请记录为 0.]

[PROCEDURE: DA051 will be presented ONLY to a random subsample of households (half). Main respondent and spouse in the selected households should answer DA051] [程序：仅仅在二次抽样被选中的家庭中询问 DA051 题。选中家庭中的主要受访者及其配偶都要回答 DA051 题.]

DA051. Now we would like to ask about the amount of time you spend on different types of physical activities in a usual week. 下面有一些问题是有关您通常每周花了多少时间做这些活动？

PHYSICAL ACTIVITIES 身体活动 (KKTYPE)	DA051.	DA052.		
		During a usual week, did you do any [...] for at least 10 minutes continuously? 您通常每周有没有至少持续做[...]十分钟?	During a usual week, on how many days did you do [...] for at least 10 minutes? 您通常每周有多少天做[...]至少十分钟?	How much time did you usually spend doing [...] on one of those days? 在做[...]的这些天里，您一天花多少时间做[...]?
A Now, think about all the vigorous activities requiring hard/high-intensity physical effort that you do in a usual week . Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, plowing, aerobics, fast bicycling, and cycling with a heavy load. Think only about those physical activities that you did for at least 10 minutes at a time. 下面请回忆	3. No 否↓ 1. Yes 是→	<input type="checkbox"/> 1..7 days 天	DA053 1. < 2 hours 小 时	DA054 1. < 30 minutes 分钟 2. ≥ 30 minutes 分钟

<p>下您通常每周做的非常消耗体力的激烈活动。激烈的活动会让你呼吸急促，比如搬运重物、挖地、耕作、有氧运动、快速骑车、骑车载货等。只需回忆您每次运动了至少十分钟的活动。</p>			<p>2. ≥ 2 hours 小时</p>	<p>DA055 3. < 4 hours 小时 4. ≥ 4 hours 小时</p>
<p>B . Now think about activities which take moderate physical effort that you do in a usual week. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or mopping the floor. Again, think about only those physical activities that you did for at least 10 minutes at a time. 下面请回忆下您通常每周做的中等强度的体力活动。中等体力的活动让您的呼吸比平时快一些，比如搬运轻便的东西、常规速度骑自行车、拖地、打太极拳、疾走。只要回忆您每次持续了至少十分钟的活动。</p>	<p>3. No 否↓ 1. Yes 是→</p>	<p>┌ 1.7 days └ 天</p>	<p>DA053 1. < 2 hours 小时</p>	<p>DA054 1. < 30 minutes 分钟 2. ≥ 30 minutes 分钟</p>
<p>C Now think about the time you spend walking in a usual week. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure. 下面回忆一下您通常每周走路花了多少时间。走路包括工作者在家的时候从一个地方走到另一个地方，以及其他您为了休闲、运动、锻炼或娱乐而散步。</p>	<p>3. No 否↓ 1. Yes 是→</p>	<p>┌ 1.7 days └ 天</p>	<p>DA053 1. < 2 hours 小时</p>	<p>DA054 1. < 30 minutes 分钟 2. ≥ 30 minutes 分钟</p>
			<p>2. ≥ 2 hours 小时</p>	<p>DA055 3. < 4 hours 小时 4. ≥ 4 hours 小时</p>

ACTIVITIES IN LAST MONTH 过去一个月的活动

[Show Card 出示卡片 11]

DA056. Have you done any of these activities in the last month? (Code all that apply) 您过去一个月是否进行了下列社交活动? (可多选)

- (1) Interacted with friends 串门、跟朋友交往

(2) Played Ma-jong, played chess, played cards, or went to community club 打麻将、下棋、打牌、去社区活动室

(3) Provided help to family, friends, or neighbors who do not live with you and who did not pay you for the help 无偿向与您不住在一起的亲人、朋友或者邻居提供帮助

(4) Went to a sport, social, or other kind of club 去公园或者其他场所跳舞、健身、练气功等

(5) Took part in a community-related organization 参加社团组织活动

(6) Done voluntary or charity work 志愿者活动或者慈善活动

(7) Cared for a sick or disabled adult who does not live with you and who did not pay you for the help 无偿照顾与您不住在一起的病人或残疾人

(8) Attended an educational or training course 上学或者参加培训课程

(9) Stock investment 炒股（基金及其他金融证券）

(10) Used the Internet 上网

(11) other 其他

(12) None of these 以上均没有

[CHECK: You cannot select 'None of these' together with any other answer. Please change your answer. 检查点：您不能同时选择“以上答案均不是”和其他选项。请重新选择。]

LOOP cnt = 1 to 10 循环点 1—10

|IF cnt IN DA056 (ACTIVITIES IN LAST MONTH) 如果 DA056 题答案为 1—10（过去一个月的活动）

DA057. Frequency of activity in the last month 过去一个月的活动频率

How often in the last month [did/have][you] [do voluntary or charity work/cared for a sick or disabled adult/provided help to family, friends or neighbors/attended an educational or training course/ Interacted with friends /go to a sport,social or other kind of club/taken part in a community-related organization]? Almost daily, almost every week, or not regularly? 过去一个月，您每隔多长时间会做刚才说的这些活动（志愿者活动或者慈善活动、照顾病人或残疾人、给家里人、朋友或者邻居提供帮助、接受教育或者参加培训课程、与朋友来往、去运动娱乐、社交或者其他类型的俱乐部、参加社团组织活动、炒股、上网）？差不多每天，差不多每周或不经常？

(1) Almost daily 差不多每天

(2) Almost every week 差不多每周

(3) Not regularly 不经常

DA058. How many meals do you normally eat every day? More than 4 meals per day, 4 meals per day, 3 meals per day, 2 meals per day, 1 meal per day or <1 meal per day? 您一般每天吃几顿饭? 每天多于 4 顿, 每天 4 顿, 每天 3 顿, 每天 2 顿, 每天一顿, 每天少于一顿? [WFER: Read each choice of the answers. 访员注意: 请读出各选项。]

(1) More than 4 meals per day 每天多于4顿

(2) 4 meals per day 每天4顿

(3) 3 meals per day 每天3顿

(4) 2 meals per day 每天2顿

(5) 1 meal per day 每天一顿

(6) <1 meal per day 每天少于一顿

INTRO. Next, I would like to ask whether you have had the habit of smoking cigarettes/smoking a pipe/chewing tobacco, now or in the past. By smoking we mean smoking more than 100 cigarettes in your life) 下面我想知道您现在或者过去是否有抽烟、用烟管吸烟或咀嚼烟草的习惯 (吸烟指的是一生吸烟 100 支以上)?

DA059. Have you ever chewed tobacco, smoked a pipe, smoked self-rolled cigarettes, or smoked cigarettes/cigars? 您吸过烟吗? (包括香烟、旱烟、用烟管吸烟或咀嚼烟草)

(1) Yes 是

(2) No 否 Skip to DA067 请跳至 DA067

DA060. Which products did/do you normally use? 吸烟时, 一般抽什么烟?

(1) Smoking a pipe 用烟管吸烟 (烟袋、旱烟)

(2) Smoking self-rolled cigarettes 自己卷烟抽

(3) Filtered cigarette 带滤咀香烟

(4) Unfiltered cigarette 不带滤咀香烟

(5) Cigar 雪茄

(6) Water cigarettes 水烟

DA061. Do you still have the habit or have you totally quit? 您现在还在吸烟还是戒烟了?

- (1) Still have 仍然抽烟 Skip DA062 请跳过 DA062
- (2) Quit 戒烟

DA062. At what age did you totally quit smoking? 您这次成功戒烟是在多少岁或那一年?

Age年龄 _____ 1...120 (DA062_1) years岁 Or 或 _____ 1900..2011 (DA062_2) Year年

[WER: Mark the year using four digits. 访员注意: 用4位数表示年。]

If DA060 =3 or 4 ask DA063 -DA064. 如果 DA060 =3 或 4, 提问 DA063 -DA064

DA063. In one day about how many cigarettes do/did you consume [preload:now/before totally quitting]? 您[系统加载: 现在/戒烟前]平均一天抽多少支香烟? _____ cigarettes 支

If DA060=3 or 4 ask DA064 . 如果DA060=3或4, 提问DA064

DA064. How much does/did it cost per pack = 20 cigarettes? 您[系统加载: 现在/戒烟前]前, 抽的香烟多少钱一包(一包 20 支)? _____ Yuan 元

[WER: Prompt R: we're asking price at that time, not current price][访员注意: 提示受访者, 此处询问的是当时价格, 非现在的价格]

DA065. At what age did you start to smoke on a regular basis? 您是多少岁开始经常抽烟的?

Age年龄 _____ 1...120 (DA065_1) years岁 Or 或 _____ 1900..2011 (DA065_2) Year年

[WER: Mark the year using four digits. 访员注意: 用4位数表示年。]

DA066. How soon after you wake up did/do you smoke your first cigarette, cigar, or pipe? 您[系统加载: 现在/戒烟前]前一般睡醒后多久就开始抽烟?

- (1) Within 5 minutes 5分钟之内
- (2) Within 6-30 minutes 6—30分钟之内
- (3) Within 31-60 minutes 31—60分钟之内
- (4) More than 1 hour 1个小时以后

DA067. Did you drink any alcoholic beverages, such as beer, wine, or liquor in the past year? How often? 在过去的一年, 您喝酒吗, 包括啤酒、葡萄酒或白酒等? 喝酒频率如何?

- (1) Drink more than once a month. 喝酒, 每月超过一次
- (2) Drink but less than once a month 喝酒, 但每月少于一次 Skip to DA069 请跳至DA069
- (3) None of these 什么都不喝 Skip to DA069 请跳至DA069

DA068. What type of alcoholic beverages did you drink? Liquor, wine, or beer? (code all that apply)您平时喝哪种酒? 烈性酒、葡萄酒、啤酒还是其他? (可多选)

(1) Liqor, including white liquor, whisky, and others 烈性酒, 包括白酒、威士忌和其他酒 Skip to DA071 请跳至DA071

(2) Beer 啤酒 Skip to DA071 请跳至DA071

(3) Wine or rice wine 葡萄酒、米酒或黄酒 Skip to DA071 请跳至DA071

DA069. Did you ever drink alcoholic beverages in the past? How often? 您以前喝酒吗? 喝酒频率如何?

- (1) I never had a drink. 我从不或极少喝酒 →Skip to DA079 请跳至DA079
- (2) I used to drink less than once a month. 我很少喝酒, 每月少于一次→Skip to DA079 请跳至DA079
- (3) I used to drink more than once a month. 我以前喝酒, 每月超过一次

DA070. When did you quit or reduce drinking? 请问您什么时候戒酒或减少喝酒次数的?

_____ 1900..2011 (DA070_1)Year 年;

[WER: Record year in 4 digits. 访员注意: 年请用4位数表示]

Or age 或年龄: _____ 1...120 (DA070_2) Years 岁

DA071. When did you start drinking? 请问您什么时候开始饮酒?

_____ 1900..2011 (DA071_1)Year 年;

[WER: Record year in 4 digits. 访员注意: 年请用4位数表示]

Or age 或年龄: _____ 1...120 (DA071_2) Years 岁

SKIP PATTERN CHECKPOINT: DRINKING 跳转格式检查: 喝酒

Now, I am going to ask you how often and how much you drank during the past year. Please tell me how often you drank per month, and how much you drank at a time on average. I will repeat the questions for different types of alcoholic beverages. 现在我想了解过去一年您喝酒的情况。请回答您平均每个月喝多少次酒, 一次大概喝多少。我会针对不同的酒类, 分别提问。

[CAPI: If DA068 answered 1, ask DA072 :] [程序: 如果DA068 选择了1, 询问DA072 .]

DA072. How often did you drink liquor, including white liquor, whisky, and others per month in the last year? 过去一年您平均一个月喝几次烈性酒, 包括白酒、威士忌?

- (1) Once a month 每月一次
- (2) 2-3 times a month 每月2-3次
- (3) Once a week 每周一次
- (4) 2-3 times a week 每周2-3次
- (5) 4-6 times a week 每周4-6次
- (6) Once a day 每天一次
- (7) Twice a day 一天两次
- (8) More than twice a day 一天超过两次

DA073. The last time you drank liquor last year, how many liang of liquor did you drink? (1 liang=50cc/50 ml) 请问您过去一年内最近一次喝烈性酒, 喝了多少两? (1两=50毫升) _____ liang 两

[CAPI: If DA068=2, ask DA074 :] [程序: 如果DA068 选择了2, 询问DA074 .]

DA074. How many times per month did you drink beer in the last year? 过去一年您平均一个月喝几次啤酒?

- (1) Once a month 一个月一次
- (2) 2-3 times a month 一个月2-3次
- (3) Once a week 每周一次
- (4) 2-3 times a week 每周2-3次
- (5) 4-6 times a week 每周4-6次
- (6) Once a day 每天一次
- (7) Twice a day 一天两次
- (8) More than twice a day 一天超过两次

DA075. The last time you drank beer last year, how many bottles of beer did you drink? (1bottle=2.5 mugs, 1mug=220cc) 请问您过去一年最近一次喝啤酒, 喝了多少瓶? (1瓶=2.5杯, 1杯=220毫升) _____
(DA075_1)0..120bottles 瓶 or或者 _____(DA075_2)0..300mugs 杯

[CAPI: If DA068 answered 3, ask DA076:] [程序: 如果DA068 选择了3, 询问DA076.]

DA076. How often did you drink wine or rice wine per month in the last year? 过去一年内您平均一个月喝几次葡萄酒、米酒或黄酒?

- (1) Once a month 一个月一次
- (2) 2-3 times a month 一个月2-3次
- (3) Once a week 每周一次
- (4) 2-3 times a week 每周2-3次
- (5) 4-6 times a week 每周4-6次
- (6) Once a day 每天一次
- (7) Twice a day 一天两次
- (8) More than twice a day 一天超过两次

DA077. The last time you drank it last year, how many liang of wine did you drink? (1 liang=50cc) 请问您过去一年最近一次喝葡萄酒、米酒或黄酒, 喝了多少两? (1两=50毫升) _____ 0.00..100.00liang 两

DA078. In the last year, have you ever taken a drink first thing in the morning to steady your nerves or get rid of a hangover? 过去一年内, 请问您是否曾经在早晨做的第一件事就是喝酒, 以平缓紧张情绪或为了摆脱宿醉的烦恼?

- (1) Yes 是
- (2) No 否

DA079. How would you rate your health status? Would you say your health is very good, good, fair, poor or very poor? 您觉得您的健康状况是很好, 好, 一般, 不好, 还是很不好?

- (1) Very good 很好
- (2) Good 好
- (3) Fair 一般
- (4) Poor 不好
- (5) Very poor 很不好

DA080. Next I have some questions about your health. Would you say your health is excellent, very good, good, fair, or poor? 您觉得您自己的健康状况怎么样? 是极好, 很好, 好, 一般还是不好?

[WVER: interviewer should read all the following options. 访员注意: 请读出所有的选项。]

- (1) Excellent 极好
- (2) Very good 很好
- (3) Good 好
- (4) Fair 一般
- (5) Poor 不好

[WER: Please do not ask proxy the following question DA079 and DA080 . 访员注意: DA079 and DA080 题不允许请代理人回答。]

INTERVIEWER CHECK AGE OF RESPONDENT? 访员请检查受访者的年龄。		1、 < 65 YEAR 岁 → COLUMN A A 栏 6、 85- 89YEAR 岁 → COLUMN F F 栏 2、 65 - 69 YEAR 岁 → COLUMN B B 栏 7、 90- 94YEAR 岁 → COLUMN G G 栏 3、 70 - 74 YEAR 岁 → COLUMN C C 栏 9、 95- 99YEAR 岁 → COLUMN H H 栏 4、 75 - 79 YEAR 岁 → COLUMN D D 栏 10、 >= 100 YEAR 岁 → COLUMN I I 栏 5、 80- 84YEAR 岁 → COLUMN E E 栏								
AGE 年龄		A	B	C	D	E	F	G	H	I
		75 years 岁	80 years 岁	85 years 岁	90 years 岁	95 years 岁	100 years 岁	105 years 岁	110 years 岁	115 years 岁
DA 081 .	Suppose there are 5 steps, where the lowest step represents the smallest chance and the highest step represents the highest chance, on what step do you think is your chance in reaching the age of [...]? 假定有五个级别, 最低一级代表可能性最小, 最高一级代表可能性最大, 您设想您活到这个年龄的可能性有多大。 1 Almost impossible 几乎不可能 2 Not very likely 不太可能 3 Maybe 有可能 4 Very likely 很可能 5 Almost certain 简直一定	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	

DB FUNCTIONAL LIMITATIONS AND HELPERS 身体功能障碍以及辅助者

[CAPI: If R is younger than 50(year of birth is after 1960) and If DA001 =1 or 2 or DA002 =1 or 2 and DA003 =2 and DA004 =2 and DA005 = and DA007 =2 or DA008 =2 skip DB001 -DB015] [程序：如果受访者年龄小于 50 岁(出生年份在 1960 年之后)，并且自我评价健康状况良好、没有残疾、慢性病和身体疼痛，跳过 DB001-DB015]

We need to understand difficulties people may have with various activities because of a health or physical problem. Please tell me whether you have difficulty performing any of the following tasks on a regular basis. Exclude any difficulties that you expect to last less than three months.人们可能会由于健康或身体的原因而在多种活动中有困难。请说说您每天做事的时候是否遇到了这些困难（排除那些你预计在三个月内能解决的问题）。每道题目的选项都是一样的，包括没有困难，有困难但仍可以完成，有困难且需要帮助，无法完成。请选择合适的答案。

DB001. Do you have any difficulty with running or jogging about 1 Km? 您现在跑或慢跑 1 公里，有困难吗？

- (1) No, I don't have any difficulty 没有困难 >> Skip to DB004 跳至DB004
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB002. Do you have difficulty ...Walking 1 km...? 您现在走 1 公里，有困难吗？

- (1) No, I don't have any difficulty 没有困难 >> skip DB003 跳过DB003
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB003. Do you have difficulty ... Walking 100 metres...? 您走 100 米，有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB004. Do you have difficulty ...Getting up from a chair after sitting for a long period...? 您在椅子上坐时间久了再站起来，有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB005. Do you have difficulty ...Climbing several flights of stairs without resting...? 您连续不停地爬几层楼，有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB006. Do you have difficulty ...Stooping, kneeling, or crouching...? 弯腰、屈膝或者下蹲，您有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB007. Do you have difficulty ...Reaching or extending your arms above shoulder level...? (he/she is regarded as not having difficulty only if he/she can extend both of his/her arms, otherwise he/she is regarded as having difficulty.) 您把手臂沿着肩向上伸展，有困难吗？（两个手都没困难才算没困难，否则算有困难）

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB008. Do you have difficulty ...Lifting or carrying weights over 10 jin, like a heavy bag of groceries...? 您提10斤重的东西，有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB009. Do you have difficulty ...Picking up a small coin from a table...? 您从桌上拿起一小枚硬币，有困难吗？

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

[CAPI: IF (DB001=1&DB003 =1&...&DB009 =1), THEN SKIP TO DB016, 如果受访者在DB001 ~DB009 没有任何困难，请跳至DB016]

Here are a few more everyday activities. Please tell me if you have any difficulties with these because of a physical, mental, emotional or memory problem. Again, exclude any that you expect to last less than three months. 下面我们想了解一下您日常生活的情况。请问您目前是否因为身体、精神、情感或者记忆方面的原因导致完成下面我们提到的一些日常行为有困难。我们指的“困难”不包括那些预计三个月内能够解决的困难。

DB010. Because of health and memory problems, do you have any difficulty with dressing? Dressing includes taking clothes out from a closet, putting them on, buttoning up, and fastening a belt. 请问您是否因为健康和记忆的原因，自己穿衣服有困难？穿衣服包括从衣橱中拿出衣服，穿上衣服，扣上纽扣，系上腰带。

-
- (1) No, I don't have any difficulty 没有困难
 - (2) I have difficulty but can still do it. 有困难但仍可以完成。
 - (3) Yes, I have difficulty and need help. 有困难,需要帮助。
 - (4) I can not do it. 无法完成

DB011. Because of health and memory problems, do you have any difficulty with bathing or showering? 请问您是否因为健康和记忆的原因, 洗澡有困难?

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB012. Because of health and memory problems, do you have any difficulty with eating, such as cutting up your food? 请问您是否因为健康和记忆的原因, 自己吃饭有困难, 比如自己夹菜? (Definition: By eating, we mean eating food by oneself when it is ready. 定义: 当饭菜准备好以后, 自己吃饭定义为用餐。)

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB013. Do you have any difficulty with getting into or out of bed? 您起床、下床有没有困难?

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB014. Because of health and memory problems, do you have any difficulties with using the toilet, including getting up and down? 请问您是否因为健康和记忆的原因, 上厕所困难, 包括蹲下、站起?

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB015. Because of health and memory problems, do you have any difficulties with controlling urination and defecation? If you use a catheter (conduit) or a pouch by yourself, then you are not considered to have difficulties. 请问您是否因为健康和记忆的原因, 控制大小便有困难? (自己能够使用导尿管或者尿袋算能够控制自理)

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB016. Because of health and memory problems, do you have any difficulties with doing household chores? 请问您是否因为健康和记忆的原因, 做家务活的时候有困难? (Definition: By doing household chores, we mean house cleaning, doing dishes, making the bed, and arranging the house. 定义: 做家务, 我们指的是房屋清洁, 洗碗盘, 整理被褥和房间摆设。)

[WFER: If R cannot mop the floor, but can scrub, or R cannot fold heavy bedding, but is able to do light ones, then mark (3). 访员注意: 如果受访者不能拖地, 但是可以擦洗桌子, 或者受访者不能整理重的被褥, 但是可以整理一些轻便的, 请选择(3).]

-
- (1) No, I don't have any difficulty 没有困难
 - (2) I have difficulty but can still do it. 有困难但仍可以完成。
 - (3) Yes, I have difficulty and need help. 有困难,需要帮助。
 - (4) I can not do it. 无法完成

DB017. Because of health and memory problems, do you have any difficulties with preparing hot meals? 请问您是否因为健康和记忆的原因, 做饭有困难? (Definition: By preparing hot meals, we mean preparing ingredients, cooking, and serving food. 定义: 做饭我们定义为准备原材料, 做饭菜, 端上餐桌。)
[IWER: If another person prepares ingredients or if R can cook rice, but is not able to prepare side dishes, then mark (3). 访员注意: 如果由于健康原因, 受访者需要别人帮忙洗菜切菜, 或者受访者只能自己煮米饭但不能做菜, 也就是说, 由于健康原因受访者只能完成做饭的一些简单的动作, 那么选择 (3)。]

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB018. Because of health and memory problems, do you have any difficulties with shopping for groceries? By shopping, we mean deciding what to buy and paying for it. 请问您是否因为健康和记忆的原因, 自己去商店买食品杂货有困难? 我们这里说的买东西是指决定买什么和付钱。

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB019. Because of health and memory problems, do you have any difficulties with managing your money, such as paying your bills, keeping track of expenses, or managing assets? 请问您是否因为健康和记忆的原因, 管钱有困难, 比如支付账单、记录支出项目、管理财物?

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

DB020. Because of health and memory problems, do you have any difficulties with taking medications? By taking medications, we mean taking the right portion of medication right on time. 请问您是否因为健康和记忆的原因, 自己吃药有困难? 吃药是指能记得什么时间吃和吃多少。

- (1) No, I don't have any difficulty 没有困难
- (2) I have difficulty but can still do it. 有困难但仍可以完成。
- (3) Yes, I have difficulty and need help. 有困难,需要帮助。
- (4) I can not do it. 无法完成

SKIP PATTERN CHECKPOINT: FUNCTIONAL DIFFICULTIES 跳转检查点: 功能障碍

IF R NEEDS ANY HELP IN DB010 ~DB020 (BOTH HELP TO SOME EXTENT, (3), AND IN EVERY RESPECT, (4)), SKIP TO DB021. 如果受访者在DB010 ~DB020 需要任何帮助 (包括(3)有困难需要帮助, (4)无法完成), 请跳至DB021。

IF R DOES NOT NEED ANY HELP, SKIP TO DB029 如果被调查者不需要任何帮助请跳转至DB029

DB021. Do you use the following auxiliary? (Code all that apply)你使用以下辅助么? (可多选)

- (1) Walking stick拐杖
- (2) Travel device代步器
- (3) Manual wheelchair手动轮椅
- (4) Electric Wheelchair电动轮椅

(5) Not any 一个都不用

DB022. Who most often helps you with [make sure we ask this only once for ALL these activities; do not ask for each problem separately] (dressing, bathing, eating, getting out of bed, using the toilet, controlling urination and defecation, doing chores, preparing hot meals, shopping, managing money, making phone calls, taking medications) (May choose up to 3 persons)? 请问在以上困难中, 谁帮助您最多(最多可选择3个)? (在穿衣、洗澡、吃饭、起床、入厕、控制大小便、家务、做饭、购物、管理钱物、打电话, 吃药等困难中)
(Select from the list displayed by CAPI) (请从CAPI列表中选择)

- 1 Spouse 配偶
- 2 Mother 母亲
- 3 Father 父亲
- 4 Mother-in-law 岳母/婆婆
- 5 Father-in-law 岳父/公公
- 6 ~ 30 Children 子女
- 31 Sibling 兄弟姐妹
- 32 Sibling of spouse 配偶的兄弟姐妹
- 33 Brother-in-law, sister-in-law 姐夫/妹夫/嫂子/弟媳
- 34 Spouse of child 孩子的配偶
- 35 Grandchild 孙子女
- 36 Other relative 其他亲属
- 37 Paid helper(such as nanny) 雇佣人员(如: 保姆)
- 38 Volunteer or Employee of facility 志愿者或者志愿机构人员
- 39 Other 其他人员
- 40 No one helped 没有人提供帮助 →Skip to DB029请跳至 DB029

PROCEDURE: For each helper 6-30 or 34 chosen in DB022, ask DB022_a. 如果 DB022 选择 6-30 或 34 (即子女或孩子配偶提供帮助最多), 对每一个人询问 DB022_a:

DB022_a. Whether it is the [helper's name chosen from DB022] him/herself taking the time? [DB022选择的帮助者]亲自帮助您的吗?

- (1) Yes 是
- (2) No 否

PROCEDURE: For each helper 1-40 chosen in DB022, ask DB023-DB026 对 DB022 选择的 1-40 的每一位提供帮助的人, 提问 DB023 -DB026:

DB023. During the last month, on about how many days did [helper's name chosen from DB022] help you? 在过去一个月内, [DB022 中选择的帮助者]帮助您了多少天? _____ 1..31Days天

DB024. On the days [helper's name chosen from DB022] helps you, about how many hours per day is that? 在[DB022 中选择的帮助者]帮助您的那些天, 他/她大概每天花多少小时帮助您? _____ 1..24Hours 小时
[WER: less than an hour=1 访员注意: 少于一个小时请记为1]

DB025. Is he/she living in your home? 他/她是否住在您家里?

- (3) Yes 是
- (4) No 否

DB026. Is [helper's name chosen from DB022 paid to help you? 请问[DB022]中选择的帮助者]帮助您，您要付钱吗？

- (1) Yes 是
- (2) No 否

SKIP PATTERN CHECKPOINT: PAID HELPER 跳转点检查：付费的帮手

IF R PAID FOR HELP IN DB026, SKIP TO DB027. 如果在DB026 受访者为获得帮助而支付费用，请跳转至DB027 .

IF R DID NOT PAY FOR HELP, SKIP TO DB029. 如果受访者不需要帮助付费，那么跳转至DB029 .

DB027. About how much in total did you pay (including value of the goods you gave them as repayment for their help) for the help during the past month? 在过去一个月您给这些帮助您的人大约总共付了多少钱？（包括作为报答给他们财物的总价值）_____ Yuan 元

DB028. Who contributed most to paying this cost? Please choose one person who paid the most. 这些钱谁出的最多，请选择一个支付的最多的人。（Select from the list displayed by CAPI）（请从CAPI列表中选择）

- 1 Yourself 您自己
- 2 Spouse 配偶
- 3 Mother 母亲
- 4 Father 父亲
- 5 Mother-in-law 岳母/婆婆
- 6 Father-in-law 岳父/公公
- 7 ~ 31 Children 子女
- 32 Sibling 兄弟姐妹
- 33 Sibling of spouse 配偶的兄弟姐妹
- 34 Brother-in-law, sister-in-law 姐夫/妹夫/嫂子/弟媳
- 35 Spouse of child 孩子的配偶
- 36 Grandchild 孙子女
- 37 Other relative 其他亲属
- 38 Other 其他人员

DB029. Do you use the following auxiliary? (Code all that apply) 你使用以下辅助工具么？（可多选）

- (1) Walking stick 拐杖
- (2) Travel device 代步器
- (3) Manual wheelchair 手动轮椅
- (4) Electric Wheelchair 电动轮椅
- (5) catheter, urine collection bag 导尿管，导尿管袋
- (6) Toilet Series 座便器
- (7) None of the above 以上都没有

DB030. Suppose that in the future, you needed help with basic daily activities like eating or dressing. Do you have relatives or friends (besides your spouse/partner) who would be willing and able to help you over a long period of time? 如果以后您在日常生活方面需要照顾，比如吃饭，穿衣，有亲人（除了配偶以外）或朋友能长期照顾您吗？

- (1) Yes 是
- (2) No 否 →Skip to DB032 请跳至DB032

DB031. What is the relationship to you of that person or those persons? (Choose all that apply) 他/她是您的

什么人? (可多选) (Select from the list displayed by CAPI) (请从CAPI列表中选择)

- 1 Mother 母亲
- 2 Father 父亲
- 3 Mother-in-law 岳母/婆婆
- 4 Father-in-law 岳父/公公
- 5 ~ 29 Children 子女
- 30 Sibling 兄弟姐妹
- 31 Sibling of spouse 配偶的兄弟姐妹
- 32 Brother-in-law, sister-in-law 姐夫/妹夫/嫂子/弟媳
- 33 Spouse of child 孩子的配偶
- 34 Grandchild 孙子女
- 35 Other relative 其他亲属
- 36 Paid helper(such as nanny) 雇佣人员 (如: 保姆)
- 37 Volunteer or Employee of facility 志愿者或者志愿机构人员
- 38 Other 其他人员

DB032. How often did the respondent receive assistance in answering this section ?受访者填写该部分问卷时是否求助?

[WFR: If it is answered by a proxy, please record the respondent's reaction. 访员注意: 如果是协助回答, 请记录受访者的反应。]

- (1) Never 从不
- (2) A few times 有一些时候
- (3) Most or all of the time 大多数时候
- (4) The section was completed by a proxy respondent (the respondent is absent) 受访者不在场, 完全请人代填 →Skip to DB033 请跳至 DB033

DB033. What is your relationship to R? 您和受访者是什么关系?

[WFR: What is the proxy's relationship to R? If unknown, please ask the proxy. 访员注意: 代填问卷的人和受访者是什么关系。如果不清楚, 请问代填者。]

- (1) Spouse 配偶
- (2) Mother 母亲
- (3) Father 父亲
- (4) Mother-in-law 岳母/婆婆
- (5) Father-in-law 岳父公公
- (6) Sibling 兄弟姐妹
- (7) Brother-in-law, sister-in-law 姐夫妹夫/嫂子弟媳
- (8) Child 孩子
- (9) Spouse of child 孩子的配偶
- (10) Grandchild 孙子女
- (11) Other relative 其他亲戚
- (12) Helper or other non-relative 帮忙的人或者其他非亲属

DB034. [WFR: Please record the reason for proxy 访员注意: 请记录代答的原因。]

What is the main reason for proxy (the respondent is absent)? 受访者不在场, 完全请人代填的主要原因是什么?

- (1) The respondent has serious physical handicaps 受访者有严重身体障碍
- (2) The respondent has serious mental handicaps 受访者有严重精神障碍
- (3) The respondent has rejected this interview. 受访者拒访
- (4) Other__ 其他(DB034_1)

E HEALTH CARE AND INSURANCE 医疗保健与保险

CARD21: Health Facilities 医疗机构

- (1) General hospital 综合医院（即全科医院，不包括中医院）
- (2) Specialized hospital 专科医院（不包括中医院）
- (3) Chinese medicine hospital 中医院
- (4) Community healthcare center 社区卫生服务中心
- (5) Township hospital 乡镇卫生院
- (6) Health care post 卫生服务站
- (7) Village clinic/Private clinic 村诊所/私人诊所
- (8) Other 其他

CARD20: Health Insurance 医疗保险

- (1) Urban employee medical insurance (yi-bao) 城镇职工医疗保险（医保）
- (2) Urban resident medical insurance 城镇居民医疗保险
- (3) New cooperative medical insurance (he-zuo-yi-liao) 新型农村合作医疗保险（合作医疗）
- (4) Urban and rural resident medical insurance 城乡居民医疗保险（合并城镇居民和新型农村合作医疗保险）
- (5) Government medical insurance (gong-fei) 公费医疗
- (6) Medical aid 医疗救助
- (7) Private medical Insurance: Purchased by R's union 商业医疗保险: 单位购买
- (8) Private medical Insurance: Purchased by Individual 商业医疗保险: 个人购买
- (9) Other medical insurance (specify) 其他医疗保险（请注明）
- (10) No insurance 没有保险

CARD23: Health Facilities for Inpatient Care 住院治疗的医疗机构

- (1) General Hospital 综合医院（即全科医院，不包括中医院）
- (2) Specialized hospital 专科医院（不包括中医院）
- (3) Chinese Medicine Hospital 中医院
- (4) Community Healthcare Center 社区卫生服务中心
- (5) Township Hospital 乡镇卫生院
- (6) Health care post 卫生服务站
- (7) Other 其他

PART I MEDICAL INSURANCE 第一部分：医疗保险

Now we would like to know about health insurance or benefits that you might have. 现在我们想了解一下您享受的健康保险或福利。

[Show Card 出示卡片 14]

EA001. Are you the policy holder/primary beneficiary of any of the types of health insurance listed below? (circle all that apply) 您本人目前是否参加了以下医疗保险? (可多选)

- (1) Urban employee medical insurance (yi-bao) 城镇职工医疗保险(医保)
- (2) Urban resident medical insurance 城镇居民医疗保险
- (3) New cooperative medical insurance (he-zuo-yi-liao) 新型农村合作医疗保险 (合作医疗)
- (4) Urban and rural resident medical insurance 城乡居民医疗保险 (合并城镇居民和新型农村合作医疗保险)
- (5) Government medical insurance (gong-fei) 公费医疗
- (6) Medical aid 医疗救助
- (7) Private medical insurance: Purchased by R's union 商业医疗保险: 单位购买
- (8) Private medical insurance: Purchased by individual 商业医疗保险: 个人购买
- (9) Other medical insurance (specify) 其他医疗保险, 请注明_____ (EA001_1)
- (10) No insurance 没有保险

[Soft check: If pick 10, cannot pick any other, "you chose no insurance and a specific type of insurance, this is not possible" 如果选 10, 不能选其他项, "您不能既选择没有保险, 又选择有某一种保险"]

F1: (1) "城镇职工医疗保险"指依法对城镇职工的基本医疗权利给予保障的社会医疗保险制度。

(2) "城镇居民医疗保险"指 2007 年 7 月国务院决定在全国 79 个城市实行城镇居民基本医疗保险试点。参保范围: 城镇非从业居民, 包括: 不属于城镇职工基本医疗保险制度覆盖范围的中小学阶段的学生 (包括职业高中、中专、技校学生)、少年儿童和其他非从业城镇居民。

(3) "新型农村合作医疗保险"指由政府组织、引导、支持, 农民自愿参加, 个人、集体和政府多方筹资, 以大病统筹为主的农民医疗互助共济制度。采取个人缴费、集体扶持和政府资助的方式筹集资金。

(4) "城乡居民医疗保险"指一些地区率先将城镇居民医疗保险与新型农村合作医疗合并, 推行统一的城乡居民医疗保险制度。

(5) "外来务工人员医疗保险"指在某些地区在城镇职工基本医疗保险以外, 专为外来务工人员设置的一种医疗保险制度。

(6) "公费医疗"指国家为保障国家工作人员身体健康而实行的一项社会保障制度。其享受对象主要是各级国家机关、党派、团体以及文化、教育、科研、卫生、体育等事业单位的工作人员和离退休人员, 二等乙级以上革命伤残军人以及在校大学生等。

(7) "医疗救助"指在政府的支持下, 依靠社会力量建立的旨在向困难群体提供某些或全部基本医疗服务的制度。

(8) "商业医疗保险"是相对于社会保险而言的。商业医疗保险由商业保险公司经办, 以营利为目的, 企业或职工自愿参加。

(9) "其他医疗保险"如中国职工保险互助会《在职职工重大疾病互助保障计划》和《生育保险》。

(10) "医疗救助"在部分区县试点, 救助标准是由各区县根据自身经济情况制定, 导致救助标准有高有低。主要三种, 一是提供社会医疗救助金, 给救助对象以经济补偿; 二是给医疗机构一定的经济补贴, 使后者直接减免救助对象的部分医疗费; 三是由社会医疗救助机构举办专门医疗机构, 免费为救助对象提供医疗服务。

(11) “医疗保险”是指基本医疗保险，是为补偿疾病所带来的医疗费用的一种保险。职工因疾病、负伤、生育时，由社会或企业提供必要的医疗服务或物质帮助的社会保险。如中国的公费医疗、劳保医疗。

For each circled type of insurance (1-11), ask the following questions EA002 --- EA008 .
对以上选择的 1-11 的保险类型，回答以下问题 EA002 --- EA008

EA002. Do you have supplemental insurance to this plan? 你有没有参加补充医疗保险？（例如大病医疗等）

- (1) Yes 有
- (2) No 无

F1: “补充医疗保险”指由于国家的基本医疗保险只能满足参保人的基本医疗需求，超过基本医疗保险范围之外的医疗需求可以通过补充医疗保险予以补充。是相对于基本医疗保险而言的，包括企业补充医疗保险、商业医疗保险、社会互助和社区医疗保险等多种形式。

EA003. Where did you set up your insurance account/policy? 您的保险是在哪里办的？

- (1) This county 本县/市
- (2) (if it is not in this county) the place of your HuKou (如户口不在本县/市) 户籍所在地
- (3) other 其它 _____(EA003_1) province 省 _____(EA003_2) county 市/县

EA004. Method of reimbursement 报销方式如何？

- (1) Get reimbursement immediately 看病当时即可报销
- (2) You pay first and get reimbursed later. 自己当时先垫付以后报销

EA005. Through which agency did you purchase your primary plan? 您的主要保险是通过什么机构办理的？

- (1) Community committee/ village committee 居委会/村委会
- (2) R's union 单位
- (3) Agency of Social insurance 社保经办机构
- (4) Private insurance company 商业保险机构
- (5) Other 其他

EA006. What's your out-of-pocket yearly premium? 您每年要自己缴纳多少保险费(包括主保险费和补充医疗保险费)？ ___ Yuan 元 [soft check upper limit: 15,000 for choice 1, 3,000 choice 2, 1,000 choice 3, 1,500 choice 4, 4,000 choice 7, 2,500 choice 9 程序检查：上限：选项 1, 15,000；选项 2, 3,000；选项 3, 1,000；选项 4, 1,500；选项 7, 4,000；选项 9, 2,500]

EA007. Who pay the premium for you? (choose all that apply) 谁给您交保费？(可多选)

- (1) Myself 自己
- (2) Children 子女
- (3) Relatives 亲属
- (4) Government 政府
- (5) R's union 单位（包括村集体）
- (6) Loan 借款
- (7) Donate 捐赠
- (8) Others 其他 Specify 请注明(EA007_1)

EA008. When did this benefit begin? 您是什么时候参加这份保险的？

[W/R: Mark the year using four digits. Take down the month as its actual number. For example, write January as "1" not "01", December as "12". If do not remember month, fill '0'. 访员注意: 用 4 位数表示年, 按照实际的月份填写月。例: 1 月写作"1", 而不是"01", 12 月写作"12"。如果记不住月份, 请填入'0'。]

1900..2011Year 年(EA008_1) | | | | , 0..12Month 月(EA008_2) | | | |

Skip to EC001 请跳至 EC001

PART II HEALTH CARE COSTS AND UTILIZATION 第二部分: 医疗成本与使用情况

[W/R: Please do not allow proxy to answer Part II. 访员注意: "医疗成本与使用情况" 这部分不允许请别人代为回答]

EC001. When did you take the last physical examination? 您最近一次常规体检时什么时候?

[W/R: Mark the year using four digits. Take down the month as its actual number. For example, write January as "1" not "01", December as "12". If do not remember month, fill '0'. 访员注意: 用 4 位数表示年, 按照实际的月份填写月。例: 1 月写作"1", 而不是"01", 12 月写作"12"。如果记不住月份, 请填入'0'。]

1900..2011Year 年(EC001_1) | | | | 0..12Month 月(EC001_2) | | | |

EC002. Who paid the physical examination cost? 谁付的体检费?

- (1) Myself 自己
- (2) Children 子女
- (3) Relatives 亲属
- (4) Government 政府
- (5) R's union 单位 (包括村集体)
- (6) R's insurance 保险
- (7) Loan 借款
- (8) Donate 捐赠
- (9) Others 其他____ Specify 请注明____(EC002_1)

The next questions pertain to medical facilities or medical providers you may have visited for outpatient care during the past 1 month (excluding hospitalization). 下面我们要问问您过去一个月, 到门诊看病或者接受治疗的情况 (不包括住院)。

ED001. In the last month have you visited a public hospital, private hospital, public health center, clinic, or health worker's or doctor's practice, or been visited by a health worker or doctor for outpatient care? 过去一个月里, 您是否去医疗机构看过门诊或者接受过上门医疗服务?

- (1) Yes 是
- (2) No 否

ED002. Have you been ill in the last month? 您在过去一个月内生过病吗?

- (1) Yes 是

(2) No 否

If ED001 =2 and ED002 =2 skip to EE001 如果 ED001 =2 并且 ED002 =2, 请跳至 EE001

If ED001 =1 skip to ED004 如果 ED001 =1, 请跳至 ED004

If ED002 =1 and ED001=2 go to ED003. 如果 ED002=1 并且 ED001 =2, 请跳至 ED003

ED003. What's the main reason for not seeking medical treatment? 您没有去看病的主要原因是什么?

- (1) Already under treatment. 之前已经看过医生了
- (2) Illness is not serious. Don't need treatment 病情不严重, 不需要看医生
- (3) Poor 没有钱看病
- (4) No time 没有时间看病
- (5) Inconvenient traffic 去医院交通不方便
- (6) Poor service 医院服务态度不好
- (7) No available treatment 认为看医生没有用
- (8) Other 其他

Skip to EE003 请跳至 EE003

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ED004. Which types of medical facilities have you visited in the last 4 weeks for outpatient treatment?

(circle all that apply) 过去一个月, 您去过哪些医疗机构接受门诊治疗? (可多选)

- (1) General hospital 综合医院 (即全科医院, 不包括中医院)
- (2) Specialized hospital 专科医院 (不包括中医院)
- (3) Chinese medicine hospital 中医院
- (4) Community healthcare center 社区卫生服务中心
- (5) Township hospital 乡镇卫生院
- (6) Health care post 卫生服务站
- (7) Village clinic/Private clinic 村诊所/私人诊所
- (8) Other 其他

PROCEDURE: For each item 1-7 checked in ED004, ask ED005 对 ED004 选择的 1-7 的每一种医疗机构, 提问 ED005:

ED005. How many times did you visit / been visited by [...] during the last month? 过去一个月中, 您去这家医疗机构看过几次门诊? Times 次

If sum(ED005)>1, then ask ED006; otherwise, skip ED006. 如果 ED005 中的次数总和>1, 则问 ED006; 否则, 就跳过 ED006.

ED006. How much did all the visits to [ED004 answer] cost during the last month? 您过去一个月去[ED004 answer]看病的总费用大概是多少?

IWER: If possible, please check the list of cost. 访员注意: 如果可能, 查看一下明细单

- A. 1. Total cost 总费用 _____(ED006_1)Yuan 元; [soft check upper bound: 30,000 上限: 30,000]
2. Didn't pay anything 没有付任何钱

PROCEDURE: IF ED006 = 1, ASK ED007

ED007.

B. 1. Self-paid part 其中自付部分 _____ (ED007_1)Yuan 元

2. Didn't pay anything. 没有付任何钱

Now I'd like to ask you some questions about your most recent visit to a health care provider in the last month. 下面我想了解一下您过去一个月最近一次就诊的情况。

ED008. Which health care provider did you visit most recently during the past month? 过去一个月, 您最近一次去了哪种医疗机构就诊?

[CAPI: Preload the health care providers in ED004. 程序: 加载 ED004 填的医疗机构。]

ED009. Is this facility public or private? 这家机构是公立的还是私立的?

- (1) Public 公立的
- (2) Private 私立的

If ED008 =1-3, ask ED010 如果 ED008 =1-3, 请回答 ED010

ED010. What's the level of this facility? 这家医疗机构是什么级别的?

- (1) County/district 县/市/区级
- (2) Regional /city 地/市
- (3) Provincial/ affiliated to a ministry 省/部属
- (4) Military 军队
- (5) Others 其他
- (6) Not applicable 不适用

ED011. What is the name of this health care provider? 这家医疗机构的名称是什么? _____

[IWER: If unknown, please write "unknown". 访员注意: 如果不知道医疗机构的名称, 请填写"不知名"。]

ED012. Did the provider visit you at home? 这次是不是医护人员上门服务?

- (1) Yes 是 → skip ED013 to ED016 and ED022, 跳过 ED013 到 ED016 和 ED022
- (2) No 否

ED013. How many kilometers is it from the medical facility to your residence? 从您家到这家医疗机构有多远?
_____. ____ Km 公里 [softcheck upper bound: 200 上限: 200]

ED014. What is the travel time (one-way) to that facility? 您上次去这家医疗机构单程花多少时间?

____ (ED014_1)

01. Minute 分钟 [softcheck range:1-59 范围: 1-59]

02. Hour 小时 [softcheck upper limit: 10 上限: 10]

方式?

(ED014_2)

- 1 Walk 步行
- 2 Bus 公交车
- 3 Car 私家车或出租车
- 4 Ambulance 救护车
- 5 Bicycle or other manual vehicles 自行车或其他人力车
- 6 Electric bicycle/electric tricycle 电动自行车/电动三轮车
- 7 Motorcycle 摩托车
- 8 Tractor 拖拉机
- 9 Train 火车
- 10 Animal or animal-pulled cart 骑牲畜或坐畜力车

If ED014 =1, skip ED015 如果 ED014 =1, 跳过 ED015

ED015. What was the total transportation cost to the facility (including fuel cost, one way trip)? 您上次去这家医疗机构的单程交通成本是多少? (包括燃料费)

□□□□, □□□□ RMB 元 [softcheck upper limit: 600 上限: 600]

ED016. Where is the health care provider located? 这家医疗机构的具体地址是?

1. province 省(ED016_1)

A. This province 本省

B. Other province, (preload province) 外省 (选择省份(ED016_1_1))

[IWER: Choose from the list of provinces, see appendix 2 请选择省份, 见附表二]

2. county/city 县/市(ED016_2)

A. This county / city 本县/市

B. Other county / city, specify 外县/市, ____ (ED016_2_1) city 市, ____ (ED016_2_2) county 县

3. township/district 乡/区(ED016_3)

A. This township/district 本乡/区

B. Other township/district, specify 外乡/区 ____ (ED016_3_1) 乡/区

4. village/street 村/街道(ED016_4)

A. This village/street 本村/街道

B. Other village/street, specify 外村/街道 ____ (ED016_4_1) 村/街道

ED017. What was the purpose of your visit? (circle all that apply) 您上次去这家医疗机构的目的是什么? (可多选)

(1) Immunization 免疫接种

-
- (2) Consultation 咨询
 - (3) Medical check-up 体检
 - (4) Treatment for illness 看病
 - (5) Other 其他

If ED017 =4, then ask ED018 —ED021, ELSE ASK ED022.

如果 ED017 答案中包含 4“看病”，继续问 ED018 —ED021 的问题，否则提问 ED022

ED018. Could you tell me the disease name? 您能告诉我您得了什么病吗? _____

ED019. Was the visit a first visit or a follow-up visit for the symptom? 这次看病是第一次就诊还是复诊?

- (1) First 第一次就诊
- (2) Follow-up 复诊

ED020 . Was the visit for ordinary outpatient service or an emergency? 这次看病是普通门诊还是急诊?

- (1) 普通门诊
- (2) 急诊

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ED021. What kind of treatment did you receive? (circle all that apply) 您这次去看病接受了以下哪种治疗?
(可多选)

- (1) Injection 注射
- (2) Laboratorium test 化验
- (3) Surgery 手术
- (4) X-ray, CT, B ultrasonic, MRI X-光、CT、B超、核磁共振等检查
- (5) Medications and purchase medical 用药、拿药
- (6) IV (Drip Infusion) 输液
- (7) Traditional treatment, eg massage, acupuncture 中医治疗, 如按摩、针灸等
- (8) Other 其他

ED022. Upon arrival, how long did you have to wait to be examined? 最近一次就诊, 您排队花了多长时间?
□□□

01. Minute 分钟 [range 范围: 1-59]

02. Hour 小时 [softcheck upper limit 上限: 6]

(ED022_1)

ED023. What was the total cost of this visit, including both treatment and medication cost (includes prescriptions you received)? 这次就诊(包括药费和诊疗费, 药费包括在这家医疗机构或其他药店购买医生开的处方药)总共花了多少钱?

1. □□□, □□□□, □□□□ RMB 元(ED023_1) [softcheck upper limit 上限: 30,000]

2. There was no cost 没有费用

PROCEDURE: IF ED023 = 1, ASK ED024

ED024. how much did you pay out of pocket, after reimbursement from insurance?? 这次就诊所花的费用里，您自己支付了多少？

1. _____, _____, _____ RMB 元(ED024_1) [soft check upper limit: 30,000, also ED025 <=ED023_1, else "Pay out of pocket cannot be more than total cost" 上限: 30,000, 而且 ED025 <=ED023_1, 因为"自己支付的费用不可能多于总费用"]

2. Did not pay anything 没有付任何钱 Go to ED026 请跳至 ED026

ED025. Who contribute most for paying the out-of-pocket cost? 自付部分谁给您交得最多？

- (1) Myself 自己
- (2) Children 子女
- (3) Relatives 亲属
- (4) Government 政府
- (5) R's union 单位 (包括村集体)
- (6) Loan 借款
- (7) Donate 捐赠
- (8) Others 其他 Specify 请注明

ED026. What was the total medication cost for this visit, including prescriptions you received? 这次就诊所付的药费(包括在这家医疗机构或其他药店购买医生开的处方药)一共是多少钱？

1. _____ RMB 元(ED026_1) [soft check upper limit: 5,000, and must be no more than ED023_1. 上限: 5,000, 而且不能多于 ED023_1]

2. Doctor did not write a prescription 没有开药 skip ED027 跳过 ED027

3. Didn't fill prescription 开了方子，没有去取药 skip ED027 跳过 ED027

ED027. How much will you eventually pay out of pocket for the medications from this visit, including prescriptions you received? 这次就诊所花的药费(包括在这家医疗机构或其他药店购买医生开的处方药)里，您自己支付了多少钱？

1. _____ RMB 元(ED027_1) [softcheck upper limit: 5,000 and ED027_1 must be no more than ED026_1 and no more than ED023_1. 上限: 5,000 而且 ED027_1 必须少于 ED026_1, 少于 ED023_1]

2. Didn't pay anything 没有自付费用

[Show Card 出示卡片 14]

ED028. What insurance did you use or will you use?(circle all that apply) 这次就诊的费用 (包含诊疗费和药费) 您使用或将使用哪种医疗保险报销? (可多选)

- (1) Urban employee medical insurance (yi-bao) 城镇职工医疗保险 (医保)

-
- (2) Urban resident medical insurance 城镇居民医疗保险
 - (3) New cooperative medical insurance (he-zuo-yi-liao) 新型农村合作医疗保险 (合作医疗)
 - (4) Urban and rural resident medical insurance 城乡居民医疗保险 (合并城镇居民和新型农村合作医疗保险)
 - (5) Government medical insurance (gong-fei) 公费医疗
 - (6) Medical aid 医疗救助
 - (7) Private medical Insurance: Purchased by R's union 商业医疗保险: 单位购买
 - (8) Private medical Insurance: Purchased by Individual 商业医疗保险: 个人购买
 - (9) Other medical insurance (specify) 其他医疗保险,请注明_____

(10) Reimbursed by R's union 单位报销

(11) No insurance 没有保险

(12) Not relevant to me 不适用

F1: (1) “城镇职工医疗保险”指依法对城镇职工的基本医疗权利给予保障的社会医疗保险制度。

(2) “城镇居民医疗保险”指 2007 年 7 月国务院决定在全国 79 个城市实行城镇居民基本医疗保险试点。参保范围: 城镇非从业居民, 包括: 不属于城镇职工基本医疗保险制度覆盖范围的中小学阶段的学生 (包括职业高中、中专、技校学生)、少年儿童和其他非从业城镇居民。

(3) “新型农村合作医疗保险”指由政府组织、引导、支持, 农民自愿参加, 个人、集体和政府多方筹资, 以大病统筹为主的农民医疗互助共济制度。采取个人缴费、集体扶持和政府资助的方式筹集资金。

(4) “城乡居民医疗保险”指一些地区率先将城镇居民医疗保险与新型农村合作医疗合并, 推行统一的城乡居民医疗保险制度。

(5) “外来务工人员医疗保险”指在某些地区在城镇职工基本医疗保险以外, 专为外来务工人员设置的一种医疗保险制度。

(6) “公费医疗”指国家为保障国家工作人员身体健康而实行的一项社会保障制度。其享受对象主要是各级国家机关、党派、团体以及文化、教育、科研、卫生、体育等事业单位的工作人员和离退休人员, 二等乙级以上革命伤残军人以及在校大学生等。

(7) “医疗救助”指在政府的支持下, 依靠社会力量建立的旨在向困难群体提供某些或全部基本医疗服务的制度。

(8) “商业医疗保险”是相对于社会保险而言的。商业医疗保险由商业保险公司经办, 以营利为目的, 企业或职工自愿参加。

(9) “其他医疗保险”如中国职工保险互助会《在职职工重大疾病互助保障计划》和《生育保险》。

(10) “医疗救助”在部分区县试点, 救助标准是由各区县根据自身经济情况制定, 导致救助标准有高有低。主要三种, 一是提供社会医疗救助金, 给救助对象以经济补偿; 二是给医疗机构一定的经济补贴, 使后者直接减免救助对象的部分医疗费; 三是由社会医疗救助机构举办专门医疗机构, 免费为救助对象提供医疗服务。

(11) “医疗保险”是指基本医疗保险, 是为补偿疾病所带来的医疗费用的一种保险。职工因疾病、负伤、生育时, 由社会或企业提供必要的医疗服务或物质帮助的社会保险。如中国的公费医疗、劳保医疗。

(12) “单位报销”指一些福利较好的单位可以对本单位职工发生的除基本医疗保险报销部分以外的医疗费用进行全额或一定额度的报销。

ED029. Did you give any "red envelopes" to the doctors for this visit? 您最近一次就诊有没有给医生送红包?

- (1) Yes 是
- (2) No 否

The following questions pertain to hospitalization (inpatient care) that you have had during the past year. 下面我们想了解一下您过去一年接受住院治疗的情况。

EE001. In the past year, did a doctor suggest that you needed inpatient care but you did not get hospitalized? 过去一年, 是否有医生说您应该住院而没有住院的情况?

- (1) Yes 有
- (2) No 没有 Skip to EE003 请跳至EE003

EE002. What's the main reason for not seeking hospitalization? 您没去住院的主要原因是什么?

- (1) Not enough money 没有钱
- (2) Not willing to go to the hospital 不愿意住院
- (3) Felt that hospital was unlikely to cure problem—hospital quality poor 住院也没有用, 医院医疗条件差
- (4) Felt that care was unlikely to cure the problem—problem too serious 觉得问题很严重, 住院也没用
- (5) No ward available. 医院没有床位
- (6) Other 其他

EE003. Have you received inpatient care in the past year? 过去一年内, 您住过院吗?

- (1) Yes 是
- (2) No 否 Skip to EF001 请跳至EF001

EE004. How many times have you received inpatient care during the past year? 过去一年, 您接受过几次住院治疗? Times 次 [If EE004 =1, skip to EE007. 如果 EE004 =1, 跳至 EE007]

EE005. What was the medical cost for all the hospitalizations you received during the past year? (Only include fees paid to the hospital, including ward fees but excluding wages paid to a hired nurse, transportation costs, and accommodation costs for yourself or family members.) 过去一年住院的总费用大概是多少? (只包括付给医院的费用, 不包括陪护的工资、自己或家人的交通费和住宿费, 但包括医院病房费。)

- A. 1. Total cost 总费用 _____(EE005_1)Yuan 元;
- 2. Didn't pay anything. 没有付任何钱。[softcheck upper limit 上限: 300,000]

PROCEDURE: IF EE005 = 1 ASK EE006

EE006.

- B. 1. Self-paid part 其中自付部分 _____(EE006_1)Yuan 元

2. Didn't pay anything. 没有付任何钱 [softcheck upper limit: 300,000 and EE005 B.1<=EE005 A.1.上限: 300,000, 而且 EE005 B.1<=EE005 A.1.]

We want details about the last hospitalization you had in the past year. 我们想了解您在过去一年中, 最后一次住院的详细情况。

If ED001 = 1 ask EE007. 如果 ED001 = 1 问 EE007.

EE007. Is this the same facility as mentioned in ED011 for outpatient care? 这家医院是[ED011]吗?

- (1) Yes 是 Skip to EE016 跳至 EE016
- (2) No 否

If EE007= 2 or EC003= 2 ask EE008 -EE015. 如果 EE007 = 2 或者 EC003 = 2 问 EE008-EE015.

[Show Card 出示卡片 17]

EE008. What is the type of health or service facility which you visited for last inpatient care (hospital admissions)/for your most recent hospitalization in the past year? 过去一年中, 您最后一次接受住院治疗所在的医疗机构的类型是什么?

- (1) General Hospital 综合医院 (即全科医院, 不包括中医院)
- (2) Specialized hospital 专科医院 (不包括中医院)
- (3) Chinese Medicine Hospital 中医院
- (4) Community Healthcare Center 社区卫生服务中心
- (5) Township Hospital 乡镇卫生院
- (6) Health care post 卫生服务站
- (7) Other 其他

EE009. Is this facility public or private? 这家医疗机构是公立的还是私立的?

- (1) Public 公立的
- (2) Private 私立的

If EE008 =1-3, ask EE010, 如果 EE008 =1-3, 请回答 EE010

EE010. What's the level of this facility? 这家医疗机构是什么级别的?

- (1) County/district 县/市/区级
- (2) Regional /city 地/市
- (3) Provincial/ affiliated to a ministry 省/部属
- (4) Military 军队
- (5) Others 其他

EE011. What is the name of this facility? 这家医疗机构的名称是什么? _____

EE012. What is the location of this facility? 这家医疗机构的具体的地址是什么?

1. province 省(EE012_1)

A. This province 本省

B. Other province, (preload province) 外省 (选择省份) (EE012_1_1)

[WER: Choose from the list of provinces, see appendix 2 访员注意: 请选择省份, 见附表二]

2. county/city 县/市(EE012_2_1)

A. This county / city 本县/市

B. Other county / city, specify 外县/市 ____县/市(EE012_2_2)

3. township/district 乡/区(EE012_3_1)

A. This township/district 本乡/区

B. Other township/district, specify 外乡/区 ____ (EE012_3_2) 乡/区

4. village/street 村/街道(EE012_4_1)

A. This village/street 本村/街道

B. Other village/street, specify 外村/街道 ____ (EE012_4_2)

EE013. How many kilometers is it from the medical facility to your residence? 从您家到这家医疗机构有几公里? [] [] [] [] [] Km 公里 [softcheck upper limit 上限: 3000]

EE014. What is the travel time (one-way) to that facility? 您上次去这家医疗机构接受住院治疗单程花多少时间?

(EE014_1)

[] []

01. Minute 分钟 [check range 范围: 1-59]

02. Hour 小时 [softcheck upper limit 上限: 20]

(EE014_2)

1 Walk 步行

2 Bus 公交车

3 Car 私家车或出租车

4. Ambulance 救护车

5 Bicycle or other manual vehicles 自行车或其他人力车

6. Electric bicycle/electric tricycle 电动自行车/电动三轮车

7. Motorcycle 摩托车

8. Tractor 拖拉机

9. Train 火车

10. Animal or animal pulled cart 骑牲畜或坐畜力车

IF EE014_2 = 2-10, ask EE015

EE015. What was the total transportation cost to the facility (including fuel cost, one way trip)? 您上次去这家医疗机构接受住院治疗的单程交通成本是多少钱? (包括燃料费) [] [] [] [] RMB 元 [soft check upper limit 上限: 600]

EE016. How many nights were you hospitalized there? 您在那里住了几晚?

[] [] [] [] Nights 个晚上 [softcheck upper limit 上限: 40]

EE017. What was the starting date of your hospital stay? 您从哪一天开始住院?

_____ 1900..2011_(EE017_1)Year 年 _____ 0..12_(EE017_2)Month 月 _____ 0..31_(EE017_3)Day 日

[W/R: Mark the year using four digits. Take down the month as its actual number. For example, write January as "1" not "01", December as "12". If do not remember month and day, fill '0'. 访员注意: 用 4 位数表示年, 按照实际的月份填写月。例: 1 月写作"1", 而不是"01", 12 月写作"12"。如果记不住月份和日期, 请填入'0'。]

EE018. What was your date of exit? 您哪天出院?

(1) _____ 1900..2011_(EE018_1)Year 年 _____ 0..12_(EE018_2)Month 月 _____ 0..31_(EE018_3)Day

[W/R: Mark the year using four digits. Take down the month as its actual number. For example, write January as "1" not "01", December as "12". If do not remember month and day, fill '0'. 访员注意: 用 4 位数表示年, 按照实际的月份填写月。例: 1 月写作"1", 而不是"01", 12 月写作"12"。如果记不住月份和日期, 请填入'0'。]

(2) Still there 仍然在住院

[soft check: date of exit should be not before starting date, "exit date is before starting date, please ask R again", also exit date should be within 1 year of today 出院日期应该比住院日期要晚, "出院日期早于住院日期, 请再问一次受访者", 出院日期应该在从今天往前数的一年之内。]

EE019. Why were you hospitalized? (Choose one choice) 您住院的原因是什么? (单选)

(1) Sickness 生病

(2) Accident 意外

(3) Violence 暴力

(4) Other 其他

EE020 . Could you tell me the name of the disease? 您能告诉我们您是得了什么病住院的吗? _____

[Show Card 出示卡片 18]

EE021. During hospitalization, what kind of treatment did you receive? (circle all that apply) 在最近的一次住院期间，您接受了哪些治疗? (可多选)

[WER: Read one by one. 访问员注意：请逐项读出以下答案。]

- (1) Medical check-up/consultation 体检或者咨询
- (2) Injection 注射
- (3) Laboratory test 化验
- (4) Surgery 手术
- (5) X-ray, CT, B ultrasonic, MRI X-光、CT、B超、核磁共振等检查
- (6) Medications 用药、拿药
- (7) IV (Drip Infusion) 输液
- (8) Traditional treatment, e.g., massage, acupuncture 中医治疗，如按摩、针灸等
- (9) Delivery 分娩

- (10) Other 其他

[PROCEDURE: If EE018 =2, please skip EE022 . 程序：如果 EE018 =2，请跳过 EE022]

EE022. Under what conditions did you leave the hospital? 您这次是在什么情况下出院的?

- (1) Fully recovered from illness, received doctor's approval 病完全好了，医生同意出院 Skip EE023 跳过 EE023
- (2) Didn't recover from illness, but received doctor's suggestion to leave 病没有完全好，医生建议出院 Skip EE023 跳过 EE023
- (3) Didn't recover from illness, requested to leave without doctor's suggestion 病没有完全好，自己要求出院
- (4) Other reasons 其他原因 Skip EE023 请跳过 EE023

EE023. Why did you want to leave the hospital before you were recovered? 您要求提前出院的原因是什么?

- (1) Can't recover from illness 久病不愈
- (2) Poor 经济困难
- (3) No space in the hospital 没有床位
- (4) Limited hospital conditions 医院医疗条件所限
- (5) Poor quality and service from health care providers 医护人员服务态度不好
- (6) Other reasons 其他原因

EE024. What was the total medical cost of hospitalization? (Only include the fees paid to the hospital, excluding the wage of hired nurse, the fare or rent, but including the ward fees.) 这次住院一共花了多少钱? (只包括付给医院的费用, 不包括陪护的工资、自己或家人的交通费和住宿费, 但包括医院病房费。)

1. , , RMB 元 (EE024_1) [softcheck upper limit 上限: 100,000]

2. There was no cost 没有费用

EE025. What was the total cost for hired nurse? 雇佣陪护照顾病人花了多少钱?

1. , , RMB 元 (EE025_1)

2. There was no cost 没有费用

EE026. What was the total cost for transportation, food and accommodation of patient and relatives? 自己和家人往返医院交通费、伙食费以及家人或陪护的住宿费一共花了多少钱?

1. , , RMB 元 (EP026_1)

2. There was no cost 没有费用

EE027. How much did you or will you eventually pay out of pocket for the total costs of hospitalization? 这次住院, 您最后自己总共付了 (将要付) 多少钱?

1. , , RMB 元 (EE027_1) [softcheck upper limit: 100,000 and EE027_1 must be no more than EE024_1 上限: 100,000, 而且 EE027_1 必须小于等于 EE024_1]

2. Didn't pay anything. 没有付任何钱

EE028. Who contributes most for paying the out-of-pocket cost? 自付部分谁给您交得最多?

- (1) Myself 自己
- (2) Children 子女
- (3) Relatives 亲属
- (4) Government 政府
- (5) R's union 单位 (包括村集体)
- (6) Loan 借款
- (7) Donate 捐赠
- (8) Others 其他 Specify 请注明

EE029. What was the total medication cost during this visit? 这次住院药费一共花了多少钱?

1. , , RMB 元 (EE029_1) [softcheck upper limit: 60,000 and EE029_1 should be no more than EE024_1 上限: 60,000, 而且 EE029_1 应该小于等于 EE024_1]

2. Didn't receive 没有用药 Skip EE030 请跳过 EE030

EE030. How much did you pay out of pocket for medication costs during this visit? 这次住院, 您自己一共付了多少钱的药费?

1. , , RMB 元 (EE030_1) [softcheck upper limit: 60,000 and EE030_1 should be no more than EE029_1 and EE024_1 上限: 60,000, 而且 EE030_1 应该小于等于 EE029_1 和 EE024_1]

2. Didn't pay anything. 没有付任何钱

[Show Card 出示卡片 14]

EE031. (Preload from EA001 or EB002) What insurance did you use or will you use? (circle all that apply)
您使用或将使用哪种医疗保险报销? (可多选)

- (1) Urban employee medical insurance (yi-bao) 城镇职工医疗保险 (医保)
- (2) Urban resident medical insurance 城镇居民医疗保险
- (3) New cooperative medical insurance (he-zuo-yi-liao) 新型农村合作医疗保险 (合作医疗)
- (4) Urban and rural resident medical insurance 城乡居民医疗保险 (合并城镇居民和新型农村合作医疗保险)
- (5) Government medical insurance (gong-fei) 公费医疗 公费医疗
- (6) Medical aid 医疗救助
- (7) Private medical insurance: Purchased by R's union 商业医疗保险: 单位购买
- (8) Private medical insurance: Purchased by Individual 商业医疗保险: 个人购买
- (9) Other medical insurance (specify) 其他医疗保险, 请注明_____
- (10) Reimbursed by R's union 单位报销
- (11) No insurance 没有保险
- (12) Not relevant to me 不适用

F1: (1) "城镇职工医疗保险"指依法对城镇职工的基本医疗权利给予保障的社会医疗保险制度。

(2) "城镇居民医疗保险"指 2007 年 7 月国务院决定在全国 79 个城市实行城镇居民基本医疗保险试点。参保范围: 城镇非从业居民, 包括: 不属于城镇职工基本医疗保险制度覆盖范围的中小学阶段的学生 (包括职业高中、中专、技校学生)、少年儿童和其他非从业城镇居民。

(3) "新型农村合作医疗保险"指由政府组织、引导、支持, 农民自愿参加, 个人、集体和政府多方筹资, 以大病统筹为主的农民医疗互助共济制度。采取个人缴费、集体扶持和政府资助的方式筹集资金。

(4) "城乡居民医疗保险"指一些地区率先将城镇居民医疗保险与新型农村合作医疗合并, 推行统一的城乡居民医疗保险制度。

(5) "外来务工人员医疗保险"指在某些地区在城镇职工基本医疗保险以外, 专为外来务工人员设置的一种医疗保险制度。

(6) "公费医疗"指国家为保障国家工作人员身体健康而实行的一项社会保障制度。其享受对象主要是各级国家机关、党派、团体以及文化、教育、科研、卫生、体育等事业单位的工作人员和离退休人员, 二等乙级以上革命伤残军人以及在校大学生等。

(7) "医疗救助"指在政府的支持下, 依靠社会力量建立的旨在向困难群体提供某些或全部基本医疗服务的制度。

(8) "商业医疗保险"是相对于社会保险而言的。商业医疗保险由商业保险公司经办, 以营利为目的, 企业或职工自愿参加。

(9) "其他医疗保险"如中国职工保险互助会《在职职工重大疾病互助保障计划》和《生育保险》。

(10) "医疗救助"在部分区县试点, 救助标准是由各区县根据自身经济情况制定, 导致救助标准有高有低。主要三种, 一是提供社会医疗救助金, 给救助对象以经济补偿; 二是给医疗机构一定的经济补贴, 使后者直接减免救助对象的部分医疗费; 三是由社会医疗救助机构举办专门医疗机构, 免费为救助对象提供医疗服务。

(11) “医疗保险”是指基本医疗保险，是为补偿疾病所带来的医疗费用的一种保险。职工因疾病、负伤、生育时，由社会或企业提供必要的医疗服务或物质帮助的社会保险。如中国的公费医疗、劳保医疗。

(12) “单位报销”指一些福利较好的单位可以对本单位职工发生的除基本医疗保险报销部分以外的医疗费用进行全额或一定额度的报销。

EE032. Did you pay any “Red Envelopes” to the doctors for this visit? 这次住院期间有没有给医生送红包？

- (1) Yes 是
- (2) No 否

Now we'd like to know whether you have treated yourself during the past month. 下面我们想了解在过去一个月，您进行自我治疗的情况。

[Show Card 出示卡片 19]

EF001. How did you treat yourself during the past month? (circle all that apply) 过去一个月，你是否进行了以下自我治疗（注意：此处不包括凭处方取药的情况）？（可多选） **[check, if choose 7 cannot choose other options 如果选择 7，就不能选其他选项。]**

- (1) Consumed over-the-counter modern medicines 自己买非处方西药
- (2) Consumed prescription medicines 自己买处方西药
- (3) Consumed traditional herbs or traditional medicines as treatment 用传统中草药或者传统方法治疗
- (4) Tonic/Health supplement 吃维生素/补品
- (5) Use health care equipment 使用保健设备
- (6) Other 其他
- (7) None 没有 Skip to EF006 跳至EF006

For each circled self-treatment method (1-5), ask questions EF002 , EF003 , EF005 对每一种选择的 1-5 的自我治疗方式，均回答 EF002 , EF003 , EF005

EF002. What is the approximate total cost to [preload EF001] during the last month? 过去一个月，自己 [preload EF001]的总成本大概是多少？

- 1. , , RMB 元(EF002_1) [softcheck upper limits: 2,000 上限检查: 2,000]
- 2. There was no cost. 没有费用。

PROCEDURE: IF EF002 = 1 ASK EF003

EF003. How much did you pay out-of-pocket? 除了报销的部分，您自己支付了多少？

- 1. , , RMB 元(EF003_1) [softchecks upper limits: 2,000 and EF003_1 should be no more than EF002_1 . 上限检查: 2,000, 而且 EF003_1 应该小于等于 EF002_1]
- 2. Didn't pay anything. 没有付任何钱 Go to EF005 请跳至 EF005

EF004. Who contribute most for paying the out-o- pocket cost? 自付部分谁给您交得最多？

-
- (1) Myself 自己
 - (2) Children 子女
 - (3) Relatives 亲属
 - (4) Government 政府
 - (5) R's union 单位 (包括村集体)
 - (6) Loan 借款
 - (7) Donate 捐赠
 - (8) Others 其他 Specify 请注明

[Show Card 出示卡片 14]

EF005. What insurance did you use? (circle all that apply) 您使用了哪种医疗保险报销? (可多选)

- (1) Urban employee medical insurance (yi-bao) 城镇职工医疗保险 (医保)
 - (2) Urban resident medical insurance 城镇居民医疗保险
 - (3) New cooperative medical insurance (he-zuo-yi-liao) 新型农村合作医疗保险 (合作医疗)
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 - (6) Medical aid 医疗救助
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(6) “公费医疗”指国家为保障国家工作人员身体健康而实行的一项社会保障制度。其享受对象主要是各级国家机关、党派、团体以及文化、教育、科研、卫生、体育等事业单位的工作人员和离退休人员, 二等乙级以上革命伤残军人以及在校大学生等。

(7) “医疗救助”指在政府的支持下, 依靠社会力量建立的旨在向困难群体提供某些或全部基本医疗服务的制度。

(8) “单位报销”指一些福利较好的单位可以对本单位职工发生的除基本医疗保险报销部分以外的医疗费用进行全额或一定额度的报销。

(9) “商业医疗保险”是相对于社会保险而言的。商业医疗保险由商业保险公司经办，以营利为目的，企业或职工自愿参加。

(10) “其他医疗保险”如中国职工保险互助会《在职职工重大疾病互助保障计划》和《生育保险》。

(11) “医疗救助”在部分区县试点，救助标准是由各区县根据自身经济情况制定，导致救助标准有高有低。主要三种，一是提供社会医疗救助金，给救助对象以经济补偿；二是给医疗机构一定的经济补贴，使后者直接减免救助对象的部分医疗费；三是社会医疗救助机构举办专门医疗机构，免费为救助对象提供医疗服务。

(12) “医疗保险”是指基本医疗保险，是为补偿疾病所带来的医疗费用的一种保险。职工因疾病、负伤、生育时，由社会或企业提供必要的医疗服务或物质帮助的社会保险。如中国的公费医疗、劳保医疗。

(14) “单位报销”指一些福利较好的单位可以对本单位职工发生的除基本医疗保险报销部分以外的医疗费用进行全额或一定额度的报销。

EF006. How often did the respondent receive assistance in answering section D-Health care and insurance?
受访者填写该部分问卷时是否求助？

[WFR: If it is answered by a proxy, the respondent's reaction. 访员注意：如果是协助回答，请记录受访者的反应。]

- (1) Never 从未
- (2) A few times 偶尔几次
- (3) Most or all of the time 大多数
- (4) The section was completed by a proxy respondent (the respondent is absent) 受访者不在场，完全请人代填 → Skip to EF007 请跳至 EFA007

EF007. What is your relationship to R? 您和受访者是什么关系？

[WFR: What is the proxy's relationship to R? If unknown, please ask the proxy. 访员注意：代填问卷的人和受访者是什么关系。如果不清楚，请问代填者。]

- (1) Spouse 配偶
- (2) Mother 母亲
- (3) Father 父亲
- (4) Mother-in-law 岳母/婆婆
- (5) Father-in-law 岳父/公公
- (6) Sibling 兄弟姐妹
- (7) Brother-in-law, sister-in-law 姐夫妹夫/嫂子弟媳
- (8) Child 孩子
- (9) Spouse of child 孩子的配偶
- (10) Grandchild 孙子女
- (11) Other relative 其他亲戚
- (12) Helper or other non-relative 帮忙的人或者其他非亲属

EF008. [WFR: Please record the reason for proxy] 访员注意：请记录代答的原因。]

What is the main reason for proxy (the respondent is absent)? 受访者不在场，完全请人代填的主要原因是什么？

- (1) The respondent has serious physical handicaps_受访者有严重身体障碍

(2) The respondent has serious mental handicaps. 受访者有严重精神障碍

(3) The respondent has rejected this interview. 受访者拒访

(4) Other __, 其他__(EF008_1)

Appendix C-2: The physical examination questionnaire of CHARLS

中国健康与养老追踪调查
体检问卷
The physical examination
questionnaire of CHARLS

北京大学

国家发展研究院

National School of Development of Peking University

2011年6月
June of 2011

For more details: <http://charls.pku.edu.cn/en/page/about/CHARLS>

The researchers can visit CHARLS official data platform to download the newest public data <http://charls.pku.edu.cn/en/page/data/2011-charls-wave1>

一、 BLOOD PRESSURE 血压

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Omron HEM-7200 Monitor, Batteries, Stopwatch

所需设备: 欧姆龙 HEM-7200 血压计, 电池, 秒表

(二) BLOOD PRESSURE 血压测量

“Now let’s talk about the first activity. I’d like to measure your blood pressure using this monitor and cuff which I will secure around your left arm. I would like to take three blood pressure measures. I will ask you to relax and remain seated and quiet during the measurements. First, I will place the cuff on your left arm. Once the cuff is placed appropriately on your arm and we are ready to begin, I’ll ask you to lay your arm on a flat surface palm facing up so that the center of your upper arm is at the same height as your heart. I will then press the Start button. The cuff will inflate and deflate automatically. After we have completed all three measures, I will give you your results.” “现在我们来进行第一项测试, 我将用血压计为您测量血压, 共量 3 次。测量过程中请您坐下、放松并保持安静。首先, 我会将袖带缠绕在您左臂上, 袖带固定好后开始测量, 请您将手臂放在平面上, 手心朝上, 使上臂和心脏同一高度, 然后我会按“开始”按钮, 袖带将自动充气和放气, 完成 3 次测量后, 我会告诉您测量结果。”

IWER: Demonstrate the measurement 访问员: 演示测量方法

- Insert arm cuff plug into jack on the side of the monitor, place the cuff on your left arm approximately ½ above the elbow. Position the arrows over the brachial artery on the inside of the arm. Press the START/STOP button to show how the cuff with inflate automatically. 将袖带插头插入血压计一侧的插孔, 袖带缠绕于左上臂肘窝上方约 1 -2 cm 处, 空气管下面的箭头应位于手臂内侧的中心处, 按“开始/停止”按钮, 演示袖带如何自动充气。

K001 “Do you have a rash, a cast, edema (swelling) in the arm, open sores or wounds, or a significant bruise where the blood pressure cuff will be in contact?”

“您手臂上有皮疹、肿胀、或在血压计袖带接触的地方有开放性溃疡或伤口、或严重瘀伤吗?”

IWER: Circle one 访问员: 选择 1 项

1.....YES → do not complete this measure and answer question in box below 是 → 未完成这次测量并回答下面方框中的问题

5.....NO → continue 否 → 继续

K002 “Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员：选择 1 项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未完成这项测量，请回答下面方框中的问题。

[Procedure: If K001=1 or K002=5, then go to LI855_1; If K001=5 and K002=1, then go to LI857-LI875. 程序：如果 K001=1 或 K002=5，请跳至 LI855_1；如果 K001=5 且 K002=1，请跳至 LI857-LI875]

(LI845) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI855_1) IWER: Why didn't R complete the blood pressure measurement? (Circle all that apply) 访

问员：为什么受试者未能完成血压测量？（可多选）

1..... R felt it would not be safe 受试者认为不安全

2..... IWER felt it would not be safe 访问员认为不安全

3..... R refused or was not willing to complete the test 受试者拒绝或不愿意测量

4..... R tried but was unable to complete test 受试者尝试了，但无法完成测量

5..... R did not understand the instructions 受试者无法明白测量的指令

6..... R had a rash, a cast, edema, etc. on arm; other health reason 受试者手臂有皮疹、水肿，或其他健康原因

7..... No suitable space 没有合适的地方进行测试

8..... Problem with equipment or supplies 测量测量仪器或设备有问题

97..... Other (Specify) 其他（请注明）：

→Go To Next Measurement 进行下一项体检

GO TO K004 请跳至K004

LI857-LI875;

IWER: Record measurements in chart: (Enter '993' in systolic reading if R tried but was unable to do it. Enter '999' if R chose not to do it.) 访员注意：在下表中记录测量值：（如果受试者尝试了但未能完成测量，请在收缩压读栏中填入“993”，如果受试者拒绝测量，则填入“999”）

Measurement 测量	Time of Reading 测量时间	Systolic Reading 收缩压	Diastolic Reading 舒张压	Pulse 脉搏
1	(LI857)__:__:__	(LI859) 60..300,993,999 mmHg	(LI860) 30..150mmHg	(LI861) 25..150P
2	(LI862)__:__:__	(LI864) 60..300,993,999 mmHg	(LI865) 30..150mmHg	(LI866) 25..150P
3	(LI867)__:__:__	(LI869) 60..300,993,999 mmHg	(LI870) 30..150mmHg	(LI871) 25..150P

[Procedure:if LI859=993 or 999, then go to LI855_1.

程序：如果 LI859=993 或 999，跳至 LI855-1。]

(LI872) IWER: Which arm was used to conduct the measurements? (Circle one) 访员员：测量了哪只手臂的血压？（选择 1 项）

1..... Left arm 左臂

2..... Right arm 右臂

(LI873) IWER: How compliant was R during this measurement? (Circle one) 访员员：受试者在测量的过程中依从性如何？（选择 1 项）

1..... R was fully compliant 完全依从

2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病，疼痛或其它症状或不适而不能完全依从

3..... R was not fully compliant, but no obvious reason for this 不能完全依从，但没有明显的原因

(LI874) IWER: What was R's position for this test? (Circle one) 访问员：测量中受试者采用什么体位？（选择 1 项）

1..... Standing 站着

2..... Sitting 坐着

3..... Lying down 躺着

(LI875) IWER: Did the R smoke, exercise, consume alcohol or food within the 30 minutes prior to completing the blood pressure test? (Circle one) 访问员：在进行测量之前 30 分钟内，受试者是否吸烟、运动、进食和饮酒？（选择 1 项）

1..... Yes 是

5..... No 否

8..... Don't Know 不知道

二、 BREATHING 呼吸功能

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Peak flow meter, Disposable mouthpiece(s) packaged in plastic bag

所需设备：肺峰流速仪，有塑料包装的一次性吹嘴

(二) BREATHING MEASUREMENT 呼吸功能测量

“Next I'm going to ask you to perform a simple measurement that will measure how fast you can expel air from your lungs. It is important that you blow as hard and as fast as you can. I would like you to perform the measurement three times. When we are ready to begin, I'll ask you to stand up. Take as deep a breath as possible. Open your mouth and close your lips firmly around the outside of the

mouthpiece, and then blow as hard and as fast as you can into the mouthpiece. Like this...” “接下来我们将进行一个简单的测量，测试您排出肺部空气的速度。关键是您要尽全力并以最快速度吹气，共测量 3 次。测量开始时，请您站立，尽全力深吸气后，屏住气并用嘴完全含住吹嘴，避免漏气，尽全力并以最快速度向吹嘴吹气。像这样...”

IWER: Demonstrate the measurement. 访问员: 演示测量方法

- Stand up, take a deep breath and then place lips around the outside of the mouthpiece. Blow as hard and as fast as you can. 站立, 深吸气后将嘴对准吹嘴, 尽全力并以最快速度吹气。

K004 "Do you understand the directions for this measurement and agree to take it?" "您能明白测量方法并愿意参加这次测量吗?"

IWER: Circle one 访问员: 选择 1 项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未能完成这次测量, 请回答下面方框中的问题

[Procedure: If K004=5, then go to LI855_2; if K001=1, then go to LI807-LI811. 程序: 如果 K004=5, 请跳至 LI855_2; 如果 K004=1, 请跳至 LI807-LI811。]

(LI845) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上面问题的回答情况

(LI855_2) IWER: Why didn't R complete the breathing test? (Circle all that apply) 访问员: 为什么受试者没有完成呼吸功能测定? (可多选)

- 1..... R felt it would not be safe 受试者认为测量不安全
- 2..... IWER felt it would not be safe 访问员认为测量不安全
- 3..... R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量
- 4..... R tried but was unable to complete test 受试者尝试但未能完成测量
- 5..... R did not understand the instructions 受试者不明白测量方法
- 6..... R could not participate due to health reasons 受试者由于健康原因不能测量
- 7..... No suitable space 没有合适的地方进行测量
- 8..... Problem with equipment or supplies 测量仪器或测量仪器或设备有问题
- 97..... Other (Specify) 其他 (请注明):

→Go To Next Measurement 进行下一项体检

Go to K006 请跳至K006

三、 HAND STRENGTH 握力

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Dynamometer.

所需设备: 握力计

(二) HAND STRENGTH 握力测量

“Now I would like to assess the strength of your hand in a gripping action. I will ask you to squeeze this handle as hard as you can, just for a couple of seconds and then let go. I will take alternately two measurements from your right and your left hands.” “现在我将测试您手部的最大握力，请您竭尽全力紧握握力计，保持几秒钟，然后放开，我将分别测量您的左右手。”

IWER: [Demonstrate the measurement](#) 访问员: 演示测量方法

- Stand, hold the dynamometer at a right angle and squeeze the handle for a few seconds. 站立，抓住握力计，肘部呈直角，并用力握紧保持几秒钟。

K006 ***“Before we begin, I’d like to make sure it is safe for you to do this measurement. Have you had surgery or experienced any swelling, inflammation, severe pain, or injury in one or both hands within the last 6 months?”*** “在测试之前，我要确保您能安全地做这项测试，在过去的6个月里，您的一只手或双手有没有做过手术或者发生任何肿胀、发炎、严重疼痛或受伤？”

IWER: [Circle one](#) 访问员: 选择1项

1 YES → continue with the next question 是 → 没有完成这项测量并回答以下问题

5 NO → skip the next question 否 → [Go to K008](#) 跳至 K008

K007 ***“In which hand (have you had surgery or experienced any swelling, inflammation, severe pain, or injury in the last 6 months)?”*** “哪只手（在过去的6个月，做过手术或肿胀、发炎、严重疼痛或受伤）？”

IWER: [Circle one](#) 访问员: 选择1项

1 BOTH HANDS → do not complete this measure and answer question in box below 双手 → 没有完成这次测量并回答下面方框中的问题

2 LEFT HAND ONLY → continue but do not perform measurement on left hand 仅左手 → 继续但不测量左手

3 RIGHT HAND ONLY → continue but do not perform measurement on right hand 仅右手 → 继续但不测量右手

K008 “Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员：选择 1 项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 没有完成这次测量并回答下面方框中的问题

[(双手受伤): If K007=1 or K008=5 ,then go to LI855_3;

(没有受伤): If K006=5 and K008=1,then go to LI815;

(左手受伤): If K006=1 and K007=2 and K008=1,then go to LI851 and LI853,skip LI816 and LI852

(右手受伤): If K006=1 and K007=3 and K008=1,then go to LI816 and LI852, skip LI851 and LI853

(LI845) BASED ON RESPONSES TO QUESTIONS ABOVE 根据对上面问题的回答情况

(LI855_3) IWER: Why didn't R complete the hand strength test? (Circle all that apply)访问员：为什么受试者没有完成握力测量？

1..... R felt it would not be safe 受试者认为测量不安全

2..... IWER felt it would not be safe 访问员认为测量不安全

3..... R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量

4..... R tried but was unable to complete test 受试者尝试但未能完成测量

5..... R did not understand the instructions 受试者不明白测量方法

6..... R could not participate due to surgery, swelling, etc.; other health reason 受试者由于手术、肿胀或其他健康原因不能测量

7..... No suitable space 没有合适的地方进行测量

8..... Problem with equipment or supplies 测量仪器或测量仪器或设备有问题

97..... Other (Specify) 其他（请注明）：

LI807-LI811;

IWER: Record measurements in chart: (Record 30 if less than 60; Record 890 if past last tick mark; Record 993 if R tried but was unable; or Record 999 if R chose not to do it.) 访问员: 在下表中记录测量: (如果结果小于 60 则记录“30”, 如果结果超过最大刻度标记则记录“890”, 如果受试者尝试了,但未能完成测量,记录为“993”, 如果受试者选择不做这项测量记录“999”)

Measurement#	Measurement Reading
测量	测量读数
1	30, 800, 890, 993, 999 (LI807)
2	30, 800, 890, 993, 999 (LI808)
3	30, 800, 890, 993, 999 (LI809)

[If LI807 =993 or 999,then go to LI855_2. 如果 LI807=993 或 999, 回答问题 LI855_2.]

(LI810) IWER: How much effort did R give to this test? (Circle one) 访问员: 受试者在测试中尽了多大的努力? (选择 1 项)

1..... R gave full effort 受试者尽了最大努力

2..... R was prevented from giving full effort by illness, pain, or other symptoms or discomforts
受试者由于生病、疼痛或其他症状或不适而没有尽全力

3..... R did not appear to give full effort, but no obvious reason for this 受试者似乎没有尽全力, 但没有明显的原因

(LI811) IWER: What was R's position for this test? (Circle one) 访问员: 受试者测量中的体位?
(选择 1 项)

1..... Standing 站立

2..... Sitting 坐着

3..... Lying down 躺着

→Go To Next Measurement 进行下一项体检

GO TO K010 请跳至 K010

(LI815) "Which is your dominant hand?" "您习惯用那手?"

IWER: Circle one 访问员: 选择 1 项

1 Right hand 右手

2 Left hand 左手

3 Both hands equally dominant 两只手差不多

(LI816、LI851-LI853) IWER: Record measurements in chart: 访问员: 在下表中记录测量结果:

Measurement # 测量	Left Hand 左手	Right Hand 右手
1	(LI816) _ _ _ . _ (0,100],993,999kg	(LI851) _ _ _ . _ (0,100],993,999kg
2	(LI852) _ _ _ . _ (0,100],993,999kg	(LI853) _ _ _ . _ (0,100],993,999kg

IWER: Record 993 if R tried but was unable. Record 999 if R chose not to do it.

访问员: 如果受试者尝试但未能完成测量记录 993, 如果受试者选择不做这项测量, 记录 999。

[IF LI816 or LI851 =993 or 999,then go to LI855_3.

如果 LI816 或 LI851=993 或 999, 回答问题 LI855_3.]

(LI817) IWER: How much effort did R give to this test? (Circle one) 访问员: 受试者在测试中尽了多大的努力? (选择 1 项)

1..... R gave full effort 受试者尽了最大努力

2..... R was prevented from giving full effort by illness, pain, or other symptoms or discomforts
受试者由于生病、疼痛或其他症状或不适而没有尽全力

3..... R did not appear to give full effort, but no obvious reason for this 受试者没有尽全力，但没有明显的原因

(LI818) IWER: What was R's position for this test? (Circle one) 访问员：受试者

测量时的体位？（选择 1 项）

1..... Standing 站立

2..... Sitting 坐着

3..... Lying down 躺着

(LI819) IWER: Did the R rest their arm on a support while performing the test? (Circle one)

访问员：在测试过程中，受试者的手臂是否得到休息？（选择 1 项）

1..... Yes 有

5..... No 无

四、 BALANCE TESTS平衡能力

"I would now like you to try to stand in different positions. I will first describe and show each position to you. Then I'd like you to try to do it. If you cannot do particular position, or if you feel it would be unsafe to try to do it, tell me and we'll move on to the next one. Let me emphasize that I do not want you to try to do any activity that you feel might be unsafe." “现在我希望您能努力以这几个姿势站好。首先我会向您描述一下每种姿势，然后希望您能尽力去做。如果您不能完成某种姿势，或者您感到那样做会很不安全，可以告诉我。我们可以继续下一种姿势。需要强调一点，我不希望您去做任何您感到不安全的动作。”

◆ SEMI-TANDEM 双脚半前后站立

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Stopwatch, Show Card

所需设备：秒表，显示卡



(二) SEMI-TANDEM 双脚半前后站立

"For the first one, I want you to try to stand with the side of the heel of one foot touching the big toe of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you. Like this..." “首先，我想让您试一下一只脚的脚跟侧面触及另外一只脚的大脚趾站着并持续 10 秒钟。只要您感到更舒服，你可以把任何一只脚放到前面。就像这样……”

K010 Before we begin, do you have any problems from recent surgery, injury or other health conditions that might prevent you from standing up from a chair and balancing? “在我们开始前，请问最近是否有手术、损伤或其他疾病影响您从椅子上站起来并保持平衡？”

IWER: Circle one 访问者：选择 1 项

1 YES → discuss with him/her whether s/he should attempt each measurement given his/her physical problems after describing each measurement. Do not assume a respondent is too physically limited to attempt a measurement without discussing it with him/her. 是 → 描述完每项测试后，要与他/她讨论，考虑到身体状况，他/她是否希望尝试每个测试。不要假定受访者身体状况不能完成测试，而不去与他们讨论。 →

Go to K011 请跳至 K011

5 NO 否 → Go to K011 请跳至 K011

K011 “Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员：选择 1 项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未完成这项测量，请回答下方框中的问题。

[Procedure: IF K011=1, then go to LI879; IF K011=5, then go to LI877

程序：如果 K011=1，跳至 LI879；如果 K011=5，跳至 LI877]

(L1876) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI877) IWER: Why didn't R complete the semi-tandem stand? (Circle all that apply) 访问员：为什么受访者没有完成双脚半前后站立测试？（访问员：选择适用的选项）

- 1..... R felt it would not be safe 受试者认为不安全的
- 2..... IWER felt it would not be safe 访问员认为不安全
- 3..... R refused or was not willing to complete the test 拒绝或不愿测量
- 4..... R tried but was unable to complete test 受试者尝试了，但无法完成测量
- 5..... R did not understand the instructions 受试者无法明白测量的指令
- 6..... R had surgery, injury or other health condition that prevented R from standing 受试者有过手术、外伤或其他健康问题影响其站立
- 7..... No suitable space 没有合适的地方进行测量
- 8..... Problem with equipment or supplies 测量仪器或设备有问题
- 97..... Other (Specify): 其他（请注明）： _____

→Go To Side-by-Side 转到双脚并拢站立测试

GO TO the procedure before K015 请跳至 K015 前的程序控制

Answer the questions in the box below. If the participant is unable to hold the position for 10 seconds, record the time in seconds to two decimal places in the box below.

回答以下方框中的问题。如果受试者不能保持这一姿势 10 秒钟，请在以下框中记录秒数（保留 2 位小数）。

回答以下方框中的问题。如果受试者不能保持这一姿势 10 秒钟，请在以下框中记录秒数（保留 2 位小数）。

(LI879) : IWER: Did R hold semi-tandem stand for a full 10 seconds without stepping out of place or grabbing hold of anything? (Circle one) 是否没有移动或抓住任何东西的情况下保持双脚半前后站持续 10 秒钟? (访问员: 选择 1 项)

1.....YES 是

5..... NO 否 → Enter amount of time R held stand in seconds to two decimal places: 记录保持站立的秒数（保留两位小数） **(LI880)** ____ . ____ **0.10** Sec 秒

993.....R tried but was unable 受试者尝试了，但没有成功

999.....R chose not to do it 受试者选择不做

[IF LI879=993 or 999, then go to LI877.

如果 LI879=993 或 999, 回答问题 LI877。]

(LI881) IWER: Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during semi-tandem stand? (Circle one) 访问员: 在测试过程中，受试者是否使用躯干、手臂或腿来保持平衡? (单选)

1.....YES 是

5.....NO 否

8..... Don't Know 不知道

IWER:

- If R was able to complete the semi-tandem for the full 10 seconds without stepping out of place or grabbing a hold of anything _ Go To Full-Tandem on page 11.

访问员:

如果受试者在没有移动或抓住任何东西的情况下，能够双脚半前后站立持续 10 秒钟，进行双脚前后成一直线站立测试。

- If R was not able to complete the semi-tandem for the full 10 seconds without stepping out of place or grabbing a hold of anything → Go To Side-By-Side.

如果受试者在没有移动或抓住任何东西的情况下，不能完成双脚半前后站测试并保持 10 秒钟，则进行双脚并拢站立测试。



◆ FULL-TANDEM 双脚前后成一直线站立

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Stopwatch, Show Card

所需设备：秒表，显示卡

(二) FULL-TANDEM 双脚前后成一直线站立

[Procedure: If R's age \geq 70, then do this measurement for 30 seconds; if R's age $<$ 70, then do this measurement for 60 seconds. 程序：如果受试者 \geq 70 岁，进行 30 秒双脚前后成一条线站立平衡测试；如果受试者 $<$ 70 岁，进行 60 秒双脚前后成一条线站立平衡测试]

K013_1.IWER: Refer to inside the front cover of this booklet to locate the full-tandem time for which R is eligible CAPI 根据受试者年龄确定受试者进行以下哪项测试。

1..... 30 seconds full-tandem balance measurement (70 years old or above) 30 秒双脚前后站立平衡测试 (受试者 70 岁或以上)

5..... 60 seconds full-tandem balance measurement (Less than 70 years old) 60 秒双脚前后站立平衡测试 (受试者小于 70 岁)

“Now I want you to try to stand with the heel of one foot in front of and touching the toes of the other foot for about [30/60] seconds. You may put either foot in front, whichever is more comfortable for you. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. Like this...”

“现在请您尝试用后一只脚的足尖抵住前一只脚的足跟站立 30/60 秒，只要您觉得舒适，任何一只脚放前面都可以。您可以使用双臂，弯曲膝盖，或移动身体来保持平衡，但尽量不要移动您的脚。尝试保持这个姿势直到我告诉您停下来。像这样...”

IWER: Demonstrate the measurement 访问员：演示测试方法

- Stand and place the heel of one foot touching the toes of the other foot. 用后一只脚的足尖抵住前一只脚的足跟站立

K013 "Do you understand the directions for this measurement and agree to take it?" (IWER: Circle one) "您能明白测量方法并愿意参加这次测量吗?" (访问员：选择 1 项)

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未能完成测试，请回答下面方框中的问题

[IF K013=1,then go to LI896;IF K013=5,then go to LI894 程序：如果 K013=1，跳至 LI896；如果 K013=5，跳至 LI894。]

(LI893) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI894) 访问员：为什么受试者没有完成双脚前后成一直线站立测量？（可多选）

- 1..... R felt it would not be safe 受试者认为测量不安全
 - 2..... IWER felt it would not be safe 访问员认为测量不安全
 - 3..... R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量
 - 4..... R tried but was unable to complete test 受试者尝试了但未能完成测量
 - 5..... R did not understand the instructions 受试者不明白测量方法
 - 6..... R had surgery, injury or other health condition that prevented R from standing 受试者由于手术、外伤或其他健康原因不能站立
 - 7..... No suitable space 没有合适的地方进行测量
 - 8..... Problem with equipment or supplies 设备的问题
 - 97..... Other (Specify) 其他（请注明）：
- Go To Next Measurement 进行下一项体检

(LI896) IWER: Did R hold full-tandem stand for a full [30/60] seconds without stepping out of place or grabbing hold of anything? (Circle one) 访问员: 受试者是否能够在没有移动脚或抓任何物的情况下前后脚站立保持[30/60]秒, ? (选择1项)

1 Yes 是

5 No → Enter amount of time R held stand in seconds to two decimal places: 否 记录受试者保持的时间, 小数点两位: (LI897) ____ . ____ Sec 秒

993 R tried but was unable 受试者尝试了, 但未能完成

999 R chose not to do it 受试者选择不做测试

[IF LI896=993 or 999, then go to LI894.

如果 LI896=993 或 999, 回答问题 LI894。]

(LI898) IWER: Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during full- tandem stand? (Circle one) 访问员: 在测试过程中, 受试者是否使用躯干、手臂或腿来保持平衡? (选择1项)

1 Yes 是

5 No 否

8 Don't Know 不知道

(LI899) IWER: Record the type of floor surface that the balance measures were conducted on. (Circle one) 访问员: 记录用于测试的地板类型。 (选择1项)

1 Linoleum/tile/wood 地板革/瓷砖/木地板

2 carpet 地毯

3 Clay 土地

4 Concrete 水泥地

5 Not sure 不确定

97 Other (Specify)其他 (请注明): _____

(LI902) IWER: How compliant was R during the balance measurements? (Circle one) 访问员: 受

试者在测量的过程中依从性如何? (选择 1 项)

1..... R was fully compliant 完全依从

2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从

3..... R did not appear to be fully compliant, but no obvious reason for this 不完全依从, 但没有明显的原因

◆ SIDE-BY-SIDE 双脚并拢站立测试

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Stopwatch, Show Card

所需设备: 秒表, 显示卡

(二) SIDE-BY-SIDE 双脚并拢站立测试

"Now I will show you the next movement. I want you to try to stand with your feet together, side-by-side for about 10 seconds. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. Like this..." "现在我向您做下一个动作。希望您能双脚并拢站立持续 10 秒钟。您可以使用手臂、屈膝或移动身体以保持平衡, 但是尽量不移动双脚。尽量保持这一姿势直到我告诉你停下来。就像这样....."

K015 "Do you understand the directions for this measurement and agree to take it?" (IWER: Circle one) "您能明白测量方法并愿意参加这次测量吗?" (访问员: 选择 1 项)

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 未能完成测试, 请回答下面方框中的问题

[Procedure: IF K015=1, then go to LI886; IF K015=5, then go to LI884

程序: 如果 K015=1, 跳至 LI886; 如果 K015=5, 跳至 LI884]

(LI883) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI884) IWER: Why didn't R complete the Side-by-Side stand? (Circle all that apply) 访问员: 为什么受试者没有完成双脚并拢站立测试? (可多选)

<p>1..... R felt it would not be safe 受试者认为测试不安全</p> <p>2..... IWER felt it would not be safe 访问员认为测试不安全</p> <p>3..... R refused or was not willing to complete the test 受试者拒绝或不愿意完成测试</p> <p>4..... R tried but was unable to complete test 受试者尝试了但未能完成测试</p> <p>5..... R did not understand the instructions 受试者不明白测试方法</p> <p>6..... R had surgery, injury or other health condition that prevented R from standing 受试者由于手术、外伤或其他健康原因不能站立</p> <p>7..... No suitable space 没有合适的地方进行测试</p> <p>8..... Problem with equipment or supplies 设备问题</p> <p>97..... Other (Specify):其他（请注明）：</p> <p>→Go To Walking Speed 进行下一项体检，步行速度</p> <p>Go to K017 请跳至K017</p>
--

Answer the questions in the box below. If the participant is unable to hold the position for 10 seconds, record the time in seconds to two decimal places in the box below. 回答以下框中的问题。如果受试者不能保持这一姿势 10 秒钟，请在以下框中记录站立的时间（单位：秒，保留 2 位小数）。

<p>(LI886) IWER 访问员: Did R hold side-by-side stand for a full 10 seconds without stepping out of place or grabbing hold of anything? (Circle one)受试者是否能够在没有移动脚或抓任何物的情况下双脚并拢站立保持 10 秒？（选择 1 项）</p> <p>1 .....Yes 是</p> <p>5 No 否, Enter amount of time R held stand in seconds to two decimal places : 记录受试者保持的时间，保留小数点两位: (LI887) _____ 0.10 秒</p> <p>993 .....R tried but was unable 受试者尝试了，但未能完成</p> <p>999 R chose not to do it 受试者选择不做测试</p> <p>[IF LI886=993 or 999, then go to LI884.</p>
--

如果 LI886=993 或 999, 回答问题 LI884。]

(LI888) IWER 访问员: Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during side-by-side stand? (Circle one) 在测试过程中, 受试者是否使用躯干、手臂或腿来保持平衡? (选择 1 项)

1YES 是

5NO 否

8 Don't Know 不知道

(LI889) IWER 访问员: Record the type of floor surface that the balance measures were conducted on. (Circle one) 记录用于测试的地板类型 (选择 1 项)

1 Linoleum/tile/wood 地板革/瓷砖/木地板

2 carpet 地毯

3 Clay 土地

4 Concrete 水泥地

5 Not sure 不确定

97 Other (Specify):其他 (请注明): _____

(LI902) IWER 访问员: How compliant was R during the balance measurements? (Circle one)

受试者在测量的过程中依从性如何? (选择 1 项)

1 R was fully compliant 是完全依从

2 R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从

3 R was not fully compliant, but no obvious reason for this 不完全依从, 但没有明显的原因

→Go to Walking Speed 进入步行速度测试.

Go to K017 请跳至K017

五、 WALKING SPEED步行速度测试

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Tape measure, Stopwatch, Masking Tape

所需设备: 卷尺, 秒表, 美纹纸胶带

(二) WALKING SPEED步行速度测试

K017_1 Is R eligible for Walking Speed Test? 是否合乎步行速度测试的条件?

1 YES R'age ≥ 60 → continue 是 受试者 ≥ 60 岁 → 继续

5 NO R'age < 60 → go to K020 否 受试者 < 60 岁 → 跳至 K020

K017 “Next, I would like to assess whether you can walk a very short distance comfortably (using a walking stick or other aid if necessary). First, I want to make sure it is safe to carry out the measurement. Do you have any problems from recent surgery, injury, or other health conditions that might prevent you from walking?”

“接下来, 我将评估你是否能很舒适地走很短的距离 (可以使用拐杖或其它必要的辅助物品)。首先, 我需确认这项测试对您来说是否安全。请问您从近期是否因手术、外伤、或有其他健康状况可能对您行走造成限制?”

IWER: Circle one 访问员: 选择 1 项

- 1..... No apparent restriction → continue 没有明显的限制 → 继续
- 2..... Yes, recent surgery → do not complete this measure and answer question in box below 是, 近期做过手术 → 未完成这项测试, 请回答下面方框中的问题。
- 3..... Yes, injury _ do not complete this measure and answer question in box below 是, 外伤 → 未完成这项测试, 请回答下面方框中的问题。
- 4..... Yes, other health condition _ do not complete this measure and answer question in box below 是, 其他健康状况 → 未完成这项测试, 请回答下面方框中的问题。

“Now let's find a place where we can conduct the measurement. We will need a clear space about 4 meters long in a non-carpeted area, if possible. I'm going to place the measuring tape alongside the space where the walk will take place.”

“现在让我们找一个合适的地方进行测试。我们需要一个约 4 米长, 没有地毯的开阔的空间。”

IWER: Set up the course (2.5 meters) 访问员: 设立好 2.5 米的线路

“This is our walking course. I am going to time you as you walk the course. I will be asking you to walk the course two times. I'll walk along side you the whole time during the measurement. Now I'd

like to demonstrate how to do the measurement. You will start by lining your feet up at the starting point. “这是我们的行走线路。当您沿着线路走的时候，我会计时。我会请您沿着线路走2次。在测量过程中，我会一直在您侧面跟随您行走。现在，我来给您演示如何进行测试。测试开始时，请自测试的起点抬腿开始步行”。

IWER: Demonstrate the measurement. 访问员：演示测试方法。

K018 “Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员：选择1项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未完成这项测试，请回答下面方框中的问题。

IF K017=1 and K018=1,then go to LI823

IF K017=2 or K017=3 or K017=4 or K018=5,then go to LI821

程序：如果 K017=1 且 K018=1，跳至 LI823；如果 K017=2 或 K017=3 或 K017=4 或 K018=5，跳至 LI821]

(LI820) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI821) IWER: Why didn't R complete the walking speed test? (Circle all that apply) 访问员：为什么受试者无法完成步行速度测试？（多选）

1 R felt it would not be safe 受试者认为不安全的

2 IWER felt it would not be safe 调查员认为不安全

3 R refused or was not willing to complete the test 受试者拒绝或不愿测量

4 R tried but was unable to complete test 受试者尝试了，但无法完成测量

5 R did not understand the instructions 受试者不能理解测试的程序

6 R had surgery, injury, or other health condition that prevented R from walking 受试者因为手术，外伤或其它健康原因妨碍了步行速度

7 No suitable space available 没有合适的地方进行测试

8 Problem with equipment or supplies 仪器或设备问题；

97 Other (Specify):其他（请注明）：

→Go To Next Measurement 转到下一个测试项目

Go to K020 请跳至K020

"I am going to time you as you walk the course at your normal pace. I will be asking you to walk the course at your usual pace a total of two times. I'll walk along side you the whole time during the measurement. I'd like you to stand here with your feet lined up. Start walking when I say 'Begin'. Walk all the way past the other end of the tape before you stop. Are you ready to go

now? Begin." 对受试者说"当你一正常步速沿着线路行走时，我会给您计时。我会请您沿着线路以正常步速行走 2 次。测量过程中，我会一直在您侧面跟随您行走。请在此站立，双脚并列。当我说"开始"，请走到胶带的终点再停下来。准备好了吗？开始"。

IWER: Record measurements in chart (Record 993 if R tried but was unable. Record 999 if R chose not to do it) 访问员：将测试结果记录在下表中：（如果尽管受试者尝试了，但无法进行测试，请填写 993。如果受试者选择不进行测试，请填写 999）

Measurement #	Walking Speed Time
测量 #	步行速度时间
1	(LI823) _____ 0.0.999 (seconds) (秒)

[IF LI823=993 or 999,then go to LI821.

如果 LI823=993 或 999，回答问题 LI821。]

Repeat the measurement: ***"Now I want you to repeat the walk. Remember to walk at your usual pace and go all the way past the other end of the course. I'd like you to stand here with your feet lined up. Start walking when I say 'Begin'. Are you ready to go now? Begin.***" 重复测量的："现在请您重走一遍。请记住，用您平常的步速，沿着线路一直走到胶带的另一端。请您在此站立，双脚并列。当我说"开始"，请走到胶带的终点再停下来。准备好了吗？开始。..."

IWER: Record measurements in chart (Record 993 if R tried but was unable. Record 999 if R chose not to do it) 访问员：将测试结果记录在下表中：（如果尽管受试者尝试了，但无法进行测试，请填写 993。如果受试者选择不进行测试，请填写 999）

Measurement #	Walking Speed Time
测量 #	步行速度时间
2	(LI824) _____ 0.0.999 (seconds) (秒)

(LI825) : IWER: Record type of floor surface. (Circle one) 访问员记录地面的类型

1..... Linoleum/tile/wood 地板革/瓷砖/木地板

2	.....	Carpet 地毯
3	.....	Clay 土地
4	.....	Concrete 水泥地
5	.....	Not sure 不知道
97	.....	Other (Specify): 其他 (请注明): _____
(LI828) IWER: Record type of aid used. (Circle one) 访问员: 记录步行辅助器。 (单选)		
1	.....	None 无
2	.....	Walking stick or cane 拐杖或手杖
3	.....	Elbow crutches 手臂仗、肘拐
4	.....	Walking frame 助行架
97	.....	Other (Specify): 其他 (请注明): _____
(LI830) IWER: How compliant was R during this measurement? (Circle one) 访问员: 受试者在测量的过程中依从性如何? (单选)		
1	.....	R was fully compliant 是完全依从
2	.....	R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从
3	.....	R was not fully compliant, but no obvious reason for this 不完全依从, 但没有明显的原因

六、 Repeated Chair Stands 重复从椅子站起的时间测试

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Stadiometer

所需设备: 椅子, 秒表

(二) Repeated Chair Stands Tests 重复从椅子站起的时间测试

"Now I will show you the next movement. Please keep your arms folded across your chest. When I say 'ready? stand', please stand up straight and then sit down again at your fastest pace five times without stopping in between and without using your arms to push off. Do you think you can do that for me? "现在我向您做一个动作, 请将双臂交叉抱于胸前, 当我说“您准备好了吗? 站起来”时, 请以您最快的速度站直然后坐下, 重复5次, 每两次之间不能停下, 而且不能用手臂推扶。

K020 "Do you understand the directions for this measurement and agree to take it?" (IWER: Circle one) "您能明白测量方法并愿意参加这次测量吗?" (访问员: 选择 1 项)

1.....YES → continue 是 → 继续

5.....NO 否 → do not complete this measure and answer question in box below 未能完成测试，请回答下面方框中的问题

[IF K020=1,then go to LI003;IF K020=5,then go to LI002.如果 K020=1,跳至 LI003； 如果 K020=5,跳至 LI002。]

(LI001) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI002) IVER 访问员： : Why didn't R complete the Side-by-Side stand? (Circle all that apply)为什么受试者没有完成重复从椅子站起时间的测试？（可多选）

1..... R felt it would not be safe 受试者认为测试不安全

2..... IVER felt it would not be safe 访问员认为测试不安全

3..... R refused or was not willing to complete the test 受试者拒绝或不愿意完成测试

4..... R tried but was unable to complete test 受试者尝试了但未能完成测试

5..... R did not understand the instructions 受试者不明白测试方法

6..... R had surgery, injury or other health condition that prevented R from standing 受试者由于手术、外伤或其他健康原因不能站立

7..... No suitable space 没有合适的地方进行测试

8..... Problem with equipment or supplies 设备问题

97..... Other (Specify):其他（请注明）：

GO TO K023 请跳至 K023

(LI003) IWER 访问员: Did R can stand up straight and then sit down again at his/her usual pace five times without stopping in between and without using arms to push off (Circle one) (选择 1 项)

1是 Yes Enter amount of time R held stand in seconds to two decimal places: 记录受试者所用的时间, 保留小数点两位 **(LI004)**: _____.____Sec 秒

5 No 否, _Enter amount of time R held stand in seconds to two decimal places **(LI005)**: 记录受试者保持的时间, 保留小数点两位: _____.____Sec 秒

993 R tried but was unable 受试者尝试了, 但未能完成

999 R chose not to do it 受试者选择不做测试

[IF LI003=993 or 999, then go to LI002.

如果 LI003=993 或 999, 回答问题 LI002。]

Record the number of stands R completed: 受试者完成的站立次数: **(LI006)** _____.**0..5times** 次

Record the chair height from floor to seat in the space provided. 从地面到坐位之间的椅子的高度: **(LI007)** _____.____**0..999cm** (厘米)

(LI008) IWER 访问员: Did R use his/her trunk arms during repeated chair stands? (Circle one)
在测试过程中, 受试者是否用了手臂? (选择 1 项)

1YES 是

5NO 否

8 Don't Know 不知道

七、 STANDING HEIGHT 身高测量

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Stadiometer

所需设备: 立式身高计

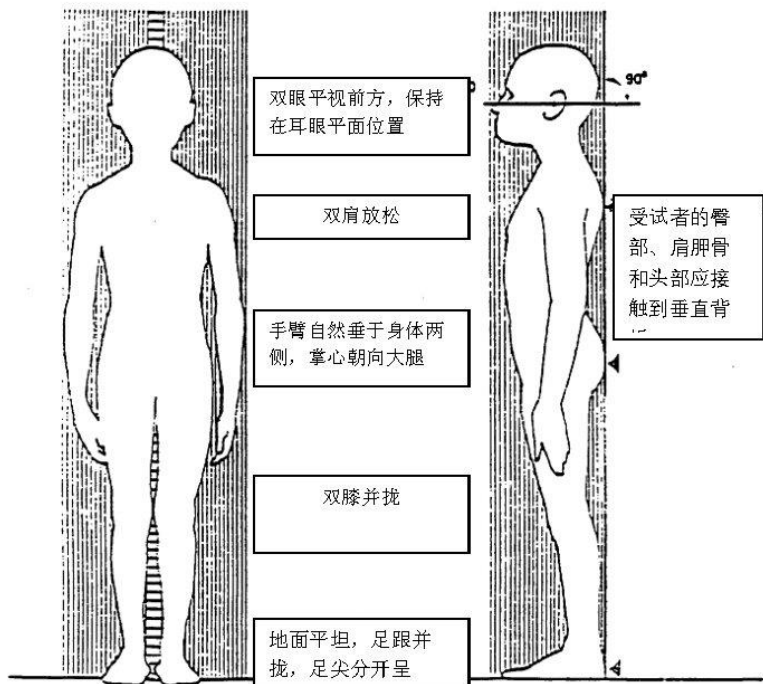


图 5

(二) STANDING HEIGHT 身高测量

"Next I will measure your height using this stadiometer. Please stand erect on the floor board of the stadiometer with your back to the vertical backboard of the stadiometer. Your weight should be evenly distributed on both feet. The heels of the feet are placed together with both heels touching the base of the vertical board. Place the feet pointed slightly outward at a 60 degree angle. Your head should be maintained in the Frankfort Horizontal Plane position."

“接下来我们将测量您的身高。请赤足、以立正姿势站在身高计的底板上，后背靠在测量仪的垂直背板上，上肢自然下垂，足跟并拢，靠垂直背板，足尖分开成 60°。头部保持在耳眼平面位置。”

K023 “Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员：选择 1 项

1.....YES → continue 是 → 继续

5.....NO→do not complete this measure and answer question inbox below 否 → 未能完成这次测量,请回答下面方框中的问题

[IF K023=1,then go to LI011;IF K023=5,then go to LI010. 如果 K023=1, 跳至 LI011； 如果 K023=5, 跳至 LI010。]

(LI009) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上面问题的回答情况

(LI010) IWER: Why didn't R complete the breathing test? (Circle all that apply) 访问员：为什么受试者没有完成身高测定？（可多选）

1.....R felt it would not be safe 受试者认为测量不安全

2.....IWER felt it would not be safe 访问员认为测量不安全

3.....R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量

4.....R tried but was unable to complete test 受试者尝试但未能完成测量

5.....R did not understand the instructions 受试者不明白测量方法

6.....R had humpback, cannot stand, etc. other health reasons 受试者由于驼背、不能站立等健康原因不能测量

7.....No suitable space 没有合适的空间进行测量

8.....Problem with equipment or supplies 设备问题

97.....Other (Specify): 其他（请注明）： _____

→Go To Next Measurement 进行下一项体检

GO TO K025 请跳至 K025

IWER: Record measurements in chart (Record 993 if R tried but was unable. Record 999 if R chose not to do it) 访问员：将测试结果记录在下表中：（如果尽管受试者尝试了，但无法进行测试，请填写 993。如果受试者选择不进行测试，请填写 999）

Measurement# 测量#	Height 身高 (cm)
1	(LI011) _____ 0..210, 993,999 (cm)

[IF LI011=993 or 999, then go to LI010.

如果 LI011=993 或 999，回答问题 LI010。]

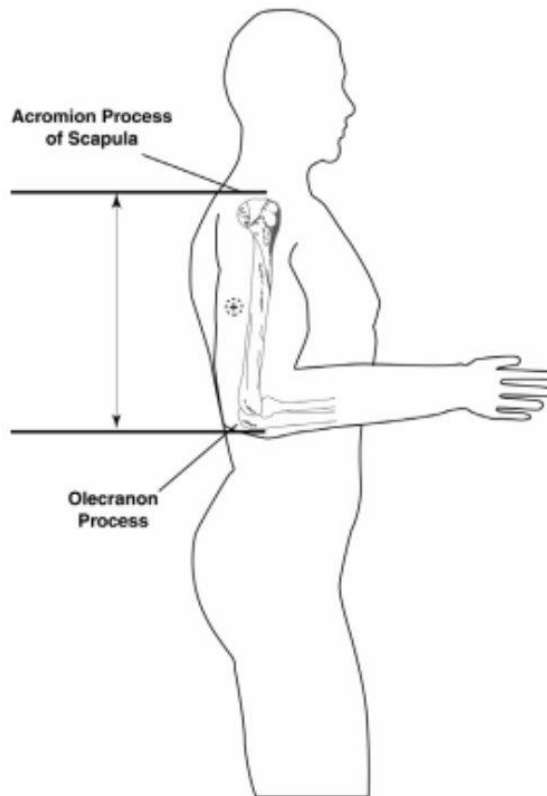
<p>(LI012) IWER: How compliant was R during this measurement? (Circle one) 访问员：受试者在测量的过程中依从性如何？（选择 1 项）</p> <p>1..... R was fully compliant 完全依从</p> <p>2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病，疼痛或其它症状或不适而不能完全依从</p> <p>3..... R was not fully compliant, but no obvious reason for this 不能完全依从，但没有明显的原因</p>

八、 UPPER ARM LENGTH 手臂长度测量

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: MA DING Rule

所需设备：马丁尺



(二) UPPER ARM LENGTH MEASUREMENT 上臂长度测量

"Next I will measure your upper arm length."

"接下来我们将测量您的手臂长度。"

K025 "Do you understand the directions for this measurement and agree to take it?" "您能明白测量方法并愿意参加这次测量吗?"

IWER: Circle one 访问员: 选择 1 项

1.....YES → continue 是 → 继续

5.....NO → do not complete this measure and answer question in box below 否 → 未能完成这次测量, 请回答下面方框中的问题

[IF K025=1, then go to LI015; IF K025=5, then go to LI014. 如果 K025=1, 跳至 LI015; 如果 K025=5, 跳至 LI014.]

(LI013) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上面问题的回答情况

(LI014) IWER: Why didn't R complete the upper arm length? (Circle all that apply) 访问员: 为什么受试者没有完成上臂长度测定? (可多选)

1.....R felt it would not be safe 受试者认为测量不安全

2.....IW ER felt it would not be safe 访问员认为测量不安全

3.....R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量

4.....R tried but was unable to complete test 受试者尝试但未能完成测量

5.....R did not understand the instructions 受试者不明白测量方法

6.....R could not participate due to health reasons 受试者由于健康原因不能测量

7.....No suitable space 没有合适的空间进行测量

8.....Problem with equipment or supplies 设备问题

97.....Other (Specify): 其他 (请注明): _____

→Go To Next Measurement 进行下一项体检

GO TO K027 请跳至 K027

IWER: Record measurements in chart (Record 993 if R tried but was unable. Record 999 if R chose not to do it) 访问员: 将测试结果记录在下表中: (如果尽管受试者尝试了, 但无法进行测试, 请填写 993。如果受试者选择不进行测试, 请填写 999)

测量#	上臂长度 (cm)
Measurement#	Upper Arm Length (CM)
1	(LI015) _____ 0..150, 993,999 (cm)

[IF LI015=993 or 999, then go to LI014. 如果 LI015=993 或 999, 回答问题 LI014。]

(LI016_0) IWER: Which arm was used to conduct the measurements? (Circle one) 访问员: 测量了哪侧上臂的长度? (选择 1 项)

1..... Left 左侧

2..... Right 右侧

(LI016) IWER: How compliant was R during this measurement? (Circle one) 访问员: 受试者在测量的过程中依从性如何? (选择 1 项)

1..... R was fully compliant 完全依从

2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从

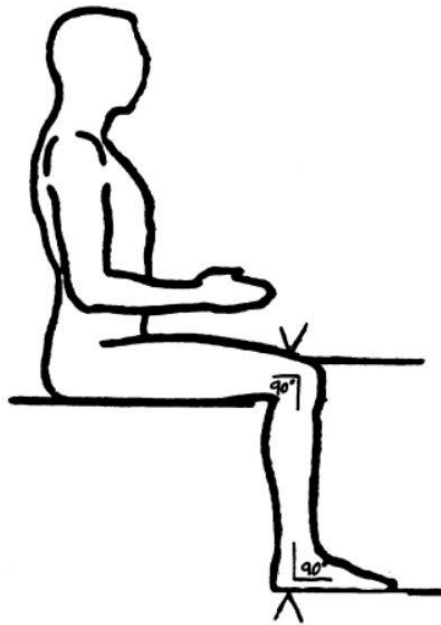
3..... R was not fully compliant, but no obvious reason for this 不能完全依从, 但没有明显的原因

九、 KNEE HEIGHT 膝高测量

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: MA DING Rule

所需设备: 马丁尺



(二) 膝高测量

"Next I will measure your knee height. Please sit on a chair with barefoot."

"接下来我们将测量您的膝高。请赤足、坐在椅子上。"

K027 "Do you understand the directions for this measurement and agree to take it?" "您能明白测量方法并愿意参加这次测量吗?"

IWER: Circle one 访问员: 选择 1 项

1.....YES → continue 是 → 继续

5.....NO 否→do not complete this measure and answer question in box below 未能完成这次测量,请回答下面方框中的问题

[IF K027=1,then go to LI019;IF K027=5,then go to LI018.如果 K027=1,跳至 LI019; 如果 K027=5,跳至 LI018。]

(LI017) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上面问题的回答情况

(LI018) IWER: Why didn't R complete the knee height? (Circle all that apply) 访问员: 为什么受试者没有完成膝高测定? (可多选)

- 1.....R felt it would not be safe 受试者认为测量不安全
- 2.....IWER felt it would not be safe 访问员认为测量不安全
- 3.....R refused or was not willing to complete the test 受试者拒绝或不愿意完成测量
- 4.....R tried but was unable to complete test 受试者尝试但未能完成测量
- 5.....R did not understand the instructions 受试者不明白测量方法
- 6.....R could not participated due to health reasons 受试者由于健康原因不能测量
- 7.....No suitable space 没有合适的空间进行测量
- 8.....Problem with equipment or supplies 设备问题
- 97.....Other (Specify): 其他(请注明): _____

→Go To Next Measurement 进行下一项体检

Go to K029 请跳至K029

IWER: Record measurements in chart (Record 993 if R tried but was unable. Record 999 if R chose not to do it) 访问员: 将测试结果记录在下表中: (如果尽管受试者尝试了, 但无法进行测试, 请填写 993。如果受试者选择不进行测试, 请填写 999)

测量#	膝高 (cm)
Measurement#	RIGHT KNEE HEIGHT(CM)
1	(LI019) _____ 0.150, 993,999 (cm)

[If LI019=993 or 999, then go to LI018. 如果 LI019=993 或 999, 回答问题 LI018。]

(LI020_0) IWER: Which leg was used to conduct the measurements? (Circle one) 访问员: 测量了哪侧腿的膝高? (选择 1 项)

1..... Left 左侧

2..... Right 右侧

(LI020) IWER: How compliant was R during this measurement? (Circle one) 访问员: 受试者在测量的过程中依从性如何? (选择 1 项)

1..... R was fully compliant 完全依从

2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从

3..... R was not fully compliant, but no obvious reason for this 不能完全依从, 但没有明显的原因

十、 WEIGHT体重测量

(一)EQUIPMENT NEEDED 所需设备

Equipment needed: Scale

所需设备: 体重秤

(二) 体重测量

K029 Is R eligible for Weight Measurement? 是否合乎测量体重的条件? 1 _____ YES weight<150kg→continue 是 体重<150kg→继续 5 _____ NO weight≥150kg→go to K032 否体重≥150kg→跳至 K032
--

K030“Now, I'd like to measure your weight. To measure your weight, I will ask you to stand on this scale, with your shoes off, while I read the display.”

“现在，我想为您测量体重。请您脱下鞋子，站在体重秤上，我来读数。”

“Do you understand the directions for this measurement and agree to take it?” “您能明白测量方法并愿意参加这次测量吗？”

IWER: Circle one 访问员: 选择 1 项

1.....YES → continue 是 → 继续

5.....NO→do not complete this measure and answer question in box below 否→ 未完成这项测量，请回答下面方框中的问题。

[IF K029=1 and K030=1,then go to LI841;IF K029=5 or K030=5,then go to LI839. 如果 K029=1 和 K030=1, 跳至 LI841; 如果 K029=5 或 K030=5, 跳至 LI839。]

(LI838) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI839) IWER: Why weren't you able to measure R's weight? (Circle all that apply) 访问员: 你为什么无法测量受试者的体重? (多选)

1 R felt it would not be safe 受试者认为不安全的

2 IWER felt it would not be safe 访问员认为不安全

3 R refused or was not willing to complete the test 受试者拒绝或不愿测量

4 R tried but was unable to complete test 受试者尝试了, 但无法完成测量

5 R did not understand the instructions 受试者无法明白测量的指令

6 R is not able to stand or balance on scale; other health reason 受试者无法在体重秤上站立或保持平衡; 其他健康方面的原因

7 No suitable space available 没有合适的地方进行测量

8 Scale did not work; other problem with equipment or supplies 体重秤坏了; 设备的其他问题;

97 Other (Specify): 其他 (请注明) _____

→Go To Next Measurement 转到下一个测试项目

GO TO K032

IWER: Record measurement in chart: (Enter 993 if R tried but received an error message.) 访问员: 将测试结果记录在以下表中: (如果尽管受试者尝试测量了, 但是显示错误信息, 请填写 993)

Measurement#	Weight Measurement
测量	体重测量值
1	(LI841) _____ 0..150, 993,999 (kg) 公斤

[IF LI841=993,then go to LI839.如果 LI841=993, 回答问题 LI839。]

(LI842) IWER: Record type of floor surface. (Circle one) 访问员: 记录地面的类型 (单选)

- 1..... Linoleum/tile/wood 地板革/瓷砖/木地板
- 2..... Carpet 地毯
- 3..... Clay 土地
- 4..... Concrete 水泥地
- 5..... Not sure 不知道
- 97..... Other (Specify): 其他 (请注明): _____

(LI844) IWER: Was R wearing shoes during the measurement? (Circle one) 受试者是否穿着鞋测量? (单选)

- 1..... Yes 是
- 5..... No 否

(LI847) IWER: How compliant was R during this measurement? (Circle one) 访问员: 受试者在测量的过程中依从性如何? (单选)

- 1..... R was fully compliant 完全依从
- 2..... R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病, 疼痛或其它症状或不适而不能完全依从
- 3..... R was not fully compliant, but no obvious reason for this 不完全依从, 但没有明显的原因

十一、 WAIST CIRCUMFERENCE 腰围测量

(一) EQUIPMENT NEEDED 所需设备

Equipment needed: Soft Tape Measure

设备: 软尺

(二) 腰围测量

“Next I’m going to perform a simple measurement of your waist circumference. For this measurement it is important for you to be standing. I will ask you to identify where on your body your navel (belly button) is located. I will then place this soft measuring tape around your waist, over your clothing, holding it securely at the level of your navel. Once the tape measure is placed appropriately around your waist then we are ready to begin. I will ask you to take a normal breath and exhale, holding your breath at the end of the exhale. I will then record the measurement.”

下一步，我会给你做一项简单的腰围测试。这项测试中需要您站着。我将用尺子在您肚脐的位置水平绕腰部一圈。当腰围尺处于正确位置时，我们开始测量。请您平静呼吸。呼气末请屏住呼吸，我会在这个时候读数。

IWER: Demonstrate the measurement. 访问员: 演示测量方法

- Stand and locate navel. Place measuring tape over the clothing around the waist at the level of the navel. Take a normal breath and exhale, holding breath at end of exhale and letting the tape out slightly.

立正，定位脐部。腰围尺在脐部位置水平绕受试者一周。平静呼吸，呼气末屏住呼吸，读数。

K032 IWER: Ask if necessary: (*“Before we begin, do you feel you are able to stand while we do this measurement?”*) (IWER: Circle one) 必要时间受访者: (“开始前，您认为在测试过程中，您是否能够站着?”)

1 YES → continue 是 → 继续

5 NO → do not complete this measure and answer question in box below 否 → 未完成这项测量，请回答下面方框中的问题。

K033 *“Do you understand the directions for this measurement and agree to take it?”* “您能明白测量方法并愿意参加这次测量吗?”

IWER: Circle one 访问员: 选择 1 项

1 YES → continue 是 → 继续

5.....NO →_ do not complete this measure and answer question in box below 否→ 未完成这项测量，请回答下面方框中的问题。

[IF K032=1 and K033=1,then go to LI907;IF K032=5 or K033=5,then go to LI905. 如果 K032=1 且 K033=1, 跳至 LI907; 如果 K032=5 或 K033=5, 跳至 LI905]

(LI904) BASED ON RESPONSES TO QUESTIONS ABOVE 根据上述问题的回答情况

(LI905) IWER: Why weren't you able to measure R's waist? (Circle all that apply)

访问员：为什么无法完成腰围测量？（多选）

1 R felt it would not be safe 受试者认为不安全的

2 IWER felt it would not be safe 调查员认为不安全

3 R refused or was not willing to complete the test 受试者拒绝或不愿测量

4 R tried but was unable to complete test 受试者尝试了，但无法完成测量

5 R did not understand the instructions 受试者无法明白测量的指令

6 R is not able to stand; other health reason 受试者无法站立；其他原因

7 No suitable space available 没有合适的地方进行测试

8 Problem with equipment or supplies 仪器或设备问题：

97 Other (Specify):其他（请注明）： _____

→END

IWER: Record measurements in chart. (Enter 993 if R tried but was unable to do it. Enter 999 if R chose not to do it.) 访问员：将测试结果记录在以下表中：（如果尽管受试者尝试测量了，但是显示错误信息，请填写 993。如果受试者选择不进行测试，请填写 999）

Measurement	Waist Measurement 腰围测量值
测量	
1	(LI907) _____ 0..999 (cm) 厘米

[IF LI907=993 or 999,then go to LI905.如果 LI907=993 或 999, 回答问题 LI905。]

(LI908) IWER: What difficulties occurred during this measurement? (Circle all that apply) 访问员：在测量过程中有哪些困难？（单选）

1没有

2R had breathing difficulties 受试者呼吸方面有困难

<p>3 .....R was unable to hold breath at the end of the exhale 受试者在呼气末不能屏住呼吸</p> <p>4 .....R was prevented from giving full effort by illness, pain, or other symptoms or discomforts 受试者因为疾病、疼痛或其他症状或不适而不能尽全力配合</p> <p>5 .....R did not appear to give full effort, but no obvious reason for this 受试者未能尽全力，但没有明显的原因</p> <p>6 .....Had difficulty or unable to locate navel 不能或定位脐部有困难</p> <p>97 .....Other (Specify):其他（请注明）： _____</p> <p>(LI910) IWER: How compliant was R during this measurement? (Circle one) 访问员：受试者在测量的过程中依从性如何？（单选）</p> <p>1 .....R was fully compliant 完全依从</p> <p>2 .....R was prevented from fully complying due to illness, pain, or other symptoms or discomforts 由于疾病，疼痛或其它症状或不适而不能完全依从</p> <p>3 .....R was not fully compliant, but no obvious reason for this 不完全依从，但没有明显的原因</p> <p>(LI912) IWER: Was the R wearing bulky clothing during this measurement? (Circle one) 访问员：受试者在测量过程中是否穿着厚重的衣服？</p> <p>1 .....Yes 是</p> <p>5 .....No 否</p>

Appendix D: The family and adult questionnaire for CFPS



Chinese Family Panel Study

Family Questionnaire (Part 1)

ISSS logo

Institute of Social Science Survey, Peking University

For more details: <http://opendata.pku.edu.cn/dataverse/CFPS>

The researchers can visit CFPS official data platform to download the newest public data <http://www.issp.pku.edu.cn/cfps/en/data/public/index.htm>

1. Co-Resident Family Members (Table T1)

Person code								
101								
102								

301								
302								

F1: (1) Members coded as "1**" are those related through blood/marriage/adoption, including parents-in-law/stepparents/nephews/nieces/grandchildren, etc. They should also be listed in Table T2 and may be interviewed with individual questionnaires.

(2) Members coded as "3**" are those not related through blood/marriage/adoption, such as housekeepers, drivers, day laborers, or other short-term temporary residents. They should not be listed in Table T2, and will not be interviewed individually.

Confirm the respondent who reported the family member roster:

A1 Do you live together with the other members of this family?

1. Yes [Skip to A2] 5. No [Continue on]

F1: "Live together" means that family and non-family members are economically related, including blood/relative relationship members and non- relative members, such as housekeepers, drivers or distant relatives who work as housekeepers.

A101 Is your family a single-person family?

1. Yes [Skip to A201] 5. No [Choose another member to interview]

F1: "Single-person family" means a family unit with only one person.

[CAPI] If A101= 5, go back to A1.

A2 Do you have a blood/marital/adoptive relationship with anyone in this family?

1. Yes [Continue] 5. No [Choose another member to interview]

[CAPI] If A2= 5, go back to A1.

A201 Your name is _____

[CAPI] If A101=1, skip to B1.

A3 How many people besides yourself are currently living together in this family? _____

Interviewer Note: People of the following 7 types who are economically connected to the family should be counted as "living together in this house". Check with the respondent to make sure these people are counted.

1. Study away from hometown
2. Out-migration for work/Work away from hometown
3. Monk
4. Visit friends/relatives
5. In prison
6. Military service
7. Abroad (Including Hong Kong, Macao, and Taiwan)

F1: "Live together" means that family and non-family members are economically related, including blood/relative relationship members and non-relative members, such as housekeepers, drivers or distant relatives who work as housekeepers.

A4 How many people besides yourself living together in this family **have lineal blood**/marriage/adoptive relationships with you? _____

Interviewer Note: this question is judged by the actual situation and does not require asking the respondent.

F1: "Lineal relationships" should include the following:

- 1) Students studying away from hometown
- 2) Children in active military service
- 3) Economically connected family members who migrate for work

A401 List the names of the people who live together in the family and also **have lineal blood**/marriage/adoptive relationships with you and your family members:

A5 How many of the family members are **non-lineal/collateral relatives**? _____

Interviewer Note: this question is judged by the actual situation and does not require asking the respondent.

F1: "Non-lineal/collateral relatives" means parents-in-law/grandparents-in-law/nephews/nieces/cousins, etc. The adopted children are lineal relatives.

A501 Among those "**Number in A5**" who **have** blood/marriage/adoptive relationships with you and your family members, but are **non-lineal/collateral relatives**, how many have been living in your family for 3 months or more? _____

F1: "Non-lineal/collateral relatives" means parents-in-law/grandparents-in-law/nephews/nieces/cousins, etc. The adopted children are lineal relatives.

A502 What are the names of these people who live together in your family, have blood/marriage/adoptive relationships with you and your family members, but are **non-lineal/collateral** relatives?

A6 Among the people living together in your family, how many of them **do not** have blood/marriage/adoptive relationships with you and your family members? _____

Interviewer Note: this question is judged by the actual situation and does not require asking the respondent.

A601 Among those "**Numbers of A6**" who **do not have** blood/marriage/adoptive relationships but are

living together in this family, how many have been living here for at least 6 months? _____

A602 What are their names? _____

B1 Date of birth of "family member's name"? _____ year ____ month ____ day; Chinese Zodiac _____;
Age _____

Interviewer Note: (1) Use YYYY/MM/DD format.

(2) If either the month or the day of birth is unknown, enter "CTRL-D".

(3) If none of the year, month, and day of birth, but age is known, enter "CTRL-D" and record age and Chinese Zodiac.

B2 "Family member's" sex:

1. Male 5. Female

B3 "Family member's" marital status: [List of marital status] [Show card]

1. Never married 2. Married 3. Cohabitation
4. Divorced 5. Widowed

B4 "Family member's" highest level of education completed [List of levels of education]

Interviewer Note: If the respondent has not completed primary school, record "1. Illiterate/Semi-literate".

1. Illiterate/Semi-literate 2. Primary school 3. Middle school
4. High school 5. 2- or 3-year college 6. 4-year college/Bachelor's degree
7. Master's degree 8. Doctoral degree

B5 "Family member's" primary occupation _____

Interviewer's Note: (1) If more than one occupation, record the one that takes the most of the time.

(2) If unemployed, record "-8 Not applicable"

(3) Record detailed information on occupation, such as department, job responsibility, position, and title.

Examples:

Chinese language teacher and grade leader of ××Primary School

Accountant of ××Company

Director of xx workshop at ××Factory

Nurse from xx hospital in ××County

Farmer who grows rice in the local village

B501 Does the "family member" holds an administrative/management position?

1. Yes 5. No [Skip to B6]

B502 What is "family member's" administrative/management position? _____

Interviewer's Note: Record the position in details.

B6 Is "family member" currently living in this family?

Interviewer Note: Short-term absences (will be back in 3 months and live in the family in the long term) should be treated as living in this family.

1. Yes [Skip to next family member] 5. No [Continue]

B601 Why is the "family member" currently not living here?

Interviewer Note: If studying abroad, record 7.

1. Study away from hometown 2. Out-migration for work/Work away from hometown
 3. Monk
 4. Visit friends/relatives 5. In prison 6. Military service
 7. Abroad (Including Hong Kong, Macao, and Taiwan)

B602 What is "family member's" contact address?

Province: _____
 County (District) _____
 Street (Village/Town) _____
 Household (Village/Group) _____
 House Number _____
 Post Code [][][][][][][][]

B603 What is "family member's" contact information?

Home Phone _____
 Work Phone _____
 Mobile phone _____
 Email _____

B604 How long has "family member" been away from home? _____ months

B7 Who is the head of the household? [Single choice] _____

2. Relationship table for the lineal family members who live together (Table T2)

Person Code	Name	Father	Mother	Spouse	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
101										
102										

- C1 Who is "family member's" father? _____
 C2 Who is "family member's" mother? _____
 C3 Who is "family member's" spouse? _____
 C4 Who is "family member's" child/children? _____

3. Information on the lineal family members who do not live together (Table T3)

Person Code										
201										
202										

D1 Date of birth of "the lineal family member who does not live together" ____ year ____ month ____ day, Chinese Zodiac _____, Age _____

Interviewer Note: (1) Use YYYY/MM/DD format.

(2) If either the month or the day of birth is unknown, enter "CTRL-D."

(3) If none of the year, month, and day of birth, but age is known, enter "CTRL-D" and record age and Chinese Zodiac.

D2 "the lineal family member who does not live together" sex:

1. Male 5. Female

D3 Is "the lineal family member who does not live together" still alive?

1. Yes [Continue] 5. No [Continue to next family member not living together]

D4 Marital status of "the lineal family member who does not live together" [List of marital status] [Show card]

1. Never married 2. Married 3. Cohabitation
4. Divorced 5. Widowed

D5 The highest level of education of "the lineal family member who does not live together" [List of levels of education]

Interviewer Note: If the respondent has not completed primary school, record "1. Illiterate/Semi-literate".

1. Illiterate/Semi-literate 2. Primary school 3. Middle school
4. High school 5. 2- or 3-year college 6. 4-year college/Bachelor's degree
7. Master's degree 8. Doctoral degree

[CAPI] If "family member" is under the age of 16, skip to D7.

D6 Occupation of "the lineal family member who does not live together" _____

Interviewer Note: (1) If more than one occupation, record the one that takes the most time.

(2) If unemployed, record "-8 Not applicable".

(3) Record detailed information on the occupation, such as department, job responsibility, position, and title.

Examples:

Chinese language teacher and grade leader of ××Primary School

Accountant of ××Company

Chinese Family Panel Study

Family Questionnaire (Part 2)

ISSS logo

Institute of Social Science Survey, Peking University

Part A

A1 How far is it from your house (permanent residence) to the nearest bus stop? ____ meters/li (Chinese miles)/kilometers

Interviewer Note: If there is no bus, record -8.

F1: "How far" refers to the distance of the nearest path you choose to get to the bus stop, rather than the direct (Euclidean) distance.

A2 Waiting time for the bus is, on average, ____ minutes.

F1: "Waiting time for the bus" refers to the time duration between when you arrive at the bus stop and when you get on the bus. There may be variations in the waiting time for different buses at different periods of the day. Ask the average time here.

[CAPI] Skip to A4 after answering A2.

A3 Long-distance bus service is:

1. Daily [Continue to A301] 5. Every few days [Skip to A302]

A301 How many long-distance buses are there per day? _____

A302 How many days is there a long-distance bus? _____

F1: "Long-distance bus" refers to the commuting bus for passenger transportation between a city and a village. There are only a few buses each day or only one bus for several days.

A4 Distance between your house and the nearest hospital/medical center: ____ meters/li (Chinese miles)/kilometers.

F1: (1) "Distance" refers to the distance of the nearest path by which you choose to get to the bus stop, rather than the direct (Euclidean) distance.

(2) "Hospital/medical center" means a place equipped with medical staff and facilities to provide general medical care and services, such as a general hospital, town hospital, community hospital, village clinic, or private clinic. Specialized hospitals such as dental clinics or supplementary clinics in drugstores do not count.

A5 How long does it take to get to the nearest hospital/medical center by the fastest means of transportation? ____ minutes/hours

Interviewer Note: Ask the time spent by taking the fastest means of transportation.

F1: (1) "The fastest means of transportation" means the fastest daily means of transportation you take, rather than the fastest among all possible means: if the family has no car, then the time should not be calculated based on the use of a car or the traffic condition.

(2) "Hospital/medical center" means a place equipped with medical staff and facilities to provide general medical care and services, such as a general hospital, town hospital, community hospital, village clinic, or private clinic. Specialized hospitals such as dental clinics or supplementary clinics in drugstores do not count.

A6 Distance between your house and the nearest high school: _____ meters/li (Chinese miles)/kilometers

F1: "Distance" refers to the distance of the nearest path by which you choose to get to the bus stop, rather than the direct (Euclidean) distance.

A7 How long does it take to travel from your house to the business center of the nearest city (town) by using the daily means of transportation: _____ minutes/hours.

Interviewer Note: Ask the time spent taking the most frequently used means of transportation.

F1: (In general term): "Business center of the nearest city (town)" refers to a "town" in a rural area and a "city" in an urban area. It refers to the busiest and most flourishing commercial place near the household. If there are more than two such places, record the more frequently visited one.

F1: (1) "Business center of a city" refers to a central business district in a city where business is highly concentrated, and commercial services are well established and served to customers both within and beyond the local area. The business street is typically of 800 meters or longer, or the business and commercial activities are concentrated in an area of 25 hectares or larger.

(2) "Business center of a town" refers to a commercial center in a rural area where business is highly concentrated, and commercial services are well established and served to customers both within and beyond the local area. The business street is typically 500 meters or longer, or the business and commercial activities are concentrated in an area 25 hectares or larger.

Part B

B1 What kind of water does your family normally use for cooking?

- | | | |
|------------------------------------|----------------------------------|-----------------|
| 1. River/Lake water | 2. Well/Spring water | 3. Tap water |
| 4. Mineral/Purified/Filtered water | 5. Rainwater | 6. Cellar water |
| 7. Pond water | 77. Other _____ [Please specify] | |

F1: (1) "Water used for cooking" refers to tap water in cities and "clean" water in villages, for example. If the water source is "tap water" (also known as "pipe water"), then do not probe its source.

(2) "Cellar water" refers to water stored in a cellar in areas that are short of water. A cellar is a container in a pot shape (jar or bottle shaped, etc.) built underground to store rain.

(3) If there have been changes in the water source, ask what the most frequently used kind of water was in the last 3 months.

B2 What kind of fuel does your family normally use for cooking?

Interviewer Note: if two or more kinds of fuel are used, record the one used for stir-frying.

- | | | | |
|-------------------|----------------|---------------------------------|-----------------|
| 1. Firewood/Straw | 2. Coal | 3. Gas/Liquid/Natural gas | 4. Solar energy |
| 5. Methane | 6. Electricity | 7. Other [Please specify] _____ | |

F1: Refers to the kind of fuel most frequently used in the last 3 months.

B3 What is the electricity condition at your home? [Select only one response]

- | | | |
|--------------------------------|--------------------------|----------------------------|
| 1. No electricity [Skip to B5] | 2. Frequent power outage | 3. Occasional power outage |
|--------------------------------|--------------------------|----------------------------|

4. Almost no power outage at all

F1: "Electricity condition" refers to whether the family has electricity supplied by an electrical network. To examine whether the household is connected to the electrical network, the interviewer can look around to see if there are lamps in the house.

B301 Estimate the average electricity consumption per month last year: _____ kilowatt hours

B4 Did your family use electricity for production or business last year?

1. Yes 5.No

F1: (In general term): "Electricity for production or business" refers to electricity not used for family lighting or domestic appliances. Any electricity usage related to production is "electricity for production or business". Record "1" even if the household runs a small grocery store at home which cannot be separated from the living space, indicating that electricity is used for production or business.

F1: There are many kinds of electricity usage in China. For example: electricity for residents' living, business, farming, production (including electricity for highly-energy consuming industries, low-energy consuming industries, township, and village enterprises), administration and public institution, and so on. Here we want to investigate the electricity used for production, which is electricity used for enterprises, including family workshops.

B5 What kind of restroom/toilet facilities does your family have? [Show card]

1. Indoor flush toilet 2.Outdoor private flush toilet 3. Outdoor public flush toilet
4. Indoor non-flush toilet 5.Outdoor private non-flush toilet 6. Outdoor public non-flush toilet
7. Other [please specify] _____

F1 (In general term): (1) "Restroom" refers to a toilet or a washing room equipped with a toilet.

(2) If there are several toilets, "restroom" here refers to the most frequently used one.

(3) If two households share a toilet with lock, and each of the two families has a key, then it is treated as a private toilet.

F1 (In technical term): "Restroom" refers to the space equipped with excrement container, bathing facilities or reserved bathing space. The function of a rest room includes bathing, excreting, washing face, making up, and washing other things. The space is called a toilet if it is only used for excreting. Here the restroom includes a toilet.

B501 How far is the toilet from the nearest source of drinking water? _____ meters

F1: "Source of drinking water" refers to the main water source for daily family use such as cooking and drinking.

B6 Where do you dump your trash?

1. Public dustbin/Garbage can 2. Brooks nearby 3. Around the house 4.
Pits

A6 Distance between your house and the nearest high school: _____ meters/li (Chinese miles)/kilometers

F1: "Distance" refers to the distance of the nearest path by which you choose to get to the bus stop, rather than the direct (Euclidean) distance.

A7 How long does it take to travel from your house to the business center of the nearest city (town) by using the daily means of transportation: _____ minutes/hours.

Interviewer Note: Ask the time spent taking the most frequently used means of transportation.

F1: (In general term): "Business center of the nearest city (town)" refers to a "town" in a rural area and a "city" in an urban area. It refers to the busiest and most flourishing commercial place near the household. If there are more than two such places, record the more frequently visited one.

F1: (1) "Business center of a city" refers to a central business district in a city where business is highly concentrated, and commercial services are well established and served to customers both within and beyond the local area. The business street is typically of 800 meters or longer, or the business and commercial activities are concentrated in an area of 25 hectares or larger.

(2) "Business center of a town" refers to a commercial center in a rural area where business is highly concentrated, and commercial services are well established and served to customers both within and beyond the local area. The business street is typically 500 meters or longer, or the business and commercial activities are concentrated in an area 25 hectares or larger.

Part B

B1 What kind of water does your family normally use for cooking?

- | | | |
|------------------------------------|----------------------------------|-----------------|
| 1. River/Lake water | 2. Well/Spring water | 3. Tap water |
| 4. Mineral/Purified/Filtered water | 5. Rainwater | 6. Cellar water |
| 7. Pond water | 77. Other _____ [Please specify] | |

F1: (1) "Water used for cooking" refers to tap water in cities and "clean" water in villages, for example. If the water source is "tap water" (also known as "pipe water"), then do not probe its source.

(2) "Cellar water" refers to water stored in a cellar in areas that are short of water. A cellar is a container in a pot shape (jar or bottle shaped, etc.) built underground to store rain.

(3) If there have been changes in the water source, ask what the most frequently used kind of water was in the last 3 months.

B2 What kind of fuel does your family normally use for cooking?

Interviewer Note: if two or more kinds of fuel are used, record the one used for stir-frying.

- | | | | |
|-------------------|----------------|---------------------------------|-----------------|
| 1. Firewood/Straw | 2. Coal | 3. Gas/Liquid/Natural gas | 4. Solar energy |
| 5. Methane | 6. Electricity | 7. Other [Please specify] _____ | |

F1: Refers to the kind of fuel most frequently used in the last 3 months.

B3 What is the electricity condition at your home? [Select only one response]

- | | | |
|--------------------------------|--------------------------|----------------------------|
| 1. No electricity [Skip to B5] | 2. Frequent power outage | 3. Occasional power outage |
|--------------------------------|--------------------------|----------------------------|

F1: (1) "This Spring Festival" refers to the Spring Festival that passed at the beginning of this year. Generally, January 1st in the Chinese lunar calendar is the "Spring Festival". The duration of Spring Festival, however, refers to the period from the last mid-December to mid-January of the current lunar calendar. More specifically, the duration refers to the time period from the Small New Year Day (December 23th or 24th) to January 15th in the lunar calendar.

(2) "Relatives" refers to blood relations except for lineal descent relatives, such as aunts and uncles.

(3) "Visit" means relatives come to your house to meet in person.

(4) It also counts if you went back to your parents' house in your hometown and your relatives visited your parents.

C2 During this Spring Festival, how many friends visited you? _____

Interviewer Note: All visitors, regardless of giving gifts or not, are counted as long as they paid a visit in person.

F1: (1) "This Spring Festival" refers to the Spring Festival that passed at the beginning of this year. Generally, January 1st in the Chinese lunar calendar is the "Spring Festival". The duration of Spring Festival, however, refers to the period from the last mid-December to mid-January of the current lunar calendar. More specifically, the duration refers to the time period from the Small New Year Day (December 23th or 24th) to January 15th in the lunar calendar.

(2) "Friends" refers to friends of any kind.

(3) Gatherings at restaurants are not counted.

C3 How many allotments of gifts/cash gifts did your family give out last year? _____ allotments

F1: (1) "Gifts" refer to material substances such as cigarettes, alcohol, tea, desserts, fruits, gold or silver jewelries, and so on.

(2) "Cash gifts" refers to cash and securities. Money given to children as the Spring Festival gift is also counted.

C301 What was the total value of the gifts/cash gifts given out last year? _____ yuan

F1: Estimate the value according to the market price at the time of giving out.

C4 Is there a genealogy of your family?

1. Yes

5. No

F1 (In general term): (1) "Family" refers to the relationships among families with the same surname and tied together through blood relationships.

(2) "Genealogy" is a name list or family tree showing the relationships among family members and ancestors.

F1 (In technical term): (1) "Family" is a population group composed of family units according to the blood relationships of the male members. It is a patriarchal system consisting of smaller families that have relatively close blood and economic relationships but do not live together or share foods and wealth.

(2) "Genealogy" (*zupu*) is also called *zongpu*, *jiachuan*, *fangpu*, *jiacheng*, *pudie*, *puxi* and so on in Chinese. It is a biographic record of the migration and development of the

family history and the figures of the family. A complete genealogy consists of the name of the genealogy, preface, explanatory notes, origin of the surname, genealogy investigation, genealogy chart, biography, ancestral temple, tomb, rules and standards, the bestowal from the emperor or the royal court, pictures of the ancestors, literature of the family members, name of the editor, and the code number of each genealogy.

C5 Last year, did your family participate in ancestor worship/tomb-sweeping activities?

1. Yes 5. No

F1: "Ancestor worship/tomb-sweeping" is a practice of ancestor memorial ceremony.

F1: Since the traditions differ across regions, ancestor worship/tomb-sweeping activities differ in the form. Some visit the ancestors' tombs and others go to the ancestral temple. Some put the memorial tablets in proper order in the main hall at home, display sacrificial offerings, and then worship the ancestors in order of seniority. During the worship ceremony among Han people, they usually cook fish, meat and other dishes in bowls showing a luxurious life. Around the Qingming Festival, descendants go to repair the tomb, known as tomb-sweeping.

C6 Last month, did your family have any of the following contacts with your neighbors? [Select all that apply]

1. Entertainment/dine together 2. Give food or gifts 3. Help each other
4. Pay a visit 5. Chat 77. Other [specify] _____
78. None of these [Skip to C7]

F1: "Entertainment" includes playing Mahjong or cards, reading newspapers, listening to radio, watching TV and so on.

"Chat" means just talking without any other activity. It only includes face-to-face chatting, whereas chatting on the Internet or over the phone does not count.

C601 Last month, how often did your family "choice of C6" with your neighbor?

1. Almost every day 2. 2-3 times a week 3. 2-3 times a month 4. Once a month

C7 Last month, did your family have any of the following contacts with your friends and relatives? [Select all that apply]

1. Entertainment/dine together 2. Give food or gifts 3. Help each other
4. Pay a visit 5. Chat 77. Other [specify] _____
78. None of these [Skip to D7]

F1: "Entertainment" includes playing Mahjong or cards, reading newspapers, listening to the radio, watching TV and so on.

"Chat" means just talking without any other activity. It only includes face-to-face chatting, whereas chatting on the Internet or over the phone does not count.

C701 Last month, how often did your family "choice of C7" with your neighbor and relatives?

1. Almost every day 2. 2-3 times a week 3. 2-3 times a month 4. Once a month

Part D

D1 The house in which your family is currently living is: [Show card; select only one response]:

1. Property right solely owned by the family [Continue to D101]
2. Joint property right with *danwei* (work unit) [Skip to D110]
3. Rented [Skip to D120]
4. Provided by the government for free [Skip to D2]
5. Provided by *danwei* for free [Skip to D2]
6. Provided by parents/children [Skip to D2]
7. Borrowed from friends or relatives [Skip to D2]
77. Other [Please specify] _____ [Skip to D2]

F1: (1) "Property right solely owned by the family" refers to the situation that the family has "the House Proprietary Certificate, Land Certificate, and the Contract Tax Payment Certificate". For rural families, self-built houses are treated as "property right solely owned by the family".

(2) "Joint property right with *danwei*" refers to the situation that the residents paid for part of the property rights and the *danwei* paid the rest. If the residents do not have a Land Certificate, it means that they have "Joint property right with *danwei*". Most of these houses are in the process of reform and the *danwei* reserves the Land Certificate, meaning "Joint property right".

D101 Who is the registered owner of the house? Family member names [Use codes from T2]

1. _____
2. _____
3. _____

Interviewer Note: If there is more than one registered owner, record according to the order on the "House Proprietary Certificate".

D102 Did you build the house yourself, or buy it?

1. Built [Continue to D103]
5. Bought [Skip to D105]

D103 In which year was the house built? _____

D104 Construction cost (including decoration cost) at that time: _____ ten thousand yuan.

[CAPI] Skip to D2 after answering D104.

D105 In which year was the house purchased? _____

D106 Total price at that time? _____ ten thousand yuan.

D107 Was it originally owned by *danwei*?

1. Yes
5. No

[CAPI] Skip to D2 after answering D104.

D110 Who is the registered owner of the house? _____

[CAPI] Use codes from T2

D111 In which year was the house purchased? _____

D112 Total price at that time? _____ ten thousand yuan.

[CAPI] Skip to D2 after answering D112.

D120 From whom do you rent the house?

1. Government 2. Real estate agency 3. *Danwei*
 4. Relative or friend 5. Private owners 6. Housing administrative bureau
 77. Other [please specify] _____

D2 The building area of your house is: _____ square meters.

F1: "Building area" refers to the area available for residents' living. The method of calculation is different according to the floor, structure and so on, and should be based on the "House Proprietary Certificate". Self-built houses can be measured using the following formula: Building area of the house = length * width * number of floors. The unit of measurement is the square meter.

D3 In which year did your family move into this house? _____

F1: "Move into" refers to actually living in.

D4 Estimate the current value of your house last month: _____ ten thousand yuan.

F1: "Current value" is the total amount received if the house is sold according to the current market price.

D5 If you had rented your house out last month, how much rent could you have received? _____ yuan

Interviewer Note: (1) Ask the payment for renting the whole house.

(2) Ask the payment for renting out the house last month rather than right now.

D6 What type is your family's house? [Show card]

1. Apartment in a building 2. Bungalow 3. Quadrangle courtyard 4. Villa
 5. Condominium villa 6. Low-rise house 77. Other [Please specify] _____

F1: (1) "Apartment in a building" refers to a home in a residential building with one or more units.

(2) "Bungalow" refers to a cottage built with straw, bricks and adobe.

(3) "Quadrangle courtyard" refers to a square-shaped, one-floor house. If a house is square shaped, but there are two or more floors on one or more sides, it is called a "Low-rise house".

(4) "Villa" refers to a one- or multiple-floor independent building bought or built by the urban residents in a villa district.

(5) "Condominium villa" is different from an apartment in a building and a villa. It has an independent entrance and 1-4 floors. The residents have separate houses built in an integral building structure shared with their neighbors.

(6) "Low-rise house" refers to a self-build or purchased building with 2-7 floors for a family's own residence.

D601 How many floors does your apartment building have? _____ Floors

Interviewer Note: Basement floor does not count.

D602 On which floor does your family live? _____ Floor

Interviewer Note: If the family lives in the basement, use negative numbers: -1 as 1st floor underground, -2 as 2nd floor underground, etc.

D7 Does your family have other houses with the property rights elsewhere?

1. Yes [Continue to ask] 2. No [Skip to D8]

F1: "Elsewhere" refers to any location other than this house. The property rights should belong to the family members. The house that currently belongs to the *danwei* but will belong to the family member in several years should be counted.

D701 How many other houses does your family have? _____

D702 The total building area of other houses: _____ square meters

F1: "Building area" refers to the area available for residents' living. The method of calculation is different according to the floor, structure and so on, and should be based on the "House Proprietary Certificate". Self-built houses can be measured using the following formula: Building area of the house = length * width * numbers of the floor. The unit of measurement is the square meter.

D703 What is the total current value of the houses? _____ ten thousand yuan.

F1: "Current value" is the total amount of value received if the house is sold according to the current market price.

D8 Does your family have any of the following difficulties in housing? [Show card; limited to three responses]

1. Children over age 12 live in the same room with the parents.
2. Family members of three generations live in the same room.
3. Children of different genders over age 12 live in the same room.
4. Beds are laid out at night and folded up during the daytime.
5. Beds are laid out in the living room.
77. Other difficulties [please specify] _____
78. None of the above

Part E

E1 Did anyone in your family leave home to work outside last year?

1. Yes
3. No [Continue to E2]
5. Not married yet last year [Continue to E2]

F1: (1) "Outside" means working in a place that is not where the person's household is registered or where the household's permanent address is. In rural areas, it usually refers to working in a different county. In urban areas, it usually refers to working in a different city.

(2) "Work outside" means that people do not migrate permanently to work in a different county from where their families reside, as in the case of rural migrant workers.

[CAPI] If E1=1, skip to the [Work Outside Home Module], otherwise continue to E2.

E2 What type of government subsidy is your family entitled to? [Select all that apply]

1. Poor families receiving the basic living allowances [Continue to E201]
2. Relatives of a military member [Skip to E202]
3. Relatives of a martyr [Skip to E202]
4. Relatives of a disabled person [Skip to E202]
78. None of the above [Skip to E3]

E201 The main reason for your family's poverty is the following:

Interviewer Note: If there is more than one reason, please select the most important one.

1. Lack of labor force 2. Poor natural conditions or natural disasters 3. Disease or injury
4. Laid off/Unemployment 5. Failure in investment 77. Other [please specify] _____

E202 How many subsidies did your family receive from any level of government last year (including material goods and money)? _____ yuan

E3 Is your family involved or partly involved in any non-agricultural industry?

1. Yes 5. No [Continue to E4]

[CAPI] If E3=1, skip to the [Non-Agricultural Business Module], otherwise continue to E4

E4 Did your family rent out houses last year?

1. Yes 5. No [Skip to E5]

F1: "Rent out" means rent the house to other people and receive a rental payment.

E401 The income from housing rent last year was _____ yuan

Interviewer Note: Record the actual income from renting out the house. If the house was rented out for only three months last year, record the rental income from those three months.

E5 Did your family rent out land or other means of production last year?

1. Yes [Continue to E501] 5. No [Skip to E6]

F1: "Means of production" refers to the products used for production and construction, including industrial and agricultural means of production.

E501 The total income from renting out land or other means of production last year was _____ yuan.

E6 Did your family rent out other things last year?

1. Yes [Continue to E601] 5. No [Skip to E7]

E601 The income from renting out other things last year was _____ yuan.

E7 Did your family sell any property (household items) last year?

Interviewer Note: Agricultural products do not count.

1. Yes [Continue to E701] 5. No [Skip to E8]

Interviewer Note: Don't count agricultural products.

E701 The total income from selling properties was _____ yuan.

E8 Has your family ever experienced demolition/relocation?

1. Yes [Continue to E801] 5. No [Skip to E9]

F1: "Demolition/relocation" means that the development and construction unit demolishes the housing owned by citizens, legal persons or other organizations according to urban planning approved by a certain administrative authority. The citizens, legal persons or other organizations should be compensated and relocated based on the open market price of their housing.

E801 In which year was the house demolished? _____

E802 The relocation compensation was _____ yuan.

E9 Has any land owned by your family been requisitioned?

1. Yes [Continue to E901] 2. No [Skip to F1]

F1: "Land requisition" means that in the public interest, the government transfers the land collectively owned by the farmers into state-owned land after providing group and individual compensation to the farmers according to the legal authorities and procedures. Land requisition is an important measure to ensure the land provision for constructing public and social welfare facilities.

E901 In which year was the land of your family requisitioned? _____

E902 What was the area of the requisitioned land? _____ mu

E903 The compensation for requisitioned land was _____ yuan.

Part F

F1 Did your family save money last year?

Interviewer Note: Regardless of whether or not the family had deposits at the end of last year, record "1" as long as the family deposited any money last year.

1. Yes 5. No

F2 The total amount of deposit at the end of last year was _____ yuan

Interviewer Note: If there was no deposit, record "0".

F1 (In general term): "Deposit" refers to money saved in a bank or at other organizations/by individuals that pay interest.

F1 (In technical term): "Deposit" is a credit activity in which banks or other credit institutions receive monetary capital and pay a certain amount of interest to the depositors based upon the property, type, and duration of the deposit. Here the amount of deposit should be a positive number, and do not distinguish different types of deposit when calculating interest. Ask for the total interest of the deposit.

[CAPI] If F2="0", skip to F3, otherwise continue to F201.

F201 Last year, the interest earned from your family's deposit was _____ yuan

F1 (In general term): "Deposit" refers to money saved in a bank or at other organizations/by individuals that pay interest.

F1 (In technical term): "Deposit" is a credit activity in which banks or other credit institutions receive monetary capital and pay a certain amount of interest to the depositors based upon the property, type, and duration of the deposit. Here the amount of deposit should be a positive number, and do not distinguish different types of deposit when calculating interest. Ask for the total interest of the deposit.

F3 Did your family have any of the following financial products last year? [Select all that apply]

1. Stocks 3. Capital funds 5. Securities 7. None of these [Skip to F4]

F1 (In general term): "Stocks, capital funds and securities" refer to the portfolios/securities purchased in a domestic or foreign stock market.

F1 (In technical term):(1) "Stock" means a certificate issued by the limited liability company which proves that the stockholder enjoys the benefits and takes responsibility for the stock he or she holds. Stock is closely related to share of the stock. Shares of stock are the content of the stock, and a stock is the manifestation of shares of stock.

(2) "Capital fund" refers to a financial organization established by the investors according to the fixed earning targets based on their conditions. It usually invests in stocks and securities in order to get high profits.

(3) "Security" refers to negotiable securities issued by the government or enterprises in order to receive long-term funds. It also refers to certificates issued to investors, proving a debt relationship when the government, financial organizations, enterprises and other organizations borrow money from the society and promise to pay interest according to interest rates and refund the principal according to the agreement. The nature of security is a certificate of debt that is legally valid. It establishes a debt relationship between the purchaser and the issuer. The issuer owes a debt to the investor.

F301 By the end of last year, the total principal of "choice of F3" was _____ yuan.

F1: "Total principal" refers to total amount of investment by the end of last year.

F302 By the end of last year, the market value of "choice of F3" was _____ yuan.

F1: "Market value" refers to the value that can be gained according to the current market price if sold.

F4 Did your family have pension/social security/government subsidy as sources of income last year?

1. Yes 5. No [Skip to F5]

F401 The total amount of income from pension/social security/government subsidy was _____ yuan;

F5 What was "**** (Family member)'s" total earnings last year (including salary, bonus, subsidy, and interest), excluding pension/social security/welfare/government subsidy? _____ yuan.

Interviewer Note: (1) Exclude agricultural income. If the respondent engaged in agricultural work only, record "-8".

(2) For respondents without any income (such as students), record "0".

[CAPI] If F5 = "CTRL+D", "CTRL+R", continue to F501, otherwise interview the next person.

F501 What was the approximate amount of "****Family member's" earnings last year (including salary, bonus, subsidy, and interest), excluding pension/social security/welfare/government subsidy?

(Approximate)

(2500/5000/7500/12000/18000/27000/40000) /60000/90000/140000/210000/320000/480000 yuan

F502 What was the accurate amount of "****Family member's" total earnings last year (including bonus, subsidy, and interest), excluding pension/social security/welfare/government subsidy? _____ yuan

[CAPI] If all the family members have F5 = "-8", skip to F7, otherwise, continue to F6.

F6 Last year, what was the approximate amount of your family's total income (including salary, bonus, subsidy, and interest), excluding pension/social security/welfare/government subsidy? (Approximate)

(2500/5000/7500/12000/18000/27000/40000) /60000/90000/140000/210000/320000/480000 yuan

[CAPI]If F6 is in a closed interval, continue to F601 within the range of the interval.

F601 Last year, what was the accurate amount of your family's total income (including salary, bonus, subsidy, and interest), excluding pension/social security/welfare/government subsidy? _____ yuan

F7 Besides the sources of income mentioned above, did your family have any other non-wage or agricultural production income last year?

Interviewer Note: "Sources of income mentioned above" include rental income, demolition compensation, salary, and pension and so on. The "agricultural production income" here refers to the net income from agricultural production.

1. Yes 5. No [Skip to F8]

F701 Last year, what was the amount of the non-wage and agricultural production income? _____ yuan

Interviewer Note: It refers to the net income from agricultural production.

F8 What was the approximate amount in cash equivalent to all the monetary /material gifts your family received last year? _____ yuan

F1: "Approximate amount in cash equivalent" refers to the amount of money needed to buy the gifts.

Part G

G1 At the end of last year, the total amount of all compensable insurances your family could have received was _____ yuan/10,000.

Interviewer Note: "Amount of all compensable insurances" refers to the sum of the highest reimbursements from all the insurances that the family could have received according to the insurance plans, rather than the actual compensation that was reimbursed.

F1: (1) "Insurance compensation" refers to the insurance compensation bought by the family or family members directly or indirectly. The ownership of the insurance compensation belongs to the family or family members.

(2) "Amount of compensable insurance" includes both the part that has already been reimbursed and the remaining part yet to be reimbursed.

G2 At the end of last year, the total amount of all debts owed to you and not yet paid was _____ yuan

G3 At the end of last year, the total estimated market value of your family's collections was _____ yuan

F1: "Collection" includes calligraphies, paintings, antiques, jades, jewelries and so on.

G4 At the end of last year, the total estimated market value of other assets, excluding the ones mentioned above, of your family was _____ yuan/10,000 yuan.

Interviewer Note: "Assets mentioned above" includes real estate, rent, income from selling properties, demolition compensation, deposits, stocks, capital funds, securities, pensions and other government subsidies, wage, cash/material gifts, insurance compensation, unpaid debts owed to the family, collections and so on.

F1: "Other assets" refers to all kinds of properties, resources, creditor's rights and other rights measured in

currency, such as family-owned companies, groceries, cars, electronic appliances, farming machines and so on.

Part H

H1 Among all the goods purchased (such as furniture, electronic appliances, toys, etc.) last year, the most expensive one cost _____ yuan.

Interviewer Note: Neither car nor house is included.

H2 Has your family borrowed money or taken a loan in any of the following ways last year? [Select all that apply]

1. Bank (including credit union) 3. Relatives/Friends 5. Private loan
77. Other [please specify] _____ 78. None of these [Skip to H3] _____

F1: "Private loan" refers to loans between individuals, between individuals and enterprises, and between enterprises. It does not involve any legal financial organizations. The question here concerns loans from non-financial organizations.

H201 Last year, the loan from "choice of H2" of your family was for _____ yuan

H202 Last year, the loan was used for

1. Building/buying a house 2. Education 3. Buying durable goods
4. Medical care for family members 5. Family's daily expenditures
77. Other [please specify] _____

F1: "Durable goods" refer to products with a unit price above 1000 yuan and a natural service life of 2 years or more.

H203 Last year, the amount of the loan used on "choice of H202" was for _____ yuan

Interviewer Note: The amount of loan used to buy the item.

H3 Now, we would like to learn about your family's daily expenditures last month. (Unit: yuan)

[Show card]

Interviewer Note: If there was no expenditure on the item, record "0".

Types of Daily Family Expenditure	Monthly Expenditure (yuan)
H301 Last month, the expenditure on food F1: "Food" refers to foods purchased by the family, items which are digestible and absorbable through the human digestive system and satisfy human body's physical and nutrient demands. Thus, these items include ordinary foods as well as food additives,	

flavorings, pigments, preservatives, oil, drinks and so on.	
H302 Last month, the expenditure on daily used commodities and necessities F1: "Daily used commodities and necessities" refers to consumer goods such as soap, shampoo, mops, towels and so on.	
H303 Last month, the expenditure on transportation (including expenditures for car maintenance) Interviewer Note: Transportation fees for tourism do not count. F1: "Expenditure on transportation" refers to daily transportation fees, including car maintenance, petrol/gas/electrical fueling costs, and bus ticket fees.	
H304 Last month, the expenditure on communication F1: "Expenditure on communication" refers to service fees for using telephones, mobile phones, the Internet and postal mail.	
H305 Last month, the expenditure on family member support F1: "Expenditure on family member support" refers only to costs associated with supporting the elderly, such as living expenses and the cost of nursing home care.	
H306 Last month, the expenditure on the home mortgage	
H307 Last month, the expenditure on the car mortgage	
H308 Last month, the expenditure on other mortgages	
H309 Last month, the expenditure on renting a house (not including mortgages)	

H4 Now, we would like to learn about your family's special expenditures last year. (Unit: yuan)

[Show card]

Interviewer Note: If there are no expenditures corresponding to the options, record "0".

Types of Family Expenditure	Total amount of the expenditure last year (yuan)
H401 Last year, the expenditure on electricity	

H402 Last year, the expenditure on medical care F1: "Expenditure on medical care" includes costs for outpatient and inpatient care (e.g., surgery, injection, X-rays, and hospitalization) and other types of health care (such as costs of massage, and learning qigong or Tai Chi)	
H403 Last year, the expenditure on clothing F1: "Expenditure on clothing" refers to the cost of clothing for the family.	
H404 Last year, the expenditure on education	
H405 Last year, the expenditure on culture, entertainment and leisure activities	
H406 Last year, the living expense (community management, heating cost, etc.; do NOT count rent/mortgage) F1: "Living expense" refers to the cost related to the family's housing. It includes costs of housing maintenance and decoration, hiring workers to maintain and decorate the house, and supplies of water, electricity and fuel.	
H407 Last year, the expenditure on miscellaneous goods and services F1: "Expenditure on miscellaneous goods and services" refers to the cost of non-consumptive goods and services, such as sofa, chairs and pipe repairing.	
H408 Last year, the expenditure on purchasing or building a house Interviewer Note: The expenditure on the home mortgage is not included.	
H409 Last year, the expenditure on commercial insurance	
H410 Last year, the expenditure on your family's own marriages and funerals	
H411 Last year, the expenditure on other items F1: "Other items" include money mailed or brought to family members who were away from home, interest expenses, fines, land use expenses and other expenses paid. Deposits saved and loans are not included.	

H5 Last year, did your family donate money or material goods to any institution or individual?

1. Yes 5. No [Skip to H503]

H501 How many times did your family donate last year? _____

H502 What was the total amount of the money or material goods your family donated last year?
_____yuan

H503 Did your family donate money or material goods to the "Earthquake Relief" after the 2008 Wenchuan Earthquake in Sichuan?

1. Yes 5. No [Skip to H6]

H504 What was the total amount of the money or material goods your family donated to the "Earthquake Relief"? _____yuan

H6 The total expenditure of your family last year was [Approximate]: _____

(2500/5000/7500/12000/18000/27000/40000/60000/90000/140000/210000/320000/480000 yuan)

F1: "Total expenditure" refers to the total amount spent by the family and its members for all the items above, including clothing, food, housing, transportation, marriage, funeral, entertainment, education, health, insurance, loan to others, home mortgage, and all living costs. Business costs are not included.

H601 How much was the total expenditure of your family last year? _____yuan

Part J

J1 Does your family own a car?

1. Yes 5. No [Skip to J2]

F1: "Own a car" means that the family has the property rights for an automobile with three or more wheels that is used to transport passengers and/or cargo.

J101 How many cars does your family have? _____

J102 In which year did you buy your first car? _____

J103 How much did your first car cost? _____yuan

J2 Does your family own a motorcycle?

1. Yes 5. No [Skip to J3]

J201 How many motorcycles does your family have? _____

J202 How much did these motorcycles cost in total? _____yuan

J3 Does your family own a tractor?

1. Yes 5. No [Skip to J4]

J301 How many tractors does your family have? _____

J302 How much did these tractors cost in total? _____yuan

J4 How many TVs does your family have? _____

Interviewer Note: If the family does not have a TV, record "0".

Part K

Interviewer Note: Agricultural work is a general concept, including farming, forestry, pasturing, fishing, sideline, raising crops, raising livestock and irrigation. In this section, it includes all the occupations with the occupation code 5000.

K1 Last year, did your family engage in any agricultural work?

1. Yes 5. No [Skip to Z1]

F1: "Agricultural work" is a general concept, including farming, forestry, pasturing, fishing, sideline, raising crops, and raising livestock.

K2 Did your family own/manage any of the following types of land for business? [Select all that apply]

Interviewer Note: (1) "Own" refers to land distributed by the village. The family owns the land if it is rented to others and the family have the land.

(2) "Manage" refers to the land distributed by the village, rented, bought or from other sources.

(3) Record "1" if the land is used with paddy-upland rotation.

1. Paddy field 2. Dry land 3. Woodland 4. Orchard 5. Grassland
6. Pond 7. None of the above [Skip to K3]

K201 How much "choice of K2" did you have? _____ mu

Interviewer Note: If none, record "0"

F1: "Have" means the land distributed by the village.

K202 How much "choice of K2" did you manage? _____ mu

Interviewer Note: If none, record "0"

K203 How much "choice of K2" did you rent? _____ mu

Interviewer Note: If none, record "0"

K204 How much "choice of K2" did you sublease? _____ mu

Interviewer Note: If none, record "0"

K3 The gross income of your family earned from agriculture, including farming, forestry, pasturing, fishing and sideline last year: _____ yuan.

F1: "Gross income" means income earned from selling agricultural products.

K4 The total cost of agricultural work (including farming, forestry, pasturing, fishing and sideline) of your family last year was _____ yuan.

F1: "Total cost of agricultural work" includes the costs of material service and labor force. The cost of material service refers to all kinds of expenditures on means of production consumed in the process of agricultural work, including direct costs such as those for seeds, fertilizers, pesticides, irrigation, and operating machines and indirect costs, including fixed assets depreciation, tax, insurance, management and sales. The cost of labor force refers to the costs of family labor and hired labor.

K401 Last year, what did your family spend on chemical fertilizers and pesticides? _____ yuan.

K5 The net income of your family from farming, forestry, pasturing, sideline and fishery last year was _____ yuan.

Interviewer Note: If the family suffered a deficit, record a negative number.

K6 Last year, did your family grow any of the following agricultural products?

1. Rice
2. Wheat
3. Corn
4. Cotton
5. Forestry products/ Forestry sideline products
78. None of these [Skip to K7]

K601 Last year, the total output of "choice of K6" was _____ 0.5kg/kg/fang

K602 Last year, the total amount of "choice of K6" sold was _____ 0.5kg/kg/fang

K603 Last year, the total sales income from "choice of K6" was _____ yuan.

K604 Last year, the total net income from "choice of K6" was _____ yuan.

Interviewer Note: If the family suffered a deficit, record a negative number.

K7 Last year, did your family raise any of the following livestock or run a fishery? [Select all that apply]

1. Pig
2. Cow
3. Sheep
4. Fish

77. None of these [Skip to Z1]

K701 Last year, the total output of "choice of K7" was _____ 0.5kg/kg/heads

F1: "Total output" refers to the total amount of all the agricultural products above produced last year.

K702 Last year, the total amount of "choice of K7" sold was _____ 0.5kg/kg/heads

K703 Last year, the total sales income from "choice of K7" was _____ yuan.

K704 Last year, the total net income from "choice of K7" was _____ yuan.

K8 Were the livestock raised in a stockade?

1. Yes
5. No [Skip to Z1]

F1: (1) "Livestock" refers to cloven-hoofed domestic animals such as cows, horses, sheep and pigs.

(2) "Raised in a stockade" means raising the livestock in a stockade or in a place surrounded by fences.

K801 What was the direct (Euclidean) distance from the stockade of pigs (cow, sheep) to the kitchen?

_____ meters

F1: "Direct (Euclidean) distance" refers to the distance between two points.

K802 What was the direct (Euclidean) distance from the stockade of pigs (cow, sheep) to the nearest

source of drinking water? _____ meters

F1: (1) "Nearest source of drinking water" refers to the main source of drinking water of the interviewed family.

(2) "Direct (Euclidean) distance" refers to the distance between two points

Part Z

Interviewer Note: The following questions are answered through your observation without asking the respondent.

Z1 Who was the main respondent that completed the family questionnaire? _____ [Record one respondent only]

Interviewer Note: Select the most important respondent.

Z101 Who else answered the family questionnaire? _____ [Limited to two respondents]

Interviewer Note: Select two relatively important respondents.

Z102 Besides the family members, who else was present during the interview? [Select all that apply]

1. Friends/relatives 2. Supervisors 3. Neighbors 4. Village/Residential community committee cadres

77. Other [Please specify the identity] _____ 78. No one else

Z201 The living condition of the interviewed family is _____ in the community:

Worst--1--2--3--4--5--6--7--> Best

Z202 Cleanliness of respondent's home:

Very messy--1--2--3--4--5--6--7--> Very Clean

F1: Family in this family questionnaire means the group of family members who live and eat together.

Z203 Respondent's emotional outlook:

Very negative--1--2--3--4--5--6--7--> Very positive

F1: Family in this family questionnaire means the group of family members who live and eat together.

Z204 Relationship between family members:

Distant--1--2--3--4--5--6--7--> Very Close 79. NA -3. Cannot judge

F1: Family in this family questionnaire means the group of family members who live and eat together.

Z205 Relationship between young and old:

Authoritative --1--2--3--4--5--6--7--> Equal 79. NA -3. Cannot judge

Z206 Gender relations:

Authoritative --1--2--3--4--5--6--7--> Equal 79. NA -3. Cannot judge

Z301 Respondent's comprehension capability:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z302 Respondent's health status:

Very Poor --1--2--3--4--5--6--7--> Very Good

- Z303 Neatness/cleanliness of respondent's clothing:
Very Poor --1--2--3--4--5--6--7--> Very Good
- Z304 Respondent's appearance:
Very Poor --1--2--3--4--5--6--7--> Very Good
- Z305 Respondent's Mandarin fluency:
Very Poor --1--2--3--4--5--6--7--> Very Good
- Z306 Respondent's level of cooperation during the interview:
Very Poor --1--2--3--4--5--6--7--> Very Good
- Z307 Respondent's intelligence:
Very Low --1--2--3--4--5--6--7--> Very High
- Z308 Respondent's courteousness:
Very Poor --1--2--3--4--5--6--7--> Very Good
- Z309 Respondent's interest in the interview:
Very Low --1--2--3--4--5--6--7--> Very High
- Z310 Respondent's suspicion of the interview:
Very Low --1--2--3--4--5--6--7--> Very High
- Z311 Reliability of respondent's response:
Very Low --1--2--3--4--5--6--7--> Very High
- Z312 Respondent's language ability with respect to self-expression:
Very Weak --1--2--3--4--5--6--7--> Very Strong

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Chinese Family Panel Study

Adult Questionnaire

2010 Interview

ISSS logo
Institute of Social Science Survey, Peking University

Part A

A1 Your date of birth is ____ year ____ month ____ day

A101 Your birth weight: ____ [Record to one decimal place]

A102 Where were you born? _____ Province _____ City _____ County (District)

A2 What is your current household registration status?

Interviewer Note: if the respondent's nationality is not China, record "79 Not applicable".

1. Agricultural 3. Non-agricultural 5. Not registered [Skip to A3]

79. Not applicable [Skip to A3]

F1: (1) "Not registered" means the child has not registered yet and his/her nationality is not foreign.

(2) "Not applicable" means non-Chinese nationality. The parents are Chinese citizens, but the child was born in a foreign country and entitled to foreign citizenship.

A201 What is the place of your current household registration?

_____ Province _____ City _____ County/District

A3 Was the county/district where you lived when you were 3 years old the same as that where you were born?

1. Yes [Skip to A302] 5. No

A301 The place of residence when you were 3 years old:

_____ Province ____ City _____ County (District)

A302 What was your household registration status when you were 3 years old?

Interviewer Note: if the respondent's nationality was not Chinese when he/she was 3, record "79 Not applicable".

1. Agricultural 3. Non-agricultural 5. Not registered 79. Not applicable

F1: (1) "Not registered" means the child has not registered yet and his/her nationality is not foreign.

(2) "Not applicable" means non-Chinese nationality. The parents are Chinese citizens, but the child was born in a foreign country and entitled to foreign citizenship.

A303 By age of 3, the longest period when your father was living away from you was _____ weeks/months/years.

A304 By age of 3, the longest period when your mother was living away from you was _____ weeks/months/years.

A4 Was your place of household registration at birth the same as that when you were 12 years old?

1. Yes [Skip to A402] 5. No

A401 The place of residence when you were 12 years old:

_____ Province ____ City _____ County (District)

A402 What was your household registration status when you were 12 years old?

Interviewer Note: if the respondent did not hold Chinese citizenship, then it is NA, and please enter "79".

1. Agricultural 3. Non-agricultural 5. Not registered 79. Not applicable

F1: (1) "Not registered" means the child has not registered yet and his/her nationality is not foreign.

(2) "Not applicable" means non-Chinese nationality. The parents are Chinese citizens, but the child was born in a foreign country and entitled to foreign citizenship.

A403 When you were ages 4-12, the longest period when your father was living away from you was _____ weeks/months/years.

A404 When you were ages 4-12, the longest period when your mother was living away from you was _____ weeks/months/years.

A5 Your ethnicity is: _____.

Interviewer Note: Based on the information from the household registration.

[CAPI] If the respondent's year of birth ≥ 1978 according to A1, skip to A7.

A6 What was your family's classification during the Cultural Revolution? _____ [Show Card]

A7 Are you a member of the following organizations? [Show Card] [Select all that apply]

Interviewer Note: School clubs do not count.

1. Communist Party of China
2. Democratic parties
3. County/District or higher level People's Congress (delegate)
4. County/District or higher level Chinese People's Political Consultative Conference (member)
5. Labor Unions
6. China Youth League
7. All-China Women's Federation
8. Federation of Industry and Commerce
9. Informal networking organizations (community, network salon, etc.)
10. Religious groups
11. Associations of private enterprises/entrepreneurs
12. Associations of individual workers
77. Other formally registered social groups (such as industry/academic associations, fellowship societies, leagues, etc.)
78. None of the above

F1 (In general term): "Organizations" refers to formally registered government agencies, parties, leagues, religious groups, associations, etc.

F1 (In technical term): (1) Organization is a cooperative system that involves more than two individuals who coordinate with each other. The basic elements of an organization include common goals, willingness to cooperate, and communication of information. Families, enterprises, governments, and social groups are basic forms of organization, and serve as life spaces upon which individuals depend for life and self-fulfillment.

(2) "Democratic parties" are the eight legally recognized political parties in the People's Republic of China, and constitute the Chinese People's Political Consultative Conference, including the following: Revolutionary Committee of the Chinese Kuomintang, China Democratic League, China Democratic National Construction Association, China Association for Promoting Democracy, Chinese Peasants' and Workers' Democratic Party, Zhi Gong Party, Jiusan Society, and Taiwan Democratic

Self-Government League.

(3) "Labor union" is an organization of workers in enterprises.

(4) "Private enterprises" are privately owned corporations and firms, including privately owned companies, private corporations, and private limited liability companies.

(5) "Individual workers" are the owners and employees in individual businesses, freelancers, and other individuals who belong to this group in accordance with laws and regulations.

(6) "Delegates in National People's Congress" are those who are elected through a multi-tiered representative electoral system as the delegates of the people to implement their rights of state administration.

(7) "Networking organizations" are organizations for social networking.

(8) "Salon" is a cozy place where the host and other participants discuss topics, express opinions, communicate thoughts and gain knowledge.

(9) According to the regulation issued by the State Council in 1989, "social groups" are non-profit autonomous organizations which are established for certain common goals on a voluntary base.

A701 In which year did you join the Communist Party of China? _____

Part B

B1 How many siblings do you have (including those who have passed away)? _____

Interviewer Note: (1) If none, record "0". (2) Do not count the respondent him/herself.

F1: (1) "Siblings" are brothers and sisters by blood or law

(2) Include the siblings who have passed away.

[CAPI] If "0", skip to B4.

B2 How many of your siblings live with you? _____

B3 What are the names of the siblings who do not live with you (including those who have passed away)?

_____, _____, _____

Interviewer Note: Fill in the blanks one by one.

B301 "**** (B3 name)" is your ()?

1. Older brother 2. Older sister 3. Younger brother 4. Younger sister

B302 How is "**** (B3 name)" related to you?

1. Same father and mother 2. Same father
3. Same mother 4. No blood relation

B303 What is "****"'s date of birth? ____ year ____ month ____ day; Zodiac ____ Age ____

Interviewer note:

- (1) Year=4 digits, month=2 digits, day=2 digits.
- (2) If the month is unknown, record "January"; if the date is unknown, record "1st" and make a note.
- (3) If only the age, but not the date of birth is known, enter "CTRL+D", and record the zodiac and age.

B304 Is "****" still alive?

1. Yes [[Skip to B307](#)]
2. No

B305 How old was "****" when he/she died?

B306 "****"'s cause of death?

[CAPI] Use the "Cause of Death Table"

[CAPI] After answering B306, start with B301 again for the next sibling.

B307 "****"'s marital status is ____ [[Show card](#)] [[List of Marital Status](#)]

1. Never married
2. Married
3. Cohabitation
4. Divorced
5. Widowed

B308 "****"'s highest educational attainment level is ____ [[Education Level Choices List](#)]

1. Illiterate/Semi-literate
2. Primary school
3. Middle school
4. High school
5. 2- or 3-year college
6. 4-year college/Bachelor's degree
7. Master's degree
8. Doctoral degree

B309 "****"'s occupation is ____

Interviewer Note;

- (1) If the respondent is a child, record "-8 Not applicable".
- (2) If more than one occupation, record the one that takes the most time.
- (3) Record detailed information on the occupation, such as department, job responsibility, position, and title.

Examples:

Chinese language teacher and grade leader of ××Primary School

Accountant of ××Company

Director of xx workshop at ××Factory

Nurse from xx hospital in ××County

Farmer who grows rice in the local village

B310 Does "****" hold an administrative/management position?

1. Yes
5. No

B311 What is "****"'s administrative/management position? _____

F1: "Administrative/management position" is the position in an organization which deals with management, for example, chief, secretary of a department, manager, etc.

B312 "****"'s residence? [Show card] [List of Residence]

1. Same neighborhood/Next door
2. Same village/street
3. Different village/street in the same county/district
4. Different district in the same city
5. Different county in the same province
6. Different province
- Province _____
7. Outside of Mainland China (including Hong Kong, Macau, and Taiwan)

F1: "Residence" is the relative geographic location to that of the respondent's family

B401 What is your father's cause of death?

[CAPI] Skip to B501 after answering B401.

B411 Who does your father live with? [Select all that apply]

B501 What is your mother's cause of death?

[CAPI] Skip to C1 after answering B501.

B511 Who does your mother live with? [Select all that apply]

Part C

C1 What is the highest level of education you have obtained so far?

1. Illiterate/Semi-literate [Skip to D1]
2. Primary school
3. Middle school
4. High school
5. 2- or 3-year college
6. 4-year college/Bachelor's degree
7. Master's degree
8. Doctoral degree
9. No need to go to school [Masked]

F1: "The highest level of education" is the highest level of education received at school.

[CAPI]

If the response to C1 is "8", continue to C101;

If the response to C1 is "7", skip to C201;

If the response to C1 is "6", skip to C301;

If the response to C1 is "5", skip to C401;

If the response to C1 is "4", skip to C501;

If the response to C1 is "3", skip to C601;

If the response to C1 is "2", skip to C701;

C101 Were you a full-time doctoral student or a part-time one?

1. Full-time
5. Part-time

C102 What was the field of your doctoral degree? [Show card]

1. Philosophy
2. Economics
3. Law
4. Education
5. Literature
6. History
7. Science
8. Engineering

9. Agriculture 10. Medicine 11. Military science 12. Management

C103 What was the specific major of your doctoral degree? _____

C104 When did you graduate from/drop out of your doctoral program? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C105 How long did you study for your doctoral degree? _____ years

C106 In which school did you study for the doctoral degree? _____

Interviewer Note: Record the full name of the school.

C107 Did you receive a doctoral degree?

1. Yes 5. No [Skip to C3]

C2 Were you ever a master student? 1. Yes 2. No [Skip to C3]

C201 Were you a full-time or part-time student?

1. Full-time 5. Part-time

F1: (1) "Full-time student" is someone who spends all of his/her time on study during a school period and does not have a formal job in any other institute or organization.

(2) "Part-time student" is someone who spends part of his/her time on study during a school period, while at the same time holding a formal job in another institute or organization.

C202 What was the field of your master's degree? [Show card]

1. Philosophy 2. Economics 3. Law 4. Education
 5. Literature 6. History 7. Science 8. Engineering
 9. Agriculture 10. Medicine 11. Military science 12. Management

C203 What was the specific major of your master's degree? _____ year

C204 When did you graduate from/drop out of your master's program? _____ year

C205 How long did you study for your master's degree? _____ years

C206 In which school did you study for the master's degree? _____

Interviewer Note: Record the full name of the school.

C207 Did you receive a master's degree?

1. Yes 5. No

C3 Were you ever a college student?

1. Yes 5. No [Skip to C4]

C301 What kind of college did you attend?

1. Ordinary college 2. Adult college
 3. Internet college 77. Other [Please specify] _____

F1: (1) "Ordinary College" is a college that enrolls students through the national college entrance exam.

(2) "Adult college" is a college for adults to be educated through, for example, correspondence courses, and part-time and off-the-job training.

(3) "Internet college" is a college that provides teaching and training through Internet.

C302 What was the field of your college study? [Show card]

- | | | | |
|----------------|--------------|----------------------|----------------|
| 1. Philosophy | 2. Economics | 3. Law | 4. Education |
| 5. Literature | 6. History | 7. Science | 8. Engineering |
| 9. Agriculture | 10. Medicine | 11. Military science | 12. Management |

C303 What was your specific major in college? _____

C304 When did you graduate from/drop out of college? _____ year

C305 How long did you study in college? _____ years

C306 In which school did you study for the bachelor's degree? _____

Interviewer Note: Record the full name of the school.

C307 Did you receive a bachelor's degree?

1. Yes 5. No

C4 Were you ever a 2- or 3-year college student?

1. Yes 2. No [Skip to C5]

C401 What kind of 2- or 3-year college did you attend?

- | | |
|----------------------------------|----------------------------------|
| 1. Ordinary 2- or 3-year college | 2. Specialized adult college |
| 3. On-line 2- or 3-year college | 77. Other [Please specify] _____ |

F1: (1) "Ordinary 2- or 3-year college college" is a college that enrolls students through the national college entrance exam.

(2) "Specialized adult college" is a college for adults to be educated through, for example, correspondence courses, and part-time and off-the-job training.

(3) "On-line vocational schools/junior college" is a college that provides teaching and training through Internet.

C402 What was the field of your 2- or 3-year college study? [Show Card]

- | | | | |
|----------------|--------------|----------------------|----------------|
| 1. Philosophy | 2. Economics | 3. Law | 4. Education |
| 5. Literature | 6. History | 7. Science | 8. Engineering |
| 9. Agriculture | 10. Medicine | 11. Military science | 12. Management |

C403 What was your specific major in the 2- or 3-year college? _____

C404 When did you graduate from/drop out of 2- or 3-year college? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without

receiving the diploma.

C405 How long did you study in 2- or 3-year college? _____ years

C406 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C407 Did you receive a diploma?

1. Yes 5. No

C5 Were you ever a high school student?

1. Yes 5. No [Skip to C6]

C501 Which kind of high school did you attend?

1. Ordinary high school 2. Adult high school 3. Ordinary specialized high school
4. Specialized adult high school 5. Vocational high school 6. Technical high school

C502 When did you graduate from/drop out of high school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C503 How many years did you study in high school? _____ years

C504 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C505 Did you receive a diploma?

1. Yes 5. No

C6 Were you ever a middle school student?

1. Yes 5. No [Skip to C7]

C601 What kind of middle school did you attend?

1. Ordinary middle school 3. Adult middle school 5. Vocational middle school

C602 When did you graduate from/drop out of middle school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C603 How many years did you study in middle school? _____ years

C604 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C605 Did you receive a diploma?

1. Yes 5. No

C7 Were you ever a primary school student?

1. Yes 2. No [Skip to C8]

C701 What kind of primary school did you attend?

1. Ordinary primary school 3. Adult primary school 5. Literacy class

C702 When did you graduate from/drop out of primary school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C703 How long did you study in primary school? _____ years

C704 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C705 Did you receive a diploma?

1. Yes 2. No

[CAPI] If the respondent is 40 years or older according to A1, skip to D1.

C8 What is the lowest level of education you believe you should have attained? [Show card]

1. Illiterate/Semi-literate [Masked] 2. Primary school 3. Middle school
4. High school 5. 2- or 3-year college 6. 4-year college/Bachelor's degree
7. Master's degree 8. Doctoral degree 9. No need to go to school

Part D

D1 In your opinion, how important is it to be able to communicate in the following languages? [Show card]

D101 Mandarin Chinese

Not Important at all 1—2—3—4—5 Extremely important

D102 Local dialect

Not Important at all 1—2—3—4—5 Extremely important

D103 English

Not Important at all 1—2—3—4—5 Extremely important

D104 Other foreign languages

Not Important at all 1—2—3—4—5 Extremely important

D105 Non-local dialects

Not Important at all 1—2—3—4—5 Extremely important

D106 Minority ethnic languages

Not Important at all 1—2—3—4—5 Extremely important

- F1: (1) "Mandarin Chinese" is the modern standard Chinese language promulgated by the government, for example, the pronunciations and tones used in national radio and television news.
- (2) "Local dialect" is a language that prevails in the local village/residential community. It has distinct characteristics compared to Mandarin Chinese in terms of pronunciation, tones and use of words.
- (3) "Non-local dialect" is a dialect that is different from the local dialect in terms of pronunciation, tone and use of words. It is also different from Mandarin Chinese.
- (4) "Minority ethnic language" is an ethnic language that differs from Chinese languages and is used by minority ethnic groups in China, including Zhuang, Buyi, Zang, Mongolian, Uyghur, Kazak, Dai, Dong, Yao, Miao, Shui, Molao, Maonan, Li, Qiang, Monpa, Lhoba, Yi, Lisu, Naxi, Bai, Laku, Hani, Jinuo, Achang, Jingpo, Drung, Pumi, Nu, Tujia, She, Gelo, Jing, Salar, Ozbek, Tartar, Khalkhas, Tu, Dongxiang, Baoan, Oroqen, Ewenki, Man, Xibe, Nanai, Korean, Va, Deang, Blang, Gaoshan, Eluosi, Tajik, Jiaorong, Zaiwa, Deng, Eastern yugur (Raohuer), Western yugur (Enger), Mian, Bunu, Lajia, Paiwan, and Ameisi.

D2 What is the primary language used in your daily communication with your family: [Select only one response]

1. Mandarin Chinese 3. Chinese dialect 5. Minority ethnic language
77. Other [Please specify] _____

- F1: (1) "Mandarin Chinese" is the modern standard Chinese language promulgated by the government, for example, the pronunciations and tones used in national radio and television news.
- (2) "Chinese dialect" is a language that prevails in the local village/residential community. It has distinct characteristics compared to Mandarin Chinese in terms of pronunciation, tones and use of words.
- (3) "Minority ethnic language" is an ethnic language that differs from Chinese languages and is used by minority ethnic groups in China, including Zhuang, Buyi, Zang, Mongolian, Uyghur, Kazak, Dai, Dong, Yao, Miao, Shui, Molao, Maonan, Li, Qiang, Monpa, Lhoba, Yi, Lisu, Naxi, Bai, Laku, Hani, Jinuo, Achang, Jingpo, Drung, Pumi, Nu, Tujia, She, Gelo, Jing, Salar, Ozbek, Tartar, Khalkhas, Tu, Dongxiang, Baoan, Oroqen, Ewenki, Man, Xibe, Nanai, Korean, Va, Deang, Blang, Gaoshan, Eluosi, Tajik, Jiaorong, Zaiwa, Deng, Eastern yugur (Raohuer), Western yugur (Enger), Mian, Bunu, Lajia, Paiwan, and Ameisi.

D3 Are you currently going to school?

1. Yes [Skip to "Schooling Module"] 5. No [Skip to E1]

F1: "Going to school" is the formal way of receiving education, which includes several phases: primary school, middle school, high school, 2- or 3-year college, 4-year college, master, and doctor. "Going to School" can refer to being either a full-time or a part-time student. However, receiving training, tutoring, and taking extra remedial course do not count as "going to school".

1. Yes 5. No

C7 Were you ever a primary school student?

1. Yes 2. No [Skip to C8]

C701 What kind of primary school did you attend?

1. Ordinary primary school 3. Adult primary school 5. Literacy class

C702 When did you graduate from/drop out of primary school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C703 How long did you study in primary school? _____ years

C704 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C705 Did you receive a diploma?

1. Yes 2. No

[CAPI] If the respondent is 40 years or older according to A1, skip to D1.

C8 What is the lowest level of education you believe you should have attained? [Show card]

1. Illiterate/Semi-literate [Masked] 2. Primary school 3. Middle school
4. High school 5. 2- or 3-year college 6. 4-year college/Bachelor's degree
7. Master's degree 8. Doctoral degree 9. No need to go to school

Part D

D1 In your opinion, how important is it to be able to communicate in the following languages? [Show card]

D101 Mandarin Chinese

Not Important at all 1—2—3—4—5 Extremely important

D102 Local dialect

Not Important at all 1—2—3—4—5 Extremely important

D103 English

Not Important at all 1—2—3—4—5 Extremely important

D104 Other foreign languages

Not Important at all 1—2—3—4—5 Extremely important

D105 Non-local dialects

Not Important at all 1—2—3—4—5 Extremely important

D106 Minority ethnic languages

receiving the diploma.

C405 How long did you study in 2- or 3-year college? _____ years

C406 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C407 Did you receive a diploma?

1. Yes 5. No

C5 Were you ever a high school student?

1. Yes 5. No [Skip to C6]

C501 Which kind of high school did you attend?

1. Ordinary high school 2. Adult high school 3. Ordinary specialized high school
4. Specialized adult high school 5. Vocational high school 6. Technical high school

C502 When did you graduate from/drop out of high school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C503 How many years did you study in high school? _____ years

C504 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C505 Did you receive a diploma?

1. Yes 5. No

C6 Were you ever a middle school student?

1. Yes 5. No [Skip to C7]

C601 What kind of middle school did you attend?

1. Ordinary middle school 3. Adult middle school 5. Vocational middle school

C602 When did you graduate from/drop out of middle school? _____ year

F1: (1) "Graduate" means finishing all the required courses, passing all the exams and receiving the diploma.

(2) "Drop out" means leaving school without finishing the required courses and exams, or without receiving the diploma.

C603 How many years did you study in middle school? _____ years

C604 In which school did you study? _____

Interviewer Note: Record the full name of the school.

C605 Did you receive a diploma?

Part EE1 Your marital status is: [\[Show card\]](#)

1. Never married 2. Married 3. Cohabitation 4. Divorced
5. Widowed

F1: (1) "Never married" refers to individuals who have never been married and are not currently cohabitating.

(2) "Married" refers to currently having a spouse, including both couples who have marriage certificates and those who live together as married couples without marriage certificates, which are known as factual marriages.

(3) "Cohabitation" refers to living with a partner without having a marriage certificate and in a different way from factual marriage. Cohabitation includes living together both before the first marriage and after the first marriage is dissolved.

(4) "Divorced" refers to formerly married individuals who are no longer married and have not yet remarried.

(5) "Widowed" refers to the situation in which one spouse has passed away, and the other has not remarried.

[CAPI]

If E1 is "1", continue to Part F.

If E1 is "2", skip to [\[Marital History Module 2\]](#).# If E1 is "3", skip to [\[Marital History Module 3\]](#).# If E1 is "4", skip to [\[Marital History Module 4\]](#).# If E1 is "5", skip to [\[Marital History Module 5\]](#).**Part F****[CAPI]** If the respondent is 60 years or older according to A1, please continue; otherwise, skip to Part G.

F1 In the past 6 months, how was the relationship between you and "## (name in Table T2)"?

1. Not close at all 2. Not very close 3. Fair 4. Close 5. Very close

F2 In the past 6 months, have you engaged in any of the following activities with your children? [Select all that apply]

1. Gave them economic help 2. They gave you economic help
3. You did housework for them 4. They did housework for you
5. You helped them take care of their children 6. They took care of you
7. You helped them with financial management 8. They helped you with financial management

F3 For which child have you done "Choice 1, 3, 5, 7"; which children have done "Choice 2, 4, 6, 8" for

you? [Select all that apply]

Part G

[CAPI] If the respondent's year of birth is later than 1978, skip to G2

G1 Have you had any of the following life experiences? [Select all that apply] [Show Card]

1. The "Send-Down" experience
2. Joined the production and construction corps
3. Laborious work at the cadre school
4. Joined the army
5. Been investigated, criticized and denounced during the Cultural Revolution
6. Not had enough to eat for a week
78. None of these [Skip to G2]

[CAPI] For each choice of G1, ask G101-103:

G101 When did "experience from G1" begin? _____ year

G102 When did "experience from G1" end? _____ year

G103 Where did "experience from G1" happen? _____ Province _____ County

G2 Have you ever had any formal work experience for more than six successive months?

Interviewer Note: Include agricultural work and self-employment.

1. Yes
5. No

G3 Do you currently have a job?

Interviewer Note: Include agricultural work and self-employment.

1. Yes
5. No

[CAPI]

If the answer to G3 is "1", and the respondent is 45 years or older, continue to G301.

If the answer to G3 is "1", and the respondent is under age 45, skip to G303.

If the answer to G3 is "5", and the answer to D3 is "1" [in school], skip to Part T.

If the answer to G3 is "5", and the answer to D3 is "5" [not in school], skip to J1.

G301 Are you currently retired? (Including retirement due to disease, internal retirement, and informal retirement)

1. Yes
2. No [Skip to G303]

G302 Reason why you continue to work after retirement: [Select only one response]

1. No longer work after retirement
2. To supplement family income for living expenses
3. To pass the time
4. Love to have a job or work
5. To make more money
6. To be energetic
77. Other [Please specify] _____

G303 What is the overall type of your current job?

1. Self-employed [Skip to G305]
3. At a company (Specific name)
5. Agriculture [Skip to G306]

G304 What is the name of your work unit? _____

Interviewer Note: Record the full name of the respondent's work unit.

G305 What type of work unit is this? [Show card]

1. Government/Party/People's organization/Military
2. State-owned/Collectively-owned public institution/Research institute
3. State-owned/State-controlled enterprise
4. Collectively-owned enterprise
5. Joint stock cooperative enterprise
6. Limited liability company/Company limited by shares
7. Private enterprise
8. Enterprise invested in by Hong Kong/Macao/Taiwan Capital
9. Company invested in by foreign capital
10. Rural family business
11. Individually owned business (*getihu*)
12. Private non-profit organization
13. Association /Guild/Foundation/Social organization
14. Residential community committee/Village committee/Autonomous organization
17. Other [Please specify] _____
17. Unable to identify

G306 What is your occupation: _____

Interviewer's Note: (1) If more than one occupation, record the one that takes the most time.

(2) Record detailed information on the occupation, such as department, job responsibility, position, and title.

Examples:

- Chinese language teacher and grade leader of ××Primary School
- Accountant of ××Company
- Director of xx workshop at ××Factory
- Nurse from xx hospital in ××County
- Farmer who grows rice in the local village

G307 What is the category of your occupation? _____

G308 What industry does your occupation belong to? _____

[CAPI] If G303=5, skip to G311 after answering G308.

G309 Do you hold an administrative/management position?

1. Yes
5. No [Skip to G311]

F1: "Administrative/management position" is the position in an organization which deals with management, for example, chief, secretary of a department, manager, etc.

G310 What is the position? _____

Interviewer Note: Record the response verbatim.

G311 When did you start to work in the current work unit/farm? _____ year

G4 Are you currently primarily engaging in in agricultural work?

1. Yes 2. No

[CAPI]

If G307=5000 type, and G4=5, do a Hard Check

If G307=5000 type, and G4=1, skip to the [Agricultural Work Module]

If G307≠5000 type, and G4=1, do a Hard Check.

If G307≠5000 type, and G4=5, skip to G401.

G401 How many months did you work last year? _____ months

Interviewer Note: If the working time was less than one month, record one month.

G402 How many days per month on average did you work during the working months in the last year?

_____ days

Interviewer Note: If the working time was less than one day, record one day.

G403 How many hours per day did you work during the working days in the last year? _____

Interviewer Note: If the working time was less than one hour, record one hour.

G404 Your primary workplace is [Select only one response]

1. Outdoors 2. Workshop 3. Indoors 4. Office
5. Home 6. Transportation vehicle 77. Other [Please specify] _____

G405 Do you have any direct subordinates?

1. Yes 2. No [Skip to G407]

F1: "Direct Subordinate" refers to a person who takes direct orders from you.

G406 How many subordinates do you have? _____

F1: Refers to the number of persons being managed by or taking order from the respondent. For example, for a chief manager, it is the total number of employees in the company; for a team foreman, it is the number of workers on the team.

G407 Did you get promoted in terms of a technical or administrative title last year?

1. Promotion in administrative title 2. Promotion in technical title
3. Both 78. Neither

F1: "Promotion" refers to a move upward to a higher-level position within an organization.

G408 What kind of promotion do you wish to receive?

1. Promotion in administrative title 3. Promotion in technical title
5. Both 78. Neither

F1: "Promotion" refers to a move upward to a higher-level position within an organization.

G5 Please evaluate the following aspects of your current job. [Show card]

G501 How satisfied are you with your current income from your job?

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G502 How satisfied are you with your current job security?

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G503 How satisfied are you with your current working environment?

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G504 How satisfied are you with your current working time?

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G505 How satisfied are you with your current job's promotion opportunity?

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G506 Overall satisfaction with your current job:

1. Very unsatisfied 2. Unsatisfied 3. Fair 4. Satisfied 1. Very satisfied

G6 Is this your first job?

1. Yes [Skip to G7] 5. No

G601 What was your first job? _____

Interviewer's Note: (1) If more than one job, record the one that takes the most time.

(2) Record detailed information on the job, such as department, job responsibility, position, and title.

Examples:

Chinese language teacher and grade leader of ××Primary School

Accountant of ××Company

Director of xx workshop at ××Factory

Nurse from xx hospital in ××County

Farmer who grows rice in the local village

G602 Have you ever changed your job on your own account?

1. Yes 5. No [Skip to G604]

F1: "Change your job on your own account" means taking one's own initiative to quit one's current job, and take a new job somewhere else.

G603 What was your main reason for leaving your last job?

Explanation: _____

Interviewer Note: Record the response verbatim.

G604 Have you ever been fired?

1. Yes 5. No [Skip to J3]

F1: "Fired" means that one is dismissed from his/her job by the employer.

G7 Did you have a part-time or second job last year?

1. Yes 5. No [Skip to J3]

G701 What was your part-time/second job? _____

Interviewer's Note: (1) If more than one occupation, record the one that takes the most time.

(2) Record detailed information on the occupation, such as department, job responsibility, position, and title.

Examples:

Chinese language teacher and grade leader of ××Primary School

Accountant of ××Company

Director of xx workshop at ××Factory

Nurse from xx hospital in ××County

Farmer who grows rice in the local village

G702 What was the amount of income you received from your part-time/second job last month?

_____ yuan

G703 How many hours did you work in your part-time/second job last month? _____ hours

[CAPI] Skip to J3 after answering G703.

Part J

J1 Have you actively looked for a job in the past month?

1. Yes [Skip to J102] 5. No

J101 Why are you currently unemployed? [Show card]

1. Participate in training 2. Do not want to work 3. Have enough economic capability and hence no need to work
4. Retired 5. Housework 6. Too old and feeble (mainly refer to elderly farmers)
7. No working capacity due to disability/illness 77. Other [please specify] _____

F1 (In general term): (1) "Retired" refers to the people who stop employment completely as they are over the upper limit of the working age, or due to other reasons as specified in the law.

(2) "Retired" also refers to those who began to work before September 30th, 1949, but do not work anymore at present.

F1 (In technical term): (1) "Retired" refers to the people who stopped employment completely due to old age or disability resulting from work or diseases.

(2) "Retired" also refers to members of senior cadres, specifically, those who joined the CPC's army, were involved in the revolution in the liberated areas, or worked undercover in the enemy's territories before September 30th, 1949. It also applies to the cadres who enjoyed the benefits from the local government in the liberated areas before the end of 1948, and those who had joined the non-Communist parties before the first Chinese People's Political Consultative Conference, advocated the CPC's work, and

were devoted to the revolution (the starting point of being devoted to the revolution is September 21st, 1949).

J102 How long have you been unemployed? _____ months

Interviewer Note: If the respondent has never worked, record "9999".

[CAPI]

01 If the response to J101 is "1", continue to J103

02 If the response to J101 is "4", skip to J2

03 If the response to J101 is "2-3,5-7", skip to J3

04 If the response to J101 is "77", skip to J3

J103 How many hours of work per week can you accept if you decide to work? _____ hours

J104 What is the lowest monthly salary you can accept if you decide to work? _____ yuan

[CAPI] Skip to J3 after answering J104.

J2 When did you retire? _____ year

F1 (In general term): (1) "Retired" refers to the people who stopped employment completely because they were over the upper limit of the working age, or for other reasons specified by the law.

(2) "Retired" also refers to those who began to work before September 30th, 1949, but do not work anymore at present.

F1 (In technical term): (1) "Retired" refers to those who stopped employment completely due to old age or disability resulting from work or diseases.

(2) "Retired" also refers to senior cadres; specifically, those who joined the CPC's army, were involved in the revolution in the liberated areas, or worked undercover in the enemy's territories before September 30th, 1949. It also applies to the cadres who enjoyed the benefits from the local government in the liberated areas before the end of 1948, and those who had joined the non-Communist parties before the first Chinese People's Political Consultative Conference, and advocated CPC's work, and devoted to the revolution (the starting point of being devoted to the revolution is September 21st, 1949).

J201 What was your wage for the last month before your retirement? _____ yuan/month

F1: Refer to the last full month's income before retirement, including the actual wage, stipend and all other types of formal income from the job.

J3 Do you have any of the following types of welfare, insurances or subsidies [Select all that apply] [Show card]:

1. Public medical insurance
2. Urban Employee Basic Medical Insurance
3. Urban Resident Basic Medical Insurance
4. Supplementary medical insurance

- | | |
|---|---|
| 5. New Rural Cooperative Medical System | 6. Urban basic pension insurance |
| 7. Rural pension insurance | 8. Supplementary pension insurance |
| 9. Maternity insurance | 10. Unemployment insurance |
| 11. Work-related injury insurance | 12. Allocation of reformed public housing |
| 13. Allocation of discounted commercial housing | 14. Subsidy for house-purchase |
| 15. Public housing funding | 16. Rental subsidy |
| 17. Minimum living allowance | 18. None of the above |

F1: (1) Public medical insurance was established based on the instruction on public medical insurance for government officials issued by the State Council in June 1952. The insurance covers government officials, party members, people's organizations, and employees from the work units that are related to health, education, academics and athletics. Disabled soldiers and college students are also covered. This insurance is financed by the local and central governments and is administered by the department of health or the ministry of finance at different levels. This insurance covers medical costs incurred in receiving outpatient and inpatient care, but not the costs of food, living and transportation. If one has financial difficulty, he/she should be compensated by his/her work unit through the administrative budget.

(2) Urban Employee Basic Medical Insurance is the material support provided by the state or society to individuals who are injured or sick, i.e. a social security system that provides medical service or economic compensation. According to the decision made by the State Council in December 1998, it is required to establish a new nationwide basic medical insurance system for urban employees. Based on this decision, those who are eligible to be covered should be the employees from the work units that are specified in the basic medical insurance and that pay the insurance premium. The medical insurance plan covers all of the work units in urban areas, including enterprises (state-owned enterprises, collective-owned enterprises, foreign commercial investment companies, private enterprise, etc.), government branches, institutions, social groups, and non-enterprise work units. It is up to the local government to decide whether rural enterprises and their employees should enter the basic medical insurance system. The insurance premium should be contributed by both the employers and employees. The document specifies that the amount contributed by the employer should be around 6% of the total income of the employee, while the amount contributed by the employee should be around 2% of his/her total income. Retired individuals are covered by the medical insurance system but do not need to pay the premium themselves.

(3) Urban Resident Basic Medical Insurance provides institutional support for basic medical care for unemployed urban residents. It covers the urban residents who have local household registration but are not covered by other types of medical insurance (e.g., Urban Employee Basic Medical Insurance, New Rural Cooperative Medical System, etc.).

(4) Supplementary medical insurance is a concept related to the basic medical insurance. As the national basic medical insurance system can only meet the basic medical needs of the participants, extra medical care may be supported by other types of medical insurance such as the supplementary

medical insurance. Unlike basic medical insurance, supplementary medical insurance is not required by law and is not mandatory. Instead, it is a voluntary plan for employers and employees. There are two main ways to implement the supplementary medical insurance plan. One is to establish and manage the insurance system according to the insurance principles in an industry. Another is to let a commercial insurance company run the system. The current basic medical insurance for urban employees in China can only meet very basic medical needs with shallow coverage, and does not cover the rural population at all. Thus, the development of supplementary medical insurance will be good for the better implementation of basic medical insurance, improvement in the medical care for urban employees, the meeting of all the citizens' medical needs, and the prosperity of a harmonious society.

(5) Urban basic pension insurance is also known as the national basic pension insurance, which is a mandatory system established by the government to cover the basic living needs of retirees. Before the 1990s, there was only one type of pension insurance for retirees in China. Since 1991, a multi-level pension insurance system has been established by incorporating basic pension insurance, enterprise supplementary pension insurance, and individual savings pension insurance. Combining social pooling and personal savings accounts, the basic pension insurance is a novel mode created by China. This system is financed the same way as the traditional basic pension insurance, that is, the cost is shared by government, work units and individuals. The basic pension insurance emphasizes social support, and is distributed in a structural way. It emphasizes the differences between the stimulus for personal saving and work contribution. Thus, this system bears the features of traditional social insurance, such as social support, risk diversification, and security, and meanwhile underlines the individual's sense of self-protection and the stimulus mechanism.

(6) Supplementary pension insurance is established by enterprises to supplement the basic pension insurance. It covers the part of the pension insurance that exceeds the basic pension for employees. It is a type of group life insurance. Enterprise supplementary pension insurance is the core of the multi-level pension system in China. Enterprises are encouraged by the country to establish such an insurance system in collaboration with commercial insurance companies.

(7) Unemployment insurance is a mandatory national insurance system, which is funded by the entire society and provides unemployed individuals with material support. It is one of the most important components of the social security system in China. The social security system includes social insurance, social relief, social welfare, community special care and placement, and social support for workers laid off from state-owned enterprises. The social insurance includes pension insurance, medical insurance, unemployment insurance, work-related injury insurance, and maternity insurance.

(8) Work-related injury insurance is a system through which the government provides support to the workers who are injured, sick, disabled, or dead due to work-related causes as well as their families. According to the current regulation, work-related insurance is paid by the employees rather than the employers.

(9) Insurance is an economic relationship established through contract which combines multiple

individuals' and groups' risks, calculates the expense based on the probability of loss, establishes funds, and provides support to those who suffer from loss or have certain financial needs.

(10) Allocation of reformed public housing is housing compensation provided by the state to employees who do not receive housing funds. It is a transitional form of the housing system during the period when the public housing system is being commercialized. The price of the house is not determined by the market, but instead by the government. The price is about the cost of housing construction. People have to meet certain requirements to be eligible for this benefit. There is also a limitation on the housing space that one can purchase, preventing people from buying a large house at a low price and hence wasting state-owned resources. Purchase of state-owned housing has other benefits in addition to low prices. For example, one can enjoy certain discount based on his/her work seniority, title and position. Usually, these public houses are not allowed to enter the open market without maintaining the house ownership for several years.

(11) Housing subsidy is a subsidy provided by the government to help people with housing problems, that is, a work unit converts its funds for construction or housing purchase into housing subsidy. The subsidy is deposited to employees' accounts on a regular basis, such as monthly, and can be drawn when the employees purchase or rent a house/apartment in the market. The subsidy has three main sources: the funds for housing construction from the government, the work unit's funds from selling houses, and other channels through which the work unit pools funds. There are three ways of dispensing the subsidy: one-time subsidy, basic subsidy plus one-time subsidy, and monthly subsidy. The first way is mainly designed for senior employees without housing, and is provided when they need to buy a house. The second way is giving a certain amount of money to employees based on their current housing conditions. Monthly subsidy targets junior employees, and is given to them monthly.

Part K

[CAPI]#01 If G4 is "1", skip to K2.

#02 If G3 is "5", skip to K3; otherwise continue to K1.

K1 The following questions pertain to your non-operating income last year. [Show card]

F1: "Non-operating income" refers to the income earned by contributing the respondent's labor or intelligence and paid by an individual or an organization/institute that is not owned by the respondent, such as a wage/salary and bonus. The income of farmers from land, water area and other properties is not included in this category.

K101 What was your average monthly wage/salary last year? _____ yuan

Interviewer Note:

(1) If none, record "0".

(2) If wage/salary and bonus cannot be separated, record the following questions as "Unclear".

K102 What was the sum of your average monthly floating wage, overtime pay, and various subsidies and bonuses last year? _____ yuan

Interviewer Note: If none, record "0".

K103 What was your year-end bonus last year? _____ yuan

Interviewer Note: If none, record "0".

K104 How much money could the goods received from your employer last year be converted to? _____ yuan

Interviewer Note: If none, record "0".

[CAPI] If G7=5, skip K105.

K105 Income from second, part-time or temporary job last year [including the amount of money that could be converted from goods]: _____ yuan

Interviewer Note: If none, record "0".

K106 Income from other labor work last year: _____ yuan

Interviewer Note: If none, record "0".

K107 Pension last year: _____ yuan

Interviewer Note: If none, record "0".

K2 Last year, the individual (private) operator's net income was _____ yuan [i.e. no other wage income except this].

Interviewer Note:

(1) This refers to the amount of profit received by the individuals who operate the business rather than the company itself. For example, for a family-operated supermarket with an annual income of 100,000 yuan, record 100,000 if all of this was given to the respondent. If the 100,000 yuan was all kept by the family as a whole, then record 0 yuan here, and it would be counted as the family income and recoded in the family questionnaire. If the 100,000 yuan was equally divided between two of family members, one of which is the respondent, then record 50,000 yuan here.

(2) If none, record "0".

F1: Refers to the operating income that goes into a personal account.

K3 Did you get any financial support from your family or relatives last year?

1. Yes; 5. No [Skip to K4]

F1: "Financial support" refers to the money or goods worth 200 yuan or more received in different ways as gifts, such as the money or goods given to you for free, and charges paid on your behalf.

K301 How much was the financial support from your family and relatives in total last year? _____ yuan

K4 Did you get any financial support (not including loans) from your village/residential community committee last year?

1. Yes 5. No [Skip to K5]

F1: "Financial support" refers to money or goods worth 200 yuan or more received in different ways as gifts, such as money or goods given to you for free, and charges paid on your behalf.

K401 How much in total was the financial support from your village/residential community committee last year? _____ yuan

K5 Did you get any subsidy or alms (not including pensions) from the government or your work unit last

year?

1. Yes 5. No [Skip to K6]

F1: (1) "Subsidy" refers to general financial support from the government and public institutions, such as "food subsidy", "price subsidy", and "transportation subsidy".

(2) "Alms" refers to the specific subsidy from the government, institutions and individuals that aims to help relieve poverty.

K501 How much in total was the subsidy or alms (not including pension) from the government or your work unit last year? _____ yuan

K6 How much was your total income (from all sources) last year? [Approximation starts at 40000]

(2500/5000/7500/12000/18000/27000/40000/60000/90000/140000/210000/320000/480000 yuan)

F1: "Total income" is the sum of all sources of income, including wages, subsidies, stipends, personal rental income, reimbursements, interest, bonuses from stock/funds/bonds, interest income from loans, and the monetary value of the goods received, etc.

[CAPI] Probe K601 after narrowing down the range.

K601 Your personal income (from all sources) last year was _____ yuan.

K7 Your personal income (from all sources) last month was _____ yuan.

K8 Please answer the following questions according to your own situation. [Show card]

K801 How popular (in terms of relations with other people) do you think you are?

Very unpopular--1--2--3--4--5--> Very popular

K802 How happy are you?

Very unhappy--1--2--3--4--5--> Very happy

K803 How confident are you about your future?

Not confident at all--1--2--3--4--5--> Very confident

K804 Is it easy for you to get on well with others?

Very difficult--1--2--3--4--5--> Very easy

Part I

Please ask the [Time Usage Module]

Part L

L1 Have you done any of the following during leisure time in the past 3 months? [Select all that apply]

[Show card]

- | | | |
|--------------|------------------------------|-----------------------------------|
| 1. Watch TV | 2. Read | 3. Bodybuilding/physical exercise |
| 4. Travel | 5. Play cards/mahjongg/games | 6. Eat out |
| 7. Housework | 8. Religious activity | 78. None of the above |

F1 (In general terms): (1) "Bodybuilding/physical exercise" refers to working out physically with an aim to improve one's physical condition. Generally speaking, the duration of exercise should be

over 20 minutes, until one sweats or feels short of breath.

(2) "Travel" refers to travelling to a place outside of the county/town where one lives.

(3) "Play cards/mahjongg/games" refers to entertainment activities, such as playing chess.

(4) "Religious activity" refers to praying, making wishes, and so on at home or in a religious place.

F1 (In technical term): (1) "Bodybuilding" refers to any exercise with an aim to improve one's physical condition and keep fit.

(2) "Physical exercise" refers to any or a combination of moderately intensive exercises that last over 20 minutes.

(3) "Travel" refers to a visit to a place which is neither a place of permanent residence nor a place of work and staying there for a short period.

(4) "Religious activity" refers to the ritual ceremonies and activities allowed by the constitution, law and related regulations.

[CAPI] For each choice, ask L101 separately.

L101 How often did you do "Activity from L1" last year?

1. Almost every day 2. Several times a week 3. Several times a month
4. Once a month 5. Once every few months.

L2 In the past 3 months, your two most common modes of transportation were: [Show card] [Limited to two responses]

1. Walk 2. Bicycle 3. Electric bicycle 4. Motorcycle 5. Bus
6. Subway 7. Taxi 8. Private car 9. Office car 10. Animal cart
11. Agricultural motor vehicle 11. Other (Please specify) _____

F1: (1) "Electric Bicycle" refers to a bicycle powered by battery.

(2) "Private car" refers to a privately owned car.

(3) "Animal cart" refers to oxcart, carriage, mule cart, and donkey cart.

L201 Have you ever taken a train?

1. Yes 5. No

L202 Have you ever taken a flight?

1. Yes 5. No

L203 Have you ever been to Hong Kong, Macao, or Taiwan?

1. Yes 5. No

L204 Have you ever been abroad (not counting HK, Macao, or Taiwan)?

1. Yes 5. No

Please go to the [Mobile Phone/Internet Module]

L3 Your main way to get information is: [Three choices at most] [Show card]

1. TV 2. Internet 3. Newspaper/Magazine 4. Radio
 5. Text message on mobile phone 6. Informed by other people
 77. Other [Please specify] _____

Part M

M1 Have you asked for others' help with any of the following so far? [Select all that apply] [Show card]

1. Borrow money 2. Child's schooling 3. Illness (see a doctor)
 4. Job search 5. Child's job search 78. None of these [Skip to M2]

M101 Did you receive help with "choice of M1"?

1. Yes 5. No [Skip to M2]

M102 What was the person who helped in relation to you?

Interviewer Note: Select only the most important one.

1. Relative 2. Friend 3. Classmate 4. Colleague 5. Sibling
 6. Parent 7. Parent-in-law 8. Grandparent or older generation
 77. Other [Please specify] _____

M103 His/Her "social status" is _____

Interviewer Note: Record the highest level, such as <<Village committee head, <<City<<Company manager, <<University Professor, <<Department<<Sub-Department Head

M2 Has anyone asked you for help with any of the following so far? [Show card]

1. Borrow money 2. Child's schooling 3. Illness (see a doctor)
 4. Job search 5. Child's job search 78. None of these [Skip to M3]

M201 Did you provide help with "choice of M2"?

Interviewer Note: Select only the most important one.

1. Yes 5. No [Skip to M3]

M202 What was the relationship of the person whom you helped to you?

Interviewer Note: Select only the most important one.

1. Relative 2. Friend 3. Classmate 4. Colleague 5. Sibling
 6. Parent 7. Parent-in-law 8. Grandparent or older generation
 78. Other [Please specify] _____

M203 His/Her "social status" is _____

Interviewer Note: Record the highest level, such as <<Village committee head, <<City<<Company manager, <<University Professor, <<Department<<Sub-Department Head

[Response choices to M3-M304 and M306] [Show card]

0. Spouse 1. Parents 2. Son 3. Daughter-in-law 4. Daughter
 5. Son-in-law 6. Grandchild 7. Other relative 8. Friend/classmate
 9. Neighbor 10. Colleague 11. Social worker
 12. Babysitter 13. Property manager 14. Teacher
 15. God/Allah/Buddhist/Deities 16. No one

[CAPI] If the respondent selects "0-6", return to Tables T1-4 to record the names.

M3 Who do you chat with most in your daily life? _____

M301 Who is the first person you will talk to when you are worried or upset? _____

M302 Who is the first person you will turn to when you have trouble? _____

M303 Who is the first person you will turn to when you are sick and need to be taken care of? _____

M304 Who is the first person you will ask when you need to borrow a large amount of money? _____

M305 Do you have anyone to whom you can talk about anything?

1. Yes 5. No [Skip to M4]

M306 Who is the one that you tell everything? [Limited to one person] _____

M4 For the following questions, please answer according to your own situation ("1" is lowest, and "5" is highest). [Show card]

M401 What is your income level in your local area?

Interviewer Note: If not applicable (such as a student who does not have any income), record "8".

Very low-----1--2--3--4--5--> Very high

M402 What is your social status in your local area?

Very low-----1--2--3--4--5--> Very high

M403 How satisfied are you with your life?

Very unsatisfied--1--2--3--4--5--> Very satisfied

M404 How confident are you about your future?

Not confident at all--1--2--3--4--5--> Very confident

M5 How important are the following things to you? [Show card]

M501 Having lots of money

Not important----1--2--3--4--5--> Very important

M502 Not being disliked by others

Not important----1--2--3--4--5--> Very important

M503 Having fun in life

Not important----1--2--3--4--5--> Very important

M504 Loving relationship with spouse

Not important----1--2--3--4--5--> Very important

M505 Not lonely

Not important----1--2--3--4--5--> Very important

M506 Feeling successful

Not important----1--2--3--4--5--> Very important

M507 Being missed posthumously

- Not important----1--2--3--4--5--Very important
- M508 A happy and harmonious family
- Not important----1--2--3--4--5--Very important
- M509 Having children to carry on the family name
- Not important----1--2--3--4--5--Very important
- M510 Children being successful
- Not important----1--2--3--4--5--Very important

M6 Of these topics from [M5], which do you think is the most important?

1. Having lots of money
2. Not being disliked by others
3. Having fun in life
4. Loving relationship with spouse
5. Not lonely
6. Feeling successful
7. Being missed posthumously
8. A happy and harmonious family
9. Having children to carry on the family name
10. Children being successful

M7 How much do you agree with the following statements? [Show card]

Interviewer Note: (1) If the respondent does not understand the questions or does not want to respond, record "6. Do not know"

(2) Do not read out or show the cards of "neither agree nor disagree" and "do not know".

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly Agree
5. Neither agree nor disagree
6. Do not know

M701 The income gap needs to increase for economic prosperity.

M702 Only with fair competition can there be a harmonious relationship between people.

M703 Wealth reflects an individual's achievement.

M704 In today's society, hard work is rewarded.

M705 In today's society, intellect is rewarded.

M706 In today's society, corruption is unavoidable in order to accomplish something big.

M707 In today's society, having social connections is more important than having individual capability.

[CAPI] If the response to any of the questions above is "6", please probe M708.

M708 Why did you answer "Do not know"?

1. Don't want to answer
3. Don't understand the question
5. I really do not know

Part N

N1 Have you ever experienced any of the following incidents? [Select all that apply][Show card]

Interviewer Note: Any experience counts regardless of the outcome of the incident.

1. Money or personal belongings stolen
2. Money or personal belongings robbed
3. Beaten or threatened
4. Break-in theft
5. Break-in robbery
77. Other [please specify] _____
78. None of the above

N2 Have you ever experienced any of the following? [Show card][Make a note if the respondent does not understand]

Interviewer Note: (1) If the respondent has not had the experience, record "79 Not applicable".

(2) "No" means having experienced this kind of situation but it does not fit the descriptions in the questionnaire.

1. Yes
5. No
79. Not applicable

N201 Facing policies that are unfavorable to you or your family

N202 Being treated unjustly due to the gap between rich and poor

N203 Being treated unjustly due to household registration

N204 Being treated unjustly due to gender

N205 Being treated unjustly by government officials

N206 Having conflict with government officials

N207 Experiencing unreasonable delays and stalling when going to government offices for business

F1: "Stalling" refers to the government officials shirking responsibilities.

N208 Being charged unreasonably when going to government offices for business

N3 Do you pay attention to any of the following news? [Select all that apply][Show card]

1. Anti-corruption
2. Law enforcement
3. International news
4. Economic news
5. Culture/Sports
6. Medical/Health
7. Agriculture/Countryside
8. Social problems
9. Environmental protection
78. None of these [Skip to N4]

N301 How often do you pay attention to "choice of N3"?

1. Very often
3. Sometimes
5. Rarely

N4 How would you rate the performance of the county/district government last year?

1. Good achievement
2. Some achievement
3. Not much achievement
4. No achievement
5. Worse than before

N5 The following questions pertain to factors affecting people's success. To what extent do you agree with these statements? [Show card]

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly Agree
5. Neither agree nor disagree [Do not read out]
6. Do not know [Do not read out]

out]

Interviewer Note: (1) If the respondent does not understand the questions or does not want to respond, select "6. Do not know".

(2) Do not read out or show the cards of "neither agree nor disagree" and "do not know".

(3) "CTRL+D", "CTRL+R", "79 (Not applicable)" are not allowed here.

N501 The higher a family's social status is, the greater the child's future achievement will be; the lower a family's social status is, the smaller the child's future achievement will be.

N502 A child from a rich family has a better chance of succeeding in the future; a child from a poor family has a worse chance of succeeding in the future.

N503 The higher level of education one receives, the higher the probability of his/her future success.

N504 The most important factor affecting one's future success is his/her talent.

N505 The most important factor affecting one's future success is his/her effort.

N506 The most important factor affecting one's future success is his/her luck.

N507 The most important factor affecting one's future success is whether his/her family has "connections".

[CAPI] If the response to any of the questions above is "6", probe N508.

N508 Why did you answer "Do not know"?

1. Don't want to answer 3. Don't understand the question 5. I really do not know

Part P

P1 Your current height is _____ centimeters.

P2 Your current weight is _____ catty (1 catty = 0.5 kilograms)

Interviewer Note: If the respondent has an abnormal body shape, make a note in F2.

P3 How would you rate your health status?

1. Healthy 2. Fair 3. Relatively unhealthy
4. Unhealthy 5. Very unhealthy

P301 How is your health now compared to that one year ago?

1. Better 3. No change 5. Worse

P302 How is your health compared to that of other people your age?

1. Better 3. About the same 5. Worse

P4 During the past two weeks, have you felt physically uncomfortable?

1. Yes 5. No [Skip to P5]

P401 During the past two weeks, what type of discomfort have you felt?

1. Fever 2. Pain 3. Diarrhea 4. Cough
5. Palpitation 77. Other [Please specify] _____ 78. None of these

P402 How serious do you think the symptom is?

1. Not serious 3. Fair 5. Serious

P403 Have you seen a doctor?

1. Yes 5. No [Skip to P405]

P404 What was the doctor's diagnosis of your illness or injury?

Interviewer Note: (1) Record the two most serious ones if there are multiple diagnosed diseases.

(2) If there is only one disease, record "-8" for the second one.

1. Disease Name _____ 2. Disease Name _____

P404 The interviewer should select from the Disease List for the type of the disease.

1. Disease Type _____ 2. Disease Type _____

P405 Since when did you suffer from this disease/illness?

1. Within the past two weeks
 3. Acute disease that occurred two weeks ago and persisted within the past two weeks
 5. Chronic disease that persisted within the past two weeks

P5 During the past six months, have you had any doctor-diagnosed chronic disease?

1. Yes 5. No [Skip to P6]

Interviewer Note: If there is more than one disease, record the two most serious ones in descending order of seriousness.

P501 What was your doctor's diagnosis of the disease you suffered from?

Interviewer Note: (1) Record the two most serious ones if there are multiple diagnosed diseases.

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1. Disease Name _____ 2. Disease Name _____

P501 The interviewer should select from the Disease List for the type of the disease.

[CAPI] Use the Disease Classification Codebook for the Chinese Family Panel Studies

2. Disease Type _____ 2. Disease Type _____

P502 When was this disease/illness diagnosed by a doctor?

1. Six months or more than six months ago 3. Within the past six months

P503 Have you received any medical treatment during the past six months?

1. Yes 5. No

P6 Were you hospitalized last year due to illness/injury?

1. Yes 5. No [Skip to P7]

F1: "Hospitalized" means that you stayed overnight in a hospital ward for at least one night due to disease or accidental injury.

P601 How many times were you hospitalized due to illness last year? _____ times

[CAPI]For each time, ask each of the following questions separately (P602-P607) .

P602 In which month was the first [or (N+1)th] time when you were hospitalized? _____

P603 How many days did you stay in hospital? _____

P604 What was the cause of hospitalization? _____

P605 What was the total cost spent on hospitalization? _____ yuan

F1: "Total cost" includes all medical costs for medicine, treatment, inpatient service as well as costs of living, food, and nursing care. "Red envelope" bribe is also included.

P606 How much of the total cost was spent on lodging, food, nursing care and other similar things? _____ yuan

F1: "Nursing care" refers to care provided by a professional worker who specializes in patient care.

P607 How much of the total cost was spent on medical treatment? _____ yuan

F1: "Medical treatment" refers to only the items that are related to medicine, treatment (including surgery) and medical examination.

P608 Your total hospitalization expenses were [sum of the responses above] yuan last year. How much of this was paid directly by your family? _____ yuan

Interviewer Note: If none, record "0".

P609 Who paid more than all the others for your family's direct medical expenses last year?

- | | | |
|------------|-------------|------------------------------|
| 1. Myself | 2. Spouse | 3. Husband and wife together |
| 4. Son | 5. Daughter | 6. Children together |
| 7. Parents | 8. Siblings | 9. Relatives |

P610 To what extent did the medical expenses paid directly by your family exceed the amount that your family could afford?

- | | | |
|---------------------------|--|----------------------|
| 1. Seriously unaffordable | 2. Slightly unaffordable | 3. Nearly affordable |
| 4. Affordable | 5. The expenses were only a small fraction of what the family could afford | |

F1: "Exceed the amount that your family could afford" means that the medical expenses were more than the total amount of money the family had in terms of cash, savings, etc.

P7 What would you do in general with a common minor illness [Such as a fever or diarrhea]?

- | | |
|--|---|
| 1. See a doctor right away | 2. Find/buy medicine myself |
| 3. Folk medical treatment | 4. Ask for religious/Buddha's help or hold a religious ritual |
| 5. Take no actions and wait for natural recovery | 7. Other [Please specify] _____ |

F1: "Religious ritual" refers to religious activities such as prayer.

[CAPI] If the response to P7 is "1", skip to P710; otherwise continue.

P402 How serious do you think the symptom is?

1. Not serious 3. Fair 5. Serious

P403 Have you seen a doctor?

1. Yes 5. No [Skip to P405]

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P6 Were you hospitalized last year due to illness/injury?

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out]

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Part P

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P401 During the past two weeks, what type of discomfort have you felt?

1. Fever 2. Pain 3. Diarrhea 4. Cough
5. Palpitation 77. Other [Please specify] _____ 78. None of these

P701 Why wouldn't you see a doctor for this kind of illness? [Show card]

1. Too expensive
2. Too far away from hospital or other medical facilities
3. No one to accompany me
4. Don't trust doctors
5. No need to see a doctor as I will get better by myself
6. Doctors have a bad attitude
7. Hospital procedures are too complicated and troublesome
77. Other (Please specify) _____

[CAPI] Skip to P8 after answering P701.

P710 Where would you go to see a doctor? [Select only one response]

1. General hospital
2. Specialty hospital
3. Community healthcare center/Township hospital
4. Community healthcare post/village clinic
5. Clinic

F1 (In general term): (1) "General hospital" refers to a so-called "big hospital" where various kinds of diseases can be diagnosed and treated.

(2) "Specialty hospital" refers to a hospital that focuses on specific types of diseases, such as a hospital for obstetrics and gynecology.

(3) "Community healthcare center/Township hospital" refers to a medical facility established at the urban community or township level to treat common diseases.

(4) "Community healthcare post/Village clinic" refers to a medical facility established at the urban community or village level to treat common diseases.

(5) "Clinic" refers to a private clinic, as well as a poorly equipped community/village clinic.

F1 (In technical term): (1) "General hospital" is also known as a "third-tier hospital," which provides nationwide medical service and is capable of providing medical treatment and training and conducting medical research. In China, hospitals are organized as a three-tiered system: the first tier is made up of small hospitals at the street community level; the second tier is made up of county level hospitals; and the third tier is made up of general hospitals.

(2) "Specialty hospital" refers to a hospital that treats patients who suffer from certain kinds of diseases, for example, a hospitals for infectious diseases, dental hospital, orthopedic hospital, and so on. In addition, some specialty hospitals serve specific subpopulations, including such hospitals as children's hospital, obstetrics and gynecology hospitals, and the emerging elderly hospitals. These hospitals are, by nature, general hospitals, as they consist of comprehensive medical divisions. It remains controversial whether hospitals of Chinese medicine and hospitals that specialize in combining Chinese and Western medicines are specialty hospitals or not. Here, these hospitals should be considered general hospitals or listed alone.

(3) "Community healthcare center" provides public and basic medical service and is non-profit, which is its fundamental characteristic.

(4) "Clinic" is a type of medical institution that is under the administration of the department of health. "Clinic" is at the same level as a Chinese medicine clinic or ethnic medicine clinic. It is at a lower level compared to hospital, MCH, nursing home, outpatient department, but at a higher level compared to village clinic, emergency center, clinical examination center, special center for disease control, or nursing center.

P711 Are you satisfied with the overall medical service of "P710"?

1. Very satisfied 2. Satisfied 3. Fair
4. Unsatisfied 5. Very unsatisfied

F1: "Medical service" refers to conditions of doctors, medicine, hospitalizations, etc. It also refers to travel distance and transportation convenience.

P712 What do you think of the level of medical expertise there?

1. Very good 2. Good 3. Fair 4. Bad 5. Very bad

P713 Would you choose to see a traditional Chinese medicine doctor if there is one?

1. Yes 3. No 5. Doesn't matter

P8 How many times did you exercise last week? _____ times

F1: "Exercise" refers to any or a combination of moderately intensive physical exercises that last over 20 minutes.

P801 How long did you exercise each time last week? _____ minutes

P9 What is your main staple food? [Select only one response]

Interviewer Note: Select the most commonly consumed one.

1. Rice 2. Noodles 3. Grain 77. Other [Please specify] _____

P901 Have you had any of the following foods in the past month? [Select all that apply] [Show card]

1. Meat 2. Fish or other aquatic products 3. Fresh fruits and vegetables
4. Dairy products 5. Bean products 6. Eggs
7. Pickled foods [such as pickled vegetables or soy]
8. Fried foods [such as potato chips or dough sticks] 78. None of these

[CAPI] #1. Ask P902 for each choice.

#2 If P901=78, skip to Q1

P902 How many times have you had "choice of P901" per week in the past month? _____ times

Interviewer note:

(4) Round to the nearest integer number. For example, if 5 times a month, then record "1".

(5) If less than once a week, record "1".

(6) If eating "choice of P901" for two meals a day, it should be counted as twice a day, and so on.

Part Q

Q1 Which of the following activities can you not perform independently? [Show card] [Can select more than one response]

1. Going out for outdoor activities (e.g., walking for about 300 meters, such as walking to a bus stop, shopping center, or parking lot)
2. Simple cooking (e.g., making a cup of tea, breaking off a piece of bread)
3. Kitchen activities (e.g. preparing lunch for 1-2 people, including peeling potatoes, cutting dishes, cooking meat, laying the table, cleaning the table after lunch, and washing dishes)
4. Taking public transportation (e.g., taking a bus or train, including getting to and back from the bus stop or train station, buying tickets, and finding a seat)
5. Shopping (going shopping at a local store or mall, including activities related to shopping, such as entering and exiting the store/mall, picking up items, paying, and bringing items back home)
6. Cleaning (e.g., making the bed, daily tidying, cleaning the bathroom floor, vacuuming, changing sheets, cleaning windows, and dumping trash)
7. Doing laundry (including the whole process of doing laundry: using the washing machine, separating and putting clothes in the machine, operating the machine, taking out, drying, and folding clothes)

78. None of these [Skip to Q2]

Q101 How much help do you need from others to do "choice of Q1"?

1. Full help
2. Lots of help
3. Some help
4. A little bit help
5. Only need someone standing by and watching
6. Sometimes do not need help

Q2 Have you smoked cigarettes in the past month?

1. Yes
5. No [Skip to Q211]

F1: "Smoke" includes carrying a cigarette in the mouth and lighting it up. To light firecrackers by smoking a cigarette also counts.

Q201 How old were you when you started to smoke? _____

Q202 How many cigarettes do you smoke per day? _____ cigarettes/packs

Q203 How much money did you spend yesterday on cigarettes? _____ yuan

[CAPI] Skip to Q3

Q211 Have you ever smoked?

1. Yes
5. No [Skip to Q3]

Q212 How old were you when you stopped smoking? _____

Q3 Have you often drunk alcohol (at least 3 times a week) in the past month?

1. Yes 5. No [Skip to Q311]

F1: "Drink often" refers to drinking at least 3 times a week, and consuming at least one cup of alcohol each time.

Q301 How old were you when you started to drink? _____

Q302 Which types of alcohol have you drunk in the past month? [Select all that apply]

1. Hard Liquor (Baijiu/whiskey/vodka) 3. Wine/Rice Wine 5. Beer

Q303 How much "choice of Q302" have you drunk in the past week? _____ liang/bottle

F1: 1 liang = 50 mL, 1 bottle = 2.5 cups, 1 cup = 220 mL

[CAPI] Skip to Q4.

Q311 Have you ever drunk alcohol often?

1. Yes 5. No [Skip to Q4]

F1: "Drink often" refers to drinking at least 3 times a week, and at least one cup of alcohol each time.

Q312 How old were you when you stopped drinking? _____

Q4 Do you have the habit of taking afternoon naps?

1. Yes 5. No [Skip to Q402]

Q401 How long a nap do you usually take? _____ hours/minutes

Q402 What time do you usually go to bed at night? __: __

Interviewer Note: Use the 24-hour system.

F1: If there is more than one sleep, record the longest one.

Q5 Are you able to remember the important things that have happened to you within a week?

1. Able to remember all of them 2. Able to remember most of them 3. Able to remember half of them
4. Able to remember a few of them 5. Able to remember only a little bit

Q6 The following are some descriptions of people's mental conditions. Please answer according to your situation in the past month. [Show card]

1. Almost every day 2. 2-3 times a week 3. 2-3 times a month 4. Once a month 5. Never

Q601 Feel depressed and cannot cheer up

Q602 Feel nervous

Q603 Feel agitated or upset and cannot remain calm

Q604 Feel hopeless about the future

Q605 Feel that everything is difficult

Q606 Think life is meaningless

F1: "Mental conditions" refers to one's emotions, will, abilities, pride and other psychological conditions, which are expressed through facial expressions, behaviors, etc.

Q7 Who would usually take care of you when you are sick or not feeling well?

Interviewer Note: If there is more than one, select the most important one.

1. Spouse 2. Children and/or their spouses 3. Grandchildren and/or their spouses
4. Other family members 5. Friends 6. Social service 7. Nanny/maid 8. No one

Part X

X1 Select one of the following tables and ask the respondent to read it out loud [Show card] [Word Module]

Interviewer Note: Ask the respondent to read out loud in Mandarin. Do not distinguish between tones/front nasal/back nasal/flat tongue/curved tongues

[CAPI] [1 = correct; 5 = incorrect] (34-word list)

X2 Math: Please select one of the four lists. [Show card][Math module]

[CAPI] [1 = correct; 5 = incorrect]

The following questions are about some special physical activities. Does your health status restrict your ability to do them? If so, to what extent?

X3 Can you touch the base of your neck with both hands?

Interviewer Note: First, make a demonstration, then ask whether the respondent can do it or not. If the respondent says yes, ask him/her to do it, and see if he/she really can. Then record the result.

1. Right hand only 2. Left hand only
3. Both hands 4. Neither hand

[CAPI] If the response to X3 is "3", skip to X4; otherwise continue to X301.

X301 How long have you not been able to do this? _____ months/years

X4 Can you touch your lower lumbar spine with both hands?

Interviewer Note: First, make a demonstration, then ask whether the respondent can do it or not. If the respondent says yes, ask him/her to do it, and see if he/she really can. Then record the result.

1. Right hand only 2. Left hand only
3. Both hands 4. Neither hand

[CAPI] If the response to X4 is "3", skip to X5; otherwise continue to X401.

X401 How long have you not been able to do this? _____ months/years

X5 Can you stand up immediately after sitting on a chair for a while?

Interviewer Note: First, make a demonstration, then ask whether the respondent can do it or not. If the respondent says yes, ask him/her to do it, and see if he/she really can. Then record the result.

1. Yes, without help or leaning on anything
3. Yes, but need help or lean on something
5. No

[CAPI] If the response to X5 is "1", skip to X6; otherwise continue to X501.

X501 How long have you not been able to do this? _____ months/years

X6 Can you pick up a book from the ground?

Interviewer Note: First, make a demonstration, then ask whether the respondent can do it or not. If the respondent says yes, ask him/her to do it, and see if he/she really can. Then record the result.

1. Yes, without sitting down
3. Yes, but need to sit down first
5. No

[CAPI] If the response to X6 is "1", skip to X7; otherwise continue to X601.

X601 How long have you not been able to do this? _____ months/years

X7 How many steps does it take for you to walk around a full circular rotation? _____

Interviewer Note: First, make a demonstration, then ask whether the respondent can do it or not. If the respondent says yes, ask him/her to do it, and see if he/she really can. Then record the result. If the respondent cannot do it, record "00".

Part Y

Y1 Your email address: _____

Interviewer Note: Record "-8" if not applicable.

Y2 Your QQ Number: _____

Interviewer Note: Record "-8" if not applicable.

Y3 Your MSN Number: _____

Interviewer Note: Record "-8" if not applicable.

Y4 Have you registered at the following websites? [Select all that apply]

1. Renren
2. Facebook
3. Kaixin
4. Hainei
5. Tianji
78. None of these

Y5 Your ID card number _____

Part Z:

Z1 Who was the main respondent that completed the adult questionnaire? _____ [Record one respondent]

only]

Interviewer Note: Select the most important respondent.

Z101 Who else answered the adult questionnaire? _____ [Limited to two respondents]

Interviewer Note: Select two relatively important respondents.

Z102 Who else besides the family members was present during the interview? [Select all that apply]

1. Friends/relatives 2. Supervisors 3. Neighbors 4. Village/Residential community committee cadres

77. Other [Please specify the identity] _____ 78. No one else

Z201 Respondent's comprehension capability:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z202 Respondent's health status:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z203 Neatness/cleanliness of respondent's clothing:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z204 Respondent's appearance:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z205 Respondent's Mandarin fluency:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z206 Respondent's level of cooperation during the interview:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z207 Respondent's intelligence:

Very Low --1--2--3--4--5--6--7--> Very High

Z208 Respondent's courteousness:

Very Poor --1--2--3--4--5--6--7--> Very Good

Z209 Respondent's interest in the interview:

Very Low --1--2--3--4--5--6--7--> Very High

Z210 Respondent's suspicion of the interview:

Very Low --1--2--3--4--5--6--7--> Very High

Z211 Reliability of respondent's response:

Very Low --1--2--3--4--5--6--7--> Very High

Z212 Respondent's language ability with respect to self-expression:

Very Weak --1--2--3--4--5--6--7--> Very Strong