# Harmonization of Cross-National Studies of Aging to the Health and Retirement Study

## Chronic Medical Conditions

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**HARMONIZATION OF CROSS-NATIONAL STUDIES OF AGING TO THE HEALTH AND RETIREMENT STUDY**

*USER GUIDE*

*Chronic Medical Conditions*

Version A

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**ABSTRACT**

This paper summarizes and compares measures of chronic diseases and medical conditions in the Health and Retirement Study (HRS) and its sister surveys from other countries: the English Longitudinal Study of Ageing (ELSA), the Survey of Health, Ageing, and Retirement in Europe (SHARE), the Korean Longitudinal Study of Aging (KLoSA), the Japanese Study on Aging and Retirement (JSTAR), the Chinese Health and Retirement Longitudinal Study (CHARLS), and the Longitudinal Aging Study in India (LASI).   The authors analyze and discuss the extent, to which these measures are comparable, the methodological differences in the way information was collected for these measures, and the implications for secondary data analysis.  This paper is one in a series of similar papers, each comparing different domains (e.g., cognition, employment and retirement, expectations, transfers, income, and wealth) across these surveys with an aim to encourage rigorous, cross-national and international comparison research on aging populations.

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**INTRODUCTION**

The Health and Retirement Study (HRS) has achieved remarkable scientific success, as demonstrated by an impressive number of users, and research studies and publications, utilizing the HRS. Its success has generated substantial interest in collecting similar data as population aging have experienced and is progressing in every region of the world.

The result has been a number of surveys designed to be comparable with the HRS: the English Longitudinal Study of Ageing (ELSA), the Survey of Health, Ageing, and Retirement in Europe (SHARE), the Korean Longitudinal Study of Aging (KLoSA), the Japanese Study on Aging and Retirement (JSTAR), the Chinese Health and Retirement Longitudinal Study (CHARLS), and the Longitudinal Aging Study in India (LASI). The overview of this family of surveys, including their research designs, samples, and key domains can be found in Lee (2010)[1].

As these surveys were designed with harmonization as a goal, they provide remarkable opportunities for cross-country studies. The value of comparative analyses, especially the opportunities they offer for learning lessons resulting from policies adopted elsewhere, is widely recognized. Yet there is only a limited number of empirical studies exploiting such opportunities. This is partly due to the difficulty associated with learning multiple surveys and the policies and institutions of each country.

Identifying comparable questions across surveys is the first step toward cross-country analyses. The RAND Meta Data Repository[2] provides users a digital library of questions for all these surveys: metadata.rand.org. Its search engines enable users to examine cross-country concordance at for each survey question. Using them, researchers can identify all questions related to particular key words or within a domain or a sub-domain. The RAND Meta Data Repository also provides macro-level statistics compiled from multiple sources[3].

Nevertheless, comparing these questions and evaluating comparability across surveys is still a labor-intensive process. Understanding all the idiosyncratic details in each survey takes still more effort. To facilitate such a process, we have prepared a series of domain-specific user guides. These user guides are designed to provide researchers with documentation about the concepts, measures and questions of particular domains in the all HRS-family surveys. For each domain, we reviewed all relevant questions

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1. Lee, J. "Data Sets for Pension and Health: Data Collection and Sharing for Policy Design," *International Social Security Review*, 2010, 63, (3-4), 197 – 222.

[2] http://metadata.rand.org

[3] Sources include: the Organization for Economic Cooperation and Development (OECD), the World Health Organization (WHO), the World Bank, the International Monetary Fund (IMF), the U.S. Census, Eurostat, national statistical offices of China, Indonesia, Japan, and Korea, International Labor Organization (ILO), and other publicly available information (i.e., Index Mundi, Doing Business).

across all surveys. These guides expand upon the information found in codebooks, questionnaires and data descriptions.  They also provide our evaluation of the comparability across surveys and recommendations for harmonized measures that can be exploited for cross-country analyses.   We hope these guides, by helping researchers save time and better understanding what can be studied in HRS-family surveys, accelerate scientific advances.

**EXECUTIVE SUMMARY AND OVERVIEW**

This guide summarizes the data on chronic medical conditions from the Health and Retirement Study (HRS) family of studies, including HRS, ELSA, and SHARE surveys in 2006, and the first wave of KLoSA and JSTAR, and pilot studies of CHARLS and LASI.  All of the surveys collected information on common chronic medical diseases.  These can be  divided into 4 domains: 1) diagnosis, i.e., whether participants reported having had a diagnosis of certain medical disease, 2) treatment, i.e., whether participants received treatment for the diagnosed medical conditions, 3) functional consequences or functional limitations resulting from specified diseases, such as stroke, lung conditions, or arthritis, and 4) quality of care indicators of proper medical management of selective diseases, such as hypertension and diabetes.

*Diagnosis of chronic medical diseases*

- All surveys collected diagnosis information on hypertension, diabetes, cancers, chronic lung diseases, stroke, and arthritis or rheumatism.
- Most surveys also had information on hypercholesterolemia; emotional, nervous, or psychiatric problems; and memory-related problems.
- Only HRS, ELSA, SHARE and LASI asked specifically about myocardial infarction (MI), while the others did not separate MI from other heart diseases.
- For harmonization purpose, general diagnosis of chronic medical conditions (e.g. heart diseases), rather than a more specific condition (e.g. congestive heart failure), may be used to maximize the number of studies that may be included.

*Treatment of specified chronic medical conditions*

- All surveys asked questions about treatment for hypertension, diabetes, chronic lung disease, heart problems, and stroke, although SHARE did not separate the treatment for heart problems from that for stroke.
- HRS, ELSA, JSTAR, and LASI collected more details on treatment for diabetes including information on oral hypoglycemics versus insulin, while the other 3 surveys did not.
- Only HRS, JSTAR, and LASI asked for type of cancer treatment (e.g., chemotherapy, surgery, radiation).
- Most surveys also collected treatment information for emotional, nervous, or psychiatric problems, and arthritis or rheumatism.

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- For harmonization purpose, more general treatment information may be used (e.g. comparing treatment for diabetes instead of insulin treatment).

*Functional consequences or limitations from chronic medical conditions*
- KLoSA is the only survey that asked whether each of the chronic medical conditions limited daily activities.
- HRS, ELSA, and LASI also collected information on functional consequences of selective medical conditions, including stroke, lung conditions, and arthritis.
- The measures on functional consequences from chronic medical conditions varied significantly across diseases and are insufficient for cross-country comparisons.

*Quality indicators of health care for chronic medical conditions*
- HRS and ELSA are the only two surveys that have collected quality of care information for hypertension and diabetes.
- ELSA had several quality indicators for medical care of diabetes, including whether the respondents had had a blood glucose test, a urine test for protein, or foot examination during the previous 12 months. ELSA also asked whether respondents with diabetes were taking angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB), which have been shown to reduce the risk of kidney complications among diabetic patients.
- The measures on quality of care varied significantly across diseases and are insufficient for cross-country comparisons.

**1. INVENTORY OF MEASURES FOR CHRONIC MEDICAL CONDITIONS**

This guide describes the data on chronic medical conditions from the Health and Retirement Study (HRS) family of surveys for the survey year 2006 or the first wave available if the data collection began after 2006.  In this guide we focus on self-reported measures of chronic diseases in each of the 7 surveys: HRS, ELSA, SHARE, KLoSA, JSTAR, CHARLS, and LASI.

The measures related to chronic medical conditions may be divided into 4 general domains: 1) diagnosis, i.e., whether participants reported receiving a diagnosis of certain medical diseases, 2) treatment, i.e., whether participants received treatment for the diagnosed medical conditions, 3) functional consequences or functional limitations caused by selective diseases, and 4) quality of care indicators for proper management of selective diseases, such as hypertension and diabetes.

As summarized in Table 1, all 7 surveys collected information related to disease diagnosis and treatment, although they varied in the spectrum and details of the medical conditions and how the questions were asked.  HRS, ELSA, KLoSA, and LASI, but not other surveys, had questions related to the functional consequences from selective diseases.  Only HRS and ELSA asked respondents about the quality indicators of medical care for two chronic medical conditions: hypertension and diabetes.

Table 1.  Domains of Chronic Medical Conditions

| Domains | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Diagnosis | X | X | X | X | X | X | X |
| Treatment | X | X | X | X | X | X | X |
| Functional consequences | X | X | | X | | | X |
| Quality of care indicators | X | X | | | | | |

Next, we will describe specific measures in these 4 chronic disease domains in each survey.

*1.1 Measures for Diagnosis of Chronic Medical Conditions*

Tables 2 summarizes the data related to disease diagnosis in these surveys.  All studies asked about hypertension; diabetes; lung diseases; heart diseases; cancers, excluding minor skin cancer; stroke; and arthritis and rheumatism.  However, the surveys did differ in questions on

specific respiratory or cardiac diseases.  For example, in addition to a general question about heart problems, HRS, ELSA, SHARE, and LASI asked for myocardial infarction (heart attack) specifically.  HRS and ELSA also had separate questions for angina and congestive heart failure. For chronic lung diseases, HRS and JSTAR specifically excluded asthma from chronic lung diseases, while other surveys were more inclusive in defining chronic lung diseases.

For neurological conditions, all surveys, except SHARE, asked a general question on whether the respondents had "emotional, nervous, or psychiatric problems".  HRS, ELSA, SHARE, JSTAR, and CHARLS also included a question on "memory-related disease".

Because of space limitation, this guide does not compare other medical conditions that also reflect functional status, such as vision or hearing impairment.

Table 2. Chronic diseases for which diagnosis information was collected in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | X | X | X | X | X | X | X |
| Diabetes | X | X | X | X | X | X | X |
| Hypercholesterolemia | | X | X | | X | X | X |
| Cancers, excluding minor skin cancer | X | X | X | X | X | X | X |
| Benign tumor | | | X | | | | |
| Lung disease | | X | X | X | | X | X |
| COPD, excluding asthma | X | | | | X | | |
| Asthma | | X | X | | | | |
| Heart problems | X | | X | X | X | X | X |
|    Myocardial infarction | X | X | X | | | | X |
|    Angina | X | X | | | | | |
|    Congestive heart failure | X | X | | | | | |
| Stroke | X | X | X | X | X | X | X |
| Liver disease | | | | X | X | X | |
| Stomach or other digestive disease | | | | | | X | |
| Peptic ulcer disease | | | X | | X | | |
| Kidney disease | | | | | | X | |
| Emotional, nervous, or psychiatric problems | X | X | | X | X | X | X |
| Memory-related disease | X | X | X | | X | X | |
| Parkinson's disease | | X | X | | X | | |
| Arthritis or rheumatism | X | X | X | X | X | X | X |
| Osteoporosis | | | X | | X | | |
| Hip or femoral fracture | | | X | | X (all fractures) | | |
| Other fractures | | | X | | | | |

*1.2 Measures for Treatment of Chronic Medical Conditions*

All surveys collected general treatment information related to the diagnosed chronic medical conditions (Table 3). Details may very, especially for diabetes and cancers. HRS, ELSA, JSTAR, and LASI asked separate questions about use of oral hypoglycemic medication and insulin injection. HRS, JSTAR, and LASI also collected information on specific type of cancer treatment: chemotherapy, surgery, and radiation. Among all the surveys, HRS has the most detailed treatment information on different types of management interventions for lung and heart diseases, including oxygen use and physical therapy for COPD, cardiac catheterization, and cardiac surgery.

Table 3. Chronic diseases for which general treatment information was collected in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | X | X | X | X | X | X | X |
| Diabetes | | | X | X | | X | |
|    Diet and exercise | | | | | X | | X |
|    Oral hypoglycemic | X | X | | | X | | X |
|    Insulin | X | X | | | X | | X |
| Hypercholesterolemia | | X | X | | X | X | X |
| Cancers, excluding minor skin cancer | | X | | X | | X | X |
|    Chemotherapy | X | | | | X | | X |
|    Surgery | X | | | | X | | X |
|    Radiation | X | | | | X | | X |
|    Combination treatment | | | | | X | | |
|    Symptom management | X | | | | | | X |
| Chronic lung disease | X | X | X | X | X | X | X |
|    Oxygen use | X | | | | | | |
|    Physical or respiratory therapy | X | | | | | | X |
| Asthma | | X | | | | | |
| Heart problems | X | | X or Stroke | X | X | X | X |
|    Myocardial infarction | X | | | | | | |
|    Angina | X | | | | | | |
|    Congestive heart failure | X | | | | | | |
|    Cardiac catheterization | X | | | | | | |
|    Cardiac surgery | X | | | | X | | |
| Stroke | X | | X or CAD | X | X | X | X |
|    Physical/occupational therapy | X | | | | | | X |
|    On blood thinning medication | | X | | | | | |
| Liver disease | | | | X | X | X | |
| Stomach or other digestive disease | | | | | | X | |
| Peptic ulcer disease | | | | X | X | | |
| Kidney disease | | | | | | X | |
| Emotional, nervous, or psychiatric problems | X | | X | X | X | X | X |
| Memory-related disease | X | | | | X | X | |
| Parkinson's disease | | | | | X | | |
| Arthritis or rheumatism | X | | X | X | X | X | X |
|    Joint replacement or surgery not involving joint? | X | | | | X | | X |
| Osteoporosis | | | X | | X | | |
| Hip or femoral fracture | | | | | X | | |

*1.3 Measures for Functional Consequences or Limitations from Chronic Medical Conditions*

KLoSA is the only survey that asked whether each of the chronic medical conditions was linked to limitation in daily activities.  HRS, ELSA, and LASI also collected information on functional consequences from selective medical conditions.  HRS asked whether a lung condition or arthritis limits usual activities.  Both ELSA and LASI asked whether stroke had lead to weakness or decreased ability to move or use extremities, difficulty speaking or swallowing, difficulty with vision, or difficulty in thinking or finding the right words to say.  The other 3 surveys (SHARE, JSTAR, and CHARLS) did not collect information on functional impairment resulting from chronic medical conditions.

*1.4 Measures for Quality of Health Care for Chronic Medical Conditions*

HRS and ELSA are the only two surveys that have collected quality of care information for hypertension and diabetes.  HRS asked whether the respondents with hypertension had blood pressure under control and whether and the last time when they had blood pressure checked by a doctor or nurse.  For respondents with diabetes, HRS asked them whether their glucose levels were under control.  ELSA had several quality of medical care indicators for diabetes, including whether the respondents had had a blood glucose test, urine test for protein, or foot examination during the previous 12 months.  ELSA also asked whether these respondents with diabetes were taking angiotensin converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB), which have been shown to reduce the risk kidney complications among diabetic patients.

**2. METHODOLOGICAL ISSUES**

This section will summarize methodological similarities and differences in obtaining information related to chronic medical condition across various surveys.

There are two ways in which the information on diagnosis of chronic medical conditions was collected: HRS, KLoSA, JSTAR, CHARLS, and LASI ask specific questions about each of the conditions, while ELSA and SHARE present respondents with a card with a list of chronic medical conditions and asks them to give the number or numbers for the conditions. ELSA and SHARE also provide detailed explanation of the meaning for long-standing illness: "By long-term we mean it has troubled you over a period of time or is likely to affect you over a period of time".

The type of health care professionals allowed to have made a diagnosis varies from study to study. HRS specifically excludes diagnosis made by nurses/nurse practitioners, chiropractors, and dentists. However, both CHARLS and LASI allow diagnosis by nurses, practitioners of traditional medicine, and other health care professionals. The details on chronic medical conditions also differ. HRS, ELSA, SHARE, and LASI have specific information on myocardial infarction, while other surveys do not. HRS and ELSA also have specific questions on angina and congestive heart failure.

Although all surveys have collected some treatment information, details vary for diabetes and cancers. For diabetes, only HRS, ELSA, JSTAR, and LASI separate oral hypoglycemic from insulin use. ELSA also has obtained information on usage of angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB), which have been shown to reduce the risk kidney complications among diabetic patients. For cancer treatment, HRS, JSTAR, and LASI collects information on type of cancer treatment: chemotherapy, surgery, and radiation.

*2.1 The Health and Retirement Study (HRS)*

*2.1.1 Diagnosis*

HRS asks the respondents whether doctors ever told them they have selective chronic medical conditions and when they were first diagnosed (e.g., DM, cancer). The medical doctors may include specialists such as dermatologists, psychiatrists, ophthalmologists, osteopaths, cardiologists, as well as family doctors, internists, and physician assistants, but do not include chiropractors, dentists, or nurses/nurse practitioners. The list of conditions include 1) hypertension, 2) diabetes, 3) cancer or malignant tumor, excluding minor skin cancer, and organ or part of body that cancer started, 4) chronic lung disease, such as chronic bronchitis or

emphysema, excluding asthma, 5) general question about heart problems, including heart attack, coronary heart disease, angina, congestive heart failure or other, 6) heart attack or myocardial infarction in last two years or since last interview, and time for most recent heart attack, 7) angina in last two years or since last interview, 8) congestive heart failure in last two years or since last interview, and whether heart failure requires overnight hospitalization, 9) stroke, and time for most recent episode of stroke, 10) emotional, nervous, or psychiatric problems, 11) memory-related disease, and specific type, 12) arthritis or rheumatism, specific type (osteoarthritis, rheumatoid arthritis, gout or lupus, or injury-related), 13) urinary incontinence,

### 2.1.2 Treatment

HRS asks the respondents whether they are now taking medications for the diagnosed chronic medical conditions.  For diabetes, it has separate questions on whether respondents are taking oral medications versus insulin injection or pump.  HRS also collects specific type of cancer treatment: 1) chemotherapy or medications, 2) surgery or biopsy, 3) radiation or X-ray, 4) medications/treatment for symptoms (pain, nausea, rashes), and 5) others.  HRS also has separate questions on whether patients with chronic lung disease are receiving oxygen, or physical or respiratory therapy, and whether stroke patients are receiving physical or occupational therapy.  For heart and joint problems, there are questions about procedures or treatment during which tubes were inserted into the veins or arteries (cardiac catheterization, coronary angiogram, or angioplasty), heart surgery, and type (replacement or not) and location of joint surgery (hip, knee, hand/wrist, foot/ankle, shoulder, spine, or other).

### 2.1.3 Functional Consequences

HRS asks respondents whether their chronic lung conditions limit their usual activities, such as household chores or work, and whether angina or arthritis limit their usual activities.  It also asks whether stroke patients still have any remaining problems, although it does not specify what kind of problems.

### 2.1.4 Quality Indicator for Medical Care

HRS has a limited number of questions on how well hypertension and diabetes have been managed.  It asks patients whether their blood pressure or diabetes is generally under control.

Respondents who were interviewed in the past are asked whether the control of blood pressure; blood sugar; cancer; chronic lung disease; heart disease; emotional, nervous, or psychiatric problems; arthritis or rheumatism; is better or worse since the last interview or is about the same. HRS asks whether the respondents have ever had their blood pressure checked by a doctor or a nurse or had a blood test for sugar level and in what year these examinations occurred last. It also asks whether diabetic patients have trouble with their kidneys or protein in the urine.

## 2.2 The English Longitudinal Study of Ageing (ELSA)

### 2.2.1 Diagnosis

ELSA starts collection of chronic disease information by defining for the respondents the meaning of long-standing illness: "By long-standing I mean anything that has troubled over a period of time, or that is likely to affect over a period of time". It shows respondents a card with a list cardiovascular conditions: 1) high blood pressure or hypertension, 2) angina, 3) a heart attack (including myocardial infarction or coronary thrombosis), 4) congestive heart failure, 5) a heart murmur, 6) an abnormal heart rhythm, 7) diabetes or high blood sugar, 8) a stroke, 9) high cholesterol, 10) others. ELSA then asks age or year when angina, heart attack, congestive heart failure, diabetes, or stroke was diagnosed and number of heart attacks and number of stroke in the past 2 years.

ELSA then presents to the respondents a different card for other chronic medical conditions, including chronic lung disease, such as chronic bronchitis or emphysema; asthma; specific types of arthritis (osteoarthritis, rheumatoid arthritis, and other kind); malignant blood disorders (leukemia, lymphoma, or other); cancer or a malignant tumor, including organ involved (lung, breast, colon/rectum, lymphoma, leukemia, melanoma or other skin cancer, somewhere else); Parkinson's disease; emotional, nervous, or psychiatric problems; Alzheimer's disease; dementia, senility or any other serious memory impairment. Similar to cardiovascular diseases, ELSA asks age or time when these other chronic medical conditions were first diagnosed. ELSA also collects detailed information on type of psychiatric problems: hallucination, anxiety, depression, schizophrenia, psychosis, mood swings, manic depression, and others.

*2.2.2 Treatment*

ELSA asks whether the respondents are currently taking medications for the diagnosed conditions.  For diabetes, it separates different treatment options (oral medication, insulin, angiotensin converting enzyme inhibitor/ACEI or angiotensin receptor blocker/ARB).  It also asks blood-thinning medication specifically for post-stroke patients, but does not separate different type of cancer treatment (e.g. chemotherapy or surgery).  ELSA collects information on whether the respondents had hip or keen replacement surgery and the reasons for the operation (arthritis, fracture, replacement of a previous artificial hip, others),

*2.2.3 Functional Consequences*

ELSA collects information about functional deficits among post-stroke patients, including weakness, difficulty speaking or swallowing, difficulty with vision, and difficulty in thinking or finding words.

*2.2.4 Quality Indicator for Medical Care*

ELSA collects detailed information on evidence-based indicators of quality of diabetes care, including use of angiotensin converting enzyme inhibitors (ACEI) and/or angiotensin receptor blocker (ARB), urine test in past 12 months, ever had protein in the urine, ever had trouble with kidney, ever had glycosylated hemoglobin (Hba1c) test, had Hba1c test in past year, had foot examination in the past 12 months, and ever had diabetes training and time when the respondents received training.  ELSA also asks all respondents, regardless of their hypertension status, whether they had blood pressure checked by any doctor or nurse in the past year.

*2.3 The Survey of Health, Ageing, and Retirement in Europe (SHARE)*

*2.3.1 Diagnosis*

SHARE starts collection of chronic disease information by explaining to respondents what "chronic or long term" means: "Some people suffer from chronic or long-term health problems. By long-term we mean it has troubled you over a period of time or is likely to affect you over a period of time.  Do you have any long-term health problems, illness, disability, or infirmity?"  It asks the respondents to look at a card which says: "Please look at card 8.  Has a doctor ever told you that you had/do you currently have any of the conditions listed on this card?  With this we

mean that a doctor has told you that you have this condition, and that you are either currently being treated for or bothered by this condition."  The list of physician-diagnosed chronic conditions include 1) a heart attack including myocardial infarction or coronary thrombosis or any other heart problem including congestive heart failure, 2) high blood pressure or hypertension, 3) high blood cholesterol, 4) a stroke or cerebral vascular disease, 5) diabetes or high blood sugar, 6) chronic lung disease such as chronic bronchitis or emphysema, 7) asthma, 8) arthritis, including osteoarthritis or rheumatism, 9) osteoporosis, 10) cancer or malignant tumor, including leukemia or lymphoma, but excluding minor skin cancers (with specific site information), 11) stomach or duodenal ulcer, 12) Parkinson's disease, 13) cataract, 14) hip fracture or femoral fracture, 15) other fracture, 16) Alzheimer's disease, dementia, organic brain syndrome, senility or any  other serious memory impairment, 17) benign tumor (fibroma, polypus, angioma), 18) others.  For the diagnosed conditions, SHARE asks for age when the respondents were first told by a doctor that they had the condition.  At later interviews, respondents are asked whether they had a heart attack, stroke, cancer, or hip fracture since the last interview and how many times since the last interview.

### 2.3.2 Treatment

In addition to defining chronic medical conditions, SHARE also defines treatment as "currently take drugs at least once a week".  It gives the respondents a card with the list: 1) medications for high blood cholesterol, 2) medication for high blood pressure, 3) medications for coronary or cerebrovascular diseases, 4) medications for other heart diseases, 5) medications for asthma, 6) medication for diabetes, 7) medication for joint pain or for joint inflammation, 8) medication for other pain (e.g. headache, back pain, etc), 9) medication for sleep problem, 10) medication for anxiety or depression, 11) hormonal medication for osteoporosis, 12) non-hormonal medication for osteoporosis, 13) medication for stomach burn, 14) medication for chronic bronchitis, and 15) other.  The medication list does not entirely match the list of chronic conditions (e.g. medications for coronary or cerebrovascular diseases are combined into one category; medications for drugs for other heart diseases; medications for stomach burns).  SHARE does not collect information on insulin use or specific cancer treatment.

### 2.3.3 Functional consequences
SHARE does not collect information on functional consequences of these chronic diseases.

*2.3.4 Quality Indicator for Medical Care*

SHARE does not collect information on care quality indicators for these chronic diseases.


*2.4 The Korean Longitudinal Study of Ageing (KLoSA)*

KLoSA has the same general question structure for each of the chronic medical conditions: 1) whether or not there has been a physician diagnosis of certain chronic medical condition, 2) for those participants with a diagnosis, the year and month when the diagnosis is first made, 3) whether the respondent is currently taking medication and treatment for that condition, and 4) whether the condition limits respondent's daily activities.


*2.4.1 Diagnosis*

KLoSA has a list of 9 chronic medical conditions: 1) high blood pressure, 2) diabetes, 3) cancer (malignant tumor), excluding minor skin cancers, 4) lung disease, 5) liver disease, 6) heart disease, 7) stroke, 8) emotional, nervous, or psychiatric problems, and 9) arthritis or rheumatism. The questionnaire does not have questions for specific heart diseases, such as angina, myocardial infarction, or congestive heart failure.  For cancer, it collects information on which organ or part of body that the respondent has cancer, including liver, stomach, lung, colon, thyroid, breast, cervix, ovary, and other specified sites.  KLoSA did not have a question specific for the diagnosis of asthma.  In addition, KLoSA collects information on prostate illness in men and urinary incontinence in women with same question structure.


*2.4.2 Treatment*

KLoSA does not separate insulin injection from treatment with oral medication among diabetes patients.  Nor does it have information on specific type of treatment for cancer (e.g. chemotherapy, surgery, or medication to alleviate symptoms, such as pain and nausea) or stroke (e.g. physical therapy).


*2.4.3 Functional Consequences*

As described above, KLoSA has general questions on whether each of these chronic medical conditions limits daily activities.

### 2.4.4 Quality Indicator for Medical Care

KLoSA does not collect information on care quality indicators for these chronic diseases.

## 2.5 The Japanese Study on Aging and Retirement (JSTAR)

### 2.5.1 Diagnosis

JSTAR phrases the questions related to chromic medical conditions a little differently from other HRS surveys by including physician's advice to seek care in connection with a condition. The introduction states: "Please tell me if you have been diagnosed by a doctor with or been advised to seek care in connection with any of them." The list of chronic medical conditions includes 1) heart disease (without specific information on angina, heart failure, cardiac infarction, valve disease), 2) high blood pressure, 3) hyperlipidemia, 4) stroke, 5) diabetes, 6) Chronic lung disease (chronic bronchitis, emphysema), 7) asthma (separate from chronic lung disease), 8) liver disease, not including liver cancer, 9) ulcer or other stomach disorder, 10) joint disorder (arthritis or rheumatism), 11) broken hip, 12) osteoporosis, 13) eye disease, 14) ear disorder, 15) bladder disorder (including incontinence and enlarged prostate), 16) Parkinson's disease, 17) depression, 18) dementia, 19) skin disorder, 20) cancer, excluding benign skin cancer, and 21) another most severe disorder not on the list. For participants who have a chronic medical disease, JSTAR then asks for the age when it was diagnosed.

### 2.5.2 Treatment

The questions for treatment offer 4 choices: 1) did not receive any particular treatment, 2) began treatment, but stopped in the middle, 3) received treatment and got better, and 4) currently undergoing treatment, or completed treatment and am still being seen. Of these, only choice #4 indicates probable current treatment. For diabetic patients, JSTAR collects more detailed information about type of treatment (diet and exercise therapy only, no medications; taking medications orally; inject insulin, with or without oral medications). JSTAR also asks whether the respondent has had surgery for heart disease, joint disorder, and eye disease. For respondents with self-reported cancer, JSTAR also collects information on the location of cancer (brain/spinal cord, mouth/tongue, throat, thyroid, lung, breast, esophagus, intestine, liver, pancreas, kidney, colon, bladder, skin, lymphoma, leukemia, prostate, ovary, cervix, uterus, and

other respondent specified site) and type of cancer treatment (surgery, radiation, chemotherapy, and combination of the above).

### 2.5.3 Functional Consequences

JSTAR does not collect information on functional consequences of these chronic diseases.

### 2.5.4 Quality Indicator for Medical Care

JSTAR does not collect information on quality indicators for medical care of these chronic diseases, but asks questions about preventive services, including mammogram, stool occult blood test, and yearly physical examination.

## 2.6 The Chinese Health and Retirement Longitudinal Study (CHARLS)

### 2.6.1 Diagnosis

CHARLS asks the respondents whether the chronic medical conditions have been diagnosed by health professionals or known by the respondent themselves.  It accepts diagnosis by physicians as well as other health care providers, including nurses, paramedics and doctors of traditional Chinese medicine ("Have you been diagnosed with [condition] by a doctor/nurse/paramedic/doctor of traditional Chinese medicine?").  The list of chronic medical conditions includes 1) hypertension, 2) high cholesterol, 3) diabetes or  high blood sugar, 4) cancer or malignant tumor (excluding minor skin cancers), 5) chronic lung diseases, such as chronic bronchitis or emphysema (excluding asthma, tumors or cancer), 6) liver disease, such as chronic hepatitis B or other liver diseases, excluding fatty liver, tumors or cancer), 7) heart attack, coronary heart disease, angina, congestive heart failure or other heart problems, 8) stroke, including transient ischemic attack or TIA, 9) kidney disease, except for tumors or cancer, 10) stomach or other digestive disease (except for tumors or cancer), 11) emotional, nervous, or psychiatric problems, 12) memory-related disease, and 13) arthritis or rheumatism.  For each diagnosis, CHARLS obtains the time when the respondents were first diagnosed or the disease was known by themselves.  For respondents with cancer, CHARLS collects information on which organ or part of body has cancer (brain, oral cavity, larynx, other pharynx, thyroid, lung, breast, esophagus, stomach, liver, pancreas, kidney, prostate, testicle, ovary, cervix, endometrium, color or rectum, bladder, skin, non-Hodgkin lymphoma, leukemia, and other organ.  CHARLS

does not have questions for specific heart diseases, such as myocardial infarction or congestive heart failure, but asks for chest pain on exertion.

### 2.6.2 Treatment

For each diagnosed medical condition, CHARLS asks whether the respondents are now taking medication or other treatment for that condition.  It does not separate specific types of treatment for diabetes (oral hypoglycemic versus insulin) or cancer (e.g. chemotherapy, surgery, or radiation), or stroke (medication versus physical or occupational therapy).

### 2.6.3 Functional Consequences

CHARLS does not collect information on functional consequences of these chronic diseases.

### 2.6.4 Quality Indicator for Medical Care

CHARLS does not collect information on care quality indicators.

## 2.7 The Longitudinal Ageing Study in India (LASI)

### 2.7.1 Diagnosis

Similar to CHARLS, LASI asks diagnosis of chronic medical conditions by physicians as well as other health care providers.  Furthermore, it collects specific information on which type of health care professionals actually made the diagnosis with the options 1) a doctor (MBBS degree), 2) Ayurvedic, unani, or homeopathic doctor, RMP, or siddha, 3) a nurse, pharmacist, or other health care professionals (Lady Health Visitor, Community Health Worker, or Auxillary Nursing Midwife), 4) other non-professional health care workers (anganwadi worker, trained DAI, ASHA), and 5) other providers.  The list of chronic medical conditions includes 1) hypertension, 2) diabetes, 3) hypercholesterolemia, 4) cancer (with location information), 5) chronic lung disease (without a separate question for asthma), 6) disease, with specific diagnosis of heart attack, 7) stroke, 8) arthritis or rheumatism, 9) emotional, nervous or psychiatric problems, 10) diseases endemic in India: anemia, tuberculosis, and malaria, and 11) urinary incontinence in females.  For each diagnosed chronic medical condition, LASI asks the respondents when the diagnosis was first made.

*2.7.2 Treatment*

LASI asks the respondents whether they are now taking any medications for their medical conditions. LASI has detailed information about treatment for diabetes (oral hypoglycemic, insulin injection, and whether the respondents are following a special diet) and cancer (chemotherapy, surgery, radiation, medication for symptom relief). For chronic lung disease, LASI asks for physical or respiratory therapy, in addition to medications, although the answers are not separated ("Are you receiving physical or respiratory therapy or any other treatment for your lung disease?"). However for stroke patients, LASI does separate physical or occupational therapy from medications in questions regarding stroke. For patients with arthritis or rheumatism, LASI collects information regarding medication use as well joint surgery, including site of surgery (hip, knee, hand or wrist, foot or ankle, shoulder, spine, and other).

*2.7.3 Functional Consequences*

LASI asks information about functional deficits among post-stroke patients, including 1) weakness, 2) difficulty speaking or swallowing, 3) difficulty with vision, and 4) difficulty in thinking or finding words.

*2.7.4 Quality Indicator for Medical Care*

LASI does not collect information on care quality indicators.

## 3. USING MEASURES IN CROSS-COUNTRY ANALYSIS

Selective information on functional consequences of chronic medical conditions as well as medical care quality indicators has been collected only in HRS, ELSA, KloSA, and LASI.  Moreover, the measures vary significantly across diseases and are insufficient for cross-country comparisons.  Therefore, only questions related to disease diagnosis and treatment allow cross-country analysis.

Table 4 lists the chronic medical conditions that were measured in all or most surveys.  In summary, all surveys collected diagnosis information on hypertension, diabetes, cancers, chronic lung diseases, stroke, and arthritis or rheumatism.  Most surveys also have information on hypercholesterolemia; emotional, nervous, or psychiatric problems; and memory-related problems to allow harmonization.  Only HRS, ELSA, LASI, and SHARE asked specific information about myocardial infarction (MI), while the others did not separate MI from other heart diseases.

Table 4. Chronic medical diseases for which diagnosis information was collected in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | X | X | X | X | X | X | X |
| Diabetes | X | X | X | X | X | X | X |
| Hypercholesterolemia | | X | X | | X | X | X |
| Cancers, excluding minor skin cancer | X | X | X | X | X | X | X |
| Chronic lung disease | X | X | X | X | X | X | X |
| Heart problems | X | X | X | X | X | X | X |
| Myocardial infarction | X | X | X | | | | X |
| Stroke | X | X | X | X | X | X | X |
| Emotional, nervous, or psychiatric problems | X | X | | X | X | X | X |
| Memory-related disease | X | X | X | | X | X | |
| Arthritis or rheumatism | X | X | X | X | X | X | X |

Table 5 summarizes the general treatment information collected for selective chronic medical conditions that would allow cross-country comparisons. All surveys asked questions about treatment for hypertension, diabetes, chronic lung disease, heart problem, stroke, although the SHARE did not separate the treatment for heart problem from that for stroke. For treatment for diabetes, HRS, ELSA, JSTAR, and LASI collected more detailed information on oral hypoglycemic versus insulin, while the other 3 surveys did not. Similarly, only HRS, JSTAR, and LASI asked for type of cancer treatment (e.g., chemotherapy, surgery, radiation). Most surveys also collected treatment information for emotional, nervous, or psychiatric problems, and arthritis or rheumatism. For harmonization purpose, general treatment information may be used to maximize the number of studies that may be included.

Table 5. Chronic medical diseases for which treatment information was collected in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | X | X | X | X | X | X | X |
| Diabetes | | | X | X | | X | |
|   Diet and exercise | | | | | X | | X |
|   Oral hypoglycemic | X | X | | | X | | X |
|   Insulin | X | X | | | X | | X |
| Hypercholesterolemia | | X | X | | X | X | X |
| Cancers, excluding minor skin cancer | | X | | X | | X | X |
|   Chemotherapy | X | | | | X | | X |
|   Surgery | X | | | | X | | X |
|   Radiation | X | | | | X | | X |
| Chronic lung disease | X | X | X | X | X | X | X |
| Heart problems | X | X | X or Stroke | X | X | X | X |
| Stroke | X | X | X or CAD | X | X | X | X |
| Emotional, nervous, or psychiatric problems | X | | X | X | X | X | X |
| Arthritis or rheumatism | X | | X | X | X | X | X |

**4. QUESTION CONCORDANCE**

    To facilitate the cross-country comparisons, the following tables summarize the question numbers that collect information on the diagnosis (Table 6) and treatment (Table 7) of chronic medical conditions that may be harmonized across these 7 surveys. These tables are followed by the exact wording of questions related to the diagnosis and treatment of the selective chronic medical conditions.

Table 6. Concordant question numbers on the diagnosis of chronic medical diseases in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | C005 | HEDIAZ-01 | PH006_2 | C005 | H-001-2 | C010-1 | I_C002 |
| Diabetes | C010 | HEDIAZ-07 | PH006_5 | C009 | H-001-5 | C010-3 | I_C006 |
| Hypercholesterolemia | | HEDIAZ-09 | PH006_3 | | H-001-3 | C010-2 | I_C055 |
| Cancers, excluding minor skin cancer | C018 | HEDIAB | PH006_10 | C013 | H-001-20 | C010-4 | I_C012 |
| Chronic lung disease | C030 | HEDIAB | PH006_6 | C019 | H-001-6 | C010-5 | I_C019 |
| Heart problems | C036 | HEDIAZ-02 HEDIAZ-03 HEDIAZ-04 HEDIAZ-06 | PH006_1 | C027 | H-001-1 | C010-7 | I_C022 |
| Stroke | C053 | HEDIAZ-08 | PH006_4 | C031 | H-001-4 | C010-8 | I_C031 |
| Emotional, nervous, or psychiatric problems | C065 | HEDIAB-07 | | C035 | H-001-17 | C010-11 | I_C049 |
| Memory-related disease | C069 | HEDIAB | PH006_16 | | H-001-18 | C010-12 | |
| Arthritis or rheumatism | C070 | HEDIAB | PH006_8 | C039 | H-001-10 | C010-13 | I_C042 |

Table 7. Concordant question numbers on the treatment of chronic medical diseases in each survey

| Conditions | HRS | ELSA | SHARE | KLoSA | JSTAR | CHARLS | LASI |
|---|---|---|---|---|---|---|---|
| Hypertension | C006 | HEMDA | PH011_2 | C007 | H-001-2-3 | C012-1 | I_C005 |
| Diabetes | | | PH011_6 | C011 | | C012-3 | |
|   Diet and exercise | | | | | H-001-5-3 | | I_C011 |
|   Oral hypoglycemic | C011 | HEMDB | | | H-001-5-3 | | I_C009 |
|   Insulin | C012 | HEINS | | | H-001-5-3 | | I_C010 |
| Hypercholesterolemia | | HECHMD | PH011_1 | | H-001-3-3 | C012-2 | I_C057 |
| Cancers, excluding minor skin cancer | | HECANB | | C017 | | C012-4 | |
|   Chemotherapy | C021 | | | | H-001-20-4 | | I_C015 |
|   Surgery | C021 | | | | H-001-20-4 | | I_C015 |
|   Radiation | C021 | | | | H-001-20-4 | | I_C015 |
| Chronic lung disease | C032 | HELNG | PH011_14 | C021 | H-001-6-2 | C012-5 | I_C021 |
| Heart problems | C037 | | PH011_3 PH011_4 | C029 | H-001-1-2 | C012-7 | I_C025 |
| Stroke | C060 | HEHRMD | PH011_3 | C033 | H-001-4-2 | C012-8 | I_C040 |
| Emotional, nervous, or psychiatric problems | C067 C068 | | PH011_10 | C037 | H-001-17-2 | C012-11 | I_C052 I_C053 |
| Arthritis or rheumatism | C074 | | PH011_7 | C041 | H-001-10-2 | C012-13 | I_C046 |

Following are the number and exact wording of questions related to the diagnosis and treatment of the selective chronic medical conditions in these 7 surveys.

*4.1 The Health and Retirement Study (HRS)*

**C005:** Has a doctor ever told you that you have high blood pressure or hypertension?

**C006:** In order to lower your blood pressure, are you now taking any medication?

**C010:** Has a doctor ever told you that you have diabetes or high blood sugar?

**C011:** In order to treat or control your diabetes, are you now taking medication that you swallow?

**C012:** Are you now using insulin shots or a pump?

**C018:** Has a doctor ever told you that you have cancer or a malignant tumor, excluding minor skin cancer?

**C021:** During the last two years, what sort of treatments have you received for cancer? 1) Chemotherapy or medication, 2) Surgery or biopsy, 3) Radiation/X-ray, 4) Medications/treatment for symptoms.

**C030:** Has a doctor ever told you that you have chronic lung disease such as chronic bronchitis or emphysema (do not include asthma)?

**C032:** Are you now taking medication or other treatment for your lung condition?

**C036:** Has a doctor ever told you that you had a heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems?

**C037:** Are you now taking or carrying medication for your heart problem?

**C053:** Has a doctor ever told you that you had a stroke?

**C060:** Are you now taking any medications because of your stroke or its complications?

**C065:** Have you ever had or has a doctor ever told you that you had any emotional, nervous, or psychiatric problems?

**C067:** Do you now get psychiatric or psychological treatment for your problem?

**C068:** Do you now take tranquilizers, antidepressants, or pills for nerves?

**C069:** Has a doctor ever told you that you have a memory-related disease?

**C070:** Have you ever had, or has a doctor ever told you that you have arthritis or rheumatism?

**C074:** Are you currently taking any medication or other treatments for your arthritis or rheumatism?

*4.2 The English Longitudinal Study of Ageing (ELSA)*

**HEDIAZ:** Has a doctor ever told that (or had) any of the conditions on this card?

**HEDIAZ-01:** High blood pressure or hypertension

**HEDIAZ-02:** Angina

**HEDIAZ-03:** A heart attack (including myocardial infarction or coronary thrombosis)

**HEDIAZ-04:** Congestive heart failure

**HEDIAZ-06:** An abnormal heart rhythm

**HEDIAZ-07:** Diabetes or high blood sugar

**HEACD:** Whether ever told had diabetes

**HEDIAZ-08:** A stroke (cerebral vascular disease)

**HEDIAZ-09:** High cholesterol


**HEDIAB:** A doctor told that (or had) any of the conditions on this card?

**HEDIAB-01:**

**HEDIAB-02:**

**HEDIAB-03:**

**HEDIAB-04:**

**HEDIAB-05:**

**HEDIAB-06:**

**HEDIAB-07:** Any emotional, nervous or psychiatric problems


**HEMDA:** Currently taking any medication, tablets or pills for high blood pressure?

**HEINS:** Whether currently injects insulin?

**HEMDB:** Whether is currently taking medication for diabetes?

**HEHRMD:** Whether taking blood thinning medication (for stroke)?

**HECHMD:** Currently taking any medication to lower cholesterol level?

**HELNG:** Taking medication or other treatment for lung condition

**HECANB:** Received any treatment for cancer

*4.3 The Survey of Health, Ageing, and Retirement in Europe (SHARE)*

**PH006:** [Has a doctor ever told you that you I will name several illnesses. Please tell me if you have been diagnosed by a doctor with or been advised to seek care in connection with any of them

**PH006_1:** A heart attack including myocardial infarction or coronary thrombosis or any other heart problem including congestive heart failure

**PH006_2:** High blood pressure or hypertension

**PH006_3:** High blood cholesterol

**PH006_4:** A stroke or cerebral vascular disease

**PH006_5:** Diabetes or high blood sugar

**PH006_6:** Chronic lung disease such as chronic bronchitis or emphysema

**PH006_8:** Arthritis, including osteoarthritis or rheumatism

**PH006_10:** Cancer or malignant tumor, including leukemia or lymphoma, but excluding minor skin cancers

**PH006_16:** Alzheimer's disease, dementia, organic brain syndrome, senility or any other serious memory impairment


**PH011:** Do you currently take drugs at least once a week for problems mentioned in this card?

**PH011_1:** Drugs for high blood cholesterol

**PH011_2:** Drugs for high blood pressure or hypertension

**PH011_3:** Drugs for coronary or cerebrovascular diseases

**PH011_4:** Drugs for other heart diseases

**PH011_6:** Drugs for diabetes

**PH011_7:** Drugs for joint pain or for joint inflammation

**PH011_10:** Drugs for anxiety or depression

**PH011_14:** Drugs for chronic bronchitis


*4.4 The Korean Longitudinal Study of Ageing (KLoSA)*

**C005:** Has a doctor ever told you that you have high blood pressure or hypertension?

**C007:** In order to lower your blood pressure, are you currently taking any medication or other treatment?

**C009:** Has a doctor ever told you that you have diabetes or high blood sugar?

**C011:** Are you now using medication that you swallow or using insulin injections to treat or control your diabetes?

**C013:** Has a doctor ever told you that you have cancer or a malignant tumor, excluding minor skin cancers?

**C017:** Are you now taking any medication to alleviate symptoms (pain, nausea, rash, etc) or receiving treatment such as chemotherapy?

**C019:** Has a doctor ever told you that you have chronic lung disease such as chronic bronchitis or emphysema?

**C021:** Are you taking medication or other treatment for your lung condition?

**C027:** Has a doctor ever told you that you had a heart attack, coronary heart disease, angina, congestive heart failure, or any other heart problems?

**C029:** Are you now taking or carrying medication or receiving treatment for your heart problem?

**C031:** Has a doctor ever told you that you had a stroke?

**C033:** Are you now taking any medications because of your stroke or its complications?

**C035:** Has a doctor ever told you that you have any emotional, nervous, or psychiatric problems?

**C037:** Do you now take tranquilizers, antidepressants, sedatives or sleeping pills or get psychiatric or psychological treatment for your problems?

**C039:** Has a doctor ever told you that you had arthritis or rheumatism?

**C041:** Are you currently taking any medication or other treatments for your arthritis or rheumatism?


*4.5 The Japanese Study on Aging and Retirement (JSTAR)*

**H-001.** I will name several illnesses. Please tell me if you have been diagnosed by a doctor with or been advised to seek care in connection with any of them

**H-001-1:** Heart disease (angina, heart failure, cardiac infarction, valve disease, etc

**H-001-2:** High blood pressure

**H-001-3:** Hyperlipidemia

**H-001-4:** Cerebral accident, cerebrovascular accident

**H-001-5:** Diabetes

**H-001-6:** Chronic lung disease (chronic bronchitis, emphysema, etc)

**H-001-10:** Joint disorder (arthritis, rheumatism)

**H-001-17:** Depression, emotional disorder

**H-001-18:** Dementia

**H-001-20:** Cancer

**H-001-@-2.** Which of the following most accurately describes that illness?

1) Did not receive any particular treatment

2) Began treatment, but stopped in the middle

3) Received treatment and got better

4) Currently undergoing treatment, or completed treatment and am still being seen

**H-001-1-2:** Heart disease (angina, heart failure, cardiac infarction, valve disease, etc

**H-001-2-2:** High blood pressure

**H-001-2-3:** Do you regularly take a medicine that was prescribed for you by a doctor (for hypertension)?

**H-001-3-2:** Hyperlipidemia

**H-001-3-3:** Do you regularly take a medicine that was prescribed for you by a doctor (for hyperlipidemia)?

**H-001-4-2:** Cerebral accident, cerebrovascular accident

**H-001-5-3:** (For diabetes) which of the following most accurately describes the treatment you are currently receiving. 1) Diet and exercise therapy only, no medications, 2) Taking medications orally, 3) Inject insulin (whether or not you are taking oral medication)

**H-001-6-2:** Chronic lung disease (chronic bronchitis, emphysema, etc)

**H-001-10-2:** Joint disorder (arthritis, rheumatism)

**H-001-17-2:** Depression, emotional disorder

**H-001-20-4:** What kind of (cancer) treatment did you have? 1) Surgery (including endoscopic surgery), 2) Radiation treatment, 3) Chemotherapy, 4) Any combination of the above.

*4.6 The Chinese Health and Retirement Longitudinal Study (CHARLS)*

**CA010.** Have you been diagnosed with [conditions listed below] by a doctor/nurse/paramedic/doctor of traditional Chinese medicine

1) Hypertension

2) High cholesterol

3) Diabetes or high blood sugar

4) Cancer of malignant tumor (excluding minor skin cancers)

5) Chronic lung diseases, such as chronic bronchitis or emphysema (except for asthma, excluding tumors or cancer)

7) Heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems

8) Stroke

11) Emotional, nervous, or psychiatric problems

12) Memory-related disease

13) Arthritis or rheumatism


**CA012.** Are you now taking any medication or other treatments to treat [conditions listed] or its complications?

1) Hypertension

2) High cholesterol

3) Diabetes or high blood sugar

4) Cancer of malignant tumor (excluding minor skin cancers)

5) Chronic lung diseases, such as chronic bronchitis or emphysema (except for asthma, excluding tumors or cancer)

7) Heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems

8) Stroke

11) Emotional, nervous, or psychiatric problems

13) Arthritis or rheumatism


*4.7 The Longitudinal Ageing Study in India (LASI)*

**I_C002:** Has a doctor [nurse, pharmacist, or other health professional or worker] ever told you that you have high blood pressure or hypertension?

**I_C005:** In order to lower your blood pressure, are you now taking any medication?

**I_C006:** Has a doctor ever told you that you have diabetes or high blood sugar?

**I_C009:** In order to treat or control your diabetes, are you now taking medications that you swallow?

**I_C010:** Are you now using insulin?

**I_C011:** Are you following a special diet?

**I_C012:** Has a doctor ever told you that you have cancer?

**I_C015:** During the last two years, what sort of treatments have you received for cancer? 1) Chemotherapy or medication, 2) Surgery or biopsy, 3) Radiation/X-ray, 4) Medicatitons and treatments for symptoms (pain, nausea, rashes)?

**I_C019:** Has a doctor ever told you that you have chronic lung disease such as chronic bronchitis or emphysema?

**I_C021:** Are you receiving physical or respiratory therapy or any other treatment for you lung disease?

**I_C022:** Has a doctor ever told you that you had/have a heart attack, coronary heart disease, angina, congestive heart failure, or any other heart problems?

**I_C025:** Are you now taking or carrying medication for your heart problem?

**I_C031:** Has a doctor ever told you that you had a stroke?

**I_C040:** Are you now taking any medications because of your stroke or its complications?

**I_C042:** Has a doctor ever told you that you had arthritis or rheumatism?

**I_C046:** Are you currently taking any medications or other treatments for your arthritis or rheumatism?

**I_C049:** Has a doctor ever told you that you have any emotional, nervous, or psychiatric problems?

**I_C052:** Do you now get psychiatric or psychological treatment for your problems?

**I_C053:** Do you now take tranquilizers, antidepressants, or pills for your nerves or psychiatric problems?

**I_C055:** Have you diagnosed with high cholesterol?

**I_C057:** Do you regularly take medications to help lower your cholesterol?