Preparing for the Challenges of Population Aging in Asia: Strengthening the Scientific Basis of Policy Development

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Chinese Academy of Social Sciences; Indian National Science Academy; Indonesian Academy of Sciences; National Research Council; Science Council of Japan

PREPARING FOR THE CHALLENGES OF POPULATION AGING IN ASIA

Strengthening the Scientific Basis of Policy Development

Chinese Academy of Social Sciences

Indian National Science Academy

Indonesian Academy of Sciences

National Research Council of the U.S. National Academies

Science Council of Japan

CONTENTS

FOREWORD

Almost every country in the world is facing an aging population, a demographic transition that raises major issues for government policies in almost all areas, most especially in health, pensions, and employment. This population aging reflects both significant increases in longevity and significant decreases in fertility.

Perhaps nowhere in the world is this demographic transition as stark as in parts of Asia, where rapid population aging is occurring at the same time as a dramatic economic transformation. With such rapid social, economic, and demographic changes under way, there is a clear need to enhance our understanding of how these transformations will affect the well-being of older people. It is particularly important to know how the changes will influence long-standing societal and familial arrangements that have traditionally been a vital part of the economic support of older people in the region.

To contribute to that understanding, the National Science Academies of China, India, Indonesia, Japan, and the United States are sponsoring two conferences on policy research and data needs to meet the challenges of population aging in Asia. The first, to be hosted by the Chinese Academy of Social Sciences, will be held in Beijing on December 9-10, 2010; the second, to be hosted by the Indian National Science Academy, will be held in New Delhi on March 14-15, 2011.

To help prepare for those conferences, the five academies have prepared this report, *Preparing for the Challenges of Population Aging in Asia: Strengthening the Scientific Basis of Policy Development*. We believe it lays the foundation for the conferences by delineating the challenges of population aging in Asia and the role data collection and scientific research can play in informing policy development. Our academies each appointed one or more experts to develop and write the report, with staff support from the National Research Council of the U.S. National Academies, and the report has satisfied the internal review requirements of the five academies.

Science academies are in a unique position to draw on the expertise of scholars from a variety of disciplines and to help lay a solid evidentiary foundation for policy making. There is much that countries can learn from each other's experiences, and we are pleased to have undertaken this collaborative effort on a major issue of the 21st century. In that spirit of coordination and collaboration, we offer this report to the conference participants, interested researchers, and policy makers throughout the world.

Chen Jiagui, *Chair of the Presidium of Academic Divisions*, Chinese Academy of Social Sciences
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KEY MESSAGES

THE CHALLENGE

- The population of Asia is aging rapidly at the same time that other major social and economic transformations are occurring throughout much of the continent. As a result, Asian countries should be planning for a time in the not-too-distant future when the fraction of the population that is aged 65 and older is considerably larger than it is today.
- Population aging is a triumph of civilization and medical science, but it also raises critical issues for countries, states, and families related to economic growth, economic security in old age, health care, and the strength of familial support systems.

PREPARING FOR AN AGING WORLD

- Scientists are increasingly being asked to assist policy makers and planners in developing sound public policies and designing more effective and efficient public services.
- Yet partly because the older population was smaller in the past, in many countries of Asia the scientific basis for formulating evidence-based policy for aging is relatively underdeveloped.
- Fortunately, there is still time to mobilize resources to study the problems associated with population aging. Investments in data collection today are likely to yield significant benefits that will accumulate over time.
- Although every country's approach to social policy is unique and undoubtedly influenced by different historical and cultural factors, countries (especially those in the relatively early stages of population aging) can learn much from each other. Coordinated research activity can compound the returns from investments made by individual countries in research.

STRENGTHENING THE SCIENTIFIC BASIS OF POLICY DEVELOPMENT

- Many of the policy challenges associated with population aging can benefit from greater scientific knowledge.
- Social and behavioral science can be invaluable to understanding key aspects of the well-being of older populations, such as family relationships, social and economic circumstances, and health status.
- Experience has shown that social science surveys are particularly useful when:
  - o They are population based.
  - o They are nationally representative.

- They have a longitudinal research design.
- They are multidisciplinary in nature and cover in one place a number of key domains, such as work, retirement, income, pensions, savings and wealth, familial support networks, and health and well-being.
- They allow for cross-national comparisons.
- Data are made publicly available in a timely fashion, thereby maximizing the power of the scientific method.

- Investments in data collection and analysis should be accompanied by training and support for the next generation of researchers in the various topics related to population aging.

A WINDOW OF OPPORTUNITY

In many countries in Asia, rapid population aging is occurring at the same time as dramatic economic and social developments are transforming much of the continent. Worldwide economic restructuring and the growing interdependence of countries and regions around the world have created a new international economic order, one where the rates of growth of industrial production in Asia surpass those in all other regions.

Increasing urbanization and rapid economic development tend to go hand in hand with higher rates of rural-urban migration, changing patterns of labor force participation, and other major social changes. All of these changes raise concerns about the possible weakening of the traditional family-value system of responsibility that historically has provided care and retirement security for the older population. In addition, the current older population in Asia is very much a transitional generation: with life expectancy rising and fertility falling, future cohorts of elderly can expect to have smaller numbers of living children—and fewer sources of familial support—than the current generation of elderly. In the face of such rapid social and economic changes, there is a clear need to better understand the prevailing social conditions of the older population and the ways in which demographic and economic transitions will affect long-standing societal and familial norms. Yet partly because there were far fewer elderly in the past, in many Asian countries the scientific basis for formulating evidence-based policy for an aging population is relatively underdeveloped.

Within a few decades, steadily increasing life expectancies and lower fertility rates in Asia will produce major increases in the share of populations aged 65 and older. The growth of the population aged 80 and older will be even more rapid. The result will be societies that look much different from those of today. Health care systems will be challenged by the large and growing size of the older population, whose ailments and diseases are much different from those of younger people. Pressure will increase on agencies that offer social services and on pension systems. And traditional

family support systems will be stressed both by increasing mobility, as more and more young people move from rural areas to cities or foreign destinations, and by the changing ratio of the elderly to the young.

By historical standards, the demographic transformations are taking place in Asia at a rapid pace. In the United States, for example, it is expected to take approximately 70 years for the percentage of the population aged 65 and older to rise from 7 percent to 14 percent; in comparison, this doubling is expected to occur in only about 25 years in China, India, and Indonesia.[1] In contrast to Western Europe and the United States, many Asian countries are "growing old before growing rich."

Responding to these challenges will be one of the most difficult tasks facing governments in the first half of this century—and the longer they wait, the more constrained their choices will be. For example, in choosing whether to prefund public pensions or fund them through a "pay as you go" mechanism, it is important to recognize that the policies that involve the accumulation of assets (such as through programs that mandate or encourage private saving for retirement or elder health care) will take a long time to mature. More generally, relatively gradual adjustments are much easier for countries—especially low-income countries—than more sudden policy changes. Fortunately, governments still have time to determine the best ways to respond to the unfolding demographic transformation.

International organizations (such as the United Nations[2]) and national governments in the region[3] are increasingly expressing concern over these issues. However, taking full advantage of the available window of opportunity will also require a greater and deeper understanding of important characteristics of the current and future elderly—such as their family relationships and living arrangements, health needs, labor force opportunities, and levels of income and saving. To face the

challenges ahead, new data will need to be collected, new research programs designed and undertaken, and greater resources devoted to research that relates to the older population.

Asia is an extraordinarily vast and heterogeneous region whose countries span the spectrum of wealth, economic development, and urbanization. In some parts of Asia, the rates of economic growth have been both spectacular and truly profound. Economic development in Pacific Asia has transformed the region and many of its cities at a speed and on a scale never before witnessed. Yet in many other parts of the continent no significant economic development has taken place. Doubtless, the effects of and the policy responses to population aging will be quite different across these various contexts.

Although an aging population is a matter of interest throughout much of Asia, this report pays particular attention to the challenges that will be faced by China, India, Indonesia, and Japan. These countries encompass the diversity of Asia and contain a large percentage of its total population (as well as a large proportion of the world's older population). In addition, they represent the range of aging trends that Asia will experience over the next half-century—from a heavily urbanized country with a mature economy and a population that is already relatively old (Japan) to a predominantly agrarian country with a still-developing economy and a population that will stay relatively young for several more decades (India). These countries are also characterized by considerable internal social, economic, and demographic diversity, as, for example, between the northern and southern states of India, the coastal and interior provinces of China, and the eastern and western parts of Indonesia.

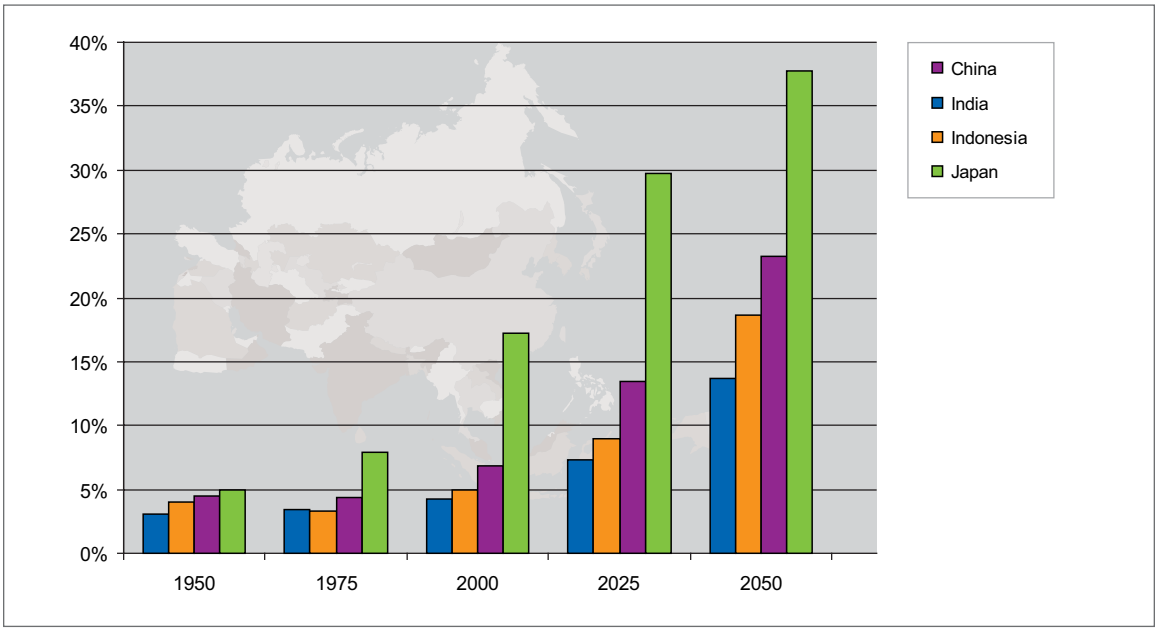
THE CHANGING DEMOGRAPHY OF ASIA

Projections indicate that the percentage of those aged 65 and older will more than triple between 2000 and 2050 in China, India, and Indonesia and more than double in Japan (see Figure 1), as the result of two long-term trends. The first is the steady increase in life expectancy that has been going on for at least 60 years and is expected to continue for the foreseeable future (see Figure 2). With improvements in nutrition, public health, and medical care, more and more people are living into their 70s, 80s, and even older.

The second long-term trend is the steady decline in fertility rates (see Figure 3) (that is, the average number of children that a woman can be expected to bear during her reproductive years), which is associated with among other things increasing standards of living, decreasing childhood mortality, and successful family planning programs. These two trends, taken together, will ultimately cause dependency ratios to rise (see Box 1).

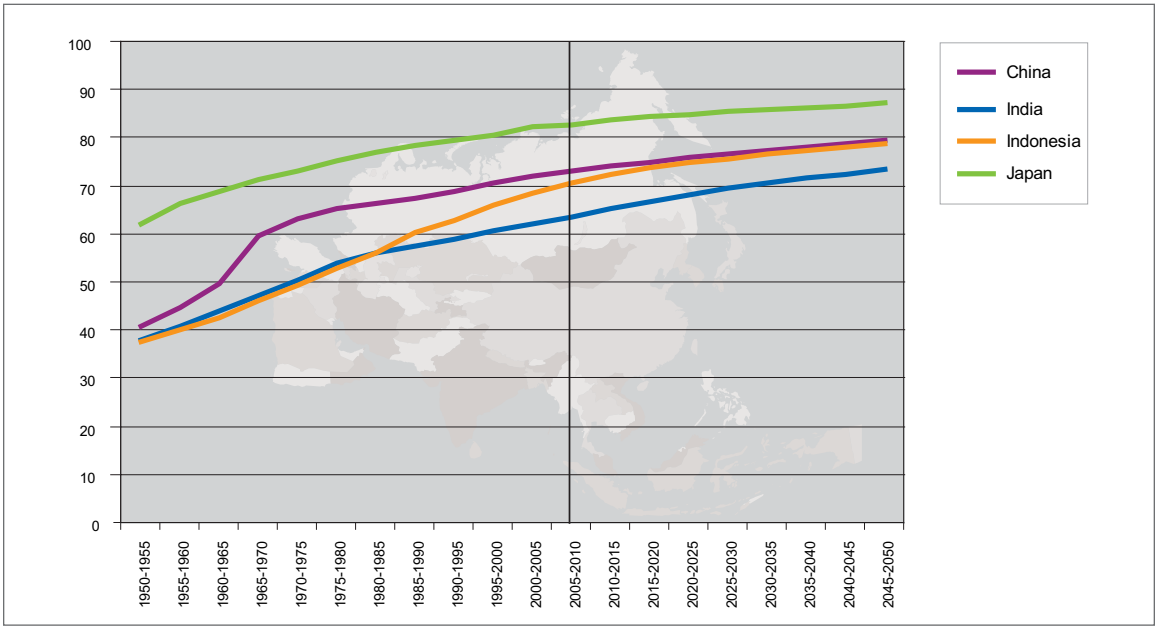
One notable characteristic of the aging populations is the difference in longevity by gender. In 2005, life expectancy was 2.4 years longer for women than men in India, 3.2 years longer for women in China, 3.8 years longer for women in Indonesia, and 7.4 years longer for women in Japan. By 2050, the gender gap is projected to increase to 3.9 years in China, 4 years in India, 4.4 years in Indonesia, and 7.5 years in Japan.[4]

FIGURE 1: PERCENTAGE OF POPULATION 65 AND OVER, 1950-2050



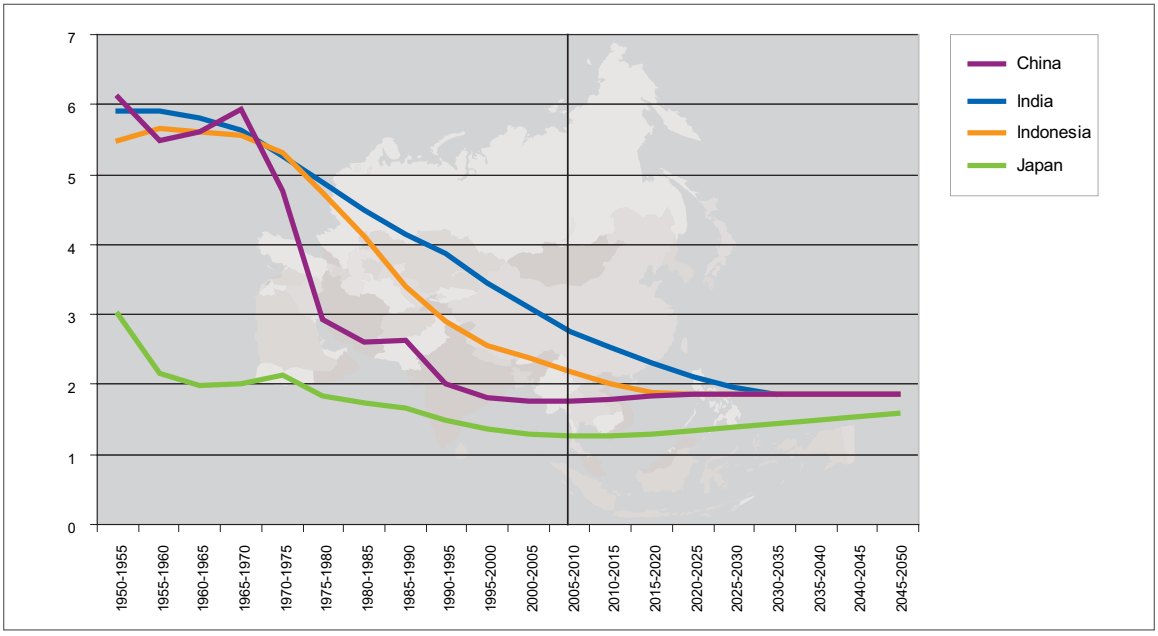
SOURCE: Data from United Nations (2008). *World Population Prospects: The 2008 Revision*. New York: United Nations Department of Economic and Social Affairs, Population Division.

FIGURE 2: CHANGING LIFE EXPECTANCIES, 1950-2050



SOURCE: Data from United Nations (2008). *World Population Prospects: The 2008 Revision*. New York: United Nations Department of Economic and Social Affairs, Population Division.

FIGURE 3: CHANGING FERTILITY RATES, 1950-2050



SOURCE: Data from United Nations (2008). *World Population Prospects: The 2008 Revision*. New York: United Nations Department of Economic and Social Affairs, Population Division.

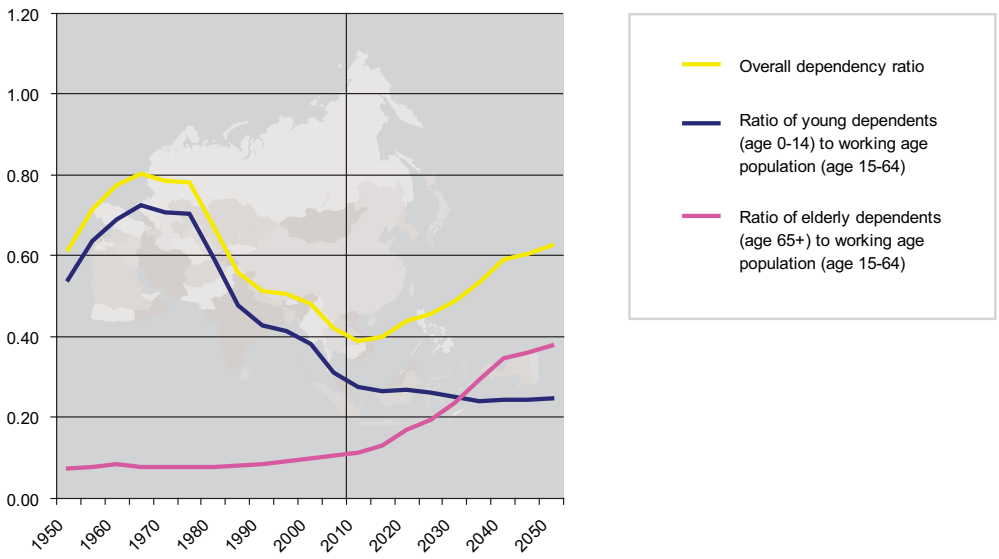
BOX 1: DEPENDENCY RATIOS

The dependency ratio is the ratio of the number of people who are either younger than 15 or older than 64 to the number of people aged between 15 and 64; it is used to approximate the average number of dependents supported by each person of working age. The dependency ratio of a country with an aging population follows a characteristic pattern over time (see Figure 4).

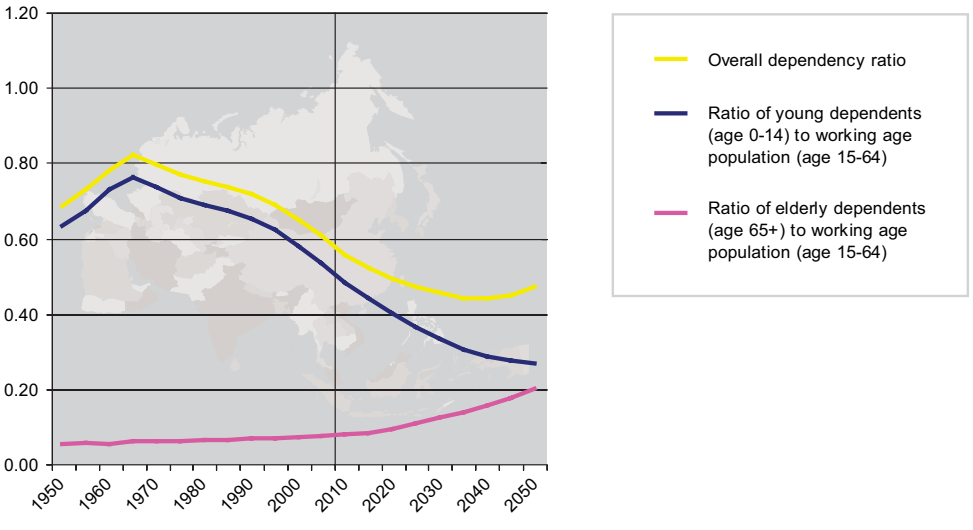
Initially, as the number of children per working-age adult decreases, the dependency ratio also decreases. If a country has appropriate social, political, and economic institutions, this change can lead to realization of a "demographic dividend"—a significant boost to a country's economic growth and development because there are relatively more workers

FIGURE 4: DEPENDENCY RATIOS FOR FOUR COUNTRIES, 1950-2050.

CHINA



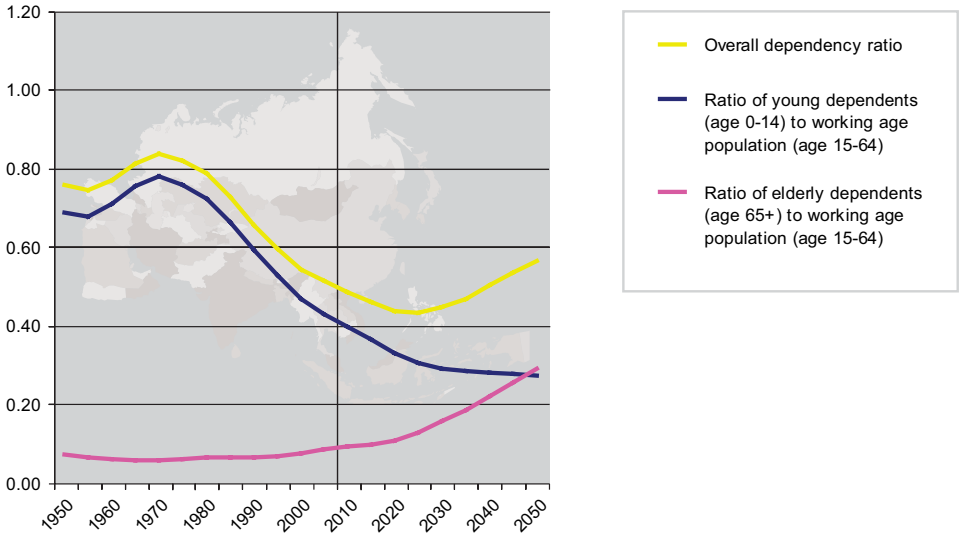
INDIA



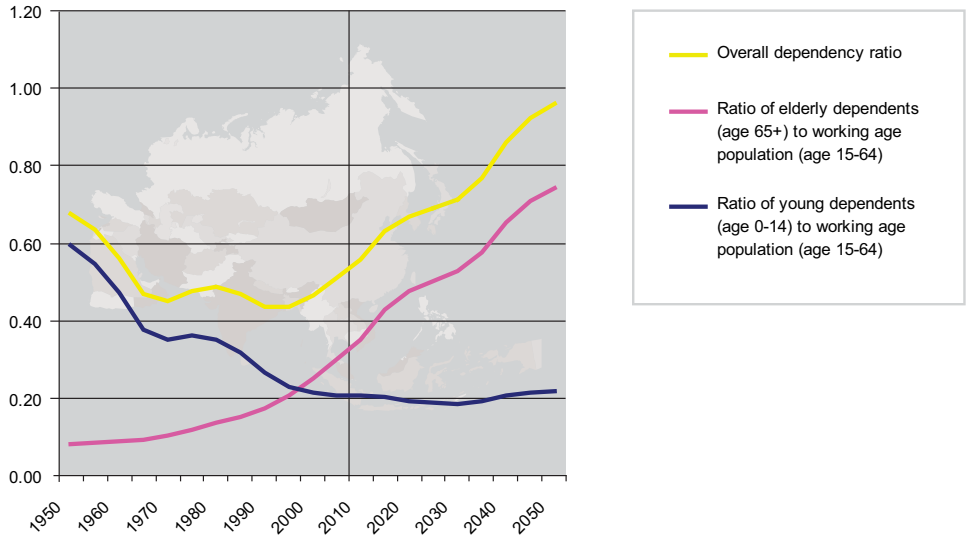
in the population who spend less of their income on dependents and thereby generate more savings, investment, and output per capita.[5] Over time, however, the effects of increasing life expectancy come to predominate, and the dependency ratio rises again. This can be a period of economic stress if appropriate policies have not been put into place.[6]

Dependency ratios in Asia all follow this general pattern, although the timing varies among countries. The dependency ratios in India and Indonesia will not reach their lowest levels until 2040 and 2025, respectively. In China, however, the dependency ratio will start rising after 2010, while in Japan the dependency ratio has been climbing upward since the 1990s. One practical implication of this timing is that Indonesia and India will have the chance to observe the ways that Japan and China deal with their own aging populations and learn from the successes and failures of those efforts.

INDONESIA



JAPAN



SOURCE: Data from *World Population Prospects: The 2008 Revision*. New York: United Nations Department of Economic and Social Affairs, Population Division.

WHAT IS IMPORTANT TO KNOW

With their populations set to age rapidly over the next few decades, Asian governments will need accurate information in order to develop appropriate policy responses. High-quality social and behavioral science can be an indispensable tool to better understand prevailing social conditions and key aspects of the well-being of older populations such as family roles and responsibilities, social and economic conditions, and health status.

Traditionally, the family has been the most important source of support for older adults in Asia, with children expected to assume primary responsibility for taking care of parents. But family roles are changing so that it is unclear how much support older people can expect their children and other family members to provide in the future. Information about the changing roles and responsibilities of the family will be crucial in discovering which needs of older adults may go unmet.

To understand how well older people will be able to take care of their own needs, it is also important to know about their economic circumstances, including their labor force participation, earnings, and level of savings. How many older people are working? How much have they saved? And if they have pensions, what sort of income can they expect to receive?

Good health is another essential determinant of quality of life. Therefore it is important to improve our understanding of the determinants of health and well-being at older ages. Typically, there is a close correlation between wealth and health. Health usually improves with income throughout the income distribution, although the reasons behind this relationship are still not well understood. On the one hand, income and wealth can secure better health. At the same time, good health may have a positive effect on income, particularly if people in good health are able to work longer. In reality, the relative importance of each of these mechanisms is almost certain to be different in different countries as well as different for different causes of illness, phases of the life-cycle, and points in time.

These categories of knowledge are by no means exhaustive, but rather illustrate what would be useful to know to prepare for an aging society.

CHANGING ROLES AND RESPONSIBILITIES OF THE FAMILY

As just noted, the centuries-long tradition in Asian societies has been for children to take care of their elderly parents. Today, however, demographic shifts are straining traditional roles and

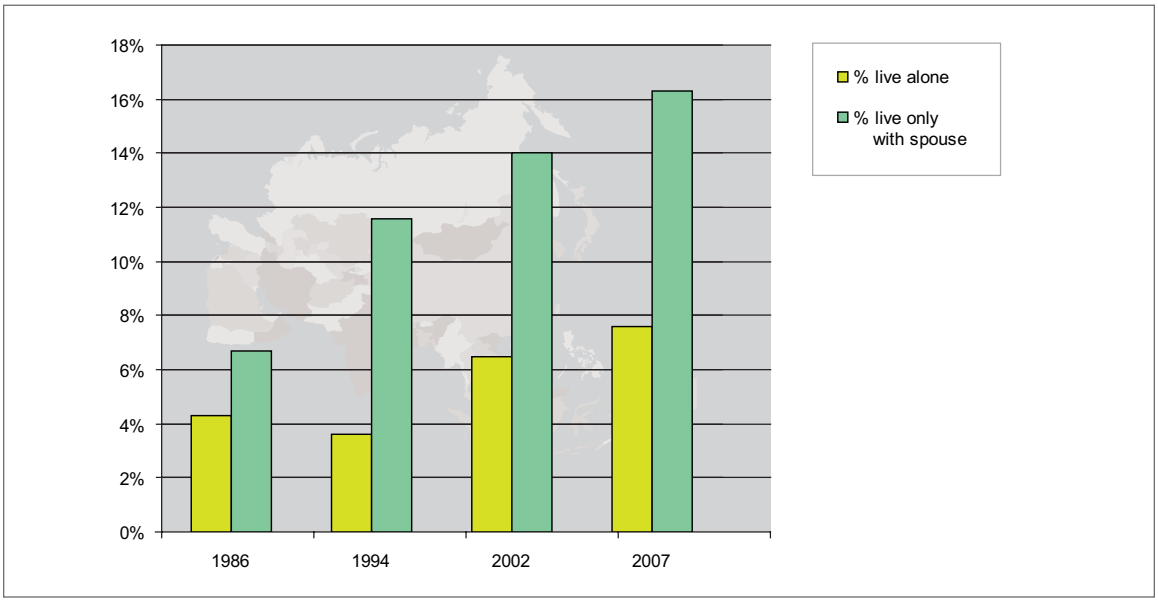
responsibilities: parents are having fewer children while also living longer lives. At the same time, increasing mobility is producing families whose members live hundreds or thousands of miles apart. More generally, children are more educated and more independent than in the past. Understanding these changes can provide useful insights into public policies relating to housing, financial transfers, the giving of physical care, and other aspects of daily life and will be vital to determining the most effective responses to the aging of the population.

Most older people in Asia still depend on assistance from their children—generally in the form of money and material goods, time, physical care, and the provision of living space—for at least part of their well-being. In India, for example, more than three-quarters of the elderly live with their children.[7] In a survey of households in New Delhi, more than two-thirds of the elderly reported that they were completely dependent on their families, with no source of independent income to fall back on.[8] In Indonesia, more than half of the older population receives financial transfers from children who do not live with them.[9] And although the proportion of men and women in Japan aged 60 and older who mentioned children as a source of income fell from 30 percent in 1981 to 15 percent in 1996,[10] about 65 percent of Japanese aged 65 and older still live with their adult children—a rate higher than in any other industrialized country.[11]

These modes of support face threats from several trends. Reductions in the number of children are leaving parents with fewer sources of assistance. Women, who have traditionally been the predominant caregivers, are entering the workforce in increasing numbers, making it difficult for them to provide traditional levels of support. And increasing urbanization and economic development is drawing children from the countryside to the cities, with two consequences: (1) there is less space for multigenerational living arrangements and (2) there is greater physical separation between elderly parents and adult children. (See Figure 5 for data on living arrangements in Thailand, which also has a rapidly aging population.) Rapid increases in life expectancy also mean that adult children will be required to provide support and care for elderly parents for longer and longer periods of time; indeed, there will be an increasing number of family caregivers—more often than not women—who reach retirement age while still looking after elderly and often ailing parents.

Yet some of the changes may have beneficial implications. Better jobs will provide children with more resources to offer their parents, and some decisions by younger family members to migrate to cities (and even move abroad) may be part of a family economic strategy and motivated in part by the needs of older parents in rural areas. Declining fertility rates also mean that parents will have

FIGURE 5: PERCENTAGE OF PEOPLE AGED 60 AND OLDER IN THAILAND WHO LIVE ALONE OR LIVE ONLY WITH A SPOUSE, 1986-2007



SOURCE: Adapted from Knodel and Chayovan (2008, Figure 5-3). *Population Ageing and the Well-being of Older Persons in Thailand*. Population Studies Center Research Report 08-659. Ann Arbor: University of Michigan.

fewer children to support, potentially leaving them with more resources to devote to their own parents. And as older people live longer and healthier lives, the levels of child care provided by grandparents to grandchildren may also increase, making it easier for mothers of young children to enter or return to the workforce.

Box 2 lists some illustrative research questions that arise from the changing roles and responsibilities of the family.

BOX 2: **ILLUSTRATIVE RESEARCH QUESTIONS ON THE CHANGING ROLES AND RESPONSIBILITIES OF THE FAMILY**

- What are the living arrangements of the older population? How do these vary by gender?
- How much do older people rely on family members for social and economic support?
- How are familial expectations and obligations changing over time?
- What do we know about the migration of family members and how it affects the well-being of the older population?

LABOR FORCE PARTICIPATION, INCOME, AND SAVINGS

When older adults stop working, they have to rely on support other than wages or salary income; changes in those types of support can in turn affect how long older adults continue working. To understand how well the older population will be able to take care of its own needs (especially in light of the changing roles and responsibilities of families), it is important to have a clear picture of both their labor force participation and their resources, such as savings, wealth, and pensions. This information would allow policy makers to better ascertain the needs of vulnerable populations, design pension and other social protection programs, and develop appropriate labor market policies.

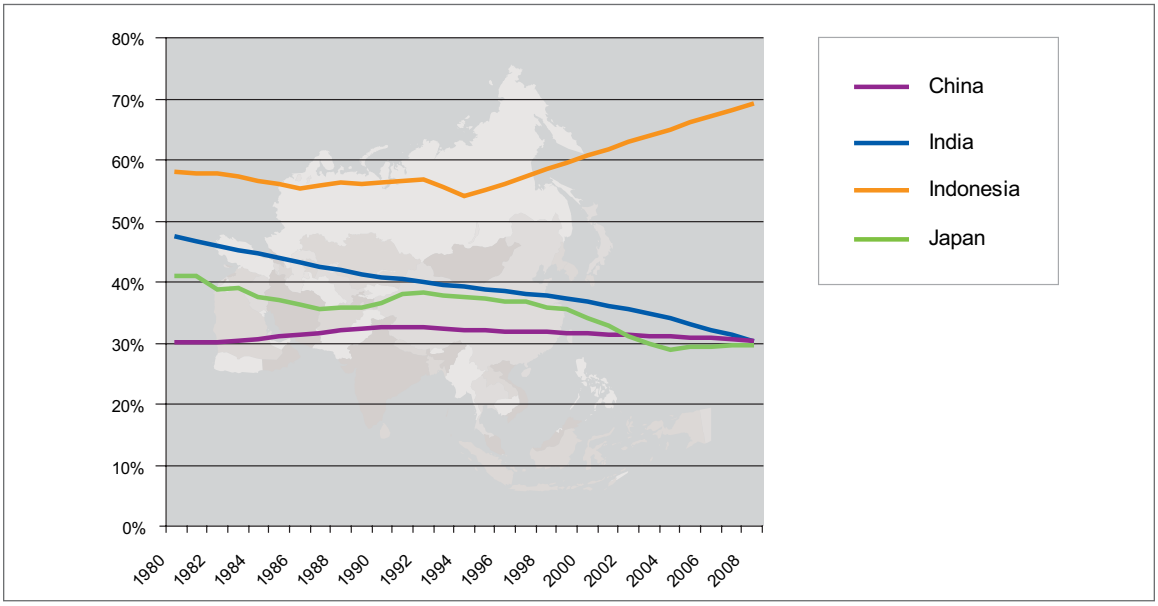
In many Asian countries, older people have few retirement resources outside of their families and do not have access to formal safety nets. Furthermore, as rapid economic changes make their work-related skills obsolete, many may not even have the option to continue working. Poverty rates among the older population in Japan are relatively high,[12] and in India high rates of inflation in the consumer goods sector have resulted in negative returns on old age savings for many people.[13] In Indonesia, support from children may not substitute for elderly parents' need to work.[14]

These problems are compounded by the fact that in many parts of Asia older people are poorly educated. Literacy rates tend to be lower among women than men[15] and lower in rural areas than urban areas.[16] Older women are especially vulnerable as they usually have less labor force experience, income, and assets than men,[17] and they are significantly more likely to be widowed.[18]

Labor force participation in Asia differs from country to country and between men (see Figure 6) and women (see Figure 7). In the developing countries of Asia, very high percentages of the older populations have work histories in agriculture, family-owned businesses, or self-employment (sectors in which there is no mandatory retirement age).[19] In India, older people in rural areas—both men and women—have historically been more likely to participate in the labor force than those in urban areas.[20] In China, the age structure of the agricultural working population over the last two decades has become older as younger workers have moved into industry and services.[21]

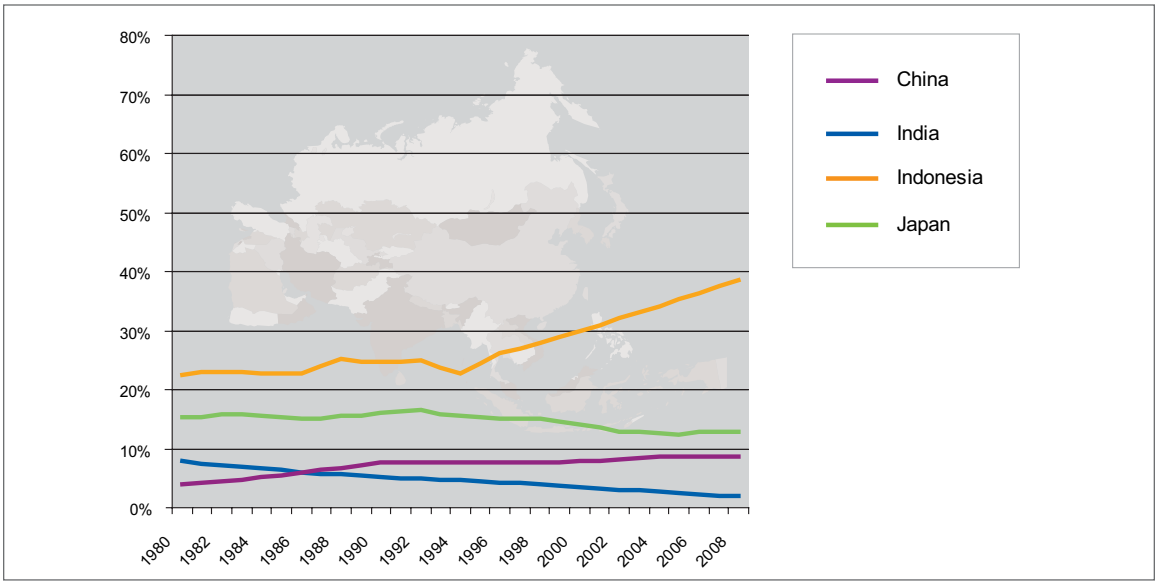
The percentage of older people with pension plans varies widely by country. In 2006, the estimated shares of the labor force covered by mandatory pension schemes were 9 percent in India, 16 percent in Indonesia, 21 percent in China, and 95 percent in Japan.[22] In general, countries with large numbers of workers in the agricultural, small business, and informal sectors—which have high labor turnover and weak work documentation—may find it difficult to set and enforce contributions to pension programs. About 70 percent of the workforce in Indonesia[23] and more than 90 percent of the workforce in India is employed in the informal sector,[24] which makes it difficult for social

FIGURE 6: PERCENTAGE OF LABOR FORCE PARTICIPATION AMONG MEN 65 AND OVER, 1980-2008



SOURCE: Data from International Labour Office (2009). *Economically Active Population Estimates and Projections 1980-2020: Version 5, Revision 2009*. Geneva, Switzerland: International Labour Office.

FIGURE 7: PERCENTAGE OF LABOR FORCE PARTICIPATION AMONG WOMEN 65 AND OVER, 1980-2008



SOURCE: Data from International Labour Office (2009). *Economically Active Population Estimates and Projections 1980-2020: Version 5, Revision 2009*. Geneva, Switzerland: International Labour Office.

BOX 3: **ILLUSTRATIVE RESEARCH QUESTIONS ON LABOR FORCE PARTICIPATION, INCOME, AND SAVINGS**

- How and why do labor force participation rates vary by age and gender?
- Are preferences related to work and retirement changing over time?
- How do the income benefits of economic growth vary across different age groups?
- What assets do older people possess?
- What are the returns to old-age savings?
- What resources will future retirees have to support themselves?
- How should public pension programs be structured?

protection programs to reach those most in need. In China, there are significant differences between cities, towns, and rural areas—where, respectively, approximately 68 percent, 21 percent, and 4 percent of older people rely on pensions as a main source of support.[25]

Despite this heterogeneity, the common trend in all Asian countries is that as the population ages, the ratio of workers to pensioners steadily declines. The large numbers of people entering retirement age will put increasing pressure on pension plans and may require governments to reconsider the level of benefits they can provide or the age at which eligibility may begin. Policy makers should also consider the possible effects of pension payments on family transfers and living arrangements; similarly, although pension coverage in most Asian countries is not as widespread or generous as it is in Western countries, Asian policy makers should nevertheless anticipate the issues and controversies that have arisen elsewhere regarding the effects of public pension programs on labor force participation and retirement.[26]

Box 3 lists some illustrative research questions on issues relating to labor force participation, income, and savings.

HEALTH AND WELL-BEING

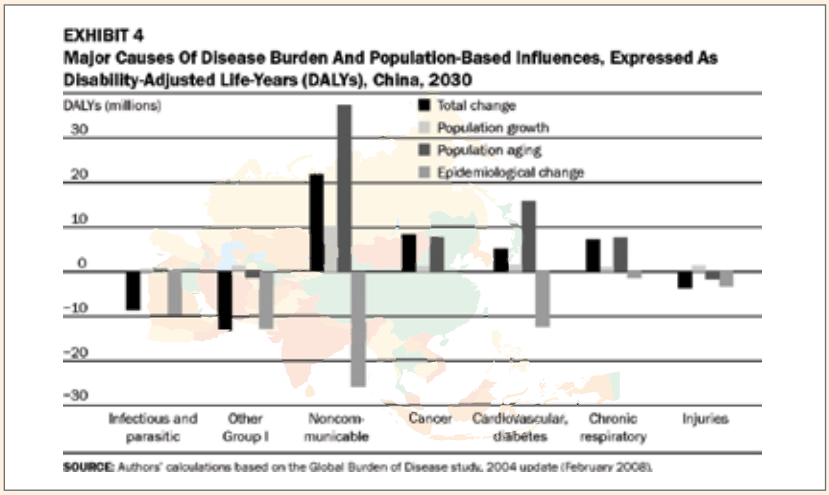
Perhaps the most important measure of how successful a country has been in dealing with the oldest members of its population is to be found in their health and well-being. The disease burdens and health care needs of aging societies are quite different from those of younger ones, and thus it is crucial that countries assemble accurate data on the health of their oldest citizens. This information can ultimately help inform policy discussions on such issues as the appropriate allocation of resources among competing health care needs and priorities, service delivery and financing, and access to care—especially access to long-term care.

BOX 4: THE SHIFTING BURDEN OF DISEASE

To track the toll that disease and injury takes on a population, researchers use the concept of disability-adjusted life years, or DALYs, which provide a convenient measure of the health gap between an ideal, totally healthy population and the real-world population with its various diseases, injuries, and poor health. Figures 8 and 9 show how the disease burden is expected to change in China and in India between 2004 and 2030.

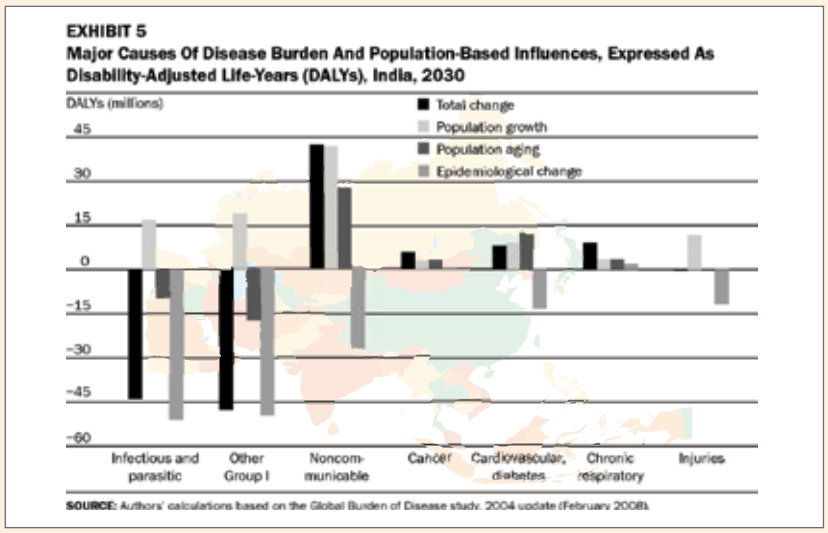
In both countries the total disease burden due to infectious and communicable diseases is expected to drop sharply, thanks mostly to improved prevention, while the total disease burden due to noncommunicable diseases, such as cancer, heart disease, and neurodegenerative disorders, will grow rapidly. In China, that growth will be due mainly to the aging of the population, as such diseases become more common with age, while in India the larger disease burden is due to the growth in the size of the population.[27]

FIGURE 8: CHANGE IN MAJOR CAUSES OF DISEASE BURDEN IN CHINA, 2004-2030



SOURCE: Chatterji, S., Kowal, P., Mathers, C., Naidoo, N., Verdes, E., Smith, J.P., and Suzman, R. (2008). The health of aging populations in China and India. *Health Affairs*, 27(4), 1,052-1,063, Exhibit 4. Available: http://content.healthaffairs.org/cgi/content/full/27/4/1052 [accessed October 2010].

FIGURE 9: CHANGE IN MAJOR CAUSES OF DISEASE BURDEN IN INDIA, 2004-2030



SOURCE: Chatterji, S., Kowal, P., Mathers, C., Naidoo, N., Verdes, E., Smith, J.P., and Suzman, R. (2008). The health of aging populations in China and India. *Health Affairs*, 27(4), 1,052-1,063, Exhibit 5. Available: http://content.healthaffairs.org/cgi/content/full/27/4/1052 [accessed October 2010].

Because older people generally require significantly more health care than young and middle-aged people, the coming demographic shift is likely to place great demands on countries' health care systems despite the increase in the years of life spent in a healthy condition. Population aging also changes the types of health care required (see Box 4). In the first few decades of life, health care is generally focused on communicable diseases and accidents; in later years, health care centers on noncommunicable diseases, such as cancer and heart disease, as well as functional and cognitive disabilities that become more common with age, such as problems with mobility or eyesight. (However, in some developing countries communicable diseases remain a problem throughout life.) The health infrastructures of developing countries in Asia, which have primarily been centered around problems of infectious diseases and maternal and child health, will therefore have to be reoriented.

Governments need to consider how older people can afford the health care they need and the public- or private-sector approaches that might best provide it. In India, only 15 percent of the country's population has access to formal health insurance, and 75 percent of all health care expenses are paid for directly by individuals.[28] And the annual per capita out-of-pocket health spending is almost four times as high among the older population as among working-age adults.[29] In Indonesia, similarly, only 15 percent of the population is covered by some form of health insurance, and it is very difficult for those aged 65 and older to obtain coverage.[30] Japan, in contrast, has universal health insurance funded by individuals, their employers, and the government.[31] China, where 45 percent of total health expenditures are paid for directly by individuals, falls in between.[32]

The health status of the older population can have important implications across a range of other domains. The healthier people are, the longer they will be able to participate in the labor force—and, more generally, lead active lives and contribute in various other ways to their communities.

BOX 5: **SCIENCE, TECHNOLOGY, AND POPULATION AGING**

The factors that underlie the dramatic increases in life expectancy in Asia and other parts of the world are only partly understood. Current scientific knowledge suggests that human beings are not yet approaching a biological limit to life expectancy, so that it is possible that major increases in life expectancy—even above and beyond those currently projected—could be achieved through a combination of factors ranging from better behavioral health choices to new research breakthroughs that enhance understanding of the genetic, physiological, and biochemical causes of aging and aging-related diseases.[33]

Major extensions in life expectancy would undoubtedly accelerate the speed of population aging and potentially accentuate the various social and economic challenges associated with aging. However, scientific and technological advances in such fields as molecular biology, genomics, immunology, cell therapy, and regenerative medicine could also do much to reduce morbidity and disability among older people and make it easier for societies to accommodate demographic change. Similarly, improvements in physical infrastructure and transportation—as well as developments in bionics, robotics, and nanotechnology, among others—have the potential to allow individuals and societies to more fully reap the rewards of longer life. Investments in science and technology can not only add years to life, but also "add life to years."

(Box 5 discusses the relationship between quality of life and science and technology.) Health, in turn, can be affected by income and wealth. Similarly, the way in which society organizes and delivers health care can change the nature of family relationships; increased prevalence of institutionalized care could, for example, make it easier for the primary caregiver (most likely female) to join the labor force.

Box 6 lists some illustrative research questions relating to health and well-being.

BOX 6: **ILLUSTRATIVE RESEARCH QUESTIONS ON HEALTH AND WELL-BEING**

- What are the prevalence rates of various diseases and chronic conditions among the elderly? How do these vary by gender?
- What are the levels of physical and mental functioning among the elderly?
- Are increases in longevity associated with higher rates of disability?
- How are various socioeconomic characteristics related to the health and health practices of the elderly? How does wealth affect health—and vice versa?
- What are the patterns of family caregiving?
- What are the rates of health care utilization among the elderly? How do they obtain care, and how do they pay for it?
- How do the health benefits of economic growth vary across different age groups?

STRENGTHENING SCIENCE TO INFORM POLICY

To meet the needs of their rapidly aging populations over the next few decades, Asian governments need to devote significant resources to research on the issues facing older people. Experience suggests a number of ways in which aging research can be especially useful for policy makers.

In the absence of randomized trials or social experiments, observational research that is longitudinal in design—that is, that uses data gathered from the same respondents on a number of different occasions—can be especially effective in untangling some of the key causal relationships related to aging.[34] For example, how do mandated changes in pension plans affect individual savings? Or, how do income levels affect health? Longitudinal data sets possess a number of advantages over cross-sectional data, although they can also be costly to implement, suffer from sample attrition between survey waves, and offer challenges in terms of keeping the sample representative of the general population over time. All of these issues, however, can be addressed through thoughtful design and careful administration.

Understanding the needs and behaviors of populations as they get older will require information and insights from a variety of specialties, including demography, psychology, sociology, economics, statistics, gerontology, and medicine. Thus, surveys of older persons are likely to prove particularly useful if they provide policy-related information on a variety of topics—including basic demographic details, family relationships and interactions, employment and income, pensions, assets, health status, and health care utilization—allowing researchers to examine the interactions between different domains.

Well-designed population studies in a single country (which allow one to take advantage of within-country heterogeneity) are certainly valuable, but the value of any one country's investment in data collection can be enhanced still further if similar data are collected elsewhere. Countries in the relatively early stages of population aging may especially benefit from the experience of countries whose populations have been aging for decades, although the challenges in different countries will undoubtedly vary somewhat according to local conditions and cultural factors.

Once the time and resources have been spent to collect data on aging populations, the best way to maximize the return from that investment is to make the data readily accessible to as broad a range of researchers as possible. Putting data into the public domain allows researchers to work independently, as well as creatively, and to replicate each others' findings—thereby advancing the scientific process. The legitimate privacy and confidentiality concerns raised by the sharing of data from surveys of this sort can be handled with a number of effective methods, both legal and statistical, for protecting the privacy of survey respondents. Open access to data is enormously valuable to researchers within individual countries and is a prerequisite to truly meaningful scientific collaboration among countries.

Many surveys of adult and elderly populations contain important elements. However, a number of longitudinal studies are also under way in China, India, Indonesia, Japan, South Korea, and Thailand that have great potential for building on existing data collection efforts and facilitating cross-national research (see Box 7). These studies, which are in various stages of development have been designed so that their data can be harmonized not only with one another, but also with comparable surveys such as the English Longitudinal Study of Aging (ELSA), the Health and Retirement Study (HRS) in the United States, the Mexican Health and Aging Study (MHAS), and the Survey of Health, Ageing, and Retirement in Europe (SHARE).[35]

BOX 7: **COUNTRY-LEVEL LONGITUDINAL POPULATION STUDIES IN ASIA**

China Health and Retirement Longitudinal Study (CHARLS)

CHARLS is a biennial survey that aims to be representative of the residents of China aged 45 and older. The sample size is estimated to be around 10,000 households and 17,000 individuals. The baseline survey took place in two provinces in the fall of 2008; the next wave will take place in 2011. The household survey includes the following parts: demographic background; family; health status and functioning; health care and insurance; work, retirement, and pension; household and individual income, expenditure, and assets; and interviewer observation. A public version of CHARLS data is available online.

Health, Aging and Retirement in Thailand (HART)

HART is a biannual survey that seeks to monitor the health and retirement of the Thai population aged 45 and older. The pilot survey of HART, with a sample size of around 1,500 people, was conducted in 2009 in areas around Bangkok and in the Northern Provinces. The current plan is to reinterview the same people in 2011 while expanding the survey to the entire Thai population aged 45 and older. The HART questionnaire contains an array of information on demographic characteristics, family support, health, employment, income, assets and liabilities, and life satisfaction.

Indonesian Family Life Survey (IFLS)

IFLS began in 1993-1994, and subsequent waves were conducted in 1997, 2000, and 2007-2008. It administers questionnaires to more than 40,000 individuals living in approximately half the country's provinces, creating a sample group that is representative of more than 80 percent of the country's population. The survey contains a wealth of information at the individual and household levels, including multiple indicators of economic and noneconomic well-being. In addition to individual- and household-level information, IFLS provides detailed information from the communities in which IFLS households are located and from the facilities that serve residents of those communities. A public version of IFLS data is available online.

Japanese Study of Aging and Retirement (JSTAR)

JSTAR takes an interdisciplinary and longitudinal approach to studying the older population. The study started in 2007 with a random sample of 4,200 people aged 50 to 75 in five municipalities, and the goal is to increase the number of municipalities (now seven) to create a nationally representative sample. A public version of JSTAR is available online.

Korean Longitudinal Study of Aging (KLoSA)

KLoSa began in 2006. It surveys people aged 45 and older every 2 years, using a nationally representative sample of approximately 10,000 people. Topics are grouped into the following categories: demographics; family; health; employment; income; assets; and subjective expectations. A public version of KLoSA data is available online.

Longitudinal Aging Study in India (LASI)

LASI is now in its pilot phase. The study's goal is to create a nationally representative survey of roughly 30,000 people aged 45 and over who will be followed for decades, with respondents being added over time to replace those who drop out or die. The pilot survey included both household and individual questions that covered: demographic characteristics; health and use of health care; family and social networks; housing; work and employment; income and consumption; assets and debts; and pensions.

Study of Global Ageing and Adult Health (SAGE)

SAGE collects data on respondents aged 18 and older, with an emphasis on people aged 50 and older, from nationally representative samples in China, Ghana, India, Mexico, Russia, and South Africa. A baseline cohort was created during 2002-2004, and the SAGE questionnaire was piloted in 2005. The data collected covered income; expenditures and transfers; work history; self-reported assessments of health linked to anchoring vignettes; risk factors; health care utilization; measured performance tests on a range of different aspects of health; well-being, happiness, and quality of life; and biomarkers. The first wave of SAGE was fully implemented in 2007-2009: it has a target sample size of 5,000 households with at least one respondent aged 50 or older and 1,000 households with a respondent aged 18-49. A second wave is being conducted during 2010-2011, and the plan is to implement future waves every 2 years. A public version of SAGE data is available online.

LOOKING TO THE FUTURE

The Asia of 2050 will be much different from the Asia of today. People are living increasingly longer and healthier lives, and birthrates are declining. As a result, during the next few decades most countries' populations will contain a significantly larger percentage of older people than is the case today. These demographic shifts are taking place alongside many other rapid social and economic changes that are transforming the lives of older people across the region. In attempting to develop appropriate policy responses, policy makers can benefit both from a clearer understanding of the current situation of older people and an improved understanding of how the changes described above are likely to affect the lives of older people in the future. Fortunately, because these changes are occurring over several decades, there is still time to strengthen the evidentiary basis for policy development. A window of opportunity exists, but it will not stay open indefinitely.

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