Population Momentum and Population Aging in
Asia and Near-East Countries

August, 2000

STUDY TITLE:	Population Momentum and Population Aging in Asia and Near-East Countries
SUBCONTRACTOR NAME:	East-West Center
PROJECT NAME:	The POLICY Project
PROJECT NUMBER;	936-3078
PRIME CONTRACT:	CCP-C-00-95-00023-04
SUBCONTRACT NO:	5402.50E.EWC.01
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This study is being supported by the Strategic and Economic Analysis Office, Asia/Near East Bureau, USAID. For additional information, contact Andrew Mason at amason@hawaii.edu.

Foreword

The objectives of the study are to document the rapid growth of older populations in the region, to address key issues and topics related to aging, and to assess the implications for programs and policies. The study takes a broad look at population aging in Asia and a more detailed look at seven Asia/Near East countries: the Philippines, Thailand, Indonesia, India, South Korea, Bangladesh, and Egypt. In this study, Asia includes East, Southeast, and South Asia, but not Western Asia. The included countries are shaded on the map that follows.

This study was undertaken at the request of and with the support of the Strategic and Economic Analysis Office, Asia/Near East Bureau of USAID. Funding for this report was made available by the POLICY Project under USAID Contract No. CCP-C-00-95-00024-04. The POLICY Project is implemented by The Futures Group International in collaboration with Research Triangle Institute and The Centre for Development and Population Activities.

The authors appreciate the support and useful suggestions provided by Koki Agarwal, Phil Estermann, James Gribble, Charles Llewellyn, Jerre Manarolla, Christopher McDermott, Robert Retherford, Zynia Rionda, John Stover, and Hania Zlotnik. We appreciate the able assistance provided by Piya Sereevinyayut and Ann Takeyasu.

Honolulu
2000

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OVERVIEW

The Year 2000 is a demographic watershed in Asia. After a century of growth, the number of children reached a peak in 1999 and, with the turn of the millennium, has begun a slow, gradual decline. Both the enormous, sustained baby boom that characterized the twentieth century and the end of that baby boom have enormous implications for population growth and age structure for the foreseeable future. Fertility decline has been substantial in many Asian countries; in some, fertility has dropped below two children per woman. Despite declining fertility, the region will experience substantial population growth during the coming decades because of what is known as population momentum. Simply put, most population growth will occur because large cohorts of children and youth will, over time, replace much smaller cohorts of middle-aged adults and elderly. The same forces will also lead to population aging with important implications for economic growth, social support systems, and public policy related to retirement, health care, and pensions.

The future of Asian economies is uncertain. During the last few decades, standards of living have risen in many countries, in some spectacularly so. But even the high-performing economies of East and Southeast Asia have experienced turmoil in recent years. China, Singapore, and Taiwan have, to this point, maintained solid growth. South Korea now appears to be recovering strongly. Others, such as Indonesia and Thailand, continue to encounter difficulties. In many Asian countries, standards of living remain low. Cambodia, Myanmar, Viet Nam, Bangladesh, India, Nepal and Pakistan all had per capita incomes of less than $500 in 1998. Although some have improved their economic performance in recent years, achieving adequate standards of living remains a distant and elusive goal in these countries.

Recent evidence shows that demographic conditions in Asia are broadly favorable to economic growth (Bloom and Williamson, 1998; Mason, 1999). But as the demographic transition proceeds, rapid growth of older populations that neither work nor save may slow rates of economic progress. If aging gathers force before Asia's low-income countries achieve adequate standards of living, the obstacles to development will be all the higher. Hence, the next few decades are a critical period for the region.

As aging proceeds, policies towards health and the economic security of the elderly are taking on increased importance. The decisions made regarding these sectors will have far-reaching implications. With increasing difficulty, countries will have to weigh the interests of the young against the old, reconsider the responsibilities of the family vis-à-vis the state, and balance concerns for equity against those for economic growth.

The material presented in Section II discusses demographic change in the region in some detail. We present population projections recently prepared by the United Nations (UN 1998), examine the underlying assumptions, and consider important sources of uncertainty. In Section III, we discuss the impact of aging on the macroeconomy, the health sector, labor and retirement policy, and old-age support systems.

Aging and Population Change

Population aging began in Asia during the 1970s. Before then, rapid growth in the number of children was producing a younger population. Between 1950 and 1975, the percentage of the population under age 15 rose from 37 to 40 percent and the mean age dropped from 21.9 to 19.7 years of age. By the mid-1970s, the trend towards a younger population had reversed itself. Growth in the number of children slowed relative to the number of working-age and the number of elderly (Figure 1). Currently, if UN projections are accurate, the percentage who are children has dropped to 30 percent of Asia's population while the percentage in the working ages has risen to sixty-four percent. The percentage elderly has increased gradually during this period and will continue to rise for the foreseeable future. By 2050, 17% of those living in Asia are expected to be 65 or older; 19% under the age of fifteen; and, 64% between the ages of 15 and 64. The median age will have reached 39 (UN, 1998, medium projections).

Figure 1. Asia's Age Transition

More detailed snapshots of Asia's projected age- and sex-structure are provided by the age pyramids for 2000, 2025, and 2050 (Figure 2). The age pyramid for 2000 is similar to those found in other relatively young populations. There is a broad base consisting of large numbers of children and a narrow top consisting of the relatively few numbers of elderly. In the past, new cohorts of ever-increasing size entered the population, enlarging the base. In the future, however, the base of the age pyramid is expected to be stable with population growth concentrated at older ages.

Figure 2. Population Pyramids for Asia.

The relative stability of Asia's young population is already apparent among the youngest age groups. In 2000, the 0-4-year-old cohort and the 5-9-year-old cohort have essentially the same population size, and neither cohort is as large as the 10-14-year-old cohort. In the future, entering cohorts are projected to be similar or somewhat smaller than preceding ones. The major demographic phenomenon will be a "filling out" of the pyramid at older ages. As this occurs, all but the oldest cohorts are projected to stabilize at around 300-350 million people per five-year age group. Between 2000 and 2025, 99% of Asia's projected population growth is accounted for by the population 30 and older and only 1% by the population under the age of 30. In contrast, the population under the age of 30 accounted for 70% of the growth between 1950 and 1975 and nearly 40% of the growth between 1975 and 2000.

The changes in Asia's population are being driven by three inter-related demographic phenomena. The first is a sustained "baby boom" that produced the largest cohort of youth in the past and, possibly, in the foreseeable future. The baby boom led to accelerated growth in the number of children between 1950 and the late 1970s and more modest growth until 1999. The second demographic event is the emergence of relative stability in the number of children. After more than a century of growth, the number of children in Asia is expected to begin a period of very slow, sustained decline. The third demographic event is the region's mortality transformation. Life expectancy at birth increased from 41 in the early 1950s to 60 by the early 1980s and is projected to reach 68 years for 2000-05.

The impact of these events on the regions age structure are traced out in Figure 3 which charts Asia's population from 1950 to 2050 separately for 15-year-age groups: 0-14, 15-29, 30-

44, 45-59, 60-74, and 75+. This representation of age-structure is advantageous in that it facilitates following cohorts over time. The impact of the "baby boom" is evident in the accelerated growth of the child population, those aged 0-14, between 1950 and 1980 and more gradual growth during the last two decades of the 20th Century. The child population more than doubled in size, increasing from about 500 million in 1950 to about 1.1 billion in 2000. Asia's baby boom was different than the post-World War II baby boom that occurred in the US and many other Western countries. It was much longer lasting, and it occurred for different reasons. The baby boom of the West resulted from an increase in rates of childbearing. Asia's baby boom was primarily the result of a decline in infant and child mortality.

The baby boom had an enormous impact on age structure that will continue well into the 21st century. The first group of baby boomers reached young adulthood in 1965 producing accelerated growth in the young adult population (15-29). In 1980 the first Asian baby-boomers had their thirtieth birthday and in 1995 reached forty-five years of age. As baby boomers enter these age groups during the next few decades, the most rapid growth in Asia's population will be among those in the prime working ages (30-59). Growth in the older population will accelerate begin in 2010 (or 2015) when the first baby boomers turn 60 (or 65).

Figure 3. Population of Asia, Fifteen year age groups, 1950-2050

Asia's future age structure will be influenced as much by the near stability of future cohorts of children as by the rapid growth of the baby boom generation. The year 2000 will produce a generation of children in Asia, the Y2K-generation, that is smaller than the preceding one. As the Y2K-generation ages, growth in the number of young adults and prime-age adults will stabilize and possibly begin to decline. As this occurs, the older cohorts, baby boomers, will continue to enlarge the absolute and relative numbers belonging to older age groups.

The impact of continuing changes in mortality on age structure is less apparent in Figure 3 than changes in size of cohorts of children. However, declining mortality at older ages will have an important impact. As life expectancy rises in the future, the gains in survival rates will be increasingly concentrated at older ages. As a consequence, older age groups grow more rapidly during their high growth period than do younger age groups. Likewise, once growth ceases older cohorts decline somewhat more gradually than do young cohorts. Thus, declining mortality in the future will reinforce the shift to an older population.

In percentage terms, the older population will be the most rapidly growing segment of Asia's population during the first half of the 21st century. The average annual rate of growth for the 60-74 year old population is projected at 2.9% and the 75+ population at 3.4%. In contrast, the 0-14 population is projected to decline at an annual rate of 0.2%, the 15-29 population is projected to be essentially the same in 2050 as in 200, the 30-44 and 45-59 populations are projected to increase at 0.5% and 1.5% annually.

The aggregate patterns for Asia are dominated by its two most populous countries, China and India. However, the general trends and the demographic forces that are influencing regional trends are also operating in other Asian countries and Egypt. The speed and timing of the transition to an older population will vary considerably among the countries within the region. In general, the countries of East Asia are furthest along in the aging process, followed by Southeast Asia, and South Asia. Japan and, then, Singapore have the oldest populations in Asia. Among Asia's major countries, Pakistan has the youngest population (measured by the median age in

2000). There 42% are under the age of 15 and only 5% are 65 and older. Aging measures for the seven countries examined in detail in this study are reported in Table 1.

Table 1. Summary measures of aging for Asia, major regions, six Asian countries and Egypt.

Population Projections to 2050: The UN's 1998 Revision

This study makes detailed use of population projections prepared by the United Nations Population Division and released in 1998 (UN 1998). Any population projection is based on a set of assumptions about long-range trends in demographic variables. The reality that emerges during the coming decades may differ considerably from projected values depending on a variety of social, political, economic, and demographic forces. Political instability, new rounds of economic crisis, the emergence of new infectious diseases, and the more rapid spread of HIV/AIDS could lead to substantial, unanticipated deterioration in mortality conditions and depressed levels of fertility. More optimistically, medical breakthroughs could lead to a substantial extension of life and more rapid increases in life expectancy than anticipated. The future course of fertility in post-transition societies is very uncertain. How low fertility will decline, how long it remains at sub-replacement levels, and whether new baby booms will occur is primarily a matter of speculation.

Despite these uncertainties, population projections provide an important and useful framework for thinking about the future. At this point, we rely single projection to describe the broad demographic trends in Asia. Below, sources of uncertainty and alternative projections are considered in some detail.

The methodology is summarized here, but the interested reader can find a more detailed explanation in Zlotnik, 1999. The methodology used by the United Nations requires estimates of the population by sex and age category in a base year (1995) and subsequent trends in age-specific rates of fertility, mortality, and international immigration from 1995 to 2050.

An estimate of the base year population in each country is obtained by revising and updating the most recent population census using available data on fertility, mortality, and, in principle, immigration. Decennial population censuses are conducted in most Asian countries in years ending with 0 or 1; hence, the most recent direct data on population were collected in 1990 or 1991. In most countries, more recent estimates of fertility and mortality are available from surveys and/or civil registration systems. The most comprehensive data are available for fertility and child mortality. Many countries do not have recent data on adult mortality. Few countries have reliable information on international immigration. Of the 32 countries of East, Southeast, and South Asia with populations of 150,000 or more, 21 have estimates of fertility available after 1993; 18 have estimated of child mortality available after 1993; 5 have estimates of adult mortality after 1993. Thirteen additional Asian countries had estimates of adult mortality for the 1990-93 period (Zlotnik, 1999, Table 1).

The UN Population Division prepares three sets of projections used here. They differ in their assumptions about future trends in fertility. The medium variant distinguishes three groups of countries. The first consists of countries with total fertility rates above replacement level (2.1 births per women). In these countries, the total fertility rate is projected to decline smoothly until it reaches 2.1 births per women at which time it remains constant throughout the remainder of the projection. The second group consists of countries with a total fertility rate between 1.5 and 2.1 births per women. In these, the fertility rate is projected to converge to 1.9 births per women.

The third group consists of countries with very low fertility, a TFR below 1.5 births per woman. In these countries, the TFR is projected to rise to a target level of 1.7 births per woman.

Of the seven countries examined in this study, five belonged to the high fertility group. Of these, Indonesia is projected to reach replacement level first, in 2000-05; India and Egypt five years later; and the Philippines and Bangladesh in 2010-15. Two countries, South Korea and Thailand, are low fertility countries where the TFR is projected to increase to 1.9 births per woman during the first part of the 21st century (Table 2).

Table 2. Fertility assumptions, medium UN projections.

In the low-fertility variant, the total fertility rate for high fertility countries is projected to decline to 1.6 births per woman; for low fertility countries to 0.4 births per women below the target fertility level used in the medium-fertility variant. Thus, the TFR in South Korea and Thailand are projected to decline to 1.5 births per woman. In the high-fertility variant, the total fertility rate for high fertility countries is projected to decline to 2.6 births per woman. The TFR for the low fertility countries is projected to rise to 0.4 births per woman above the target level, a TFR of 2.3 in South Korea and Thailand (Zlotnik, 1999).

UN population projections are based on a single set of mortality assumptions, rather than alternative variants as employed to characterize fertility. In most countries, life expectancy at birth is expected to increase steadily, based on the recent or medium-term experience, but more slowly as high levels of life expectancy are reached. Countries with a life expectancy under 65, for example, are projected to gains 2-2.5 years in life expectancy per quinquennium. When life expectancy reaches 70, the gain per quinquennia is only 1.0 years. At higher levels, the increase per quinquennium drops to 0.3 to 0.5 years of life. The mortality pattern is assumed to converge to an ultimate life table with a life expectancy of 82.5 for males and 87.5 for females, although no country reaches the ultimate life expectancy by the end of the projection period (Zlotnik, 1999). Mortality assumptions for 3 Asian countries, Cambodia, India, and Thailand, explicitly include the impact of HIV/AIDS. Details of the procedures followed are available in Zlotnik, 1999.

The projected life expectancy, at ten-year intervals, for each of the study countries is reported in Table 3. In every country a steady increase in life expectancy is anticipated. The most rapid projected increase occurs in countries with low levels of life expectancy in 1990-95, Bangladesh, Indonesia, Egypt, India, and the Philippines. Slower increases are anticipated in Thailand and South Korea. The projections anticipate substantial convergence in mortality conditions. By 2040-45, the difference between the lowest and the highest country, Bangladesh and South Korea, is only 5.4 years. In 1990-95, the difference was estimated at 15.3 years.

Table 3. Projected life expectancy, ANE countries.

The final component of the UN population projections is international migration. The information about international migration is limited and unreliable, but in most instances international migration is a relatively small component of population growth. In some instances, however, political instability or natural disasters have generated large-scale movements between countries. These are largely unpredictable in nature and no attempt is made to capture them in the UN projections, although the projections do anticipate the return of refugees to the country of origin in some instances. The seven study countries are all classified as population "exporters", although Thailand is a net exporter only for the period 2000-05. Thereafter, no net international migration is projected. Net outflows by South Koreans are projected to decline and stabilize at zero by 2020-25. The other study countries are projected to experience net outflows on a continuing basis. As a percentage of its population, the Philippines has the largest projected net outflows, averaging 0.1% of the population per year between 2000 and 2050. Indonesia and Bangladesh both have net outflows equal to 0.06% of their population per year. The absolute number of out-migrants from India exceeds that from the other study countries, but is only 0.01% of the population per year. Obviously, net migration is a relatively small component of population growth even in the Philippines. The impact on age structure may be substantially larger than these net rates suggest to the extent that the age distribution of immigrants is heavily concentrated in particular age groups. Data on the age distribution of projected migrants are not available by the UN. Hence, the extent to which immigration is influencing population aging in Asia cannot be directly assessed. This is an issue, however, to which we return below.

A brief overview of population projections was provided above. Detailed data are presented in Appendix A.

Labor Force Projections to 2050

The previous section examines the impact of population momentum on population aging in ANE countries. Population momentum also had deep implications for the size and age distribution of the labor force (economically active population). The broad labor force trends for Asia are summarized by Figures 1 and 2 which show both the historical and projected labor forces in ten-year age groups for males and females. In many respects, the labor force trends are similar to the population trends described above. This is hardly surprising as a key determinant of the size of the labor force in any age group is the size of the population in that age group. The values presented here, unless otherwise indicated, are based on the UN's medium variant population projections.

In some countries, the labor force trends differ from the population trends because of important changes in labor force participation rates (activity rates). As discussed in more detail below, the activity rates of three demographic groups, in particular, are changing in many countries. First, many teenagers and young adults are extending their time in school and delaying their entry to the labor force. Second, activity rates among women have increased as rates of childbearing have declined. Third, activity rates among older males have dropped.

Estimates and projections of participation rates primarily rely on the ILO's Economically Active Population Estimates and Projection (EAPEP) for 1996. The EAPEP provides estimates and projections of labor force participation rates by sex and five-year age groups for the period 1950-2010 at ten-year intervals and for 1995. These projections were expanded to 2050 by making additional assumptions, the details of which are provided in Appendix B. The participation rates were combined with UN population from the 1998 Revision to yield estimates and projections of the labor force by age and sex.[1]

Figure 4. Male labor force of Asia; ten year age group 1950-2050

Figure 5. Female labor force of Asia; ten year age group 1950-2050

The labor force transition for Asia is dominated by its two largest countries, China and India. However, most ANE countries have similar experiences with slight variation in the timing

[1] The 1996 EAPEP uses the 1998 edition of the UN population projections.

and speed of the transition. The region and ANE countries have experienced substantial labor force growth that has come in waves, affecting the youngest first followed by successively older age groups. This phenomenon is very similar to what we have seen in the previous section, and directly reflects the impact of population momentum. The size of the child labor force, those aged 10-19, accelerated during the 1960s and 1970s, reached a peak in 1980, entered a period of decline that is projected to continue.[2] Growth in the size of the labor force in this age group ceased earlier than its corresponding population because of the rapid decrease in activity rates of the age group since 1980. The young-adult labor force, those aged 20-29, increased most rapidly during 1970's and 1980's and is projected to reach a peak in 2010. The prime-age male and female labor force, those aged 30 to 49, has been increasing rapidly for the last two decades and is projected to peak in 2030. An older labor force, those aged 60 and over, is relatively small and has increased slowly during the last 50 years. Its era of rapid increase is not expected to begin until 2010 or later. In percentage terms, the elderly labor force is projected to increase most rapidly during the next 50 years. However, declining activity rates among the elderly could slow this growth considerably.

The labor forces of Asia, sub-regions, seven Asian countries and Egypt are provided in Table 4. Detailed data and figures are provided in Appendix B. Note that the broad changes experienced in ANE countries are similar to those of the region as a whole. There are differences in timing and magnitudes. South Korea and Thailand are further along in their transitions and their labor forces are expected to grow little or not at all between 2000 and 2050. The elderly labor forces are expected to grow substantially in both countries but less so than in India, Bangladesh, Egypt or elsewhere. Japan is much further along in the transition and, unlike most

[2] The activity rates for those in this age group are assumed to be constant after 2010 but one can well imagine continued decline in those rates with further reductions in the size of the child labor force.

ANE countries, population decline is anticipated by the UN projections. Although Japan's elderly labor force is expected to grow modestly, its total labor force is projected to decline by 20 million workers between 2000 and 2050.

Table 4. Total labor force, labor force aged 65 and over, regions of Asia and eight ANE countries

Changes in labor force participation rates have an important impact on the size and key characteristics of the labor force. The changes that have occurred in Asia, shown in Figures 6 and 7, are similar to those that individual ANE countries have also experienced. Three general changes have been pervasive. First, adult men aged 25-54 are reducing their participation slightly, while adult women are increasing theirs. Second, young men and women aged 15-24 are postponing their entry in the labor market. Third, elderly men are withdrawing from the labor force at a younger age. The effects of these changes are to concentrate the labor force at prime ages and to increase the number of women as compared to men.

The inverse U shaped profile of activity rates by age for men (Figure 6) is typical of most countries. The activity rates of men aged 24-54 are slightly decreasing in some countries because more workers are being discouraged in weak labor markets. Younger workers aged 15-24 show declining activity rates mostly due to the increase in the age limit for compulsory schooling and the growing trend among the young for higher education. In some instances, young people are discouraged and not seeking work because they think no work is available for their skills.

Figure 6. Male labor force participation rates of Asia by age group

For men aged 55 and over, activity rates have declined substantially for the last 50 years and are projected to continue to decrease, although more gradually, in the future. This is mostly because they have been discouraged and have ceased seeking work as employment opportunities for this age group have shrunk. Rapid technological progress has made their skills and competencies obsolete, reducing their productivity. Employers appear to be reluctant to employ or even to retain older workers on the grounds that aging reduces productivity, and seniority-based remuneration raises the cost of employing older workers. Many older persons have lost their job opportunities because employment has shifted out of agriculture. Jobs in agriculture have been the most important source of employment for the elderly, and this sector is not subject to the labor market rigidities that exist in an urban setting. Rapid changes in educational systems might also have given middle aged and younger workers a competitive advantage over their older counterparts. In some countries, mandatory early retirement provisions have affected activity rates among the elderly. Finally, for some developed countries such as Japan and Korea, higher standards of living, an increased preference for retirement, and the development of pension systems have contributed to lower activity rates among older men.

In most Asian countries, pension programs are sufficiently small that they have had a modest influence on retirement. However, as Asian countries begin to implement new programs for the elderly, participation rates could decline more rapidly than projected. This possibility and other policy aspects of labor force activity by older adults are considered in more detail below.

The activity rate profile of women (Figure 7) is moving closer to that of men, although, even in 2010, women are considerably less likely to be in the labor force than are men. The increase in female participation, concentrated in the 25-59 age group, can be traced to a variety of important developments. Changes in family responsibilities, particularly delayed marriage and the decline in childrearing responsibilities, have played a particularly important role. The development of social infrastructure such as child-care, preschool and elderly-care facilities; changes in the work organization and the development of part-time work; the growth of new industries that require workers with dexterity and intelligence rather than brute strength have all contributed to the increased feminization of the labor force. Improved survey procedures also measure women's activities more accurately by asking women what they do rather than asking them for their profession.

The trend toward higher female participation in Asia is not replicated in the experience of Bangladesh or Thailand. Women in both of these countries have much higher activity rates than to other countries in the region. As their levels are already so high, a small decrease is foreseen for next 50 years.

For younger women in Asia, the trend in activity rates is similar to that for younger men. As they remain in school longer their participation rates have declined. The gender gap in participation has largely disappeared at this age as young women are as likely to be in the labor force as are young men. For women aged 55 participation rates are generally low, have changed very little, and are projected to remain relatively constant.

Figure 7. Female labor force participation rates of Asia by age group

Activity rates vary widely among countries or sub-regions, reflecting varying labor market conditions, industrial structures, educational systems, gender bias, and pension systems. Two differences are particularly important. First, participation by elderly men varies widely. Whereas most of countries in Southeastern and South-central Asia recorded participation rates ranging from 50 percent to 60 percent at the mid-1990’s, Japan and South Korea recorded rates of around 35 percent. Second, there are differences in the pattern of female participation. The M-shaped women’s activity profile found in relatively developed countries in the region such as Japan and Korea was characteristic of the female life cycle in the 1950’s through the 1970’s. The bimodal shape was the result of women leaving the work force at around the age of 25 years to marry and raise children; a proportion returning later at around 35 years of age when their children had entered school or older children could take care of younger ones. This M-shape is not characteristic of other countries probably because of such factors as the dominance of agriculture sector, and/or different ways of child rearing. Even where the M-shape is found, the increase in female activity rates is causing its gradual disappearance.

The changing age structure of the Asian labor force reflects changes both in activity rates and changes in the underlying population. Declining activity rates among the young are reinforced by declining population growth rates among the young. Declining activity rates among the elderly, however, are more than offset by the rapid growth of elderly populations throughout Asia. The resulting age transition of the Asia population is shown in detail in Figures 8 and 9.

The proportion of Asian young male and female workers aged 10 to 19 has experienced a sharp decline for the last two decades. Although India and Bangladesh still will have a relatively high proportion of young workers (10-19) for the next decade, they too will begin to experience the same shift occurring elsewhere in the region. Prior to 1990, Asia as a whole did not experience any change in the proportion of old labor force aged 50 and over, although in Japan the proportion of labor force aged 50 and over has already increased very substantially. Korea and Thailand are also beginning to experience an increase in the proportion 50 and older. In the coming decades, both for Asia as a whole and for most ANE countries, the proportion of labor force aged 50 to 59 and aged 60 and over is projected to increase markedly. By 2050, almost 30 percent of the male labor force is projected to be 50 or older; a somewhat smaller proportion of the female labor force will be concentrated at these ages.

Figure 8. Male labor force transition of Asia

Figure 9. Female labor force transition of Asia

In conclusion, if the projections presented here prove to be accurate, declining labor force participation rates and stable or declining population will lead to a decline in the number of young workers. Continued increases in female labor force participation combined with a larger population in the prime working ages will lead to a significantly larger female labor force. The number of elderly workers will also grow substantially even though the proportion of elderly men participating in labor force is expected to decline.

Demographic Characteristics of the Older Population and Labor Force

Currently Asia's older population is concentrated at younger ages but over time the older members will disproportionately increase their numbers. Of the population 55 or older in 2000, roughly half are between the ages of 55 and 64 and roughly half are 65 or older. Of those 65 or older, roughly two-thirds are aged 65-74 and the remainder are 75 and above. Between now and 2025 the age-distribution of Asia's older population is relatively stable, but between 2025 and 2050 the percentage of the older population aged 75 and above is expected to increase substantially. By 2050, among men, the percentage 75 and above is projected to reach 23 percent of the older population; among women, the percentage 75 and above is projected to reach 30 percent (Table 5).

Table 5. Demographic characteristics of the older population, Asia.

In general, older women outnumber older men; they are also concentrated at older ages than older men. The reason is that, in most countries, survival rates for women are higher than for men. For the population 55 and older in 2000, Asia has about 10 women for every 9 men. At older ages, the sex ratio is even more unbalanced. Among those 75 and older, there are approximately 10 women for every 7 men. This is a persistent feature of Asia's population and is expected to change only modestly over the 50-year projection period.

The older labor force is concentrated at younger ages reflecting the decline in labor force participation rates at older ages. In 2000, about 70 percent of workers in the 55 and older age group were aged 55-64 and about 30 percent were 65 or older. A modest shift in the distribution toward older ages after 2025 is anticipated. Older men are much more likely to be in the labor force than older women. In 2000, there are about 150 older men for every 100 older women in the labor force. The dominance of men among older workers is even greater at later ages. Among those 65 and older, there were 250 men in the labor force for every 100 women. Again, little change is anticipated during the next fifty years.

The demographic characteristics of the older populations vary within Asia. In East Asia, a somewhat higher percentage of the older population is 75 or older. Over time the differences are expected to increase. By 2050, one-third of the older population is expected to be 75 or older in East Asia. In South Asia and Southeast Asia, about one-quarter will fall into the oldest age group. Among ANE countries, Japan's older population is much more heavily concentrated at the oldest age group than is true of other countries. By 2050, over 40 percent are projected to be 75 or older in Japan. Aging is less advanced in other ANE countries --- Egypt and Bangladesh, for example (Table 6).

Table 6. Demographic characteristics of the older population, Asia and ANE countries.

The gender balance also varies among the regions and countries of Asia. Currently, Southeast Asia has a relatively low sex ratio, i.e., relatively few men, as compared with East and South Asia. Among the individual ANE countries, the populations of Japan, South Korea, Thailand, and Egypt are most heavily weighted towards women. Bangladesh, on the other hand, has an unusually high sex ratio. Over the projection period, these differences become attenuated, although Japan, South Korea, and Thailand continue to have a relatively low sex ratio among their older populations (Table 6).

The activity rates of the older population are projected to decline during the coming decades. In part, this reflects an earlier age at retirement and, in part, changes in the age distribution of the older population. The most rapid changes tend to be in the countries experiencing the most rapid aging: Japan, South Korea, and Thailand. As this occurs, the older population will depend more on transfers and their financial assets and less on labor earnings.

Demographics and the Support System for the Elderly

The demographic trends described will have a sustained and irreversible impact on the nature of the support system on which the elderly rely. In this section, we describe these changes in more specific terms.

Marital status

Many elderly rely on their marital partner both for personal and financial support. Over time the proportion of the elderly who are married can shift substantially because of changes in the proportion celibate, i.e., who never marry, the proportion who divorce, mortality rates, and the proportions who remarry after divorce or the death of a spouse. In most Asian countries relatively low percentages never marry and rates of divorce are low. In the future, these two factors may become more important. The proportions of young adults who have ever-married have declined precipitously in many Asian countries. The decline may be entirely the result of a preference for a later age at marriage, but it may be that the proportion who never marry will rise. Likewise, rates of divorce have also increased in many Asian countries and, if rates of remarriage are low, the impact on the support system could be considerable at some point in the future.

In contrast with the uncertain changes in celibacy and divorce, changes in mortality rates are having and will continue to have a large impact on the proportion of the elderly who are married. Thus, the proportion widowed is the focus of this section.

A substantial portion of the elderly and particularly elderly women are widowed. In the year 2000, for example, we estimate once women reach their late sixties (65-69) about half of all Korean and Indonesian women and about 40 percent of all Thai and Filipino women are widows.

Among older women the proportions are even greater. Depending on the nature of the support system, the loss of a spouse can have a devastating impact on the marital partner who remains. The proportions of elderly men who are widowed are much lower. Of men in their late sixties, for example, we estimate that fewer than 15 percent were widowed in the year 2000. Detailed values are provided in Appendix C.

Women are much more likely to be widowed than men for several reasons. First, men are subject to higher mortality rates and typically die at a younger age than do women. Second, wives are typically younger than their husbands, adding further to the number of years by which they can expect to outlive their husbands. Third, older women are relatively unlikely to remarry in Asia should their husband die. A final issue is whether or not the mortality of husbands and wives is independent or not. If the loss of a spouse greatly increases mortality risks among women, for example, we would expect to see lower proportions who are widowed. Although the evidence is indirect, the statistical analysis presented in the appendix suggests that wives do not face substantially elevated mortality risks at the loss of their husband. On the other hand, husbands who experience the loss of a wife may be subject to greater mortality risks.

As mortality rates decline in the future, the proportion of men and women at any age who are widowed will decline in the absence of offsetting changes. Changes in any of the factors mentioned above, the age gap between husbands and wives, the proportions remarrying, and the correlation between mortality of husbands and wives, could also influence the proportions married. The results presented here, however, are based on the assumption that these other factors will remain constant and that only mortality changes will influence the proportions widowed. A detailed discussion of the methodology is presented in Appendix C.

Projections of the proportion widowed have been prepared for four Asian countries for which the requisite data were available. The trends are similar in all four countries, suggesting that it may be safe to generalize from their experience. As expected, the age-profiles of the proportions widowed shift steadily downward during the projection period. The changes are very substantial. A rough characterization is that, for women, the proportions widowed drops in half at each age group between 2000 and 2050. For men, the percentage changes are even greater and the proportions of males who are widowed reach low levels by 2050 (Figure 10).

Figure 10. Projections of proportions widowed.

Although these changes are large, they are not out of keeping with trends in Japan where the proportions widowed dropped very rapidly between 1970 and 1995. The steep decline reflects the very substantial increase in the proportion of men and women surviving to advanced ages.

The changes in widowhood have potentially far-reaching, but complex, implications for the support system for the elderly. In the future, older men and women can expect to have a surviving spouse to a much later age. That spouse may be an important resource providing personal care, companionship, and financial resources. On the other hand, that spouse may be a burden and a drain on the limited human and financial resources of his or her elderly partner.

Population dependency ratio and the economic support ratio

In all economic settings, the existence of large populations that are not currently productive requires that economic resources be transferred from the productive population to the non-productive population. The relative sizes of those two groups determines in part the relative size of the transfers or the "burden" of the non-productive on the productive population.

The non-productive population consists of two age groups, the young and the elderly. As described above, the demographic transition is accompanied by important changes in the relative sizes of the productive and non-productive populations. In many Asian populations, rapid fertility decline has led to a rapid drop in the relative size of the child population and, consequently, a substantial rise in the productive population relative to the non-productive population. As the transition has proceeded, however, the relative size of the elderly dependent population has increased, producing a decline in the productive relative to the non-productive population. This demographic phenomenon undermines the capacity of the productive population to support the non-productive population.

These demographic changes are measured in two ways. The first makes use of the population dependency ratio. This is a standard measure. The child dependency ratio is conventionally constructed as the ratio of the population 0-14 to the population 15-64. The old-age dependency ratio is constructed as the ratio of the population 65 and older to the population 15-64. The total dependency ratio is the sum of these two or the ratio of the dependent population (0-14 plus 65 and older) to the productive population (15-64).

The second measure is the economic support ratio, which is the ratio of the productive population to the consuming population. Often the productive population is calculated using weights to adjust for age-variation in the labor force participation rates and productivity of the working-age population. The consuming population is constructed using weights to adjust for age-variation in material "needs". We use a simple variant of the economic support ratio here.

For the productive population we use the labor force unadjusted for age-variation in productivity; for the consuming population we count children aged 0-15 as 0.5 and all adults as 1.0.

Dependency ratios and the economic support ratio are provided for the regions of Asia and ANE countries in Table 7. The table summarizes the important trends highlighted above. The major trends anticipated in the region are a decline in the child dependency ratio and a rise in the old age dependency ratio during the next fifty years.

In East Asia, the old age dependency ratio dominates the trend in the total dependency ratio that increases modestly between 2000 and 2025 and more substantially between 2025 and 2050. In Southeast and South Asia, the trend in the total dependency ratio is dominated by the child dependency ratio between 2000 and 2025. Thereafter, the total dependency ratio begins to rise in step with the old age dependency ratio.

The pattern for the economic support ratio is similar to the pattern for the total dependency ratio. They move inversely because consumers are in the numerator and producers in the denominator in the support ratio. In the year 2000, the number of workers per effective consumer varies from 0.52 in South Asia to 0.68 in East Asia, giving East Asia an enormous advantage. By 2050, the demographic advantage of East Asia disappears entirely with both East and South Asia reaching 0.55 workers per effective consumer. South Asia will be in a slightly better position to support its dependent population in 2050; East Asia in a much worse position. Southeast Asia's position is essentially unchanged though advantaged as compared with East or South Asia.

Table 7. Summary of dependency ratios and economic support ratios.

Sources of Uncertainty

The UN has been projecting populations since 1950 and, hence, the reliability of its projections has been widely scrutinized. In the past, projections by the UN have differed substantially from actual population trends because estimates of the base year population have been in error and because trends in birth and death rates have differed substantially from the projected levels. In recent years, global birth rates and death rates have declined more rapidly than anticipated and, consequently, global population growth has been slower and population aging more rapid than projected (Keilman, 1999). Other population projection efforts also have had limited success. Even though the US offers a much richer source of data on population and vital events than is typical elsewhere, population projections prepared by the US Census Bureau and the US Social Security Administration have not proven to be very accurate (Lee, 1999).

Fertility trends

The methodology employed by the UN for projecting fertility is described in general terms above. The medium variant fertility transition projected by the UN is characterized in more concrete terms by Figure 11. This figure plots the decline in TFR during any five-year period against the TFR at the beginning of the period.[3] The TFR in the typical high fertility country is projected to decline by about 0.4 to 0.5 births per woman every five years until the TFR drops to about 2.8. At that point the pace of decline slows rapidly and stops when fertility reaches replacement level, a TFR of 2.1. The typical country with a TFR below 1.7 experiences a rise in the TFR until it reaches 1.7. A country with a TFR between 1.7 and 1.9 experiences a rise in the TFR until it reaches 1.9, and a country with a TFR between 1.9 and 2.1 experiences no change in its TFR. There is some variation around the typical pattern, but the differences between countries that are experiencing rapid fertility transition (90th percentile) and a slow fertility transition (10th percentile) are relatively small as compared with historical experience.

Figure 11. Global Fertility Transition, UN 1998 Revision, Medium Variant.

The medium variant fertility transition is compared with the most recent historical pattern for the world based on UN estimates of the TFR for 1985-90 and 1990-95. For high fertility countries, the median pace of fertility decline from the UN medium variant are quite similar to the historical values. The historical range (shown in Figure 12), however, is much greater than the projected range (shown in Figure 11). For example, the pace of fertility decline in countries with a TFR near 5 was 0.2 births per quinquennium for the 10th percentile and 1.2 births per quinquennium for the 90th percentile, a difference of 1 birth per quinquennia. In contrast, the range in the projections is less than 0.2 births.[4]

Figure 12. Analysis of TFR Projection, Comparison of Medium Variant to Global Historical Pattern.

If the fertility transition of the future is similar to the fertility transition of the past, the UN medium variant projections will accurately capture the typical experience of high fertility

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[3] Figure 4 is constructed using UN projections of the TFR from 1995-2000 to 2045-50 for all countries. The data were sorted by TFR and moving samples of 99 observations were employed to calculate the median change in the TFR and the 10th and 90th percentiles fat each different TFR level, calculated as the median TFR of each sample.

[4] The historical pattern is constructed using methods similar to those followed for constructing Figure 4. The moving sample is much smaller (37 observations) because a much smaller number of observations are available.)

countries. However, in any five-year period, the experience of any country can be expected to deviate substantially from the typical pattern. Moreover, the medium variant projection may systematically understate the fertility decline for regions or the world, because the distribution of fertility decline in the historical data is highly skewed. In the past, a substantial number of countries experienced very rapid fertility decline a phenomenon that is not captured in the projected data.

For many purposes a time perspective longer than five years is appropriate. If the within country variation in fertility decline is not highly autocorrelated, the average fertility decline over a ten, fifteen, or twenty year period will be much closer to the median. This occurs because rapid fertility decline in one five-year period is balanced by slow fertility decline in another five-year period. One simple method of assessing this issue is to calculate the average decline per quinquennium over a ten-year period using data for 1980-85 and 1990-95. The 90th percentile is substantially lower, about 0.9 births per quinquennium for TFRs in the 5 to 6 range. This confirms that the average rate of change for longer periods tends to fall within narrower bans than the range for five years plotted in the figures presented here.

In the past, UN projections have systematically underestimated the pace of fertility decline because fertility decline has accelerated over time. If the trend to a more rapid fertility transition continues, then the projected fertility in *1998 Revision* once again will be higher than the actual. In the absence of information about why fertility decline accelerated, however, it is difficult to anticipate whether or not such rapid fertility decline will occur and in which countries. Rapid fertility decline in the past few decades has been associated to a considerable extent with rapid social and economic development in East and Southeast Asia. Rapid fertility decline has also occurred in Bangladesh despite its low level of development. To a great extent rapid fertility decline in other high fertility countries will depend to some extent, but not entirely, on whether they enjoy development success. In the past, a number of modeling efforts have attempted to tie demographic trends explicitly to changes in social and economic variables although this approach has largely fallen out of fashion. Recently, Sanderson has argued that incorporating information about socioeconomic variables can lead to improved population forecasts (Sanderson, 1999).

During the past few decades, accurately projecting the speed of fertility decline among high fertility countries has been particularly important because such a large percentage of the world's population lived in high fertility countries. As the demographic transition has continued, however, attention will increasingly focus on forecasting fertility in low fertility countries. Of the seven study countries examined here, for example, two (South Korea and Thailand) have below replacement fertility, four (Indonesia, Egypt, Bangladesh, and India) have TFRs projected at between 2 and 3 births per woman for 1995-2000, and the Philippines has a projected TFR of 3.2 for 1995-2000 (Table 2). How rapidly these countries reach low levels of fertility is becoming less of an issue, and whether or not fertility drops far below replacement fertility is becoming more important.

At low levels of fertility, the medium variant of the *1998 Revision* differs substantially, in both quantitative and qualitative terms, from historical experience. The actual decline in fertility between 1985-90 and 1990-95 was substantially more rapid among low fertility countries than in the projections. Even at the lowest TFR captured by the historical median, a TFR of about 1.8, fertility is continuing to decline by about 0.1 births per five-year period. At low levels fertility decline slowed, but it did not stabilize in the typical country. Even if we examine the eleven countries with TFRs below 1.6 births per woman in 1985-90, five experienced a further decline in fertility and six experienced a rise in fertility. Nothing in the historical experience of low fertility countries supports the assumption that high fertility countries will converge to replacement fertility nor that low fertility countries will experience a rise in fertility, although neither of these possibilities can be ruled out.

Standard practice, and the UN approach to uncertainty, is to offer alternative variants. As explained above, the UN provides two variants employing alternative assumptions about fertility. The high and low fertility variants are compared to the recent historical fertility transition in Figure 13. Note that these variants differ primarily with respect to fertility trends at low and moderate TFRs. The high fertility variant assumes that, among high fertility countries, the TFR will stabilize at 2.5. Thus, projected fertility decline is much slower than was the case in the recent past (or earlier for that matter). The low fertility variant more closely tracks historical experience. Given this variant, projected fertility continue to decline even at low levels. The pace of the decline is substantially more rapid than has been true in recent history.

Figure 13. Comparison of high and low fertility variants to historical experience.

Emphasizing the typical pattern, the median, in historical data tends to de-emphasize the wide range of historical experience at low fertility levels. Some countries with low fertility levels experienced much more substantial declines in fertility than is typical; some experienced substantial increases in their fertility levels. Moreover, the historical patterns presented in the figure are based on limited experience with low fertility. One cannot rule out the possibility that fertility rates will drop to or remain at very low levels or that they will rise the levels well above replacement. Lee's (1993) analysis of US fertility trends employing a stochastic forecasting model, for example, estimated a 95% confidence interval for average US TFR from 1990 to 2065 from a high of 2.7 births per woman to a low of 1.3 births per woman.

The implications of alternative fertility outcomes for population aging are discussed below, but before turning to that we examine uncertainty with regard to future mortality.

Mortality trends

The UN projected mortality transition is represented in Figure 14 using the same methodology employed to represent the fertility transition above. The typical high mortality country is projected to experience an increase in life expectancy at birth of about 2.5 years per quinquennium. Once life expectancy reaches about 60, the rate of increase slows gradually. Countries with life expectancies exceeding 80 typically experience an increase of 0.4 years per quinquennium in the UN projections. Note that UN does not use alternative mortality variants; hence, the mortality pattern portrayed in Figure 14 applies to all variants. At low levels of life expectancy the rate of increase varies considerably among the countries; the range is vary narrow at higher levels of life expectancy.

Figure 14. Global Mortality Transition, UN Population Projections.

The mortality transition based on historical data for 1950-95 is represented in Figure 15. There are apparent similarities and apparent differences between the historical data and the UN projections. The median rate of increase for countries with life expectancies between 45 and 60 are very similar; the variances are also similar for life expectancies in the 45 to 55 year range. At higher life expectancies the projected decline for the typical country is much smoother and continuous than has been true in the past. The historical data shows a peculiar dip for countries with a life expectancy of around 70. For countries with a life expectancy in the 72-75 range the rate of decline is about one year per quinquennium with no clear indication of a slow down. The range is much greater in the historical data at high levels of life expectancy than in the UN projections.

Figure 15. Life Expectancy Transition, 1950-1995.

In Figure 16, the UN mortality projections are compared both to the full set of historical data available and to the most recent historical period, 1985-95. The historical patterns differ markedly at low levels of life expectancy. The gains were much smaller between 1985-90 and 1990-95 reflecting primarily the impact of the AIDS epidemic in sub-Saharan Africa. Although the UN projections explicitly incorporate the impact of the AIDS epidemic, they anticipate a return to a mortality transition that is similar to the experience for the 1950-95 period.

The UN projections do not incorporate the dip in the rate of increase that occurs at life expectancy of 70 in both historical patterns. The historical pattern reflects relatively stagnant mortality conditions in Eastern European countries. Whether change in that region of the world eventually will result in more rapid improvements in mortality remains to be seen, but UN projections appear to be optimistic on this score.

Figure 16. Comparison of UN mortality projections to historical data.

The UN projections also anticipate continued decline in the rate of change at high levels of life expectancy. Given the paucity of data at life expectancies so high, there is little direct empirical evidence regarding this issue. The historical patterns represented here do not extend beyond 75 years of life expectancy because the last observation is based on the 99 countries with the highest life expectancy in the world in 1985-90. If we reduce the size of the sample so as to focus on a select group of countries with exceptionally high levels of life expectancy we find some indication of slower increase. The 14 countries with life expectancies exceeding 77 (a median of 77.4) experienced a median increase in life expectancy of 0.83 years per quinquennium. Although their experience suggests a further slowdown, the rate of increase was greater than in the UN projections. At a median life expectancy of 77.4 the median increase projected by the UN is 0.65 years per quinquennium.

How do the differences between the historical pattern and the UN projections bear on the course of life expectancy in the countries that are the focus of this study? In 1990-95, life expectancy varied from a low of 56 in Bangladesh to a high of 71 in South Korea (Table 3). Projected life expectancy in each of these countries is higher, but less so for South Korea and Thailand, because the UN model projects more rapid increase in life expectancy near 70 than has been the case of the historical data. South Korea and, to a lesser extent, Thailand are most influenced by uncertainties about trends in life expectancy at high levels. If the slow down envisioned in the UN projections does not emerge, both of these countries would have higher life expectancies.

This issue is examined more formally in Table 8 which compares the projected increase in life expectancy with the increase that would occur if each country followed the median path in the historical data. The historical model is based on centered moving average of 99 observations for countries with a population of 2 million or more. Data for 1950-95 are included. At the upper ranges of life expectancy the size of the moving sample was reduced, as necessary, to obtain estimates. The smallest sample included is 30 observations for which the median increase was 0.9 years per quinquennium. The median was similar for the highest 15 observations, but for the highest ten observations the median increase was approximately 0.5 years per quinquennium. The UN methodology anticipates more rapid increases in life expectancy in Bangladesh, Indonesia, Egypt, and the Philippines than does the historical model. The UN anticipates a slower increase in life expectancy in South Korea, Thailand, and India than does the historical model. The slower increases in UN projections of life expectancy in Thailand and India are due, in part, to the projected impact of AIDS in those countries.

Table 8. Projected life expectancy among the study countries, Asia and the Near East, 1995-2050.

The differences between the average rate of increase in life expectancy in the UN projections and a historically based model are relatively modest (about 10%) and it may well be that the differences in the UN projections are entirely appropriate. However, the differences between the historical data and the UN projections highlight the possibility that political changes, the emergence of infectious diseases, medical advance, and other unforeseen events may have an important bearing on the course of life expectancy in the future. Moreover, individual countries may deviate substantially from the typical pattern. The historical data indicates a relatively wide range in the pace of mortality decline.

The UN projections do not provide alternative mortality variants that would allow an assessment of the impact on population aging of unusually rapid or unusually slow mortality decline. For Asia, sub-regions of Asia, and the seven study countries from Asia and the Near East, however, we have estimated two variants that allow such an assessment. This was accomplished by preparing alternative projections. In the high mortality variant, life expectancy is assumed to increase half as rapidly as in the UN projections. Hence, the projected life expectancy achieved in 2020-25 in the UN projections is not achieved until 2040-45 in the high mortality projection. In the low mortality variant, life expectancy is assumed to increase twice as rapidly as in the UN projections. Hence, the projected life expectancy achieved in 2040-45 in the UN projections is achieved in 2020-25 in the low mortality projections. Preparing alternative projections in this manner is feasible using the data that are publicly available from the UN. A chief limitation is that the low mortality projections cannot be extended beyond 2020-25. There is no obvious way that this limitation can be circumvented without modifying and fully implementing the UN projection methodology, an effort that is beyond the scope of this study.

Before we present and discuss alternative variants, we should consider the difficulties of interpreting these variants. The choice of assumptions used to implement variants is to a great extent arbitrary and we can provide little guidance about the probability that vital rates will fall within the span captured by alternative scenarios. Likewise, we cannot attach probabilities to the alternative outcomes. Our rough assessment is that the span in mortality decline between the high and low variant is wide. Mortality increase twice as rapid as projected by the UN is greater than the 90th percentile in the historical data. Given historical experience, the probability that a country would experience such rapid mortality decline consistently over a twenty-five year period must be substantially less than 0.1. Experiencing mortality decline that is half a rapid as in the UN projections is roughly comparable to the 10th percentile in the historical data, but again the probability of a country experiencing such a slow rate of mortality change for a sustained period of time would be much lower. Balanced against these observations is the possibility of large unforeseen events that have a large and sustained impact on mortality and the uncertainties about the pace of mortality change at high levels of life expectancy.

Alternative variants

Detailed population projections for Asia and the seven study countries are provided in the appendix tables. Here we briefly describe results from the alternative scenarios.

The size of the population 65 and older is not influenced by fertility variation for 65 years. Thus, the number of elderly is identical in the three fertility variants produced by the United Nations. The impact of mortality variation on the size of the elderly population is reported in Table 9. Irrespective of the mortality variant, the elderly population will increase substantially by 2025 and between 2025 and 2050. In all cases, the elderly population at least doubles between 2000 and 2025. In Southeast Asia and South Asia, the projected population 65 and older doubles again between 2025 and 2050. The size of the elderly population is affected by the mortality variant. If low mortality conditions prevail between 2000 and 2025, the population 65 and older is approximately 20% larger than if high mortality conditions hold.

Table 9. Population 65 and older.

The population growth rates of the population 65 and older reinforce the conclusion that rapid growth of the elderly population during the next fifty years can be safely assumed, even if it is not certain (Table 10). The most rapid growth in the elderly population is likely to occur in Southeast Asia, but this conclusion is sensitive to the mortality variant. If mortality rates decline slowly in Southeast Asia and rapidly in South Asia, then South Asia would experience the most rapid growth in the elderly population. Of the seven countries for which separate projections have been prepared, the Philippines is projected to experience the most rapid growth in the elderly population between 2000 and 2025 and Bangladesh is projected to experience the most rapid growth during the second quarter of the 21st century. Most countries are projected to experience somewhat slower growth in their elderly populations during the second quarter than the first quarter of the 21st century. The decline is particularly marked in South Korea. The mortality variant has a substantial impact on the rate of growth of the elderly population. During the first quarter century, the difference in the low mortality variant and the high mortality variant is consistently more than 0.5 percentage points but less than 0.8 percentage point.

Table 10. Growth rate, population 65 and older, three mortality variants.

The old age dependency ratio, the ratio of the population 65 and older to the population 15-64, is influenced both by mortality variation and, after 15 years, by fertility variation. The ratios are available for the nine combinations of fertility and mortality projected. Table 11 presents only the variants which produce the lowest old age dependency ratio (var1: high fertility, high mortality), the UN's medium fertility projection (var5), and the highest old age dependency ratio (var9: low fertility and low mortality until 2025; var6: low fertility and medium mortality after 2025). In 2025 the highest and lowest dependency ratios differ by roughly 20 percent. By 2050 the range widens considerably even though variant 9 is not available. The medium mortality, low fertility variant old age dependency ratio is 50 percent higher or substantially more for variant 6 than for variant 1.

Table 11. Old age dependency ratios, regions of Asia and seven ANE countries.

The demographic trends that produce the most extreme values of the old age dependency ratio do not necessarily produce the most extreme values of the total dependency ratio. Low fertility and low mortality rates produce the highest old age dependency ratio, but not the highest overall dependency ratio (Table 12). The reason is that low fertility yields a population with fewer in the working ages, but also fewer children. In the variants analyzed here, lower fertility generally produced a lower overall dependency ratio even though it produced a higher old age dependency ratio. Mortality variation of the type evaluated here generally has the same impact on total and old age dependency ratios because lower mortality rates produce more surviving children and more surviving elderly. Hence, low mortality is associated both with high old age dependency and high total dependency. In both 2025 and 2050, low fertility and high mortality consistently produced the lowest overall dependency ratio (variant 3) and high fertility and low mortality consistently produced the highest overall dependency ratio (variant 7 in 2025; variant 4 in 2050).

The changes in the overall dependency ratios between now and 2025 are very sensitive to the demographic assumption. In 2025, the highest total dependency ratio exceeded the lowest total dependency ratio by between 10 and 18 percentage points, depending on the country or region. The old age dependency ratios differed by only 2 to 3 percentage points across variants. By 2050, however, the value of the old age dependency ratio differs considerably from one variant to the next.

Table 12. Total dependency ratio, regions of Asia and seven ANE countries.

HIV/AIDS

The emergence of HIV/AIDS has greatly increased uncertainty about population trends, especially in sub-Saharan Africa. To this point, many Asian countries have experienced much lower rates of exposure. However, Thailand, other countries in Indochina, southern China, and India are experiencing serious epidemics. The emergence of HIV/AIDS in other Asian countries in the next few decades could have a serious demographic impact that will influence the course of aging and support systems.

UN Population Projections incorporate the impact of the HIV/AIDS epidemic in three Asian countries of which two, Thailand and India, are subject to more detailed examination in this study. Of the seven study countries, Thailand has the highest estimated rate of HIV prevalence. The most recent estimate from UN AIDS is that 2.2 percent of Thai adults aged 15-49 are infected. In India, the percentage HIV-positive is 0.82 percent. Estimates of the prevalence of HIV/AIDS are much lower in other Asian countries examined in this study (Table 13). Although under-reporting is a serious issue, there is little doubt that the epidemic is far more serious in Thailand and other countries of Indochina than elsewhere in Asia.

Table 13. HIV prevalence in selected Asia and Near East Countries.

In the most heavily affected countries of the world, the HIV/AIDS epidemic is having a major impact on mortality conditions. The US Census Bureau estimates that Thailand's epidemic increased its crude death rate by 16% and reduced life expectancy at birth by 2.3 years, 69.0

rather than 71.3, in 1998. Projections to 2010 anticipate similarly large effects in 2010 (US Bureau of the Census, 1999).

There is a good deal of uncertainty about the course of the HIV/AIDS epidemic and its future impact on mortality in Thailand or in other Asian countries. How rapidly the epidemic spreads will depend on the extent to which individuals curtail or modify high-risk behavior and on the response of institutions to this public health crisis. The impact on mortality and, hence, aging will depend on the development of new forms of treatment that may delay or reduce the progression from HIV to AIDS to death. How these issues will unfold is difficult to foretell. At least in Thailand, current indications are that the response to the epidemic has succeeded in reducing the incidence of HIV/AIDS infection to levels lower than anticipated a few years ago. Hence, the demographic impact may be somewhat less than incorporated into the UN projections or into projections conducted by other agencies, e.g., the U.S. Census Bureau or the Thai government (the National Economic and Social Development Board). In other countries, the epidemic may emerge with serious effects not anticipated in current demographic assessments.

Uncertainty about the course of the epidemic in Thailand has been explicitly considered by the NESDB working group on HIV/AIDS (Thailand, 1994). They examined three scenarios: a baseline scenario that assumes a continuation of risk behavior at 1993 levels; a medium intervention scenario that assumes a substantial decline in commercial sex and an increase in condom use; and, a high intervention scenario that assumes a very large decline in commercial sex and a very large increase in condom use. The baseline scenario yields cumulative AIDS death of 2.1 million between 1987 and 2020. The medium intervention scenario yields 1.4 million deaths, and the high intervention scenario yields 1.2 million deaths.

The impact of AIDS-related mortality on population age structure is very different than the impact of general changes in mortality. Deaths are heavily concentrated among young adults and, to a lesser extent, children. Projections for Thailand, for example, estimate that 76 per cent of all AIDS deaths in 2000 will occur to those between the ages of 20 and 39. Under 10 percent will be to children; under 1 percent will be to the elderly (NESDB Working Group, 1994). Consequently, the immediate impact of the epidemic is to raise both the child dependency ratio and especially, in percentage terms, the old age dependency ratio. The medium-term impact on the child dependency ratio is muted to the extent that deaths occur among adults who have not yet begun or not yet completed their childbearing.

The impact of the HIV/AIDS epidemic on broad measures of aging is relatively modest in Thailand. Using projections prepared by the Thai government in 1995, the peak in deaths due to AIDS as a percentage of the total population will occur between 2000 and 2005. The projected direct impact of higher mortality during this period is to raise the youth dependency ratio from 0.341 to 0.343 and the old age dependency ratio from 0.103 to 0.104.[5] The impact of the epidemic is cumulative in the sense that additional deaths during subsequent periods will lead to further increases in the old age dependency ratio. However, as time proceeds the impact on old age dependency is lessened as cohorts that experienced higher death rates reach old age. This would first begin to occur during the second quarter of the twenty-first century and would partially offset higher deaths among working-age cohorts. Thus, it appears unlikely that the HIV/AIDS epidemic will lead to a substantially accelerated aging of the Thai population or populations of other Asian countries.

[5] Calculations are based on the medium HIV/AIDS intervention variant. These values are calculated assuming that those who died from HIV/AIDS between 2000 and 2005 would not have died from other causes prior to 2005. The impact of differences in the numbers of adults of childbearing age on the number of children is not incorporated.

Although HIV/AIDS had a modest impact on the overall burden of population aging, families that experience the loss of one or more adult members will be seriously affected by the epidemic. To a substantial extent, support for the elderly in Asian societies is family-based. Social norms are changing, but most elderly live with and rely on their children for financial support and personal assistance. With the decline in childbearing to low levels, elderly parents are becoming increasingly dependent on one or two adult children. Because the responsibilities of child to parent are strongly gender-based in many Asian societies, the loss of even a single adult child can threaten the viability of the family support system. We are not aware of estimates of the extent to which AIDS-related mortality will lead to an increase in the number of elderly who have no surviving sons or daughters, but this may be an important emerging issue. In some societies, the epidemic may require the development of and greater reliance on alternatives to family-based support systems for the elderly.

Immigration

International migration is a source of uncertainty for any regional or national population, but for the most part Asia and individual Asian countries have not experienced international immigration in recent decades at levels sufficient to have had a large demographic impact. There are, of course, exceptions to this generalization. Substantial numbers of Filipinos have emigrated to the United States and other receiving countries. The Philippines, Thailand, Pakistan, South Korea and other Asian countries have exported labor, on a temporary basis, to the Middle East in large numbers. Political upheavals have also generated international migration. The Vietnam War, revolution in China, partition of India, and the Korean War all generated large scale movements of populations. Such events are difficult, perhaps impossible, to predict and their impact on aging is uncertain.

Data allowing a comprehensive assessment of trend in international migration are limited. Statistics on international migration flows are rather scarce, but population censuses frequently provide information about the number of foreign born residents. Table 14 presents the number of foreign born or foreign residents enumerated by census or population registers in Asia separately for males and females. In order to provide a comparative picture, migrant populations are also shown for Oceania and North America where migration has played a vital role in population growth.

Table 14. Migrant populations, proportion of foreign born in population, and the growth rate of migrant population; 1965, 1975, 1985 and 1990.

The world's migrant population rose from 75 million in 1965 to 120 million in 1990, at an average annual rate of 1.9 percent. However, estimates of the number of migrants for intermediate years reveal that the growth rate of migrant stock has not been constant. Instead, it has been rising steadily, rising from 1.2 percent per year during 1965-1975 to 2.2 percent annually during 1975-1985 and reaching 2.6 percent per year during 1985-1990. The trend for Asia is more mixed. The migrant population of Asia declined at 0.6 percent between 1965 and 1975, increased by 2.7 percent during 1975-1985 and 2.1 percent during 1985-1990. Despite this growth, however, by 1990 international migrants counted for only 2.3 percent of the world's total population and 1.4 percent of Asia's. Migration can play a much more important role than has been the cases in Asia. Nine percent of North America's population is foreign born and 18 percent of Oceania's. In Asia, perhaps only Singapore has such a large immigrant population.

The limited data on international migration that is available has been used by the United Nations to make simple projections of net international migration that are incorporated into the population projections used here. Historical data on migration are not available as part of the *World Population Prospects: The 1998 Revision*. Projections of international migration rates are summarized in Table 15 for Asia, Oceania, and North America.

Table 15. Net migration, net migration rate, population growth rate, and contribution of net migration to population growth.

The UN anticipates that Asia will experience net out-migration during the first half of the twenty-first century and that Oceania and North America will experience net in-migration. The net number of Asian's immigrating is projected to be 5.5 million over the period 2000-2005. This number is projected to decrease until mid 2020s and stabilize at 4 million thereafter. The net migration rate per year (number of net migration divided by population) is relatively small in Asia, which is projected drop from -0.3 to -0.2 outmigrants per year per 1000 persons. Within Asia, Southeast Asia is expected to experience the highest net immigration as a percentage of its population (-0.4 per 1,000), whereas countries like Japan, Korea, and Thailand are expected to experience no net migration at all after 2020.

Projected net migration is sufficiently small that it contributes little to population growth in Asia. Its projected population growth is reduced by only 2.4 percent between 2000 and 2005 by net immigration and only by 8.3 percent between 2045 and 2050. In contrast, North

America's projected population growth rate is increased by 41 percent by net immigration between 2000 and 2005 and by 120 percent between 2045 and 2050. Net immigration also plays an important role in Oceania's overall population growth.

The impact of international migration on the demographic characteristics of both the sending and the receiving populations depend on whether the demographic characteristics of the immigrant population differs substantially from that of the sending or receiving population and also whether immigrant populations are subject to different demographic rates than the sending or the receiving populations. To the extent that immigration is economically motivated, those of working age are more likely to immigrate and particularly those who are relatively young. However, migrants of working age are often accompanied by family members. Family reunification may lead to immigration by older populations. Schooling opportunities may lead to immigration by younger populations.

Data allowing a comprehensive assessment of the demographic features of international migrants is relatively scarce. However, the US and a few other countries publish some data on the characteristics of immigrants admitted to the US. These data have been used to assess whether immigrants to US are heavily concentrated in a few age groups or not. The values presented in Table 16 are calculated as the ratio of the average number of immigrants in each age group in 1996 and 1997 divided by the sending country's population in that age group in 1995. We do not know the extent to which this partial measure of immigration captures the behavior of all immigrants from a country but given the US is an important receiving country for many nations experiencing net out-migration.

There is a clear age-pattern to US immigration. Working age adults, particularly those in their late twenties and thirties, were most likely to immigrate to the US in 1996-97. For the world as a whole, the proportion immigrating was lower for children and for those 40 and older. The elderly were relatively unlikely to immigrate to the US. In general, then, the immediate impact of immigration to the US was to reduce the working age population of the sending countries and to increase the working age population of the US. Note, however, that the immigrant stream was small as compared to the world population and had a negligible impact on the age-distribution of the population living outside of the US. On average, there were 24 immigrants admitted to the US for every 100,000 persons aged 25 to 34 in the world. As noted above, an immigrant stream of that size was far from negligible from the US perspective and does have implications for the US age distribution.

Data available for four ANE countries demonstrates the diversity in the age pattern of immigration to the US. In general, the age pattern is not as heavily concentrated at the younger working ages in any of these four countries. In Bangladesh, India, and the Philippines the aged distributions are bi-modal with peaks occurring at older ages. The percentage of elderly Filipino's immigrating to the US is particularly high and reflects both family reunification and special rights extended to Filipino's who served in the US military in World War II. To the extent that the age-profile of emigration from ANE countries is more diffuse, the impact of immigration on the age distribution of the sending countries will be smaller. Again, as noted above, we do not know whether the age-profile of US immigrants is similar or not to net immigration to all countries.

Table 16. Immigrants admitted to US per 1000 persons in the sending country, 1996-97.

The overall results suggest that migration patterns by age groups are quite different across countries. One important conclusion is that information about both in-migrants and out-migrants by age group in each country would greatly facilitate efforts to assess the comprehensive effect of immigration on demographic composition. Unfortunately, such information is not available for most countries in the region. Despite the limited information, the influence of net migration on the age distribution of most Asian countries has been quite modest in the past. Unless much larger and persistent migrant streams emerge in the future, Asia's populations will not be unduly influenced by international migration.

Asia's economic crisis

During the last few years, several East and Southeast Asian countries have experienced an economic contraction of unprecedented severity. The economic contraction aggravated social vulnerabilities, especially for the poor who are most vulnerable during times of crisis. The health of the older persons, like that of young children and women of childbearing ages, is also particularly vulnerable to the influences of rising medical costs due to inflationary effects of the crisis. There are various social dimensions of Asian Economic crisis (Atinc and Walton, 1998), which include its demographic impact. If the crisis has a sufficiently large demographic impact in the short-run or if the crisis persists for more than a few years, trends in fertility, mortality, migration, and age-structure may be affected in a number of Asian countries.

Table 17 presents economic indicators for the worst affected Asian countries, namely Indonesia, Korea, Thailand, and the Philippines. The Asian economic crisis translated into rapid contractions in national output and employment. Real gross domestic product declined by as much as 13 percent in Indonesia and as little as 0.5 percent in the Philippines in 1998. Severe exchange rate devaluation created inflationary pressure that resulted in higher prices particularly for imported goods, including drugs and medical supplies. The unemployment rate has also been risen rapidly. In Thailand, it has increased from 0.9 percent in 1997 to 5.3 percent in 1998. In Korea, it reached an unprecedented 6.8 percent in 1998. Net job losses in the four countries reached over 5 million in 1998. The macroeconomic shock undercut fragile coping mechanisms, and for some may have produced life-threatening declines in income.

Table 17. Macroeconomic indicators of selected Asian countries, 1994-1998

The severity of the Asian financial crisis could have affected, in principle, the demography of countries in a various ways. Mason (1997) enumerates the channels through which economic contraction influences a country's demography. Fertility can be affected in several different ways, but the most important is probably decisions by couples to postpone marriage and childbearing. In low income settings, a variety of physiological factors, which influence the supply of children, may also respond to economic fluctuations. But these factors probably play a minor role except in cases of widespread famine. Increases in cost of contraceptives may increase unplanned pregnancies. However, many Asian countries such as Korea, India, and Indonesia are self-sufficient when it comes to contraceptives. Even where the use of modern contraceptives is limited, traditional methods may allow couples to postpone or reduce their childbearing.

Mortality and, more probably, morbidity may increase as a consequence of worsening living conditions. The decrease in income for the lower strata might result in lower food and health care consumption. Deterioration in the quality of publicly provided health care services may have an important impact. The immediate and direct role of the public sector is in the provision of individual and public health services, including, but not limited to, immunization, health education, and primary health services. Public works programs that improve the quality of water supply and sanitation systems also have potentials for influencing mortality. Changes in food policy also may have an important demographic impact (Behrman, 1997). Thus, it is possible that a drop in public investment and expenditure on public services and programs is having an adverse effect on mortality.

The economic crisis may also influence immigration. Labor importing countries may restrict immigration as the demand for labor declines and unemployment rises. On the other hand, workers in labor exporting countries have greater incentives to go abroad. Currency devaluations have substantially increased the wages available abroad in terms of the home country's currency. Economic contraction at home has reduced wages and increased unemployment. A likely consequence is a rise in illegal migration. What will happen to the number returning is uncertain, because return migration depends on many factors such as wage differentials between countries and alternative employment opportunities between countries. For illegal immigrants the severity of penalties imposed might affect the amount of return-migration.

No clear evidence is currently available to assess the impact of the Asian economic crisis on population growth and structure. Part of the problem can be traced to inadequate data. Current and reliable data on fertility, mortality, and migration are not yet available. Another problem is isolating the effect that is especially attributable to the factors in question. Models are not sufficiently developed to analyze aggregate trends in fertility and mortality and disentangle the impacts of short-term economic phenomena from long-term social and economic change. The third problem is that short-term responses of fertility to economic factors may be quite different from long-term responses. The fertility, mortality, and migration responses can be sometimes temporary and of little demographic significance.

Existing studies of the demographic impact of economic crisis are limited mostly to the Latin American experience in the 1980s. Some studies have found that fertility is pro-cyclical and mortality is counter-cyclical, but the effect, if any, is temporary. Palloni and Hill (1997) and Bravo (1997) found that economic fluctuations had substantial contemporaneous effects on fertility and mortality in Latin America. In many cases, however, the effects are not statistically significant, even jointly. Other studies, such as Ortega-Orsona and Reher (1997), reached similar conclusions.

In summary, there is no clear evidence of abrupt and widespread changes in demography responding to economic fluctuations. One important point made by Mason (1997) is that people in many developing countries have shown a remarkable ability to minimize the impact of severe economic crisis. Many developing countries experienced major and prolonged declines in real income, high rates of unemployment, rapid inflation, and significant cuts in social services. In most countries, the demographic impact was not significant. Considering that many East and Southeast Asian economies are recovering rather rapidly these days, it is not likely that the Asian economic crisis will have a substantial influence on the region’s demography, especially in the long run.

The Implications of Aging and Policy Alternatives

Aging and Economic Growth in Asia

Aging has particularly salient implications for particular sectors (health) or programs (public pensions), that are discussed in more detail elsewhere in this study. But aging also has broad and important implications for economic growth that transcend these more particular concerns. Important features of the economy are likely to be influenced by population aging, including labor force characteristics, saving rates, poverty and income inequality, interest rates, international capital flows, trade, and international migration (Johnson and Lee, 1987; Deardorff, 1987; Kelley, 1988). In this section, however, we focus only a few important aspects of the connection between aging and economic growth.

Most research on the economic implications of aging focuses on national trends. However, aging is a regional and global phenomenon. As economies within Asia have become increasingly integrated in the regional and global economy, they are subject to both the demographic changes occurring within their own country, but also the demographic changes occurring elsewhere.

The economic impact of aging has been the subject of more empirically based research in recent years, however analysis relies heavily on models that incorporate our general understanding about how economies work and interact with demographic conditions. This is unavoidable because even the countries furthest along in their demographic transitions have not yet experienced aging to the degree now anticipated. Moreover, aging in Asia has features that will inevitably distinguish it from aging in the West. Aging is occurring more rapidly and, in some instances, at lower levels of income. Thus, the impact of aging in Asia may be very different than elsewhere.

The economic impact of aging will depend to a great extent on the institutional setting and most particularly on the systems that govern the transfer of resources between generations. These systems include government programs that provide health care benefits and pensions. They also include family based support systems that are prevalent in Asia. The institutional setting is far from static, however. Family support systems are clearly eroding in many Asian countries. Governments are playing an increasingly important role in determining the responsibility that one generation bears for another. Any assessment of the implications of aging must incorporate the nature of these systems.

During the past few decades, demographic change has favored economic growth in many Asian countries, and particularly in the successful countries of East Asia. Changes in age structure have led to an increased concentration of populations at the working ages leading, in direct fashion, to rapid labor force growth and more rapid growth in per capita income. Changes in age structure, reduced fertility, and improved mortality conditioned have also had a favorable impact on saving and investment in both physical and human capital. In most Asian countries, demographic conditions will continue to favor economic growth for several decades or more.

With varying timing, however, demographic conditions will turn less favorable to economic growth. The proportion of the population in the working ages will begin to decline relative to the retired population. Saving rates are likely to decline leading to slower accumulation of physical capital. The stock of human capital may also grow more slowly as time proceeds. Of course, demography is not destiny and unforeseen developments in the region may overwhelm these demographic forces.

Slower economic growth should not be viewed with undue alarm where it occurs in countries that have achieved high standards of living and are approaching the end of their demographic transition. Asia’s high rates of economic growth are inherently transitory in nature, a consequence, in part, of rapid demographic transition. Countries that have successfully seized the economic opportunities presented by demographic change are reaching higher standards of living more rapidly than elsewhere. Once higher standards of living are achieved and population aging begins in full-force, economic growth is likely to slow to the more modest levels found in mature economies. It is mistaken to view older populations as economically disadvantaged. They may be relatively poorly endowed in labor resources, but given appropriate policies they may be relatively well-endowed in physical and human capital.

This admittedly optimistic scenario will not play out in countries that fail to harness the potential of an aging population. Policies that encourage the accumulation of physical and human capital, the development of well-functioning financial institutions, a favorable investment environment and integration into the global economy will all become increasingly important. The challenge for many Asian countries is that the pace of aging is so accelerated and the time to adjust to its new realities so limited.

Population aging influences per capita income directly by influencing the proportion of the population engaged in productive activities and indirectly by influencing the productivity of those who are employed. These two distinct channels can be conveniently distinguished algebraically representing per capita income as the product of output per worker (Y/L) and the proportion of the population in the labor force (L/N)[6]:

$$Y/N = Y/L \times L/N.$$

A simple refinement incorporates the fact that "consumption needs" and productivity vary with the age of the individual. Measuring "population" as the number of "equivalent adults" using weights that vary with age and sex provides a refined measure of the standard of living, income per equivalent adult. Likewise, the labor force is measured as the number of "effective workers" using age- and sex-specific weights that capture systematic variation in labor productivity. The

[6] Bloom and Williamson, 1998 have recently made use of this identity in their analysis of population and economic growth.

equation then states that income per equivalent adult is the product of output per effective worker and the economic support ratio (effective worker per equivalent adult).

The same relationship can be represented in growth terms:

$$g(Y/N) = g(Y/L) + g(L/N).$$

The rate of economic growth, as measured by the rate of growth of income per equivalent adult, is the sum of two components: the rate of growth of output per effective worker and the rate of growth of the economic support ratio. The connection between demographic conditions and these two components are examined in the following sections.

Aging and the economic support ratio

Demographic transition throughout the world has systematically produced changes in the economic support ratio that, at times, have accelerated and, at other times, depressed economic growth. In East and Southeast Asia, changes in the economic support ratio have been favorable during the last few decades. Because of population aging, however, the support ratio is expected to decline during this and future decades in East Asia and beginning in 2010 in Southeast Asia. The countries of South Asia began to enjoy favorable growth in their support ratios only during the 1990s. The benefits will be relatively short-lived there, lasting for only two decades.

During the past fifty years, changes in the support ratio have been less important to economic growth than changes in output per worker. Annual increases tend to be relatively small, but they are quite persistent. Thus, over the course of several decades they have, in the past, contributed to significant increases in per capita income. In the future, changes in the support ratio will depress economic growth. The decline in the support ratio in East Asia is expected to be particularly precipitous, dropping from 0.76 workers per equivalent consumer in 2000 to only 0.57 workers per equivalent consumer in 2050.

The economic support ratio for Southeast Asia, 1950-2050, shown in Figure 7, illustrates how the support ratio typically varies over the transition: declining as the proportion of children in the population increases, rising as the child population stabilizes and the working age population continues growing, then declining as labor force growth slows and the elderly population increases.[7] In Southeast Asia, changes in the economic support ratio depressed growth in income per equivalent adult by 0.4 percent (during the 1950s) and contributed as much as 0.25 percent per annum in additional growth in income per equivalent adult in the 1980s. The final panel in Figure 17 summarizes the economic support ratio by identifying the three distinct periods of successive contraction, expansion, and contraction with the average growth rates during each period. This device is used below to compare the experience of Asia's sub-regions and individual countries.

Figure 17. The Economic Support Ratio, Southeast Asia

As a broad generalization, the economic support ratios in each of Asia's major regions and in the individual countries analyzed follow the pattern shown in Figure 17. Figure 18 identifies the extended periods during which the economic support ratio is contributing either to contraction or expansion. To convey the magnitudes of the changes the height of the bars are

[7] The figure is constructed using average growth rates during each decade. The support ratio is calculated as the labor force divided by the number of equivalent adults, based on a weight of 0.5 for those under 15 and 1.0 for those 15 and older. Variation in labor productivity by age and sex are not incorporated into these calculations.)

drawn in proportion to the magnitude of the changes in each country over the 100-year period.[8] Only the Philippines departs from the general pattern shown above. The Philippines did not experience an initial decline in the support ratio. The data presented here do not capture the early stages of Japan's demographic transition. Elsewhere, the cycle in the economic support ratio is present. That said, there are substantial differences among the regions and from one country to the next.

Figure 18. Summary of Economic Support Ratios, Asia and Selected Countries

The values for East Asia are dominated by China. During the last three decades, growth of the support ratio has spurred economic growth by about 0.2 percent per years, but henceforth the support ratio will serve as a substantially dampening force, declining by over 0.5 percent per annum. In South Asia the support ratio grew particularly rapidly during the 1990s and the 2000s, but the impetus provided to economic growth is short-lived as compared with the East and Southeast Asian experiences. As is true of Southeast Asia, the support ratio will be a negative growth factor beginning in the 2010s. In neither South or Southeast Asia is the support ratio expected to decline nearly as rapidly as in East Asia.

Even more varied patterns become evident as we focus our attention on individual countries. In some countries, of which South Korea and Indonesia are the most notable examples, support ratios have grown more rapidly than elsewhere. In others, India being an example, the support ratio increased very modestly. Likewise, the dampening impact of the support ratio varies considerably among the countries of the region. The average rates of decline

[8] The height is proportional to the average of the absolute value of the rates of growth.

are greatest in South Korea and Thailand and much smaller in the Philippines, Bangladesh, and India. Although the correlation is by no means perfect, there is a clear tendency for the countries with the larger gains in the support ratio to experience the greater declines. Compare, for example, the Philippines to South Korea.

The changes in the support ratios are modest as compared with rates of economic growth in the region. In South Korea, for example, the annual increase in the support ratio between 1960 and 1990 was 0.54 percent per annum. Income per equivalent adult grew ten times more rapidly, 6.4 percent, during the same period. In India, the support ratio declined on average by 0.2 percent per annum as compared with an annual increase in income per equivalent adult of 1.8 percent between 1950 and 1990. In a few instances, more dramatic changes in the support ratio occur during a single decade. In South Korea the support ratio increased by 1.3 percent per annum during the 1970s. During the current decade, Egypt and Bangladesh support ratios are projected to increase by 0.6 percent.

In the past changes in the support ratio have tended to reinforce growth in output per worker. South Korea, Thailand, and Indonesia all experienced rapid growth in output per worker and rising support ratios while the less successful economies of Bangladesh and India experienced declining ratios. During the next fifty years, regional differences in economic support ratios may help the countries of Southeast and South Asia to "catch up" with the countries of East Asia. Japan, China, South Korea and other NIEs will experience decline in their support ratios retarding the economic growth of those economies.

Aging and output per worker

The impact of declining population growth and aging on growth in output per worker is indirect but potentially more important than the more direct impact of changes in the economic support ratio. Economic research distinguishes two sources of economic growth: technology or increases in factor productivity and factor augmentation or increases in physical and human capital per worker. Demographic factors may operate through both of these channels.

Economists have suggested a variety of reasons why slowing population growth and population aging may lead to slower productivity growth. The most extensive work on productivity and population has examined the response of the agricultural sector to population pressure. Studies by Boserup (1965, 1981), Hayami and Ruttan (1987), and Pingali and Binswanger (1987) have convincingly demonstrated that innovation in agriculture, induced by population growth, has led to increased productivity of land. These studies do not show that total factor productivity nor that labor productivity increase in response to population growth.

Population growth will accelerate productivity growth in an economy characterized by increasing returns to scale, a feature of recently-developed endogenous growth models (see Robinson and Srinivasan, 1997 for a recent review.) Under these conditions, slowing population growth in Asia would depress productivity growth. However, empirical studies to date provide little support for the existence of scale economies. Moreover, Singapore and Hong Kong provide persuasive Asian cases of countries relying on trade to realize potential scale economies. Simon (1981) has argued that a larger population will produce more geniuses, though we know of no direct evidence on this issue. A frequent hypothesis is that an older workforce will be less innovative for a variety of reasons.

Countering these hypotheses are the possibilities that diseconomies of scale stifle innovation and that labor shortages may spur innovation that increases labor productivity. One well-known study presents evidence that the slow-down in labor force growth has led to more rapid growth in labor productivity among the industrialized countries (Cutler et al., 1991). However, no consensus about the connection between productivity growth and demographics has emerged on the basis of the limited evidence available to date.

Aging, saving, and wealth

Under the right conditions, population aging will lead to a substantial increase in wealth or capital per worker. This occurs primarily because: (1) older members of the population have greater wealth, on average, than younger members; and (2) because increased life expectancy leads individuals to save more in anticipation of longer periods of retirement. In countries that are experiencing very rapid demographic transition, the impact on capital accumulation and economic growth may be particularly pronounced.

Public policy may have a profound influence on the connection between aging and the accumulation of wealth. Some retirement systems, e.g., Singapore's Central Provident Fund, institutionalize the connection between aging on wealth. Other systems, such as pay-as-you-go pension programs and traditional family-based systems, may undermine the impact of aging on wealth.[9]

The emergence of retirement in modern societies requires and is facilitated by the development of institutions that channel resources to the non-working elderly. Initially, the extended family serves this role as elderly parents live with and rely on their children for both

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[9] This section draws heavily on several recent studies by one of the authors in collaboration with other scholars (Lee, Mason, and Miller, 2000, forthcoming a,b,c).

personal and material support. Of course, in many instances the elderly may be serving a productive role within the family, caring for children or providing other valued services. The extended family has persisted throughout Asia and in most countries remains the primary institution that provides support to the elderly.[10] But even in Asia, family support systems are being supplanted by new institutions.

Many countries in Europe, the U.S., and Latin America have implemented pension programs that reduce reliance on the family. These systems typically operate on a pay-as-you-go basis, meaning that the retirement needs of those who are currently retired are met by taxing those who are currently working. These programs differ from a family based system in that providing for the elderly is the collective, rather than an individual, responsibility of workers. It is very similar in that both systems rely on transfers from workers to retirees.

Public transfer programs are supplemented by private systems that finance retirement through the accumulation of real wealth. Even in traditional societies, farmers may acquire and improve land or accumulate livestock. In modern societies, we rely extensively on financial markets to purchase stocks, bonds, and other financial instruments, indirectly establishing ownership of real wealth and a claim to the associated future earnings. Individuals may accumulate real wealth acting independently of any organized pension program or they may participate in employee-based pension systems. In a few countries, Chile, Singapore, and Malaysia being examples, governments mandate and operate funded pension programs either independently or in cooperation with the private sector.

From the perspective of meeting retirement needs, systems based on transfers and systems based on the accumulation of real wealth are in one sense identical. Either system

[10] See section III.D.1 on this.

produces a stream of income during the retirement years. Likewise, either flow represents wealth to that individual—real wealth in one case, transfer wealth in the other.[11] From the perspective of the economy, however, real wealth and transfer wealth are very different. Real wealth is productive and contributes to improved standards of living. Indeed, the rapid accumulation of real wealth is widely viewed as critical to East Asia's rapid economic growth. In contrast, transfer wealth contributes nothing to economic growth.

Although aging and the emergence of retirement have led to an increased demand for wealth, other motives influence saving and forces other than the ones stressed here are also at play. Families may accumulate wealth to protect themselves against short-term fluctuations in their incomes or needs. Some are motivated by a desire to pass on an estate to their children. Economists differ about the relative importance of these and other saving motives and some question the applicability of the lifecycle model with its emphasis on retirement needs. Calculating the wealth needed to fund future needs is an exceedingly complex task beyond the ability of even sophisticated consumers. People rely on intuition and rules of thumb and make adjustments as they approach retirement. They rely on advice of varying quality from financial experts. In some instances, mandatory employee-based and public pension programs make the decisions for consumers, institutionalizing the relationship between wealth and demography.

A number of studies have examined the connection between demographics and saving rates (Mason, 1987, 1988; Williamson and Higgins, 1997; Kelley and Schmidt, 1996; Deaton and Paxson, 2000.) They differ in their support for the lifecycle model and in their assessment of the impact of changing age structure. However, these studies are limited because they are based on simpler models that do not capture important features of the dynamic relationship between

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[11] In other respects the systems may be very different. One may offer a more secure source of funding; rates of return may differ considerably.

population and saving and they do not consider the impact of alternative support systems. Moreover, existing empirical work about the early stages of the demographic transition is much more reliable that estimates about later stages because, to this point, no country has completed the demographic transition.

Simulation techniques provide a means to examine the paths of saving and wealth over the demographic transition if behavior is governed by the life cycle model (Lee, Mason, and Miller, forthcoming a, b, c). They show that rapidly changing demographic conditions, such as those found in East Asia, lead to equally rapid increases in saving and wealth. As the transition progresses, however, saving rates return to much lower levels while wealth stabilizes at a high level. Given conventional economic growth models, output per worker would also experience a period of rapid, but transitory, growth. Output per worker would eventually grow at modest levels governed by productivity increases alone. Thus, population aging leads to a decline in saving and a slowdown, but not a reversal, in economic growth.

The simulated transition of wealth (Figure 19) and saving (Figure 20) for Taiwan are compared to simulated changes given a much slower demographic transition such as experienced in France or the United States. While the total fertility rate declined from 6 births per woman to 2 births per woman in only 30 years in Taiwan, the fertility transition in United States took approximately 100 years and in France occurred over a period of two centuries. Life expectancy also increased much more rapidly in Taiwan than in the West.[12] In each of the three simulations, demographics are identical at the end of the transition; they differ only in their timing and speed of the transition.

[12] These simulations do not include the impact of the baby-boom. See Lee, Mason, and Miller, 2000 for US simulations based on US economic and demographic data.

Prior to the demographic transition, the demand for wealth was relatively small, equal to or less than twice gross domestic product (GDP). At the end of the demographic transition, the life cycle demand for wealth exceeds 5 times GDP. In each of the three scenarios, the demand for wealth experiences a period of acceleration followed by convergence to the high post-transition level. In the simulation based on Taiwan demographics, however, wealth grows much more rapidly and saving rates reach a much higher peak.

Figure 19. Wealth/Output: Taiwan, US, & France.

Figure 20. Saving Rate: Taiwan, US, & France, 1800-2100.

The simulations presented here do not distinguish real wealth from transfer wealth. The path of real wealth and real saving will depend on the extent to which life cycle needs are being met by transfer systems. In the United States, for example, Social Security (OASI) wealth is 1.75 times GDP or about 15 trillion dollars for the year 2000. This amounts to almost half of the total demand for life cycle wealth in the year 2000. Thus, demographic change in the U.S. should have a more attenuated impact on saving and wealth in the absence of substantial reform to the Social Security system (Lee, Mason, and Miller, 2000). In Egypt and most Asian countries, public transfers are much less important but family transfers are pervasive. Until recently in Taiwan, for example, the elderly relied almost entirely on transfer wealth obtained by living with their adult children. If the family support system were to persist in Asia, then changing demographic conditions would not lead to high saving rates and rapid accumulation of real wealth. Rather, it is demographic changes in conjunction with the erosion of the family support system that lead to high rates of saving and real wealth (Lee, Mason, and Miller, 2000.)

Changes in saving and investment throughout the world appear to be broadly consistent with the demographic forces described here. Data available for 104 countries are used to compare investment rates in 1960 and 1990 in Figure 21.[13] Many countries are clustered around the 45-degree line indicating similar investment rates in 1960 and 1990. Countries with high rates of investment in 1960 tended to have lower rates of investment in 1990. These declines occurred mostly among Western countries that were relatively advanced in their demographic transitions. Fourteen of the twenty-two countries with investment rates of twenty-five percent of GDP or more in 1960 were Western. As a group they experienced a decline in their investment rate by five percentage points by 1990.

The experience within Asia is broadly supportive of the thesis that rapid demographic transition leads initially to high rates of saving and investment. Asian countries that experienced rapid demographic transition experienced higher investment rates (and higher saving rates) in 1990 than in 1960. Some of the countries in question had very low investment rates in 1960 but among the highest investment rates in the world by 1990. South Korea and Indonesia are excellent examples. The experience of the slow transition countries was quite different. The Philippines, India, Pakistan, Bangladesh, and Egypt, with delayed and relatively slow transitions, did not experience a substantial increase in their investment rates.

Figure 21. Investment rates, 1960 versus 1990, countries of the world.

[13] Investment data are used here rather than saving data because of their greater availability. The two variables are high correlated.

Among the countries of Asia, only Japan is sufficiently far along in its demographic transition to experience a decline in its saving ratio because of demographic forces. Many scholars, though not all, believe that saving rates will decline precipitously as a consequence of population aging. Recent forecasts anticipate a decline in gross national saving rates to between about 5 and 15 percent of GDP as compared with a peak of 40 percent achieved during the 1970s (Figure 22).[14]

Figure 22. Gross national saving, Japan 1885-1997 and forecasts.

The evidence about population, wealth, and saving is suggestive rather than conclusive. It is clear that substantially increased wealth and a period of high saving rates are necessary if the elderly are to support themselves during retirement in a self-reliant fashion rather than by depending on transfers from younger generations. Aging will not necessarily lead to a substantial increase in wealth, because other factors may undermine the demand for wealth in an aging society.

Concluding observations on aging and economic growth

Unforeseen developments may intervene in any long-range assessment of the economy. Perhaps technological breakthroughs will lead to productivity growth that is much more rapid than has been true of the past. The strength of the US economy during the last few years provides fuel for optimistic assessments. Demographic change, however, will almost surely dampen economic growth in many countries during the coming decades. Two trends are particularly

[14] See Mason and Ogawa, forthcoming for a summary of recent forecasts of Japanese saving and a more detailed discussion of the issues.

salient. The first is the decline in the economic support ratio. The number of consumers will grow more rapidly than the number of workers. The second is the impact of aging on saving and investment. After a period of extraordinarily high rates of saving and investment in many Asian countries, an era with lower rates of saving and investment and slower growth in labor productivity appears likely.

Understanding the impact of demographics on the macro economy is important for at least two reasons. First, long-range planning depends on a realistic assessment of long-range economic prospects. Unduly optimistic forecasts of long-term economic growth leads to irresponsible fiscal policy and the continuation of unsustainable pension and health care programs. Second, a better understanding of the implications of aging for the economy helps to avoid the implementation of policies designed to pursue unrealistic and inappropriate objectives. One simple example of this is the frequent call for higher national saving rates for economies with aging populations. As discussed above, the saving rate needed to meet the retirement needs of an aging population depends to a great extent on the nature of the demographic transition. Given a rapid transition, high saving rates are required for a limited period. Later in the transition, however, retirement needs can be satisfied with a relatively modest national saving rate.

Understanding the connection between population aging and the macro economy is also important in framing a wide range of policies appropriate to aging societies. This is an issue that we take up in our concluding section, below.

Health and Health-Care Policy

Population aging is expected to place an increasing burden on the health sectors in Asia. Increases in the levels of economic development, income, education, housing, sanitation and health care delivery can be expected to lead to reduced mortality, increased longevity and increased demand for health services by the aging population. Among the largest and most advanced OECD countries, including Japan, health care spending for the elderly (age 65 years and older) is roughly 4 times the per capita rate for those under age 65 accounting for some 2.5-5% of GDP (Anderson and Hussey 2000, p. 195). This portends of a substantial shift in resources as the Asian countries seek to treat acute and chronic conditions of a non-communicable nature, which will afflict the aging populations of these countries. Aging populations in Asian countries can expect to suffer from cardiovascular diseases (CVD), cancer, (particularly lung cancer), chronic obstructive pulmonary disease (COPD), musculoskeletal conditions (including osteoporosis), dementia, and blindness and lesser visual impairments (WHO 1998, pp. 106-110). Simultaneously, however, infectious diseases, both new and resurgent, will continue to plague ANE countries (WHO 1999, Chapter 2, pp. 13-27). In this regard, India is a leading example where tuberculosis threatens all ages and the elderly are particularly vulnerable to infection. Therefore, it is extremely important that countries pursue an efficient and effective health policy as treatment of communicable and non-communicable diseases place claims on resources.

National health expenditures

An important health policy consideration is the allocation of resources to the health sector from the overall production of the economy. This is typically measured as the percentage share of national health expenditures within GDP. However, for data on health expenditures to be comparable across counties, the national health accounts must use standardized definitions and methods. One of the best sources for comparable data on national health expenditures is the OECD (OECD 1999). Unfortunately, the standards of accounting are not uniform in most developing countries. Using World Bank data, Jowett (1999) reports that national health expenditures, as a percent of GDP, actually fell in a number of low-income countries, including Bangladesh and Nepal, during the period 1990 and 1995. It is difficult to determine whether this is due to general social-economic conditions and shifts in policy or is a remnant of inconsistent accounting. There has been a movement to improve national health accounts in many developing countries, including the Philippines, Egypt, India and Thailand (Berman 1997; Rannan-Eliya, et al. 1997; Tangharoensathien, et al. 1999). Differing methods can account for large differences in estimated spending. For example, Tangharoensathien, et al. (1999) compute health care consumption expenditures using a National Health Accounts prototype to be 3.00% of GDP in Thailand 1994, while the National Economic and Social Development Board (NESDB) method renders 5.01% for the same year. Using WHO data, national health expenditures for the ANE countries are reported in Table 18.

Table 18. National health expenditures as percentage of GDP, 1997, WHO estimates.

The estimates for Bangladesh and the Philippines are quite different than World Bank estimates reported by Bos, et al. (1998) a few years prior (see Table 19). In addition, the Korean estimates of national health expenditures as a share of GDP vary a great deal between the WHO definition and the OECD definitions, 6.7% vs. 6.0%.

Table 19. National health expenditures as percentage of GDP, World Bank estimates.

According to the OECD, national health expenditures as a percentage of GDP were 7.2% in Japan and 6.0% in Korea in 1997. In the case of Japan, national health expenditures increased from 3.0% to 7.2% of GDP during the period 1960-97. In Korea, health expenditures increased from 2.3% to 6.0% of GDP during the period 1970-97 (See Figure 23).

Figure 23. Rates of total expenditure on health by GDP.

These percentages are approximately half of the US expenditure rate of 13.9%. Nonetheless, health expenditures as a percent of GDP have increased for all the majored developed countries during the period 1960-97 (See Table 20). Aging populations are surely a contributing factor to the rise of health expenditures in OECD countries. There is some debate, however, the effect aging has on health expenditures.

Table 20. National health expenditure as percentage of GDP 1960-1996, G7 countries, Australia and South Korea.

Aging and health expenditures

If aging increases the demand for medical care, then the changing age structure will drive-up per-capita health care expenditures and the size of the health sector. Analyzing OECD data, O'Connell (1996) finds that for some countries, including the United States, Japan, Italy, Austria, Canada, Finland, and Greece, age structure has a significant effect on per capita health care expenditures. Some previous studies had often failed to find age as a significant factor, *ceteris paribus*, in determining health expenditures (Gerdtham, Søgaard, Andersson, and Jönsson 1992; Getzen 1992). Utilizing an aggregate US time-series 1960-87, Murthy and Ukpolo (1994) do find that the age structure is an important determinant of health care spending. Similar results have been found with OECD cross-sections. Overall, however, the results are mixed.

All these studies rely on aggregate country data. Zweifel et al. (1999) utilize micro data on health expenditures by elderly individuals in Switzerland spanning the period 1983-1992. They find no effect of aging on health care expenditures for individuals who die at age 65+. Their results indicate that the main determinant of spending is the years remaining till death, as very substantial health care expenditures occur in the last two years of life–an observation consistent with US Medicare data (HCFA 1998). In the US in 1996, Medicare beneficiaries in the terminal year of life comprised 6.4% of all beneficiaries but accounted for 20.5% of program payments (HCFA 1998, p.42). Average expenditures for beneficiaries who died were 3.8 times higher than for those who survived (HCFA 1998, pp. 42-43). In the Zweifel et al. (1999) study, there is little difference, for example, between the expenditures for someone who dies at 70 and someone who dies at age 80. The main driver of individual health expenditures is death not age. Populations which age due to increased longevity will push health expenditures into higher ages. Although individual health care expenditures may not depend on age, aggregate spending will be greater for older populations because the proportion of the population near the last few years of life will be greater. If we look at projected mortality as a ratio of population 15-64 with this view in mind, Japan and Korea can expect rising health care expenditures and a rising burden (See Figure 24).

Figure 24. Burden of death, India, Japan and South Korea.

A similar conclusion can be drawn with respect to long-term care expenditures associated with severe disability. The prevalence of severe disability is falling in many OECD countries among the younger old, age 65-75. Nevertheless, aggregate expenditures for long-term care, including institutional care and home care, are projected to rise as a percentage of GDP because the proportion elderly in the population will be larger (Jacobzone, Chambois, Chaplain and Robine 1998).

Income and health expenditures

The expansion of a country's health care system is thought to accompany general economic development and rising per capita income. Evidence of increasing demand for health care services is captured in an estimated income-elasticity, which indicates the sensitivity of the health care demand to changes in income. An income-elasticity is a unit-free measure of this responsiveness and is calculated as the percentage change in the quantity demanded of health care goods and services divided by the percentage change in income. An income-elasticity equal to unity implies the health care system will grow proportionally with income and, thus, glean a constant share of society resources. An income-elasticity greater than unity implies the health care system will grow more than proportionally with income and absorb an increasing share of national production. Finally, an income-elasticity less than unity implies the health care system will grow less than proportionally with income and claim a decreasing share of resources and output.

Table 21 summarizes the findings for a large number of studies, which estimate income elasticities for health care from expenditure data. Using aggregate data, estimates for OECD countries elasticities are around 1 or greater than 1. In developed countries, most health care consumers are covered by health insurance. Given that a household is covered by health insurance, the purchasing is achieved through the insurance pool rather than household income.

Therefore, *ceteris paribus*, household income is an unimportant determinant of health care demand in insured societies and income elasticities are near zero when estimated on micro data (Getzen 2000). Thus, the difference between estimates based on aggregate country data and household data can be explained by the presence of insurance. This hypothesis is consistent with data from Southeast Asia. If we estimate health care spending from household expenditure surveys in Indonesia, the Philippines and Thailand in 1980's, a time when health insurance was extremely limited in these countries, estimated income-elasticities are significantly greater than one. This implies that health care spending will grow in these countries with the rise in economic development independent of aging.

Table 21. Estimated income elasticities form health care expenditure data.

Health care financing systems

To care for their populations, health care systems must finance their use of resources. This brings major issues of equity and efficiency in the finance and delivery of care. Countries must decide what type of health care to produce and for whom and do so efficiently. Many developing countries, for example Egypt, India, Indonesia, and the Philippines, focus on maternal and child health because it is viewed as most "cost-effective," in terms of lives saved. The financing of long-term care in these countries is a low priority, because providing primary care to all has yet to be achieved and aging has not become a major issue. In the case of India efficiency dictates infectious and communicable disease control, as diseases like TB are extremely prevalent (Table 22). Different choices face Japan, Korea and Taiwan. Japan, like the U.S., is choosing to heavily subsidize the health care for the elderly. Japan is also heavily subsidizing long-term insurance. As there is very little economic justification in terms of efficiency (i.e., public good and externality arguments) for these subsidies, only equity arguments prevail. Political economy would imply that the elderly are claiming an increasing share of resources because they are an increasing portion of the electorate in the U.S. and Japan.

Table 22. Tuberculosis among populations 60 and older, 1990.

Egypt

Egypt is embarking on major reform of the health system. A largely fragmented system will be re-organized with the Ministry of Health and Population (MOHP) responsible for delivery and the Health Insurance Organization (HIO) responsible for financing (Partnerships for Health Reform 1999). Heretofore, each organization has engaged in both financing and delivery of services with HIO operating over 300 health care facilities, including hospitals, clinics and dialysis units (Nandakumar, et al. 2000). The separation of financing and delivery is hoped to encourage greater efficiency in production and consumption of services while improving quality and equity. Due to limited resources, the new health system model will focus on primary health care with the goal of providing a basic package of services for the entire population (Partnerships for Health Reform 1999). The vanguard project of Egypt's health reform is the health insurance program for school children. Under Law 99, passed by the People's Assembly of Egypt in June 1992, all school children are provided health insurance through HIO. This represents a landmark event in health care financing in Egypt as the number of person covered increased from 3.75 million in 1988 to 14 million in 1993 as a result of Law 99 (Nandakumar, et al. 2000). This has increased the percentage of the population covered from 5 to 25% over this period (Nandakumar, et al. 2000). Prior to the introduction of Egypt's School Health Insurance Program (SHIP), HIO primarily insured government employees. Coverage was mandated and financed through a wage-based premium between 1-4% depending on the employees' salary and modest cash co-payments. The premium expense is shared between the employer and the employee with the employee's share not to exceed 1% of wages. The financing of the SHIP system is accomplished through general tax revenues, a dedicated cigarette tax, a mandated household premium and 33% co-payment on drugs (Nandakumar, et al. 2000).

Despite recent advances, health insurance coverage for the elderly in Egypt is extremely limited. Approximately 2% of the elderly population is covered through the Health Insurance Organization (HIO) by virtue of being retired government employees, spouses or widows thereof (Nadakumar, El-Adawy and Cohen 1998). There are only a small number of nursing home facilities and generally very few facilities and services specifically designed for and provided to the elderly. Although care for the aged is seen as an important policy goal (Partnerships for Health Reform 1999), the constraint on resources has forced it into a low priority position as Egypt reforms its finance and delivery system.

India

The Indian health care system includes a wide variety of traditional medicine delivered along side a government operated Western-style hospital system. The private sector dominates both the finance and delivery of health care in India. Seventy-five percent of all financing comes from households' out-of-pocket payments and much of their spending is directed toward private out-patient services (Berman 1998).

Japan

Japan has a system of universal coverage achieved through a patchwork of more than 5000 independent insurance plans, which are generally employment-based and funded through premium contributions from employee/beneficiaries, employers (including the public sector) and government tax revenues (Ikegami and Campbell 1999; Arai and Ikegami 1998). There is no private health insurance and the entire population is covered through these public schemes (Oliver, Ikegami and Ikeda, 1997). There are three basic types of plans. The first type is based on large employers in the private sector through Society-Managed Health Insurance (SMHI) plans and the public sector through Mutual Aid Associations (MAAs), with premiums roughly split between employer and employee. The second type is Government Managed Health Insurance (GMHI), which is a national scheme that covers employees of small enterprises and their dependents. The GMHI plan is subsidized at a 14% rate by government tax revenues. Under these employment-based plans additional financing is garnered through co-payments, which generally run at 10% for employees and 20% (inpatient) and 30% (outpatient) for their dependents (Arai and Ikegami 1998; Ikegami 1991). The third type, Citizens' Health Insurance (CHI), covers the self-employed and retirees and is based within local communities through the city, town and village governments (Ikegami and Campbell 1999, pp. 57-58). Government subsidies for CHI plans average 50%. In addition to direct government subsidies, the premium structures in all three types of plans are designed to generate cross-subsidies from the rich to the poor and young to the old. In other words, the elderly pay less than actuarially fair rates even on a tax-adjusted basis.

In addition the basic health insurance described above, Japan has instituted a mandatory long-term care insurance program (*Kaigo Hoken*) for the elderly effective 1 April 2000

(Campbell and Ikegami 2000; Ikegami 1999; Ikegami 1998; Ikegami 1997; Watts 2000). This mandatory public program requires everyone age 40 years and older to contribute premium payments to the national-insurance pool. For workers aged 40-64 the program will provide services in the event of disability. Their mandatory premium payments can be viewed as a wage tax and, in this regard, is similar to that which funds the US Medicare program. In addition, general tax revenues will fund 50% of the program with this burden shared by the national and local governments (25% national, 12.5% prefectures and 12.5% municipalities). The beneficiaries, mostly frail elderly, will pay a 10% co-payment at the point of service for nursing care (Koinuma 1999). A modest monthly premium, expected to average ¥2800 ($25) in the first year of the program, will be deducted from the public pension payments of those aged 65 years and older (Creighton and Ikegami 2000). Financed services consist of institutional care and community-based care (including home care) while medical services will continue to be financed through the existing health insurance system. The system will use a managed care approach with pre-approval necessary for services to be covered. Service levels will be defined as a financial amount depending on the medically determined health needs of the beneficiary and will range from ¥61,500 to ¥358,300 ($567 to $3305) per month (Creighton and Ikegami 2000). The degree of family support will play no direct role in determining benefit levels (Ikegami 1998). Providers of nursing-home care and home-care services will be local public providers as well as private sector competitors. In principle, the new scheme will also permit international providers to compete and receive payments with some US firms planning joint ventures to enter the Japan elder care market (Saphir 2000).

Philippines

There two major health policy developments in the Philippines. The first is the plan for national health insurance (Busse and Schwartz 1997) and the second is the decentralization of public health care delivery system (Bossert, Beauvais and Bowser 2000).

The Republic of the Philippines is attempting to achieve universal health insurance coverage by the year 2010. The National Health Insurance Act of 1995 (Republic Act No. 7875) instituted The National Health Insurance Program and established the Philippine Health Insurance Corporation (PhilHealth) for this purpose. The National Health Insurance Program (NHIP), formerly known as Medicare, is a health insurance program for Social Security System (SSS) members and their dependents and is based on the standard principle of risk-pooling with additional cross-subsidization from the healthy to the ill and from the relatively high-income to low-income. PhilHealth is now the legislatively mandated administrator of the Medicare program. As a result, the SSS, which administered the Medicare program for private sector workers, has transferred the administration of the program to PhilHealth.

The main focus is coverage for hospitalization. The current plan covers hospital charges (i.e., room and board, drugs, and diagnostic tests), professional fees, surgical expenses, and surgical family planning services, including vasectomy and tubal-ligation. The program is quite modest but is expected to evolve over a fifteen-year period to a comprehensive system in both the level of benefits and proportion of the population covered. Five years into the program few of the early goals have been met and the program is not likely to reach its goal of complete and comprehensive coverage by the year 2010.

Under “Devolution,” control and financing of the public health care delivery system has been transferred to local government units. The National government provides some funding by “revenue-sharing. ” Provincial governments are expected to collect taxes to finance their contribution to the health care delivery system. Tax collection administration and enforcement is weak in many areas of the Philippines making it difficult for local governments to finance their share. Eventually it is hoped that public sector providers will become more efficient as they compete with the private sector for PhilHealth payments and in the process become more self-sufficient. In this regard, the Philippines is pursuing a *managed competition* approach in combination with a *single-payer system* (i.e., PhilHealth).

South Korea

The South Korean health care system is financed through employment-based insurance schemes. Participation is compulsory and coverage is universal since 1989 (Yang 1996, Shin 1998). Employees of the Government and private schools are covered under a single insurance pool, the Korean Medical Insurance Corporation. Industrial employees are pooled onto Medical Insurance Societies, which number approximately 150. Together, these wage earners and their dependents constitute approximately 47% of the population (Shin 1998). Participation and premiums are compulsory with the legal burden of the premium roughly a 50-50 split between the employee and employer. Premium rates range from 3.2% to 3.8% of wages (Shin 1998). The self-employed and their dependents in urban and rural areas are grouped into Medical Insurance Societies of which there are several hundred covering approximately 49% of the population (Shin 1998). These insurance pools are funded by premium contributions from the beneficiaries determined by income and wealth tests and by government subsidies. However, the degree of cross-subsidization is relatively modest compared to social insurance schemes in most OECD countries. The poor are covered by Medical Aid program, with approximately 4% of the population eligible (Shin 1998). Although the proportion of the population covered is complete, the coverage level and services included in the benefit package are quite limited. As a result approximately 50 % of health care expenditures are financed through cash payments by the beneficiaries at the point of service. These so-called “out-of-pocket” payments include co-insurance and deductibles for covered services and full payments for uncovered services. For covered outpatient services a patient pays a flat fee/deducible plus a co-insurance rate. The outpatient co-insurance rates are 30% for services rendered in outpatient clinics, 50% for hospital outpatient services and 55% for general hospital outpatient services (Yang 1996) and are obviously designed to discourage hospital outpatient use. The co-insurance rate for inpatient care is a uniform 20% (Yang 1996). These cash payments represent a significant portion of household spending for the low-income and the elderly. Lifting this burden remains a major challenge for the Korean health care system (Table 23).

Table 23. Out-of-pocket payments as percentage of total health expenditure: South Korea

Health care providers are reimbursed on a fee-for-service basis under government regulated fee schedules. Korea is, however, reforming the payment system with a USA style case-based approach using diagnostic related groups (DRGs) for hospital payments (Fetter 1991; Averill 1991) and resource-based relative value scales (RBRVS) to construct physician payments (Hsiao, 1988a, 1988b, Hsiao and Dunn 1991, Hadley 1991). These payment reforms are expected in increase efficiency and curtail the rapid growth of expenditures, which seem unabated under fee-for-service despite hefty out-of-pocket payments.

Thailand

Thailand's public sector health delivery system consist of a nationwide system of community health service stations (village health stations), health centers, community (district) hospitals and provincial (regional and general) hospitals with provincial hospitals providing extensive outpatient (ambulatory care) and inpatient services. This system is administered by the Ministry of Public Health and is the main provider of services in rural Thailand. The relatively high-income urban areas support a vibrant and growing private health sector with numerous private hospitals and clinics and physicians in private practice. In addition, many provincial hospital-based physicians and other physicians, who are public-sector employees, maintain private practices. In the Bangkok Metropolis nearly 50% of the physicians and dentist are employed in the private sector and account for approximately one-half of the provision of services associated with out-patient visits (Mongkolsmai 1997). Forty-two percent of the hospital beds in Bangkok are in the private sector compared to 16% in other provinces (Mongkolsmai 1997). Inpatient admissions in the public and private sectors are in roughly the same proportion as the supply of beds in the respective sectors.

Approximately 59% of the Thai population is covered by some type of health insurance (Mongkolsmai 1997). There are four main categories of publicly sponsored insurance schemes (Mongkolsmai 1997; Tangcharoensathien, Supachutikul and Lertiendumrong 1999; Supakankunti 2000). The first is public assistance for the poor, elderly (aged 60 plus years) and primary school children, which provides free medical care through the public delivery system and is financed though general tax revenue. This scheme is means-tested for low-income households. The beneficiaries are given a health card, which gives them free access to the (sub-district) health centers and community (district) hospitals. This scheme uses " limit access to higher-level facilities, as written referral is required. In 1993 36% of the population including 3.5 million elderly persons were covered by this scheme (Mongkolsmai 1997). The second major category of public insurance is the Civil Servant and State Enterprises Medical Benefit Scheme, which is financed 100% through government tax revenues. The public sector as employer provides this generous fringe benefit to employees, their spouses, parents and up to three children under age 18 years thus covering 11% of the population (Mongkolsmai 1997; Tangcharoensathien, Supachutikul and Lertiendumrong 1999). Government retirees receiving pensions carry this benefit with them into old age. The third major category is the compulsory Social Security scheme, which covers private sector employees in firms with more than 10 employees. Social Security is financed through premiums based on 4.5 % of wages with contributions split evenly between three parties: employer 1.5%, employee 1.5%, and government (tax revenues) 1.5% (Mongkolsmai 1997; Tangcharoensathien, Supachutikul, and Lertiendumrong 1999). The premiums, therefore, consist of a 3% wage tax plus a 1.5% subsidy. This generates within Social Security a substantial cross-subsidy from high-wage earners to low-wage earners with a maximum premium differential of 3:1. Employers with 10 or more employees are required to either participate in Social Security or provide a more generous private scheme. Approximately 8% of the population is covered by Social Security and Workers' Compensation, which is for on-the-job injury (Mongkolsmai 1997).

The fourth type of public insurance scheme is the Health Card Program, which is a voluntary program mainly targeting near poor and middle-income rural households. The annual premium is 1000 baht (approximately $25) per household up to a maximum of 5 persons with households contributing 50% and government tax revenues financing 50% (Supakankunti 2000). The Health Care Program (HCP) gives access to the public delivery system in much the same way as the welfare scheme for the poor, elderly and school children, as the cardholders are restricted to MOPH providers. Because it is a voluntary system, the HCP is subject to adverse selection (Supakankunti 2000) a problem not faced by the compulsory Social Security scheme. In addition to these four publicly sponsored insurance schemes about 1-2% of the population is covered by private health insurance (Mongkolsmai 1997; Supakankunti 2000).

Policy issues in health care financing design

Health insurance can spur substantial expansion of the health sector by providing consumers of services with strong, effective demand for health care, which thereby generates a ready source of revenues for providers. A health insurance system, however, must finance payouts with some combination of taxes and insurance premiums.

Risk-Sharing

Health insurance provides protection against the risk of medical expenses by allowing the insured to share that risk with other members of the group. In any particular period, insured individuals faced with adverse health outcomes and associated medical expenses will receive payment either directly or indirectly from a common financial pool. That financial pool is supported by all members of the group through taxes or premium contributions. Because all contribute but few claim benefits, the pool remains financially solvent. With subgroups placing claims on the group's financial resources in a more or less random fashion, the risk is spread over many individuals and is substantially lower than that faced by an individual in financial isolation. Although most public insurance and some private insurance perform a redistributive function as well, risk-sharing is considered the fundamental function of insurance. Private insurance markets, however, may fail to spread risks properly owing to informational imperfections. This has important implications for health policy.

Informational imperfections

Asymmetry in information about the actions of insured agents and the potential risks faced by insurers leads to partial failure of insurance markets. This insurance problem falls into two categories, *moral hazard* (hidden action) and *adverse selection* (hidden risk) (Pauly 1968, 1974; Rothschild and Stiglitz 1976).

Moral hazard. Moral hazard is most broadly defined as an informational problem of hidden action and unobservable states of nature (Leu 1986; Arnott and Stiglitz 1988). In the case of medical insurance, moral hazard arise whenever an individual can affect the probability of illness or accident (Pauly 1974; Marshall 1976; Arnott and Stiglitz 1988, 1990), or the level of utilization or expenditure, given a particular outcome (Pauly 1968; Zeckhauser 1970). The insurer cannot observe the actions of the insured. Therefore, premiums and associated incentives for prevention are not at appropriate levels to induce optimal behavior, and competitive equilibrium is inefficient (Arnott and Stiglitz 1990). As a result of moral hazard, insurance claims will increase more than proportionally with the increased level of insurance coverage. Some risks, therefore, are uninsurable. In sum, moral hazard leads to less than full insurance coverage and higher insurance and medical costs. If public-sector financing increases insurance coverage and benefits, expenditures will likely rise because of moral hazard (Leu 1986).

Co-payments limit the moral hazard effect by leaving the insured with some risk and direct cost (Pauly 1968, 1974) and thus an incentive to restrain expenditures (Zeckhauser 1970). In the case of traditional reimbursement insurance, two forms of co-payment are typically used, deductibles and co-insurance. The effectiveness of co-payments in restraining moral hazard may be reduced, however, by supplemental insurance coverage (Pauly 1974). A sound long-term care insurance program would require some level of co-payment.

Deductibles leave some initial level of expenditure completely uninsured. The insured individual must reach a particular level of out-of-pocket expenditure (the deductible amount) before the insurance coverage becomes effective. The deductible leaves the individual uninsured for small expenses. This has the effect of reducing administrative costs because some small expenses never enter the system. Moreover, deductibles discourage the use of formal medical services for trivial conditions. With the prudent use of deductibles, the risk-sharing function is kept largely intact as large and catastrophic expenses continue to be insured. Sound actuarial management of any insurance scheme calls for substantial deductibles for many types of covered services. The failure of developed countries to implement relatively large deductibles under social insurance has contributed to the escalating costs of health care within those societies. It is important to incorporate deductibles and other forms of cost sharing into a health insurance scheme from the outset because the political economy of health care makes it difficult to remove generous entitlements once they are granted.

Under co-insurance, a percentage or per-unit amount of expenses is borne by the insured at the point of service. User fees for medical services fall under this general rubric. These direct out-of-pocket expenses discourage excessive use and thus reduce moral hazard. The risk-sharing function, however, is partially sacrificed under co-insurance. Therefore, co-insurance rates should not be so excessive as to render the insurance coverage ineffective. Under the usual assumptions associated with individual preferences toward risk, it is never optimal to impose a 100% co-insurance (0% insurance) rate (Shavell 1979). What is needed is a balance between economic incentives and risk-spreading (Zeckhauser 1970).

In developed countries, co-insurance rates of 10-20% are common. For example, under Japan's employer-based system, which covers approximately 63% of the population, employees face a 10% co-insurance rate while their dependents face rates of 20% in-patient care and 30% for out-patient care (Ikegami 1991, p. 91). The appropriate co-insurance rates vary among countries and service types, depending upon the responsiveness of supply and demand to rate variations. In the case of Korea high deductibles and co-insurance rates lead to out-pocket-payments of approximately 50%. This substantially limits *moral hazard*, but reduces *risk-spreading* by half.

Given the presence of moral hazard, public and private insurance plans that are efficient will provide less than complete insurance. Under free-market systems, this situation presents an opportunity for a secondary insurer to provide supplemental coverage to the purchaser or beneficiary of the primary plan. Supplemental insurance typically parallels a primary insurance contract or benefit plan and provides financial payment for the uncovered portion. In other words, supplemental coverage usually insures for the deductibles and co-insurance specified by the primary plan. Supplemental insurers rarely provide benefits or cover services that are not also partially covered by the primary insurer with good reason. Supplemental coverage, by providing increased insurance, induces additional moral hazard. The cost of the increased moral hazard, however, is borne largely by the primary insurer and is reflected in higher premiums or taxes there. Thus, the premium on supplemental coverage is low relative to the cost of moral hazard precisely because the primary insurer is bearing some of that cost. In relation to the marginal social cost, the supplemental premium is too low. Overall, supplemental coverage leads to overinsurance, resulting in increased moral hazard, which in turn renders overutilization. For this reason, some analysts call for taxation or prohibition of supplemental coverage unless that coverage is provided by the primary insurer.

Adverse selection. Adverse selection, a classic asymmetric information problem, results from unobservability of the risks by the insurer. It occurs when high-risk patient-consumers self-select favorable insurance coverage, thereby driving up insurance premiums and driving out low-risk patient-consumers, causing in turn a further increase in premiums. Eventually the insurance market shrinks, leaving some individuals and households uninsured or with less than full coverage (Rothschild and Stiglitz 1976). If private insurers can screen out high-risk patients, those patients may be uninsured. Moreover, screening of patients uses valuable resources and may result in a misallocation (Crocker and Snow 1986; Borenstein 1989). In either case, some segment of the consumer market is left uninsured or underinsured.

Universal coverage

With universal coverage, all members of a society are covered by health insurance. This is typically accomplished by requiring mandatory participation in a public health insurance scheme, requiring everyone to purchase private insurance, or a combination of the two. The main advantage of universal coverage is that it eliminates the adverse selection problem by preventing individuals from self-selecting and insurers from screening. Nevertheless, universal coverage accentuates the moral hazard problem. Thus, total expenditures will rise unless cost-containment measures are introduced. In this regard, it is particularly important how payments to private providers are structured.

Provider payment mechanisms and policy

Several payment mechanisms exist for the reimbursement of health care providers. Among these are fee-for-service, capitation, and prospective payment systems (cased-based payment).

Fee-for-service. Arrangements for fee-for-service payment call for all health services to be priced separately and paid for separately. Under a health insurance reimbursement scheme based on fee-for-service, the more service that is performed, the higher the total reimbursement. As a result, fee-for-service providers have an incentive to overproduce. If the insurer has purchasing power *vis-à-vis* providers, then fees can be negotiated downward or the government can fix fees, thus restraining production and total expenses. Japan, for example, has effectively restrained the growth of health expenditures relative to other developed economies through a system of fixed and regulated fees (Ikegami 1991). This, however, will distort relative prices over time leading to inefficiencies in the mix and types of services provided.

Capitation**.** Under a capitation scheme, providers of health care are paid a fixed amount per person per year to provide services. The most common capitation scheme in the United States, is that used by health maintenance organizations (HMOs) (Andreano and Helminiak 1987; Luft 1981). Commercial insurers often refer to insurance contracts, which are financed through capitated payments, as “risk-products” because the financial risk of large medical expenses is borne by the contracted provider. Thailand’s employment-based health insurance scheme, under the Social Security Act of 1990, purchases service bundles for beneficiaries with capitated payments (Mills et al. 2000). Capitation is seen as a method for controlling costs as it removes the incentives inherent in a fee-for-service scheme to provide large amounts of services and testing and encourage utilization. Whereas with fee-for-service, greater service provision generates larger revenues, under a capitation scheme each procedure contributes to costs but adds nothing to revenues because payments are made in a lump sum. Providers, therefore, have an incentive to be cost-efficient in the production of services and to restrain overuse. Theoretically, the most cost-efficient mixture of inputs and services will result under capitation. But providers have incentives to reduce costs by reducing their levels of service. In addition, providers also have incentives to encourage positive selectivity by attracting healthy patients (*cream-skimming, cherry-picking*) and discourage negative selectivity by avoiding ill patients (*dumping*) (Newhouse 1996). These are major reasons why an effective health policy requires monitoring of contracted providers.

Prospective payment systems. Under a prospective payment system, fixed payments per episode or condition are determined before a medical condition occurs. This often referred to as *case-based* payment. For example, in the U.S. hospitals are paid on a per case basis under the DRG prices (Fetter 1991). As with capitation, the lump-sum nature of the payment means that providers suffer economic losses or earn profits if the cost of service varies from the payment level. Also as with capitation, providers have an incentive to be cost-efficient and to restrain the use of services. A disadvantage is that hospitals also have an incentive to discharge patients too early. A major difficulty with this payment scheme is selecting the right payment levels.

Equity

Health insurance provides a vehicle for achieving equity goals. Most public insurance schemes explicitly incorporate cross-subsidization from high-income groups to low-income groups and medically indigent individuals as a feature of the plan. To ensure that all have needed coverage and access, subsidies must be provided to targeted beneficiary groups. These subsidies are of two types. First, low-income groups need assistance in meeting their premium obligations. Generally, public schemes incorporate income tests for premium or tax contributions. Second, some households have financial difficulty with co-payments and require additional subsidies at the point of service.

Equity issues have been carefully investigated for 12 OECD countries (Wagstaff and van Doorslaer 1992; Wagstaff, van Doorslaer, van der Burg, et al. 1999; van Doorslaer and Wagstaff. 1992; van Doorslaer, Wagstaff, van der Burg, et al. 1999). The most recent evidence suggests that tax financing of the health care system is a progressive method of funding care (Wagstaff, van Doorslaer, van der Burg, et al. 1999). Social insurance is also progressive in the OECD, except for Germany and the Netherlands, where heavy reliance on insurance premiums, instead of taxes, has generated a regressive, albeit well financed, system. Direct (out-of-pocket) payment is the most regressive method of financing health care. These results suggest that the Korean system, where out-of-pocket payments are roughly 50% of financing, would tend to be regressive. By contrast, the Japan system, which is heavily reliant on general taxes, is likely to progressive. However, this issue has not been carefully and extensively researched for the ANE countries and therefore, definite conclusions cannot be drawn.

Group size

For financing schemes to be efficient and sustainable, critical mass must be achieved in the size of risk pools. Diamond (1992) suggests that groups of 10,000 to 100,000 individuals will be sufficiently large to make a generous package of preventive, promotive, and curative care financially viable. This group size may not be necessary to achieve more modest goals of financing simple prevention, basic drug therapy, and primary care, although under usual circumstances, the larger the group, the easier it is to spread risk and predict expenditures. In the case of community financing, the public sector can act as a facilitator in pooling groups to achieve optimal size. This is particularly important in the case of community financing among rural towns and villages.

Mandated coverage

Financial sustainability of any insurance scheme requires that the design safeguard against *adverse selection*. The problem is most apparent when households with sick members and high expected expenses choose to participate in a finance scheme and healthy low-expense households choose not to participate. Voluntary systems inevitably face this problem. If a scheme is able to attain universal participation, the adverse selection problem is eliminated. This is why compulsory programs are frequently recommended by analysts.

Some analysts claim, however, that a voluntary health-insurance scheme at the village level in Africa has been successful in financing basic services (Chabot, Boal, and da Silva 1991). In this case, social persuasion at the village level and government subsidy at the national level achieved high participation. Nevertheless, in the long run voluntary systems are fragile because rising expenses will cause healthy participants to exit or force an increase in government subsidies.

Catastrophic/disability insurance

The greatest underlying demand for health insurance is for protection against large, catastrophic expenses that are unpredictable (e.g., long-term disability). Unfortunately, the same characteristics that create the need, namely large expenses and lack of predictability, also make catastrophic insurance the most difficult to underwrite and the least attractive for the private sector to supply. Large risks are best handled by large diversified groups, and the public sector may have certain advantages in facilitating large-group formation. If community financing schemes are expected to deliver acute care and be financially viable, the public sector must backstop catastrophic care through finance or referral.

Cost containment

Efficient financing requires two types of controls on costs. First, some level of cost-sharing by consumers of health services is efficient. Second, price controls on markets receiving the most generous financing are potentially efficient. Such pricing policies have successfully restrained expenditures in Japan (Ikegami 1991) and represent an important policy instrument for Developing countries within the larger health financing scheme.

Employment-based insurance programs

Employment-based health insurance should be neither encouraged nor discouraged as a matter of public policy but rather should voluntarily arise by virtue of scale economies and similar sources of fundamental economic efficiency. South Korea, Japan, Taiwan and, to a lesser extent, the Philippines began their health insurance schemes by mandating coverage at the level of the employment relation initially with civil servants in all cases, and later with all workers in the case of South Korea, Japan and Taiwan. As a practical matter this may be the easiest way to operationalize either a public or a private insurance scheme. The long-run consequences of employment-based schemes include some undesirable outcomes, however, as illustrated in the case of the United States.

In the United States, most private health insurance is employment-based. Most large employers provide health insurance to employees as part of the total compensation package in the form of a fringe benefit. There are several economic reasons why employers and employees find that such an arrangement is to their mutual private advantage. First, relatively large groups can achieve economies of scale, to the extent that such economies exist, in organizing and administering health plans. In this regard the employment-based groups may also experience economies of scope in administration, as employers maintain administrative records on employees in the normal course of business. Thus, there may be cost complementarities in processing and maintaining information on employees and their families. Second, larger groups may have greater purchasing power than individuals in negotiating health insurance contracts and thus better able to obtain lower prices or better coverage. Third and most significant, employment-based health insurance coverage is treated as nontaxable income under U.S. tax law. As a result, employer-provided health insurance in afforded a substantial tax subsidy, which increases the demand for health insurance and in turn the demand for medical care (Feldstein and Friedman 1977; Vogel 1980; Greenspan and Vogel 1980). This tax subsidy distorts both the quantity and the type of health insurance purchased (Pauly 1986), as well as labor market decisions and is thus a source of allocative inefficiency. Moreover, the tax subsidy afforded to employer-provided insurance is regressive in that it confers greater benefit to higher-income households, which face higher marginal tax rates. In sum, the U.S. employment-based system has distorted health care and labor markets and contributed to escalating costs, inefficiency, and inequity in the health care system.

In contrast to the U.S. system, the private finance system in Australia is based at the individual and household level and has no direct linkage to employment (Altman and Jackson

1991). Health insurance premiums, when paid by employers, are treated as taxable income. As a result, there is relatively little distortion in health insurance choice and labor market decisions. The absence of an artificially imposed linkage between insurance and employment partly explains the lower expenditures of the Australian health care system relative to that in the United States, 8.4% and 13.9% of GDP, respectively, in 1997 (OECD, 1999).

Analysts have recommended that the United States end the special tax treatment of health insurance premiums in a move toward efficiency (Diamond 1992; Pauly et al. 1991). Nevertheless, the political economy of the health system makes it difficult to remove these employment-based subsidies, once granted (Wolfe 1993). This is why it is important for policymakers within developing countries to avoid creating strong employment-health finance linkages in their health systems or allowing those linkages to become entrenched.

Competition and regulation

For reasons already discussed, neither a purely privatized health system relying on unfettered competition nor a purely public system is likely to generate optimal efficiency and equity given a society's goals. The best of all *feasible* solutions is probably second best overall. One potential solution is a system in which all households participate and make informed, but limited, choices among competing health insurers and health care providers. The government acts as a facilitator and rule- maker to limit the inefficiencies of competition. The government sector also subsidizes some households to achieve equity and acts as the insurer/financier-of-last-resort to secure the system. Such a system would fall under the general rubric of *managed competition* (Enthoven 1988) and has been proposed as a reform policy for the United States (Diamond 1992; Pauly et al. 1991).

Labor and Retirement Policy

As populations age and labor force growth slows in Asia the labor force choices made by older workers and the employment practices they face will take on increased salience. Economic performance will be influenced in two ways. First, the burden of the old-age support system will be influenced by the retirement decisions made by older workers and their employers. If workers respond to increased life expectancy by extending their years in the work place, the material needs of the elderly can be met at a smaller cost to younger generations. If, on the other hand, workers retire at a younger age, additional resources will have to be mobilized for their support during retirement. Alternatively, living standards for the elderly will decline relative to those enjoyed by younger generations.

Second, the labor force behavior of older workers will become increasingly important as labor force growth slows and labor shortages emerge. In part, older workers will be more important simply because a larger share of the population and the workforce will be fifty or older. In addition, any response in the overall supply of workers will increasingly depend on decisions by older workers. Prime age adult males are for the most part fully employed. The high and increasing returns to education will provide a powerful incentive for young adults to opt for school and delay their entry to the workforce. Most Asian countries have been reluctant to open their borders to substantial numbers of foreign workers. Only increased labor force participation among women and older workers will moderate the influence of slower or negative growth of the working age population.

The employment decisions made by older workers will bear not only on aggregate economic performance, but also on their individual welfare and that of their families. For many older workers continued employment is critical to maintaining economic security. For some, however, deteriorating health may dictate withdrawal from the labor force. Others may prefer an extended period of retirement at a reduced material standard of living.

To a great extent, retirement outcomes are the result of the interaction between labor demand and labor supply. Older workers make decisions about their continued employment based on their wages and non-pecuniary benefits, their wealth and non-labor income, their expectations about public and private economic support, and their assessment of current and future materials needs. Firms make decisions about employing older workers based on their current productivity, their future value, and the wages that must be paid to retain their services.

If the decisions of older workers and firms are not influenced by tax and retirement polices and if labor markets are well-functioning, there is little rationale for government intervention. The reality, however, is that tax and retirement policies have considerable influence and that labor markets are characterized by numerous rigidities that affect labor force outcomes. There are many ways in which government policy can be improved to eliminate barriers to the continued employment of older workers and to mitigate some of the economic problems associated with rapid aging.

Retirement trends

The trend towards earlier retirement appears to be a persistent feature of development. The experience is most thoroughly documented for the developed countries. Since 1950 the average retirement age for men has dropped in every OECD country but Iceland. Other countries have experienced a marked decline. In Finland, Spain, and the Netherlands the retirement age has declined by more than 6 years. In Austria, Belgium, Finland, France, Luxembourg and the Netherlands the average retirement age for men had dropped below 60 by 1995 (Table 24).

Table 24. Average retirement age among men, OECD countries 1950-1995

Comparable data are not available for most Asian countries and, consequently, the trends in retirement and the factors influencing work have been investigated less thoroughly (Hermalin, 1997). Nonetheless, trends in labor force participation rates suggest changes in Asia that are similar to those occurring in the West. Retirement trends in Asia are summarized below in two ways using labor force participation rates (activity rates) for men. The first is the median age of workers who retired during any five-year period. This measure is crude because it is based on broad age groups and does not capture non-linearities that characterize labor force participation. It also reflects the age-distribution of the underlying population. Moreover, the upper age group is 65 and older. Frequently, more than half of this group is still active. In this case, the median age is extrapolated assuming a linear decline in activity rates.

The second methods uses the retirement hazard rate, the proportion retiring between age *a-5* and age *a* out of those who were active at age *a-5* (Hurd, 1990). Current retirement behavior is captured in crude fashion assuming that the cross-section activity rates capture the participation probabilities for individuals. The hazard rate from one age group, say 55-59, to the next age group is calculated as:

$$H_{55-59\ to\ 60-64} = 1 - \frac{LFPR_{60-64}}{LFPR_{55-59}}$$

where H represents the retirement hazard rate and LFPR represents labor force participation rates.

The median ages at retirement, presented in Table 25, exhibit two interesting features. First, most Asian countries are experiencing a substantial decline in the median age at retirement. Although the concept of the median age at retirement is different from that of the average retirement age, the changes in Asia appear to be similar in magnitude to the changes in OECD countries. Second, the cross-sectional pattern is broadly consistent with the view that development leads to an earlier age at retirement. The median age at retirement for East Asia had dropped below 65 by 1980 and reached 62 for 1995. In contrast, the median age was close to 65 in both South and Southeast Asia in 1995. Retirement may not be an option in a poor rural setting—many people work as long as they are able.

Table 25. Median age at retirement, Asian males aged 40 and over 1950-2010

Hazard rates for Asian male for 1950-2010, shown in Figure 25, confirm the shift towards an earlier age at retirement. The probability of retiring between the ages of 55-59 and 60-64 given membership in the labor force at age 55-59 was 0.251 for Asian men in 1950. In other words, about one quarter of men aged 55-59 in 1950 retired by the time they reached 60-64. The retirement hazard rate has increased rapidly for the last 50 years and is projected to increase for the next few decades. The probability of retiring between 55-59 and 60-64 increased to 0.373 in 1990, and is projected to reach slightly less than 0.5 by 2010.

Figure 25. Retirement hazard rates, Asian men 1950-2010

Causes of retirement

The clear connection between the level of development and age at retirement suggests a simple model of retirement behavior, namely that workers are opting for a longer retirement because they can afford it. Most research on retirement behavior provides some limited support of this view, but the research also points to a variety of forces that are influencing behavior. Most recently, Auer and Fortuny (2000) used the 1995 European Union Labour Force Survey, to examine why retired men aged 55-64 left their last job (Table 26). Although there is a wide variation among countries, there are two noticeable causes of early retirement. First, a substantial percentage of men reported that their retirement was voluntary. Almost one half of the men in Austria and 30 percent of the men in Denmark offered this explanation. Second, in countries experiencing deep recessions in 1990s, namely Sweden, Finland, UK and Spain, high percentages of older men were dismissed from their last job. These results and many other studies demonstrate that a comprehensive understanding of retirement must look to three set of factors: supply factors that influence the willingness of older workers to remain in the labor force; demand factors that influence the willingness of employers to hire or to retain older workers; and, institutional rigidities in the labor market that preclude outcomes that would be preferred both by older workers and their employers.

Table 26. Main reasons for leaving the job, men aged 55-64, EU

Labor supply effects

The rise in wages that accompanies development has conflicting effects on retirement behavior. Retirement becomes more expensive to workers in the sense that they forego a higher wage by withdrawing from the labor force. However, higher wages over the work-life provide individuals with the resources needed to support a longer retirement period. The trend in retirement age reflects, in part, the strength of these two effects in the face of general wage growth, but also the impact of public policy on wages and retirement wealth.

First, governments impose taxes on income and/or earnings reducing the after-tax wage and, consequently, the cost of early retirement. In some instances, the effective tax rate faced by those near retirement age may be higher than the tax rate faced by other workers because the lifetime value of retirement benefits are lower to those who continue to work. To the extent, then, that these policies exist and encourage early retirement, government policy serves to undermine economic growth and support systems for the elderly. Second, public transfer programs shift wealth across generations. In principle, transfer programs can favor any particular generation, but in practice public programs have transferred wealth from those who were young workers or who had not yet entered the labor force, including those not yet born, at the time the program was established to older workers and retirees. During the early stages of transfer programs, then, the wealth effect reinforces the effect of reduced wages encouraging a younger age at retirement. When transfer programs mature, however, their impact on retirement is ambiguous since older workers face lower wages and lower wealth than they would have in the absence of the transfer program. What is unknown, however, is whether or not the effects on retirement behavior are negligible, substantial, or some where in between.

In developed countries social security benefits and private pensions have increased over time and are now the primary income sources for the elderly. In the US, for example, the income of the elderly has grown more rapidly than the income of the non-elderly or the income of households to which children belong. This has been a direct outcome of increases in the Social Security program. Income from earnings fell from 29 percent in 1967 to 17 percent in 1986. The fraction of income from social security and pensions increased from 49 to 54 percent, mostly because of increases in Social Security. Several researchers have concluded that large increase in Social Security benefits were responsible, in part, for fall in labor force participation rate among older Americans (Hurd, 1990).

Many other studies have investigated the effect of pension and social security programs on retirement decision. Most conclude that the growth of pension and social security programs has led to earlier retirement, but no consensus has emerged about the magnitude of the effect. For example, Gustman et al. (1994) find small effects; Lumsdaine et al. (1997) substantial ones. Studies that have focused on social security rule modifications conclude that their impact is modest. Simulations using firm data show that changes in social security policy in the U.S. will have little impact on the age at which workers accept their private pension, mainly because private pension wealth in the U.S. is substantially larger than social security benefits (Stock and Wise, 1990; Lumsdaine et. al., 1997). Of course, many workers in the U.S. do not have private pensions on which they can draw. Studies of the impact of pensions on retirement usually find that workers with generous pensions retire earlier than those with smaller pensions, but the magnitudes of the effects vary considerably across studies.

Evidence for Asian countries is very limited. Asian firms have used compensation schemes to encourage older workers to retire early. In Korea, for example, as unemployment became more acute during the recent financial crisis a variety of programs were introduced to encourage early retirement. A number of firms offered compensation for loss of earnings and to bridge the gap until a full pension could be claimed. Although there is little empirical evidence on the magnitude of the impact, reliance on the programs suggests that firms perceive their employees as being responsive to such incentives. If so, these measures might have accentuated the decline in the retirement age. Expansion of public programs currently being considered in many countries may lead to further declines in the age at retirement.

Labor demand and retirement

Retirement decisions are also affected by labor demand. Many Asian economies, especially in East and Southeast Asia, experienced strong economic performance, until recently, and a correspondingly strong demand for workers. In recent years, however, economic crisis and slower growth in many Asian countries has adversely affected the demand for labor. Women and older workers are most vulnerable when enterprises restructure and few governments have effective policies that prohibit employment practices that discriminate on the basis of gender or age.

Many governments allow firms to target the elderly in the belief that it will improve job prospects for young employed males viewed as the primary breadwinner for the family. Moreover, because of the seniority-based wage system in many Asian countries, employers may believe that older worker are receiving wages and benefits that are too high relative to their productivity. Although older workers are more experienced than younger workers, they may have poor health and suffer other effects of aging that reduces their productivity. Consequently, the elderly may be forced into early retirement when there are general down-turns in the economy or when particular sectors or firms decline or restructure their production processes.

Estimating labor demand models has proven to be much more difficult than estimating labor supply models in part because of the lack of firm-level data. Consequently, evidence about the impact of demand side factors is relatively poor (Lumsdaine and Mitchell, 1999). One issue examined in empirical studies is the relative productivity of younger and older workers.

Although many economists, especially young economists, have assumed that younger worker are more productive, other studies find that older workers have superior skills (Mitchell, 1990). Although older workers may be less productive than younger peers due to skill obsolescence, this is not a consequence of aging per se but due to a lack of re-training (Auer and Fortuny, 2000).

Most studies find that poor health leads to early retirement (Rust, 1988; Quinn et. al., 1990). Poor health raises the opportunity cost of work, influencing the supply of labor. It also signals lower productivity to employers affecting the demand. Given the improvements in health that have accompanied economic development, it is puzzling that age at retirement has declined, not increased. It may be that other factors have overwhelmed the influence of better health. Or, it may be that higher incomes have enabled workers with poorer health to withdraw from the labor force.

It is far from clear that governments should support practices aimed at encouraging early retirement by workers. A reduction in the employment of older workers does not necessarily lead to an increase in the employment of young workers in the short run, because old and young workers frequently have different skills. Moreover, entry to and exit from the labor market do not occur in the same sectors or occupations. In the long run, withdrawal of older workers from the labor force does not necessarily result in greater employment of younger workers either. The number of jobs is not fixed in the long run. From a social welfare perspective, encouraging early retirement may reduce employment, income, and economic welfare, in general.

Rigidities in labor market

Labor market rigidities refer to structural impediments created by firms or labor unions or imposed by governments that reduce the flexibility of employment practices. The presence of these rigidities may lead to welfare losses by reducing employment by older workers. The rigidities can take a variety of forms. Many governments in Asia and throughout the world have mandatory retirement ages. Firms may have inflexible rules about work hours. Seniority wage systems may preclude the downward adjustment of salaries for workers with diminished productivity.

To a great extent, labor market rigidities are a feature of the growth of the urban, industrial sector. Agricultural workers, the self-employed, and those working in small-scale enterprise are much less subject to market rigidities than are those working in the public sector or for large-scale industrial firms. Thus, the shift of labor from the rural agriculture sector to the urban non-agricultural sector has led to increased labor market rigidities and possibly a younger age at retirement. Although other factors, emphasized above, have played a role in the decline in the age at retirement, the simple relationship between activity rates of elderly and the percentage of agriculture sector employment reinforces the emergence of labor market rigidities (Figure 26).

Figure 26. Relationship between activity rates of elderly and the percentage of employment in agriculture sector, 1990

Older workers approaching retirement often desire gradual retirement because the desired amount of working time usually decreases gradually as tastes shift toward leisure. If the labor market is flexible and older workers can vary their amount of work according to their preference and productivity, then either a fall in their desire to work or a fall in their marginal productivity will result in a fall in the volume of work. However, what has been actually happening is somewhat different because of labor market rigidities. The evidence for the U.S. is illustrative. About 70 percent of the transitions in the U.S. have been from full-time work to no work (Rust, 1989; Berkovec and Stern, 1988). Several studies have found marked peaks in retirement ages rather than a smooth transition (Rust, 1989; Lumsdaine et. al., 1996). Researchers suggest that it is "institutional rigidities" in labor market that is responsible for this particular pattern of retirement (Lumsdaine and Mitchell, 1999). These rigidities include the existence of statutory retirement age (pension-receivable age) and working time constraint (Lumsdaine and Mitchell, 1999).

Mandatory retirement ages are pervasive. Most countries in the world impose a statutory age at retirement (Table 27). Some countries have a lower retirement age for women than for men. This is a puzzling form of gender discrimination given that women have a longer life expectancy than men in most countries of the world. Many countries have moved to equalize the retirement age for men and women. The statutory retirement age in less developed regions is generally lower than in more developed regions. Developed countries usually have a statutory age of either 65 or more. For most Asian countries, the statutory retirement age is less than 65. It is 65 in Japan, 60 in the Philippines and Korea, and 55 in Indonesia and India. The lower mandatory retirement age in developing countries may reflect the lower life expectancy and poorer health status of older workers, but many developing countries have been slow to adjust mandatory retirement ages upward despite rapid improvements in life expectancy and health status.

Table 27. Statutory retirement age

The impact of mandatory retirement laws on work by the elderly depends, of course, on the extent to which the policies conflict with the desires of older workers and their employers. Several years ago the U.S. passed a law banning discrimination on the basis of age. The elimination of a mandatory retirement age had a strong, positive impact on employment rates for older workers. Moreover, the rise of older workers' employment did not result in a decline in employment among younger workers (Neumark and Stock, 1999).

Mandatory retirement is the most obvious example of a labor market rigidity that influences retirement decisions, but other features of the labor market may also play an important role. The market rigidities sometimes include the inability to change working hours on a given job or changing to a different job that offers the desired combination of hours (Hurd, 1996). In a rigid market, the optimal constrained choice can be to work more than is desired and then not to work at all, rather than to reduce work effort more gradually. Firms that have seniority based wage profiles may encourage retirement rather than reduce either wages or the amount of work when wages exceed older workers' marginal productivity (Lazear, 1979). Some Asian countries, especially Japan and Korea, have had a long tradition of seniority based wages, that might encourage earlier retirement.

Concluding remarks: policy options

Policies that undermine work effort and promote, or dictate, early retirement are damaging in several ways. First, older workers who are not yet financially prepared for retirement are forced to accept a lower material standard of living during their retirement years.

Given the importance of the family support system in Asia, some of the extra burden will be shouldered by the families of the elderly. Second, economic growth is reduced by the loss of human capital. Third, the fiscal viability of public support programs is damaged by the decline in the number of earners and the tax base relative to the number of beneficiaries. These issues are particularly salient in aging societies, but under any circumstance eliminating work dis-incentives and labor market impediments is sound economic policy.

Different policy options address the impact of pension programs, tax policy, and labor market rigidities. One option is to increase the mandatory retirement age or, preferably, to eliminate it altogether. For many workers the pensionable age, the age at which an individual qualifies for a pension, affects retirement behavior with as much force as the mandatory retirement age. One possible approach is to remove the statutory pensionable age and to provide pension benefits that are actuarially determined by the age at which an individual chooses to retire. Thus, a decision to retire early does not impose additional costs on the retirement system nor does the retirement system either encourage or discourage retirement by older workers.

Although income and earnings taxes influence work incentives and, in many instances, reduce work effort, reducing average tax rates may not be a viable option. However, adopting a PAYGO pension program necessarily requires higher taxes with adverse effects on work effort. Another policy option is changing the tax structure. One possibility is to shift the relative burden born by labor and non-labor income. Of course, increasing taxes on non-labor income will adversely affect saving and investment. Another option is to flatten the rate structure. In a progressive system, the marginal tax rate rises as workers increase the hours employed. Hence, the after-tax wage declines the more individuals work. Flattening the tax structure will generally encourage employees to work more hours. In the face of labor market rigidities that limit the availability of part-time employment, a flattening of the tax rate may lead workers to increase their age at retirement.

The elimination of labor market rigidities is a high priority for effectively utilizing the human resource potential of older workers and for allowing older workers to remain in the labor force as long as they so choose. If employers have the flexibility to hire older workers on a part-time basis, vary responsibilities as the capabilities of older workers change, and pay a wage commensurate with the productivity, not the seniority, of older workers, employers will be much less reluctant to hire or retain older workers. Gradual retirement has some clear advantages. It enables older workers to postpone the complete loss of labor earnings. It allows employers and employees to adjust the demands of work to any decline in capabilities that might be associated with age. It also allows firms to retain experienced workers and facilitates the transmission of that experience to the next generation of employees. Particularly as labor force growth slows and, in some countries, turns negative, more flexible and innovative employment practices will become increasingly attractive.

In addition to eliminating rigidities in the labor market, more active steps are possible to meet the human resource needs of older workers. Occupational re-training programs and general educational upgrading will allow older workers to take up new occupations and to cope with rapid technological change. It is well known that individuals with low educational attainment and low skills are at a higher risk of remaining jobless for an extended period of time. The education upgrading and re-training will provide the basis for workers to acquire skills throughout their working life and thus enter their older ages relatively well equipped. Without re-training, skills of the elderly will be obsolete and the incoming cohorts of younger workers will continue to have skill advantages. Employers may be reluctant to invest in the human capital of older workers because of concerns that the employer will derive benefits over a shorter period of time. Turnover among older workers, however, may be much lower than it is among younger workers.

Improving the flexibility of the labor market, of course, raises dangers that older workers will experience age discrimination with their levels of responsibility and/or wages reduced for reasons unrelated to their capability. The need for effective systems for monitoring and correcting age-discrimination will become increasingly important if systematic abuse is to be avoided.

Old-age Support Systems

Family support systems

In most traditional Asian societies, the family bears primary or exclusive responsibility for providing old age security. Most elderly live in an extended, multi-generation family and rely on their adult children, their spouse, and other family members for both material needs and personal care. Even when children are living separately from their parents, contact is more frequent and resource flows more substantial than in the West. By and large, the family-based approach has been remarkably successful, especially given the potential for great inter-generational income inequality in the rapidly growing economies of Asia. When the elderly were young, their earnings were a pittance in comparison to what today's workers can command. But the family support system has from every indication insured that the elderly have shared in the region's economic success. Income inequality is quite low among developing countries, particularly in East and South Asia, and the elderly appear to have maintained standards of living comparable to those enjoyed by their offspring.

Despite its success, the traditional family support system is under a great deal of pressure from demographic, social, and economic change and these pressures are likely to grow in the coming decades. The same demographic forces that are leading to a decline in the aggregate support ratio are leading to a decline in the support ratio at the family level. With increases in life expectancy adults are more likely to have surviving elderly parents, and the persistence of low fertility means that sons and daughters will have fewer siblings with whom to share the responsibilities of parental care. Economic forces are reinforcing the demographic ones. The young are leaving their home for urban centers and new employment opportunities leading to more physical isolation from their parents. Women are entering the workforce, reducing the time available to provide family support. Exposure to the West may be introducing new ideas about marriage, family, and individualism. Marriage rates have dropped substantially in a number of countries. If a significant number of men and women choose to forego marriage altogether, this could have significant implications for family support. Finally, the development of financial markets and employee-based and public pension programs offer alternative mechanisms for securing old-age support.

The Asian family is responding to these pressures. Change has been most pronounced in Japan and recently in South Korea. In other countries the changes have been relatively modest to this point. Throughout the region, however, the family support system remains much stronger than in the West. The issue for public policy is not to devise a support system that presumes a minimal role for the family. Rather the challenge is to assess the distinctive advantages of alternative approaches and to devise complementary programs.

The current situation

In Asia, most elderly live with their children. Census and survey data available for Thailand, the Philippines, Indonesia, Sri Lanka, Singapore, Taiwan, Vietnam, Korea, and Japan confirm that the extended, multi-generation family is a resilient feature of Asian society. Japan and South Korea are distinctive among these countries in that only half of their elderly were living with children in 1990. In the other countries, the percentage of elderly living with children ranged from 67 percent in Indonesia to 85 percent in Singapore (Table 28). Intergenerational co-residence is much less frequent in the West. In Australia, the Netherlands, and the United States only 16, 12, and 13 percent, respectively of those 65 and older lived with their children in the 1980s (World Bank, 1994).

Table 28. Living arrangements, elderly population, selected Asian countries.

The elderly do not depend exclusively on their children. Many living independently of their children are living with their spouse. Older men are more likely to be living with their spouse as compared with older women in every country for which data are available. The difference is particularly pronounced in Japan where 36 percent of elderly men live only with their spouse as compared with 16 percent of elderly women. The differences between men and women reflect the reality that most women outlive their husbands both because they are younger than their husbands and because they live longer. Because older women are much more likely to be widowed than older men, they are also much more likely to live alone. In Korea, for example, 13 percent of women 65 and older lived by themselves as compared with only 3 percent of elderly men. In Indonesia, 15 percent of elderly women lived alone and only 3 percent of elderly men. In Thailand 5.5 percent of elderly women lived alone, as compared with 3.3 percent of elderly men (Table 29). Very small percentages of either older women or older men live in households consisting of unrelated members. Relatively small numbers live in institutions. Only in Japan are elderly women more likely to be living in institutions than are elderly men.

Table 29. Non-Family Living Arrangements for the Elderly (65 and older) in Asia.

The elderly are far from a homogeneous group. Men and women differ in their needs and the way that they rely on their family. Likewise, the situation for those in their sixties is considerably different than for those in their seventies and eighties. Detailed data are more limited at older ages because of the small samples in many surveys. However, survey data from the 1980s for the Philippines, Singapore, Taiwan, and Thailand show that those who were 75 and older were actually somewhat less likely to be living with their children than those in their sixties. Interpreting these data is somewhat problematic. The decline in co-residence with children may reflect nothing more than the fact that children are becoming adults and no longer depending on their parents. Despite the decline a high percentage of those 75 and older are living with their children (Table 30).

Table 30. Percentage living with one or more children by parents' age, ASEAN survey.

A somewhat different picture emerges from data on the proportion living alone drawn from censuses (Table 31). Reliance on census data allows greater age detail and provides clear evidence, especially for women, that the proportion living alone reaches a peak and then declines at older ages. For men, the proportion living alone typically peaks among those aged 80-84, although a less uniform picture emerges in the Philippines and Thailand. For females, the proportion living alone peaks in the late sixties and seventies in Japan, Korea, and Indonesia. In Taiwan, the Philippines, and Thailand the peak is at a later age. Note that even though the proportion living alone declines at older ages for women, women 85 and older are still more likely to be living alone than are men.

Table 31. Proportion of older adults living alone by age and sex, selected Asian countries.

A complete description of Asia is hampered by the lack of representative, national level data for most South Asian countries. With the exception of Sri Lanka, we do not have survey or census data on living arrangements that can be used to describe either the recent situation or trends. The consensus is that multi-generation family is as important in South Asia as it has historically been in East and Southeast Asia and that the family support system has probably not eroded in recent years. According to the World Bank, "well over 75 percent of the old live with their children in all of [the subcontinent] countries - almost 95 percent in Nepal" (World Bank, 1994) although the basis for this statement is not altogether clear.

Two small scale surveys recently conducted in Bangladesh and Pakistan do find that the great majority of elderly in those countries live with their children. In Bangladesh, about 400 elderly (60 and older) living in Manikgonj and Rajshahi were surveyed in 1997. Only 1.0 percent of rural elderly and only 1.4 percent of urban elderly lived alone. Another 1.5 percent of rural elderly and 0.9 percent of urban elderly lived only with a spouse. Over 95 percent of both urban and rural elderly lived with their children (Samad and Abedin, 2000).

The survey of elderly in Pakistan was similar in design to the Bangladesh survey. About 400 households with elderly were surveyed in 1997. About half were rural and half were urban residents. The urban survey was drawn from locations near Islamabad and Rawalpindi; the rural sample from villages in Punjab and N.W.F.P. Hence, it is not representative of Pakistan as a whole. Of rural residents, 86 percent of those 60-69 and 93 percent of those 70 and older lived with an adult child (18 or older). Of urban elderly, either 60-69 or 70 and older, 92 percent lived with and adult child (Afzal, 2000).

National level data on household size provides a rough indication of living arrangements in South Asia and these data are consistent with the view that the extended family persists in South Asia. The number of adults 15 and older per household in South Asian countries ranges from 3.0 members in Bangladesh to 3.8 members in Pakistan. In most Southeast Asian countries, the number of adults per household are comparable. In Malaysia, Myanmar, the Philippines, Singapore, and Thailand the average household has more than 3 adults. Among East Asian countries the number of adults per household is under 3 adults per household ranging down to 2.5 in Japan in 1995 (Table 32). One cannot directly infer living arrangements for the elderly from such a crude measure as adults per household. The patterns we observe in the region partly reflect differences in age structure and differences in living arrangements among young and middle-aged adults. However, the data suggest that the extended family is as prevalent in South Asia as it is in Southeast Asia.

Table 32. Household size, children and adults per household, Asian countries.

Despite the continuing prevalence of the multi-generation extended family, there are clear indications of a shift toward more independent living arrangements. The change has proceeded much further in Japan and Korea than elsewhere. In 1950, 80 percent of elderly Japanese lived with their children (Ogawa and Retherford, 1997) as compared with 50 percent in 1990. In South Korea, the proportion of elderly women living alone nearly doubled between 1980 and 1990 and the proportion living with their children dropped from 78 percent in 1984 to 47 percent in 1994. In Taiwan, between 1973 and 1986, the proportion of older parents living with a married son declined from 82 percent to 70 percent (Weinstein and others 1994). Outside of East Asia, living arrangements are changing more slowly or not at all. In Thailand and Singapore, the percentages of older adults living with a child have dropped modestly. No change is evident in the Philippines. The number of adults per household does not appear to have dropped at all in Southeast or South Asia (Table 32).

The changes in living arrangements that are occurring can only be taken as indicative of changes in the family support system. One difficulty is that resource flows within the household are rarely documented; hence, one cannot with any degree of assurance assess whether co-residence is a means by which children are providing support to elderly parents, by which elderly parents are providing resources to their adult children, or neither. Thus, declining coresidence does not necessarily indicate a decline in support for the elderly.

A few studies in Asia have tried to assess the extent to which co-residence was accompanied by resource flows. In a 1988 survey, adult children in Japan were found to be much more much likely to move into their parents domicile than the converse, suggesting a transfer of housing services from parent to child. However, the reported circumstances surrounding decisions to co-reside indicated that children moved in with their parents in response to some perceived need on the part of the parents (Martin and Tsuya, 1994.) In a 1986 survey, children in Thailand were asked about the support that they provided to their elderly parents. Among coresident children, 32% provided money and 55% food and clothing and among non-coresident children, 41% provided money and 30% food and clothing (Knodel and Chayovan, 1997).

A second difficulty is that the extent to which living arrangements are changing may be exaggerated by the simple dichotomy "living together/not living together" implicit in the definition of a household. In Thailand, for example, members of the same extended family may live in separate households, but within a single compound. In an urban variant on the same theme, members of extended families in Singapore live in separate units within the same apartment building (Yap, 1998). In Tokyo, 50.9% of those 65 and older lived with their children in 1989, but another 11% lived in the same complex or the same domicile but maintained a separate budget. An additional, 11.1% lived in the same neighborhood as one of their children (Miyajima, 1994).

Despite these complexities there are clear indications that the family support system is declining or expected to decline in the future. Ministry of Labor data for Japan reports the proportion of elderly dependent "primarily on their children's income" in 1980, 1983, and 1988. Thirteen to fourteen percent of working men in each year depended on their children for the primary source of income. Among retired men, the proportion depending on children as the primary source of income declined from 37% in 1980 to 23% in 1988. Among working women, the percentage dependent on children declined from 37% in 1980 to 28% in 1988. And for women who were not working, the percentage depending on their children dropped from 52% to 24% in only eight years (Miyajima, 1994).

Surveys of young Japanese adults indicate that they are increasingly likely to discount the family as an important support system on which they can rely in their old age. Remarkable documentation about shifting attitudes is provided by a survey of ever-married women under the age of 50 conducted by the Mainichi Newspaper. Since 1950, women have periodically been asked: "Are you planning to depend on your children in your older age (including adopted children, if any)?" In 1950, 65% replied that they expected to depend on their children, 16% responded that they had never thought about the issue, and 20% reported that they did not expect to depend on their children. By 1990, only 18% responded that they expected to rely on their children, 20% had never thought about it, and 62% did not expect to depend on their children (Ogawa and Retherford, 1993).

Taiwan's family support system has been subject to less erosion. The proportion of married women aged 20-39 reporting that they regularly gave money to the husband's parents increased from 32% in 1973, to 42% in 1980 where it remained in 1986. The percentage reporting that they never gave money to their husband's parents declined from 35% in 1973 to 15% in 1980 and 1986. The proportion reporting that they never gave money to the wife's parents declined from 58% in 1980 to 48% in 1986. (The question was not posed in 1973)(Weinstein et al., 1994). However, recent analysis of household income for Taiwan indicates that beginning in the late 1980s the per capita income of the households in which elderly live has declined relative to households containing no elderly. The source of the decline was an increase in the extent to which the elderly were living independently of their children. Even though interhousehold transfers to the elderly have increased there, they have been insufficient to offset the decline due to changing co-residence (Mason and Miller, 1996).

Other Asian countries exhibit similar shifts. In South Korea, only 8 percent of women responding to a 1997 survey indicated that they wished to live with their children in old age and 70 percent did not (Lee, 1998). In the Philippines, recent survey results indicate that fewer adults wish to live with their children than is currently the case (Natividad and Cruz, 1997).

The future of family support systems

A variety of forces have been identified that are undermining and will continue to undermine the family support system. The decline in agriculture, urbanization, secularization, financial sector development, public policy, and demographics all seem to push in favor of formal systems of support for the elderly. In opinion surveys in several Asian countries described above respondents clearly expect to rely less on their family for old-age support than is now the case. In policy circles, eventual decline in the importance of the family appears to be widely accepted. The World Bank expressed this view succinctly: "It is inevitable that formal systems should eventually replace informal systems as the dominant form of old age support." (World Bank 1994).

A review of the record over the last few decades does give one pause in reaching conclusions about how rapidly support systems will evolve in Asia and whether or not they will come to resemble those found in the West. The most economically advanced countries of Asia, Japan, Singapore, Taiwan, and Korea, have already experienced many of the economic and social forces thought to undermine family support systems. Their populations are wealthy, educated, and urbanized. Their labor forces are employed in industrial and service sectors. They have well-developed financial sectors and, in some countries, well-developed pension programs. Their populations are aging as rapidly as in the West. Yet, the family support system remains much more important in Asia. Perhaps, then, the family support system will continue to play a more important role than envisioned by many. The need for public programs is further diminished by the high rates of saving in many Asian.

That is not to say that the family support system will remain as important as it is today. Many of the countries of Asia have yet to experience the economic and social changes that have occurred in the most advanced countries of Asia. Moreover, demographic changes on the horizon could prove to be very important. Among the countries of Asia, only Japan has experienced the "demographic squeeze" caused by the combined impact of longer life expectancy and lower fertility. In the other countries, fertility decline has been quite recent and the elderly of today have historically high numbers of surviving offspring upon whom they can rely (Feeney and Mason, 1998). Over the coming decades, however, elderly will be living longer and have fewer children, placing considerable strain on the family support system.

At the same time that demographics are working against support from children, they are working in favor of support by marital partners. This may be a particularly important change for elderly women who are so likely to be widowed. As the projections presented above show, the proportion widowed should decline substantially in the future increasing the extent to which the elderly can rely on their marital partners.

Public policy may also have an important influence on the role of the family in the future. Several Asian governments have explicitly recognized the desirably of maintaining a strong family support system and have adopted pro-family policies. In Singapore, children are now legally responsible for the support of their elderly parents. In Malaysia and Singapore, public housing policy has been revised to better accommodate multi-generational living arrangements. Many East and Southeast Asian countries are providing day care and other support services aimed at helping children care for their elderly parents. Malaysia provides tax incentives and other governments have considered or adopted similar policies (World Bank, 1994).

The advantages and disadvantages of family support systems

Enforceability: Will systems persist?

Except perhaps in Singapore the "contract" governing family support systems is a social contract not a legal one. As a consequence, norms and social pressure are relied on to insure that each generation cares for the preceding one. If some children choose not to honor the contract, their parents have no recourse and no support. If a generation chooses not to honor the contract, either a generation of elderly will suffer the consequences or the public sector will have to step into the gap.

This particular problem is not unique to a family support system. Businesses can fail leaving their employees pensionless. Governments can fall or renege on their commitments. Hence, the relative advantage of formal and informal systems depends on the stability of the political and economic environment in which the system operates. In many settings, the family is the most reliable institution upon which the elderly can depend.

Risk pooling

Support systems for the elderly involve risk pooling at which family is disadvantaged. The family consists of only a few earners who in many instances live in the same geographic locale and who are employed in the same occupation and industry. The elderly who depend on them will be subject to income shocks that can be averaged away in large-scale systems. Similarly, in family support systems the members are exposed to the risk that their elderly members will live to a late age. Although in principle annuities can be relied on to insure against this risk, either these markets are under-developed or families choose not to protect themselves. Either a large-scale public or private system can pool against this risk through its pension program. It is common in Asia, however, to make lump-sum payments at the time of retirement. By doing so, these programs do not insure participants against the risk of unusual longevity.

Administrative efficiency

Formal support systems are difficult to administer and subject to ineptitude and corruption. Thus, they may be beyond the capacity of countries lacking the appropriate human resources and legal and regulatory environment. In contrast, family support systems are extremely easy to administer.

Economic efficiency and growth

The tax and benefit structure of some formal systems can lead to economic inefficiency by discouraging work and saving. Formal systems are also susceptible to evasion and shirking. To some extent these problems are less severe in a family support system because family members can more effectively monitor each other's behavior and because some costs are internalized.

Family support systems, however, also undermine the pension motive for saving and, consequently, may reduce rates of saving and growth (as compared, for example, with a compulsory, funded program such as found in Malaysia or Singapore).

Rates of return

Mature transfer systems, whether they are family based or public programs, can sustain rates of return no greater than the rate of growth of the economy. If workers accumulate wealth to finance their retirement, acting either independently or as part of a funded public pension program, the rate of return is equal to the return to private capital. In many Asian countries, rates of economic growth reached unprecedented levels during the last few decades and the elderly enjoyed high rates of return through their participation in family support systems. In other Asian economies and the mature economies of the West, rates of economic growth have been much more modest. Consequently, the rates of return to transfer systems have been low as compared with those available through funded programs. The differences in the rate of return has been one of the key factors that has increased interest in the U.S. of moving away from its PAYGO Social Security system.

Transition costs and unfunded liabilities

Family support systems are just like PAYGO public systems in another important respect. Both systems have unfunded liabilities. When few adults reach old age and even fewer retire, the liabilities implicit in a transfer system are relatively small. But as the retired population grows relative to the working age population, the debt of the support system becomes very large.

As countries in Latin America and the West shifting from PAYGO to funded pension programs these debts come due. Either they must be paid by current and future retirees who will forego some of the pensions that were committed to them. Or, if benefits are maintained, the more typical response, they must be funded by higher taxes on current and future workers.

If Asian countries maintain family support systems, the same logic applies. During any transition either benefits to those who are currently retired or who are about to retire will be sacrificed; or, current and future workers will bear the cost because they will be required to support their parents at the same time that they must save more to support their own retirement.

A recent analysis of Taiwan concluded that the unfunded liabilities required to maintain a family support system would reach five times national output by mid-century as compared with twice national output today. The rise in unfunded liabilities would greatly impede pension reform.

Public support systems

In the industrial economies of the West and the developing economies of Latin America, governments have been actively involved in insuring economic support for the elderly. In most Asian countries, however, the public sector has played a relatively small part in the provision of old-age security. Asia has relied much more heavily on the traditional system of family support.

The trend, however, is toward more formal systems of social protection in response to or in anticipation of eroding family support systems. As the demographic transition proceeds and the family-level support ratio declines, providing old-age security will become an increasingly burdensome family responsibility. Other social and economic forces are reinforcing the demographic effects. Continued economic growth and Westernization are bringing about a shift in attitudes toward more individualistic lifestyles and consumption patterns. The development of capital markets is offering new investment opportunities allowing the elderly to rely on accumulated wealth rather than on their families for old age security. As noted in the previous section, the family support system has resisted these forces, but clear changes are underway in some countries. One of the major challenges facing the region is to respond to the changes in the family support system without accelerating its demise.

Government involvement in the provision of old-age support is justified primarily on two grounds. First, government programs address the growing life-cycle problem. Adults are typically living many years after they are no longer economically productive. As the importance of family support declines, the elderly may increasingly rely on personal savings to finance consumption during their retirement years. However, many may not be sufficiently far-sighted to save adequately. Or, financial institutions may be inadequate to provide attractive and secure long-term investment opportunities. Second, governments may intervene out of concern over poverty and income inequality. In most Asian countries, income inequality is relatively low as compared to countries at similar development stages. However, as Asian countries have achieved higher average standards of living, many are re-examining their policies towards poverty and inequality. The recent financial crisis has fueled these concerns, although a clear assessment of the impact of the crisis on older populations is not yet available.

The actual policies that countries pursue will be influenced by both of these considerations. Indeed, they are complementary in the sense that policies that help working age adults prepare for retirement may help to alleviate future inequality. The evolution of policies towards the elderly may also be heavily influenced by political considerations, especially as the voting power and influence of the elderly population increases over the coming decades.

What policy choices are desirable for old age support systems in Asia? To address this question, we begin with a brief description of public support systems found around the world and a comparison of Asia's programs to those found elsewhere. Then we address four important policy issues: (1) the extent to which governments should rely on mandatory programs; (2) alternative approaches to finance; (3) strategies for risk-sharing; and (4) private versus public management of programs.

Current situation

During the last sixty years national governments throughout the world have come to play an increasingly important role in providing for the social security of their citizens. Between 1940 and 1999, the number of countries offering social security programs increased from 57 to 172. Old age, disability, and survivor benefit programs (OASDI) and work injury programs are the most common. Among those countries with any type of social security program, the number providing OASDI has increased from 33 (58%) to 167 (98%). Currently, only 5 out of the 172 countries with any type of social security programs do not offer old age benefit schemes. Asian governments have also adopted a wide range of social security programs. Only Bangladesh and Myanmar do not offer OASDI in any form (U.S. Social Security Administration, 1999).

OASDI programs vary considerably with respect to the methods of finance, determination of benefits, and eligibility requirements. Most countries rely on contributory programs, i.e., programs that are partially or fully financed by payroll taxes. A number of countries in Europe and Asia rely on non-contributory schemes financed out of general revenues. Most of these programs provide means-tested benefits; a few provide universal flat-rate benefits. In many more countries retirement benefits are tied to the earnings history of each worker. In seven countries, national governments are not directly involved in providing benefits to the elderly, but mandate that private companies provide programs for their employees. Thirty countries, including Indonesia, India, Nepal, Malaysia, Singapore, and Sri Lanka in Asia, have mandatory saving programs, two-thirds of which are administered by the public sector.

Table 33. Types of schemes providing cash benefits to the aged, disabled and/or survivors, 1999

Although most countries in the world offer OASDI programs, in many countries coverage is limited to a small percentage of the work force. A few Asian countries, Malaysia, Singapore, and Japan, have programs with close to universal coverage. Most Asian countries do not. The percentage of workers covered by old-age benefits in 1992 was only one percent in India, seven percent in Indonesia, and 26 percent in Korea (Table 34). Many countries restrict coverage to those who are employed in the formal sector, who hold a regular job position, or who work for firms with a minimum number of employees or earnings. The Employees Provident Fund in India, for example, applies a combination of provisions to restrict membership: employment must fall within the scope of one of 177 prescribed occupations; the establishment must have at least 20 workers; and, the establishment must have been operating for at least three years.

Table 34. Coverage of schemes providing cash benefits to the aged, disabled and/or survivals

The relatively modest scope of programs in most Asian countries is also reflected in financial measures of their size. The proportions of public expenditure on pension programs and other social security programs are very low in most Asian countries as compared with European and Latin American countries (Panel A, Table 35). In 1993, the percentage of public expenditure on social security programs was two percent in the Philippines and eight percent in Korea. In contrast, the percentages in other regions were far higher: 22 percent in the US, 31 percent in Chile, and over 40 percent in most European countries. Likewise, the percentages of tax revenues contributed through participation in social security programs were generally lower in Asia than elsewhere (Panel B, Table 35). In 1996, the figures were 1.4 percent in Thailand and about 9 percent in Korea, as compared with 33 percent in the US and about 40 percent in Sweden and the Netherlands. Social security programs are becoming increasingly important in Asia, however. Social security's proportion of tax revenue increased from 0.1 to 1.1 in Malaysia and from 0.7 to 8.8 in Korea between 1972 and 1996.

Table 35. Percentages of social security expenditure and tax revenue, selected years

The wide variation in the size of public pension programs is documented further by the percentages of old age benefit expenditure in GDP (Table 36). With the exception of Japan, most Asian countries are spending less than two percent of GDP on pension benefits. In 1993, the percentages were only 0.22 percent in India, 0.14 percent in Korea, and zero percent in Bangladesh, Thailand and Indonesia. Japan, Singapore and China were spending more than one percent of their GDP on old-age benefits. The percentages in North America and Europe were far higher: 6.3 percent in the US and 17.7 percent in Sweden, for example.

Table 36. Percentages of old-age benefit and other social security expenditure in GDP, circa 1993

The differences in spending on public pensions reflect coverage and average benefit levels, but also differences in the number of elderly and the maturity of pension programs. Pension programs consume a larger share of public resources in the developed countries because a much larger proportion of their populations have reached retirement ages. Moreover, those programs were established many decades ago so that a high percentage of current retirees meet eligibility requirements. As populations age and as programs mature in Asian countries, the share of public resources devoted to pensions will rise. Whether or not they will rise to the levels common in industrialized countries in the West will depend on the direction of public policy over the coming decades.

Reform of public support systems has received a great deal of attention in recent years especially in Latin America and the West. As the retired population has increased and public support systems have matured, the high costs of commitments made to the support of the elderly are becoming increasingly apparent. In some respects Asia is fortunate because aging is not as advanced as in the West, except in Japan, and because Asian public support programs are not as ambitious as those found in the West and many Latin American countries. Asia is at a critical juncture, however, because its populations are beginning to age and at a much more rapid pace than in the West. Further complicating matters is that some of the necessary pre-conditions for establishing sound public support systems, e.g., political stability and strong financial institutions, may not be met in some Asian countries. In the face of these circumstances, a strategy for establishing effective and sustainable public support system for the elderly is an urgent priority.

Should governments require universal participation in comprehensive programs?

Why should old-age security programs be mandatory? In general, redistributive goals cannot be achieved through voluntary programs. Hence, to the extent that old-age support programs are designed to reduce income inequality, mandatory participation is required. Moreover, compulsory programs are adopted because individuals may be unable to adequately provide for their retirement years, because of myopia, ignorance, or other reasons, when left to their own devices.

Although justified in some circumstances, mandatory programs also have their drawbacks. Mandatory programs may decrease welfare by requiring actions that individuals do not prefer. For example, compulsory saving programs may require individuals to accumulate more wealth, and consume less during their working years, than they would prefer. Mandatory programs may create inefficiency and slow economic growth by inducing behavioral changes. Public support programs, for example, may reduce saving rates and lead to early retirement.

It is not always the case that transfer programs that target the elderly will reduce income inequality. The elderly, as a group, may have lower standards of living and higher rates of poverty than younger generations, but the extent to which this is true varies from country to country and over time. The economic status of the elderly depends on a variety of factors: (1) labor force and retirement policies and the labor force behavior of older workers; (2) the extent to which the elderly have accumulated wealth and, hence, the policies and systems that govern the financial sector; (3) the strength of the family support system; and, (4) unforeseen events that affect older individuals and the elderly as a group. For example, Asia's recent financial crisis has almost certainly adversely affected the prospects for many elderly and older workers nearing retirement.

Even if the elderly are economically disadvantaged, old-age security programs may be a relatively inefficient method of redistributing income. Many programs provide benefits to the elderly irrespective of their economic status. Moreover, high-income individuals may receive greater lifetime benefits because of their higher life expectancy. Mandatory programs may not achieve their intended goals because of non-compliance, rent-seeking by strong political groups, or behavioral changes such as reductions in the family support system (Valdés-Prieto). These problems are likely to be most severe when the program's goals are not shared by a nation's populace or when program participants are not confident in the ability of the government to achieve stated goals.

In light of these potential problems, governments should also explore alternative means of achieving the redistributive and life-cycle goals of old-age security programs. As discussed above, government policies or private employment practices may discriminate against older worker. Gender discrimination in various forms may adversely affect the economic circumstances of older women (who make up a disproportionately large share of the elderly). Poorly developed financial institutions may interfere with the ability of workers to provide for their own old-age security. Directly addressing these problems can reduce the scale of mandatory old-age security programs and, consequently, their adverse effects.

Many Asian governments have, to this point, implemented public support systems on a more limited scale, in part, because of assessments about their capacity to efficiently operate such programs and, in part, because of assessments about the need for these programs. In many countries, a high proportion of the labor force is employed in the urban informal sector or the agricultural sector. There is a high incidence of casual workers and many workers who are underemployed. The lower paid self-employed, casual workers, domestic workers, agricultural workers and informal sector workers are often subject to low and irregular incomes and face uncertainty of about their day-to-day circumstances. Many of these workers may be unwilling to pay higher taxes in return for a promise of payments in the distant future. Moreover, there may be severe technical difficulties in collecting revenues in sectors where labor-turnover is high and documentation is weak (Bailey, 1997a). As a consequence many pension systems throughout the region are restricted to public servants and those in the formal and larger private sectors.

Compliance problems have been serious in those cases where governments have attempted to expand old-age security programs too rapidly. Some developing countries have sought to extend coverage to some of the self-employed and even to employees such as domestic workers. The Philippines, for example, has accorded high priority to extending coverage to all private employees under age 60. Recent legislation requires that household help and self-employed workers be insured. In this instance, there is a probably a substantial gap between coverage under the law and coverage in practice (Bailey, 1997a). In practice, many schemes have experienced difficulty in ensuring compliance and registering employers as well as employees. Ambiguities in legislation have led to confusion about who should be covered. Problems relating to the declaration of earnings have led to underpayment and late payments, and, in many instances, no payment at all.

The speed with which programs are extended may also be influenced by different assessments of the need for old-age support programs. In this regard, Asia faces conflicting prospects. Many Asian countries are experiencing population aging at a much faster rate than has occurred elsewhere. Consequently, countries like Indonesia, Thailand, Korea, and China will have to establish programs relatively quickly. However, even in the long-term government programs may prove to be a less important component in the old-age security of the elderly because of the persistence of the family support system and the high rates of saving found in many countries.

Financing: funded or pay-as-you-go?

Old-age security programs are funded in one of two ways. Under a “pay-as-you-go” (PAYGO) system, current retirees are supported by transfers from current workers who will, in turn, be supported in old age by the next “generation” of workers. Current revenues cover current obligations, and there is no saving to pay future pensions. In a fully funded scheme, each generation finances its own retirement. Taxes paid by workers on their earning are accumulated, along with interest payments, in a retirement fund. The fund is then used to provide retirement benefits. Many programs are neither entirely funded nor entirely PAYGO. Some countries may accumulate trust funds that cover a portion of the future obligations. Historically, European countries and Latin American countries relied primarily on PAYGO systems, although recent reforms have promoted a shift to funded systems. Malaysia and Singapore have relied on funded systems, while South Korea, the Philippines and Egypt have programs that are partially funded and partially PAYGO (World Bank, 1994).

The distinction between PAYGO and funded financing applies equally well to private programs. Family-based transfer systems finance old age security by transferring income for family members who are of working age to family members who have retired. Thus, they are essentially PAYGO. When individuals accumulate wealth to provide for their own retirement, they are relying on a funded approach to financing old age security. It is not completely apparent which financing system is operating when multi-generation households are prevalent. Non-working elderly living in extended households may be receiving transfers from their children, or they may be receiving returns on financial wealth on investment they made in a household enterprise, or some combination of the two.

A key difference between PAYGO programs and funded programs is that funded programs do not transfer resources across generations. In contrast, the motivation for establishing an old-age security program is the view that elderly are in need of financial assistance. Immediately raising the economic status of the elderly as a group can be accomplished only be transferring resources from those in the working ages. A PAYGO program may accomplish this, but a funded program will not. The impact of establishing a PAYGO system on the intergenerational distribution of income is uncertain because to some extent an increase in public transfers will reduce private transfers. The extent to which this occurs is not well-established (World Bank, 1994).

In a mature old-age security program, a well-run funded system can support higher benefit levels than a PAYGO system because a funded system can achieve higher rates of return. PAYGO financing can sustain an annual rate of return equal to the rate of economic growth (the rate of population growth plus the rate of productivity growth). The rate of return available from funded systems depends on the yield from the assets in which the retirement funds are invested. On average, the sustainable returns are higher than those available from a PAYGO system depending on the risk associated with the investment strategy employed. A critical element of a successful funded system, however, is the management of the investment fund. Whether management is left in public or private hands, the potential for large-scale failures is a serious concern.

A potentially important advantage of funded systems is that they promote economic growth by raising rates of national saving. Pension funds, public and private, are an increasingly important source of capital. Countries with large mandatory funded systems, such as Singapore, have very high rates of public saving and national saving (Toh 1998, Baillu and Reisen 1997).

PAYGO systems may lead to lower rates of private saving by undermining the pension motive, although the empirical evidence on this issue is mixed (World Bank 1994).

Risk pooling and old-age support systems

Any support system for the elderly involves numerous risks. Workers may experience disability destroying their ability to provide for their old age security. Older adults are exposed to the risk of unusual longevity with the possibility that they will outlive the financial resources available for their support. Because of investment risk, some savers experience very high rates of return and others very low rates of return. Some savers may lose all of their savings. Workers who rely on public programs are subject to political and insolvency risk. The taxing ability of the government can decline or the political regime may change, with the new government repudiating the arrangements made by a previous government. Workers who depend on occupational retirement plans are subject to similar risks. In many countries, the pension plans of employers may not be funded and workers bear the risk of losing their pensions because of employer insolvency.

A variety of systems exist for pooling risks and reducing the exposure of retirees to the uncertainties. In the absence of other insurance arrangements, one of the chief disadvantages of family support systems is the limited ability of the family to pool risks. The family bears all of the costs when one of its members lives to an unusually old age, or when disability strikes, or when the family farm fails. One of the chief advantages of public systems is that some or all of these risks are pooled across all participants in the system. Most public defined benefit programs insure against longevity risk by providing a monthly benefit that lasts as long as the beneficiary survives. Of course, the lifetime benefit received by individuals who die at a young age are correspondingly reduced. Some defined benefit and many defined contribution programs provide a lump-sum benefit at the time of retirement providing no insurance against longevity risk. In some countries, low cost annuities are available that allow participants in these programs to protect themselves against longevity risk. Most public, defined benefit programs also include a disability insurance component. Many defined contribution programs do not include a disability feature and, hence, alternative arrangements are necessary to insure against such risks.

The inherent difference between defined benefit and defined contribution programs is their treatment of investment risk. Defined contribution programs expose participants to investment risk and the benefits received by any cohort of retirees will be influenced, for example, by volatility in financial markets. Defined benefit programs spread the risks of volatile financial markets among all workers. In either approach, workers still bear the risks of uncertainties about their wage increases.

In many countries, the primary risk faced by a public programs is political and insolvency risk. PAYGO plans depend on the continued commitment of the state to honor obligations made by previous regimes. Given the political instability that exists in many countries in Asia and elsewhere in the developing world, these obligations may or may not be met. Funded systems are not immune from political risk. Pension funds can be diverted to other purposes by governments. However, funded systems may provide more protection from political risk by clearly establishing the property rights of program participants. Some funded systems provide further protection by relying on multiple, private firms (Valdés-Prieto forthcoming, World Bank 1994).

Governance: centrally or privately managed?

In addition to questions of coverage and financing, governance problems are requiring reform in Asia. Issues range from institutional arrangement to management and operation. There are wide variety of institutional arrangements for the governance of social security in Asia, which lies in the spectrum between reliance on private insurance and direct administration by central government (Bailey, 1997b). In many Asian countries, the government is directly responsible for the administration of the social security scheme. The Social Security Organization in Thailand, which is administered by divisions of the Ministry of Labor, is an example of such direct administration by central government. The Employees Provident Fund in India is semi-autonomous with a Central Board of Trustees, but it is, in practice, subject to considerable control by the central government. In the Philippines, there are several autonomous social security institutions governed by their own supervisory board.

Should pension reserves be publicly or privately managed? Private management may be preferable because the profit motive and competition will lead to higher (risk-adjusted) returns and a broader range of choices. Public fund managers may be driven more by the interests of the political party in power than by the interest of beneficiaries. Publicly managed funds are usually invested in government securities or state enterprises often at below market interest rates (World Bank, 1994). As governments obtain privileged access to large pension reserves, they may pursue large-scale public infrastructure projects in ways that are not subject to the scrutiny of open capital market. The danger is that choices are made without an explicit productivity comparison, without a market test based on interest rates and risk (World Bank, 1994).

Private administration may also bring important risks. Autonomous programs have been established to insulate them from political interference, but autonomy may lead to lower program participation, especially low-income workers, if autonomous organizations are viewed as having less authority (Turner, 1997). Some countries with underdeveloped financial systems have been reluctant to allow private management of investment funds because of fears of fraud and incompetence. Effective regulation by the government may be difficult in many developing countries. The recent experience of Chilean reform suggests that reliance on private institutions does require a significant amount of administrative capabilities from the state, expressed in an ability to regulate financial intermediaries effectively (Valdés-Prieto, forthcoming).

Conclusion

Developing and implementing an effective strategy for dealing with old-age security issues is a difficult task. Countries must confront many complex technical issues. Decisions must be based on little more than educated guesses about very long-term changes in both demographic and economic characteristics. Capacities for implementing programs vary widely. Political considerations may in many instances establish additional road-blocks. Despite these difficulties, the rapid speed of aging in Asia requires a sound and comprehensive response.

Governments can take important, immediate steps that will benefit both broad development concerns and the elderly. Policies that increase labor market flexibility and remove barriers faced by older workers should be a priority. Developing a sound financial infrastructure will encourage higher rates of personal saving and allow for the emergence of the financial institutions needed for successful pension reform. The elimination of gender discrimination will allow women, the largest group of elderly, to better prepare for their later years in life.

Substituting saving for transfers is a central feature of many of the current reform efforts. A system that emphasizes individual saving has many advantages. The sustainable rates of return are higher than under PAYGO programs. Saving programs are less likely to encourage evasion or to encourage early retirement and they are less likely to be subverted by political pressure. Moreover, saving is pro-growth. The World Bank summarizes the view as follows: "…many analysts would argue that saving would be growth-enhancing for most countries and for the world as a whole today. For these reasons, many capital-scarce countries are becoming increasingly interested in funded old age security arrangement" (World Bank, 1994).

A funded scheme has an important disadvantage: it is a weak tool for alleviating poverty among poor elderly. Thus, in developing an appropriate strategy, it is critical to assess the relative position of the old and other groups in the income distribution. Unless the elderly are disproportionately poor, a scheme that emphasizes redistribution may be avoidable. Moreover, to the extent that poverty among the elderly is a problem, an alternative is to address it through a comprehensive poverty alleviation program rather than an old-age security program.

A strategy many low-income countries have followed is to establish a PAYGO system. The advantages of the approach are several. The immediate needs of the elderly are addressed. Transfer programs are less complex to administer than funded programs. And given the very high support ratio typical of low-income countries, the fiscal burden is manageable. PAYGO programs, however, become increasingly unattractive, relative to funded programs, as countries develop better financial institutions and administrative capacity and their populations age. Reform, however, is a difficult and costly process particularly if the existing PAYGO system provides substantial benefits and if population aging has advanced relatively far. In Latin America several governments have reformed their programs and others have explored the possibility. In too many cases, however, the potential costs of the transition between the two systems have not been carefully assessed, thereby risking failure in the reform process (Rofman, forthcoming).

Asia has an advantage over Latin America because large-scale PAYGO programs have been avoided. On the other hand, many Asian countries have barely begun to develop programs that will address the economic security of the elderly. Unfortunately, many Asian countries lack the legal structure, financial markets and administrative capacity, needed if comprehensive and effective programs are to be established. The family support system has served the needs of the elderly with considerable success. The traditional approach, however, will become an increasingly poor substitute for modern systems. Given the pace of aging in Asia, the region has a relatively short window of opportunity for implementing the programs and policies needed to protect the economic security of its older members.

Conclusions

Asia has entered a new demographic era. The number of children, those aged 0-14, reached a peak in the year 2000 after decades of rapid and sustained growth. As we move into the next century, the number of children may stabilize at the current level of around 300 – 350 million. Or, if fertility rates drop to low levels, Asia could experience a period of sustained decline in the number of children.

During the next few decades, the adult population will continue to grow, older populations especially rapidly. Between 2000 and 2050, the 60-74 year old group is expected to increase at annual rate of 2.9% and the 75+ population at 3.4%. By 2050, 17% of Asia's population will be 65 and older while the percentage under 15 will shrink to 19%. This is a remarkable change from the 1970s when the percentage under age 15 reached 40% of the total and the percentage 65 and older was only 4%.

Aging is a world-wide phenomenon, but the pace of aging is especially rapid in many Asian countries which experienced rapid gains in life expectancy and precipitous declines in fertility. Japan, China, and several other East and Southeast Asian countries are expected to experience an especially rapid transition to an aged society. As a consequence, these countries will have less time to adjust to the social, economic, and political changes that accompany aging.

Some Asian countries are also experiencing population aging at much lower development levels than in the West. Indonesia's old-age dependency ratio projected for 2050, for example, is a little higher than the ratio projected for the US in 2020. Even if Indonesia could achieve annual growth in per capita income of 4% per annum, a remote possibility, its per capita income in 2050 would reach only two-thirds of the current US level. Thus, Indonesia and other Asian countries may not be prepared for the challenges that population aging brings.

Forecasting demographic change for individual countries or for the region as a whole is, of course, a precarious exercise. Uncertainties abound. In some countries, even the current values of fertility, mortality, and population age-structure are a matter of dispute. Trends in fertility rates are difficult to predict. Will Pakistan experience rapid fertility decline? Will childbearing in Japan recovery from the low levels that persist there? Will fertility rise in China as it relaxes its one-child policy? How will fertility and other demographic variables be influenced by economic crisis in Southeast Asia?

Trends in mortality have been smoother and more predictable than trends in fertility. After the end of World War II, the countries of Asia experienced rapid declines in infant and child mortality and steady increases in life expectancy. As mortality rates have reached low levels, the rate of increase has slowed but progress has continued to be steady. The recent mortality experience of countries in Africa and Eastern Europe cannot help but raise doubts about future mortality trends in Asia. HIV/AIDS presents the most immediate challenge in Indochina and India. Thailand has made substantial progress in controlling the spread of the epidemic, but the same cannot be said for India, Burma, or Cambodia. The re-emergence of malaria and tuberculosis and the emergence of new infectious diseases may disrupt the steady progress that Asia has to this point enjoyed.

The implications of uncertainty for population age-structure in this study are explored using alternative fertility scenarios prepared by the United Nations Population Division and alternative mortality scenarios constructed by the authors. Taken together these scenarios reinforce general observations about population aging in Asia and the individual countries examined here. With some confidence we can anticipate rapid growth in elderly populations and higher old-age dependency ratios. Catastrophic events may lead to a different outcome, but the more likely scenarios explored here all point to substantial population aging. The differences across scenarios are relatively modest in 2025, but much more substantial in 2050. Hence, long-range planning of the type needed in the design of old-age security programs, for example, must build in sufficient flexibility to accommodate uncertainty about future demographic trends.

Immigration patterns may also change in ways that influence population aging or mediate its impact. Historically, political crisis and war have precipitated mass migrations in Asia, and the future may hold more of the same. The region has not yet achieved a political stability that would rule out similar events. The possibilities are many: conflict between North and South Korea, Taiwan and mainland China, or India and Pakistan; internal strife in the Philippines, Indonesia, and Burma to name a few. The impact on population aging of large-scale refugee movements is uncertain, because the migration often involves entire communities rather than particular segments. This contrasts with economically motivated immigration typically dominated by young adults.

Most Asian countries have very restrictive immigration policies. Even in the face of severe labor shortages, Japan, for example, has admitted only a limited number of foreign workers on a temporary basis. Policies and attitudes towards immigration may change as populations age and labor force growth slows and, in some instances, turns negative. If so, then migration flows from younger (India, Pakistan, Bangladesh) to older (Japan, Korea, China) populations may attenuate the pace of aging in countries further along in their demographic transitions and speed the aging process in countries earlier in the transition.

As population aging proceeds in Asia, the region must deal with three broad sets of economic changes addressed in this report: changes in the size and basic character of the health sector; the need to develop a much larger and comprehensive approach to old-age security; and, changes in macroeconomic conditions.

A thoroughly pessimistic view of the future of health care in Asia is that large cohorts of elderly will make ever-increasing demands on health systems, driving up costs, consuming larger shares of national income, burdening future generations of tax-payers, yielding little more than a few extra months or years of low-quality life. The available evidence does not support such a pessimistic view.

Health care expenditures as a percentage of national income are higher in OECD countries than in developing countries and they are rising over time. In part, the rise in health care expenditures is a reflection of the high priority attached to health by individuals and societies. More is being spent on health because it is so valued. The impact of aging on health care expenditure has not been firmly established. Longer-living populations are also healthier populations less in need of health care services. At the same time, longer-living populations are more heavily concentrated at older ages where health care needs are greater. In particular, the proportion of the population concentrated in the last year or two of life rises, contributing to higher health care expenditures. In some countries, the system of health care finance is a major contributor to rising health care expenditure. Direct and indirect subsidization of health care is leading to inefficiency in the production of health care services, over-use of services by consumers, and behavior by individuals that is subject to higher health risks, e.g., smoking.

Population aging is leading to a shift in the ways in which health care resources are being used. Expenditures on reproductive health, public health measures, and the treatment of infectious diseases are becoming relatively less important. Expenditures on the treatment of acute and chronic conditions, such as, cardiovascular diseases and cancer are becoming more important. These shifts clearly influence the kinds of services the health care industry provides, but the changes also have important implications for health care policy. When the key health problems are the prevalence infectious diseases or an unsafe water supply, the existence of externalities insures that too few resources will be devoted to health care in the absence of active government involvement. But when acute and chronic conditions come to dominate the health care agenda, government involvement is more likely to result in excessive resources devoted to health care, in general, or to particular forms of health care. The key challenge for Asian countries over the coming decades will be to continually reform their health care systems in congruence with the changes in health care needs.

In Asia as in most societies, supporting children is primarily a family responsibility. Governments may provide or subsidize education and health care, but the principle costs of rearing children are borne by parents and other family members. Supporting the elderly also has been primarily a family responsibility, but the family support system is evolving and, in some respects, is in decline. In some countries, elderly are already relying less on their children for their material needs and more on a combination of wealth accumulated during their working years and public transfer programs financed by taxing workers. These changes are well underway in some Asian countries and on the horizon in others.

The family has been an effective provider of old-age support, and will continue to serve an important role in the future. Modern institutions are a poor substitute for the personal care and attention that families provide. But the family also has its limitations. The family is poorly equipped to deal with many of the risks associated with aging. Family “contracts” are largely unenforceable exposing the elderly to the danger that their children will default on their commitments. Family support systems may provide a low rate of return as compared with alternatives. These limitations are becoming increasingly apparent as social and economic development undermines traditional values and as elderly populations grow relative to the population expected to provide support.

There are two broad challenges in the old-age support area. One is to provide an enabling environment that will allow older adults to maintain as much economic independence as is possible. Three areas appear to be particularly important. First, governments can ban employment policies that encourage early retirement and reduce job opportunities and job mobility for older workers. Second, governments can establish a regulatory environment and, in other ways, encourage the development of the financial sector that will allow workers to save for their retirement. Third, governments can eliminate discriminatory practices, including those governing education, employment, property ownership, and inheritance, which undermine the economic independence of older women.

The second challenge is to design a public system of old-age support that promotes economic self-sufficiency, satisfies distributional objectives, and insures the elderly against risks, such as, longevity risk. Governments must be certain that they have the ability to operate programs they choose to implement and, where appropriate, should rely on public-private partnership insuring an efficient and equitable support system. Many Asian governments have an advantage. They have not adopted large-scale programs that are costly and difficult to reform. However, the development of comprehensive and sound programs has become an urgent matter.

The success with which countries meet challenges in the health and old-age security area will depend, in large part, on the economic performance of their economies. Pessimistic views about the impact of aging on economic growth abound and with some reason. In the coming decades, labor force growth will slow and, in some countries, turn negative. The workforce will become older and more experienced, but possibly less mobile and innovative. Rates of saving and investment may decline significantly from the high levels that currently fuel much of the region's economic growth.

Slower economic growth may well be inevitable, but little cause for concern if countries achieve standards of living comparable to the levels now found in Japan, Singapore, and Hong Kong. A growing body of evidence suggests that increases in life expectancy have made an important contribution to economic growth by encouraging investment in human capital and higher rates of saving. Thus, aging societies may be poorly endowed in labor quantity, but well-endowed in physical and human capital. This optimistic outcome will only be realized, however, if countries adopt policies that encourage saving, investment in education, the development of well-functioning financial institutions, a favorable investment environment, and integration into the global economy.


RUSSIA
GEORGIA
ARMENIA
TURKEY
AZERBAIJAN
CYPRUS
LEBANON
ISRAEL
JORDAN
SYRIA
IRAQ
KAZAKHSTAN
UZB.
TURKM.
MONGOLIA
NORTH KOREA
JAPAN
SOUTH KOREA
KYRGYZSTAN
TAJIKISTAN
KUWAIT
BAHRAIN
QATAR
IRAN
AFGHAN.
CHINA
AFRICA
SAUDI ARABIA
PAKISTAN
BHUTAN
Pacific Ocean
TAIWAN
U.A.E.
NEPAL
YEMEN
OMAN
INDIA
MACAU
LAOS
PHILIPPINES
BANGLADESH
Arabian Sea
THAI.
VIETNAM
MYANMAR (BURMA)
CAMBODIA
BRUNEI
SRI LANKA
MALAYSIA
MALDIVES
INDONESIA
0
1,000 mi
0
1,000 km
Indian Ocean
SINGAPORE
80° E
100° E
120° E

Figure 1. Asia's age transition

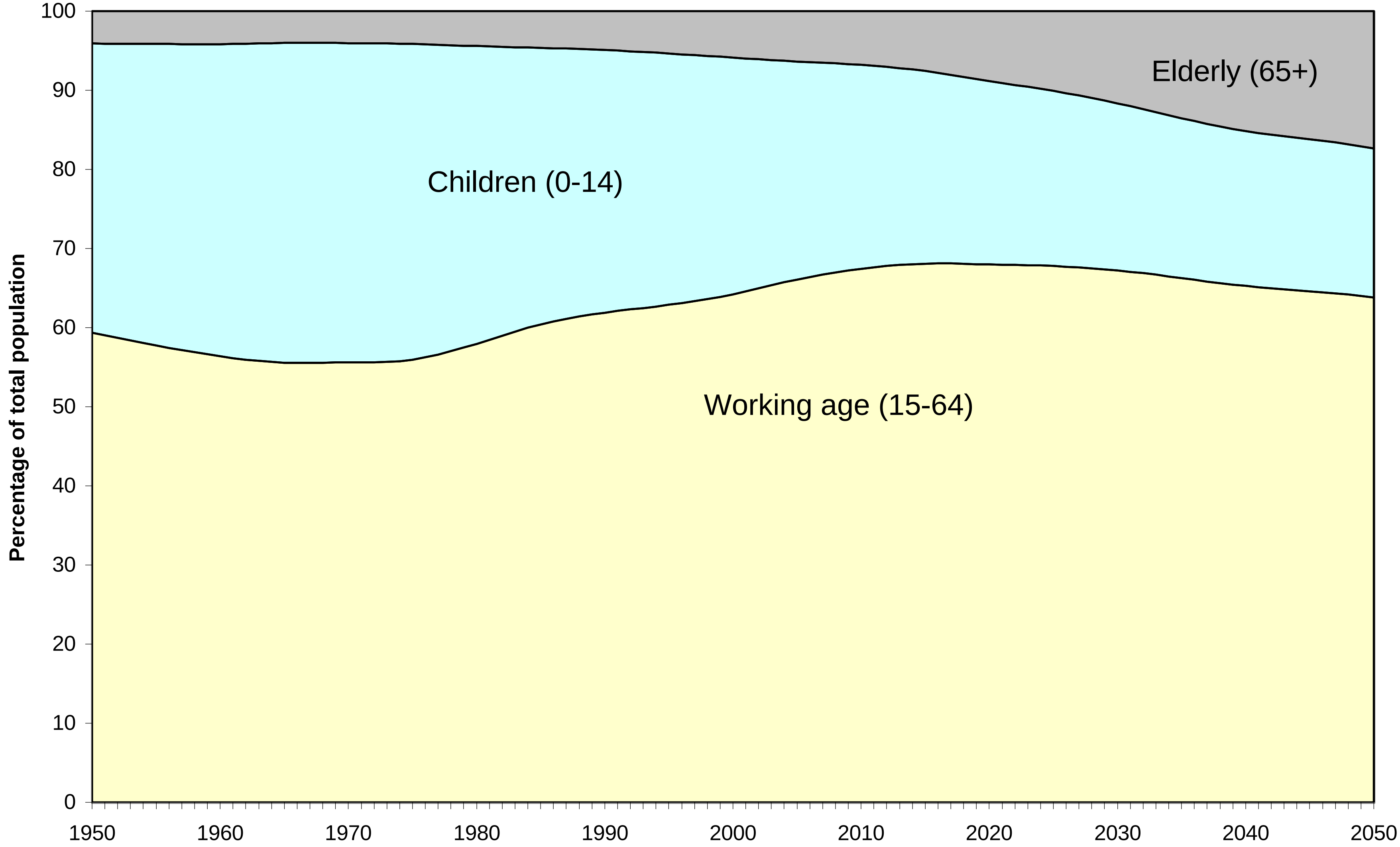
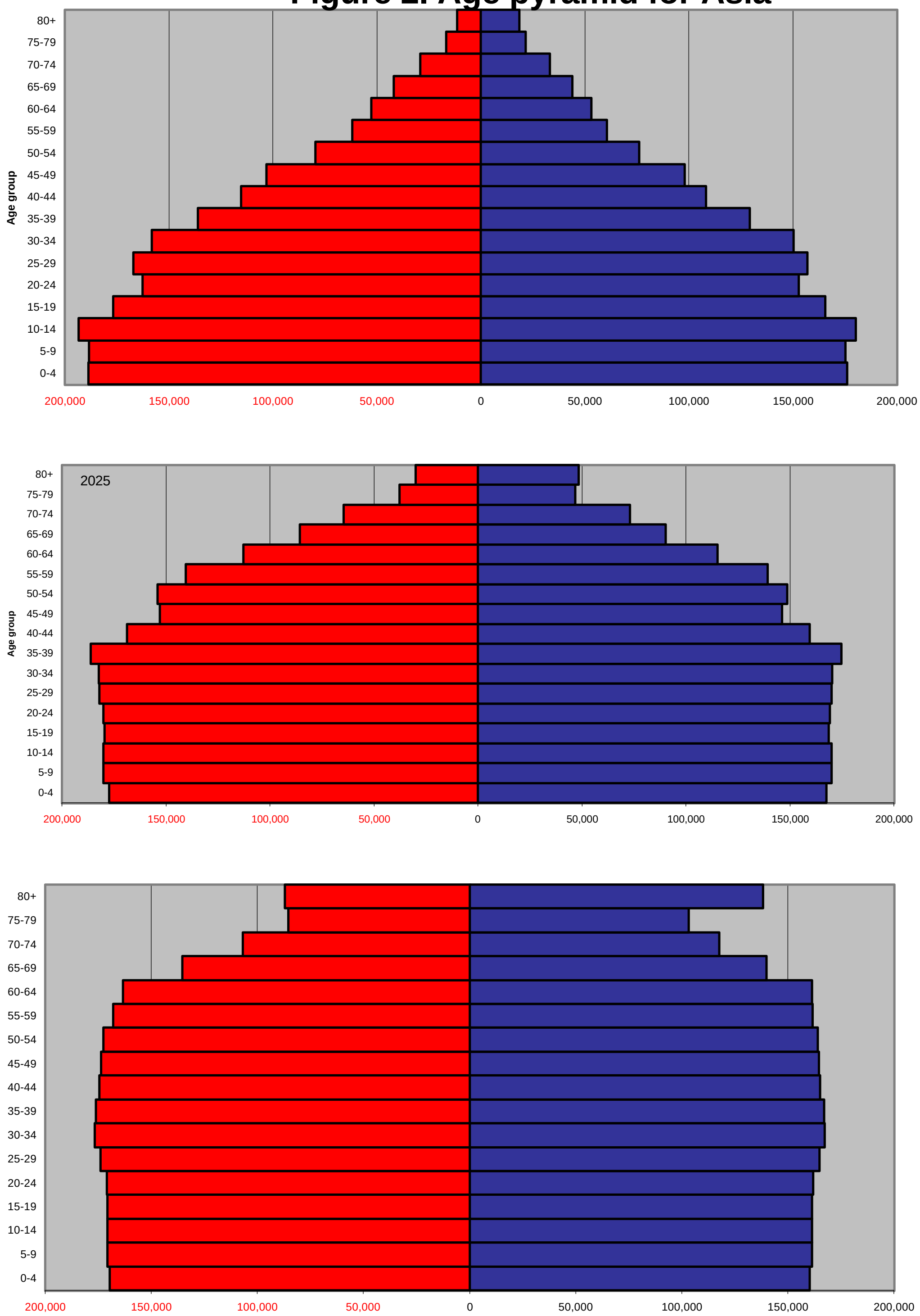


Figure 2. Age pyramid for Asia



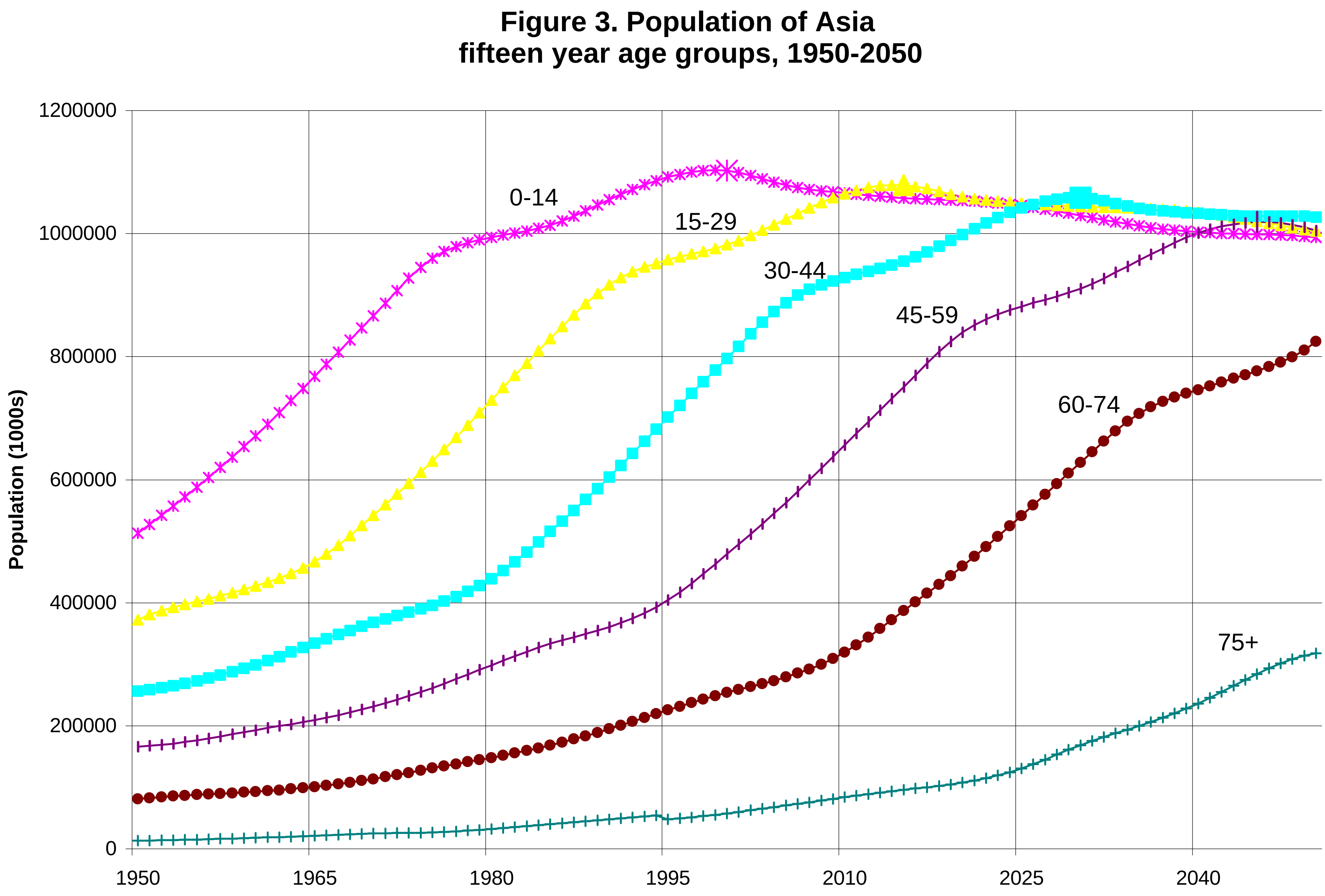


Figure 3. Population of Asia
fifteen year age groups, 1950-2050
Population (1000s)
1200000
1000000
800000
600000
400000
200000
0
1950
1965
1980
1995
2010
2025
2040
0-14
15-29
30-44
45-59
60-74
75+

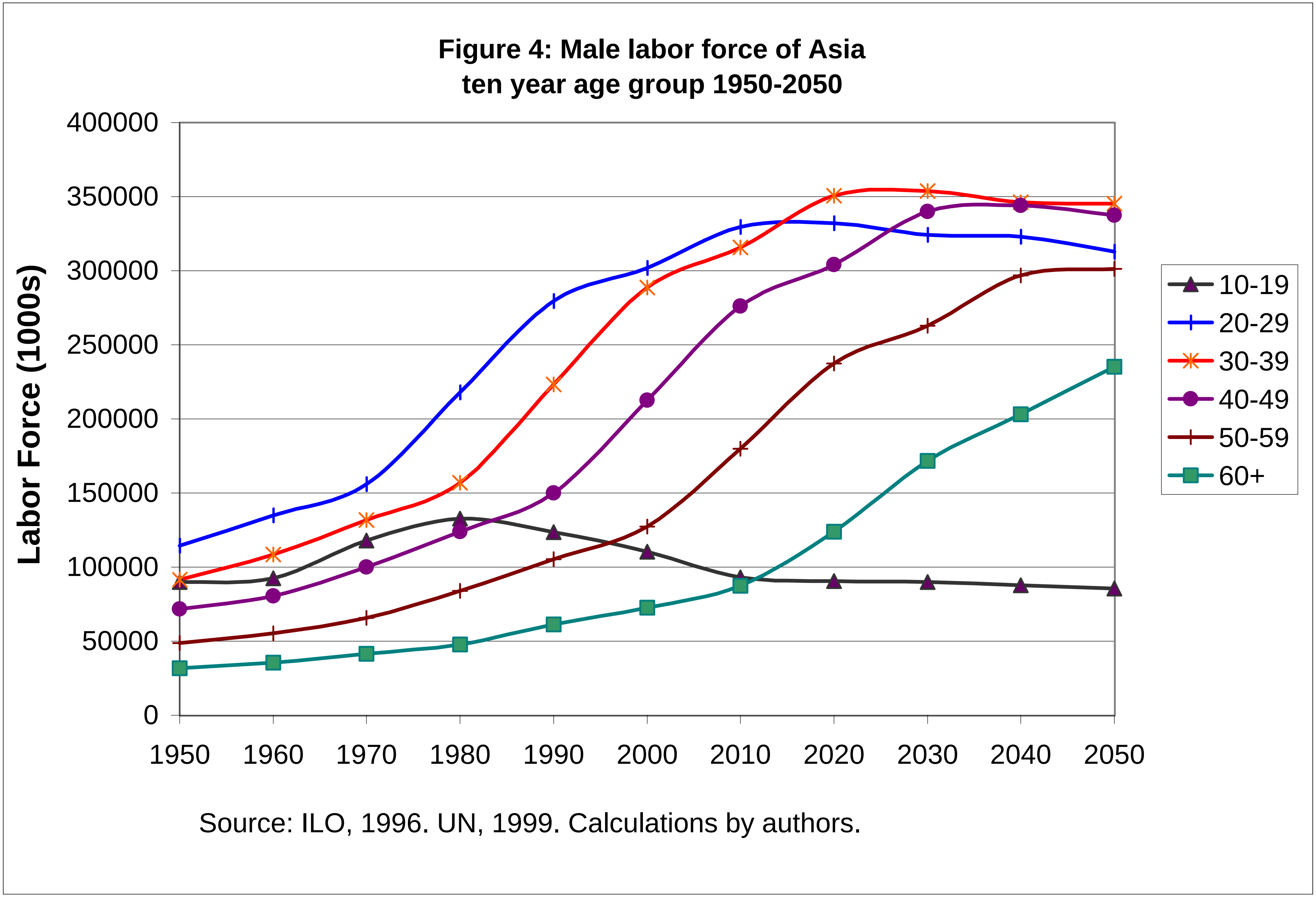


Figure 4: Male labor force of Asia
ten year age group 1950-2050
Labor Force (1000s)
400000
350000
300000
250000
200000
150000
100000
50000
0
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
10-19
20-29
30-39
40-49
50-59
60+
Source: ILO, 1996. UN, 1999. Calculations by authors.

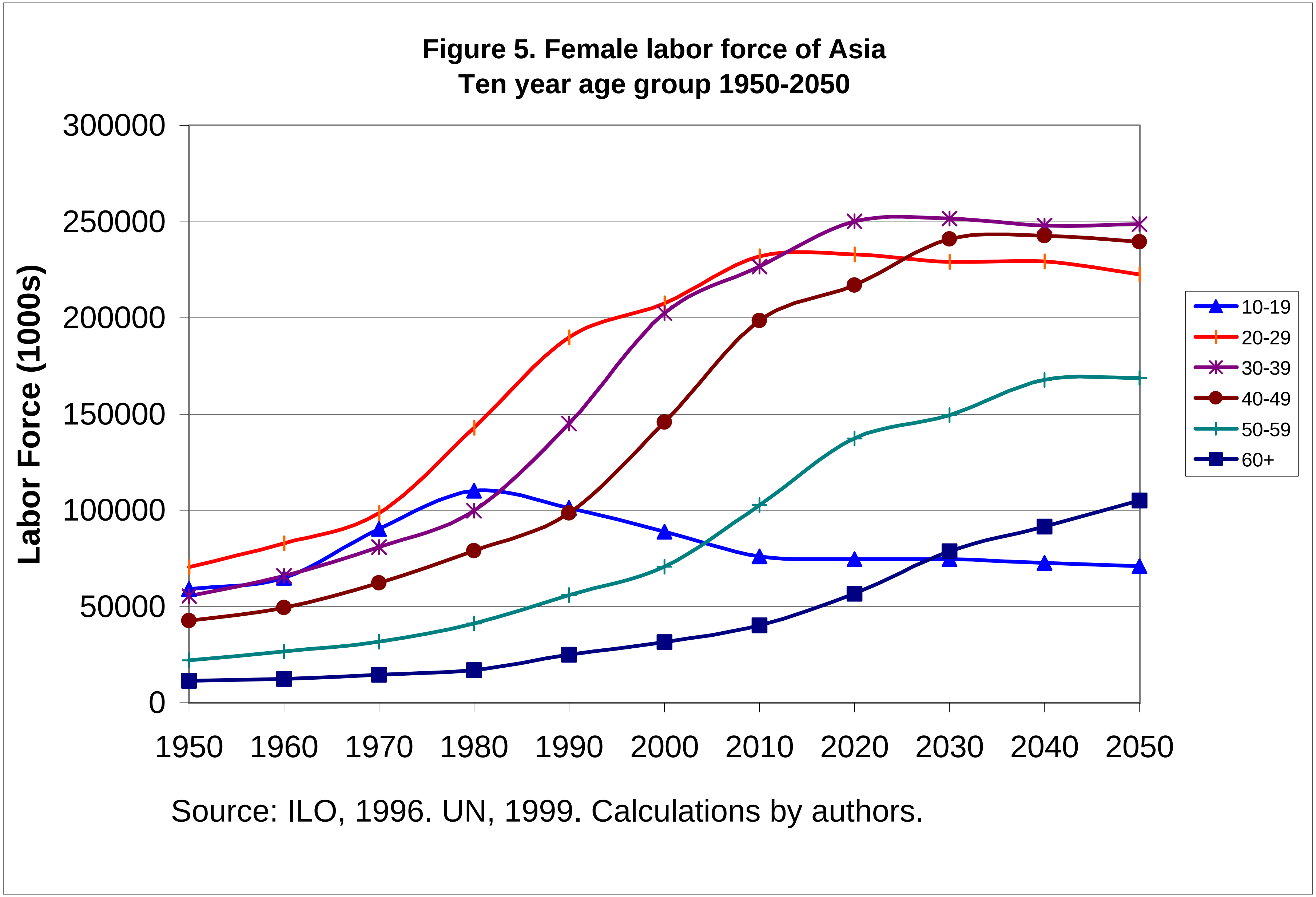
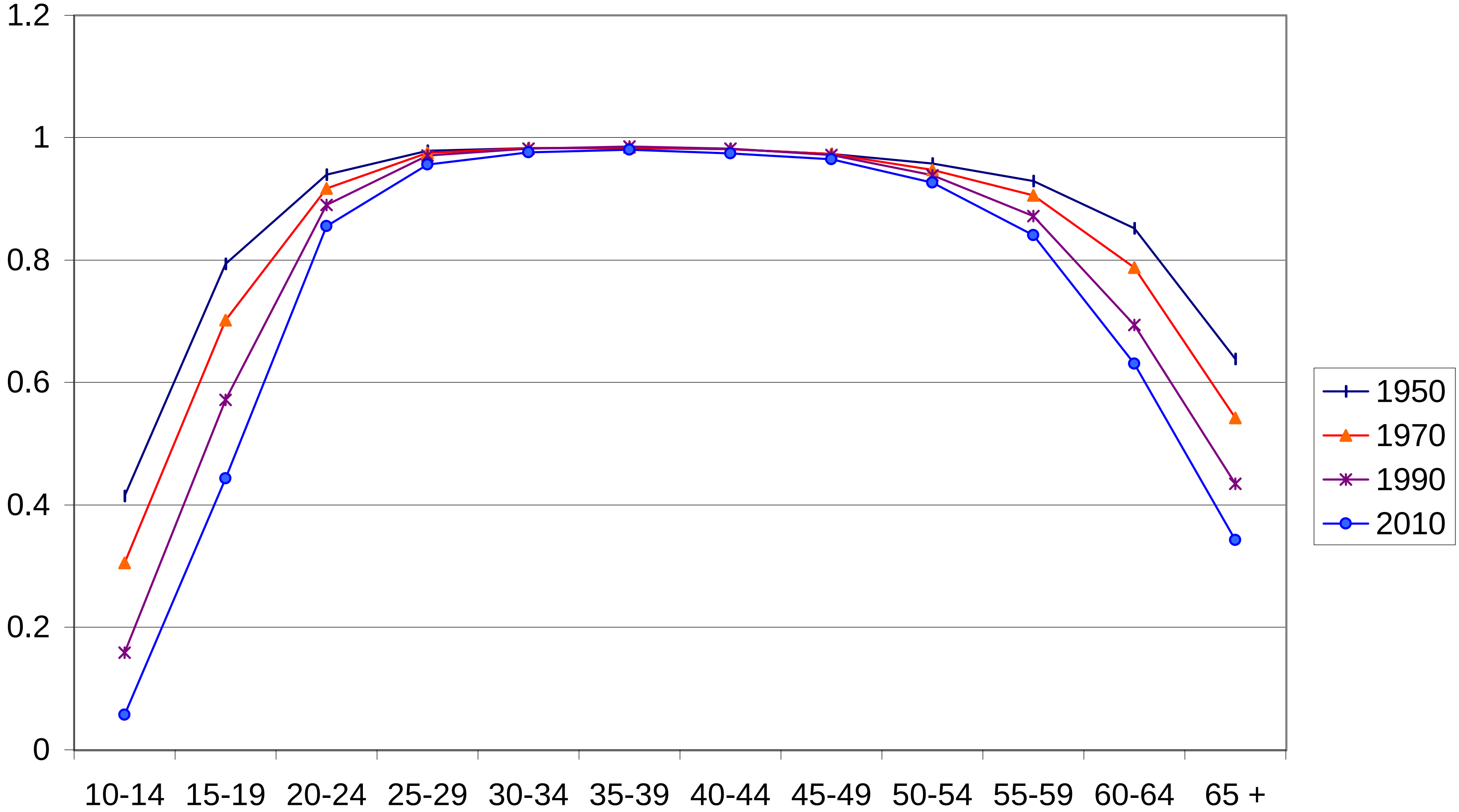


Figure 5. Female labor force of Asia
Ten year age group 1950-2050
Labor Force (1000s)
300000
250000
200000
150000
100000
50000
0
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
10-19
20-29
30-39
40-49
50-59
60+
Source: ILO, 1996. UN, 1999. Calculations by authors.

Figure 6. Male labor force participation rates of Asia by age group



Source: ILO, 1996.

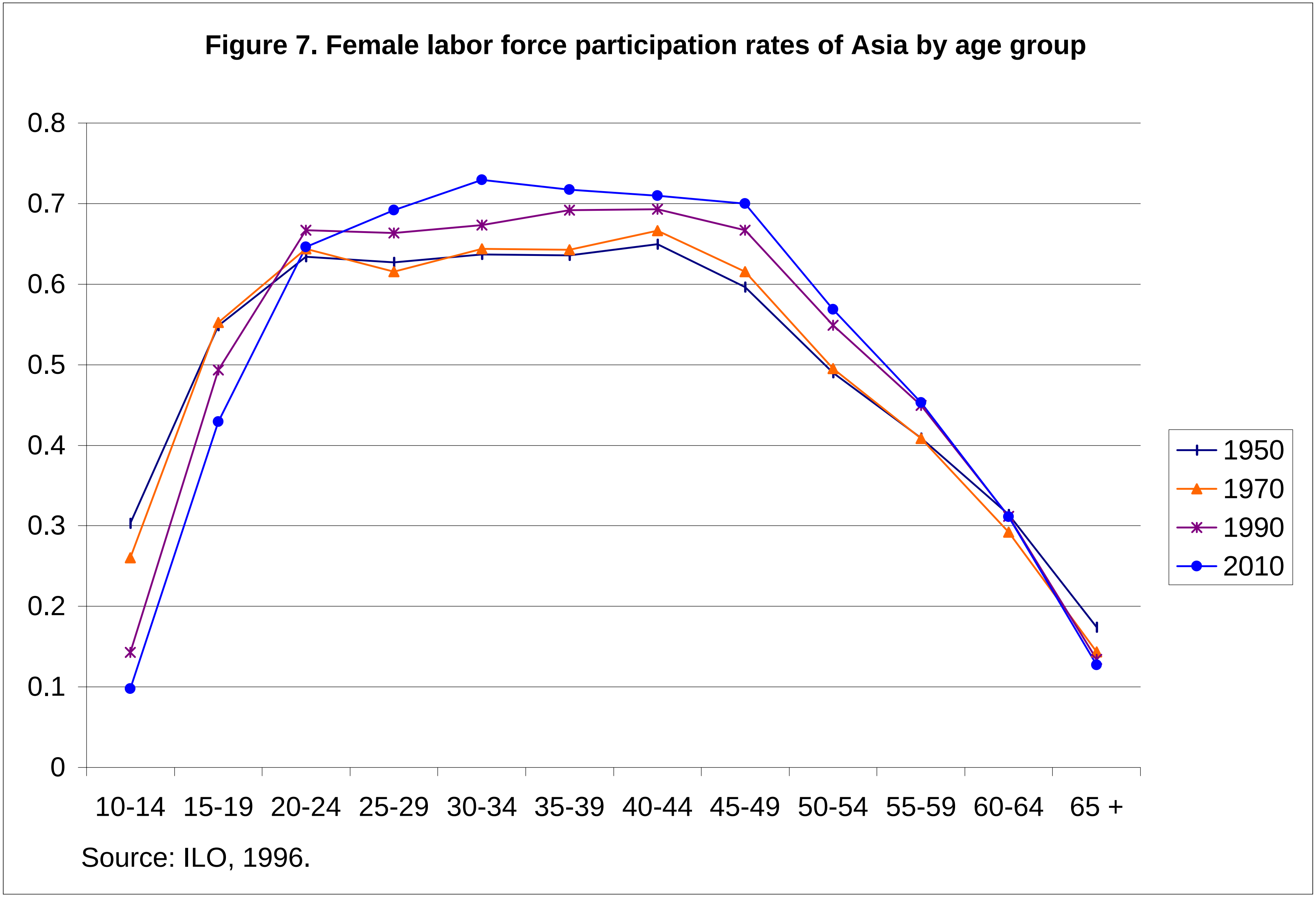
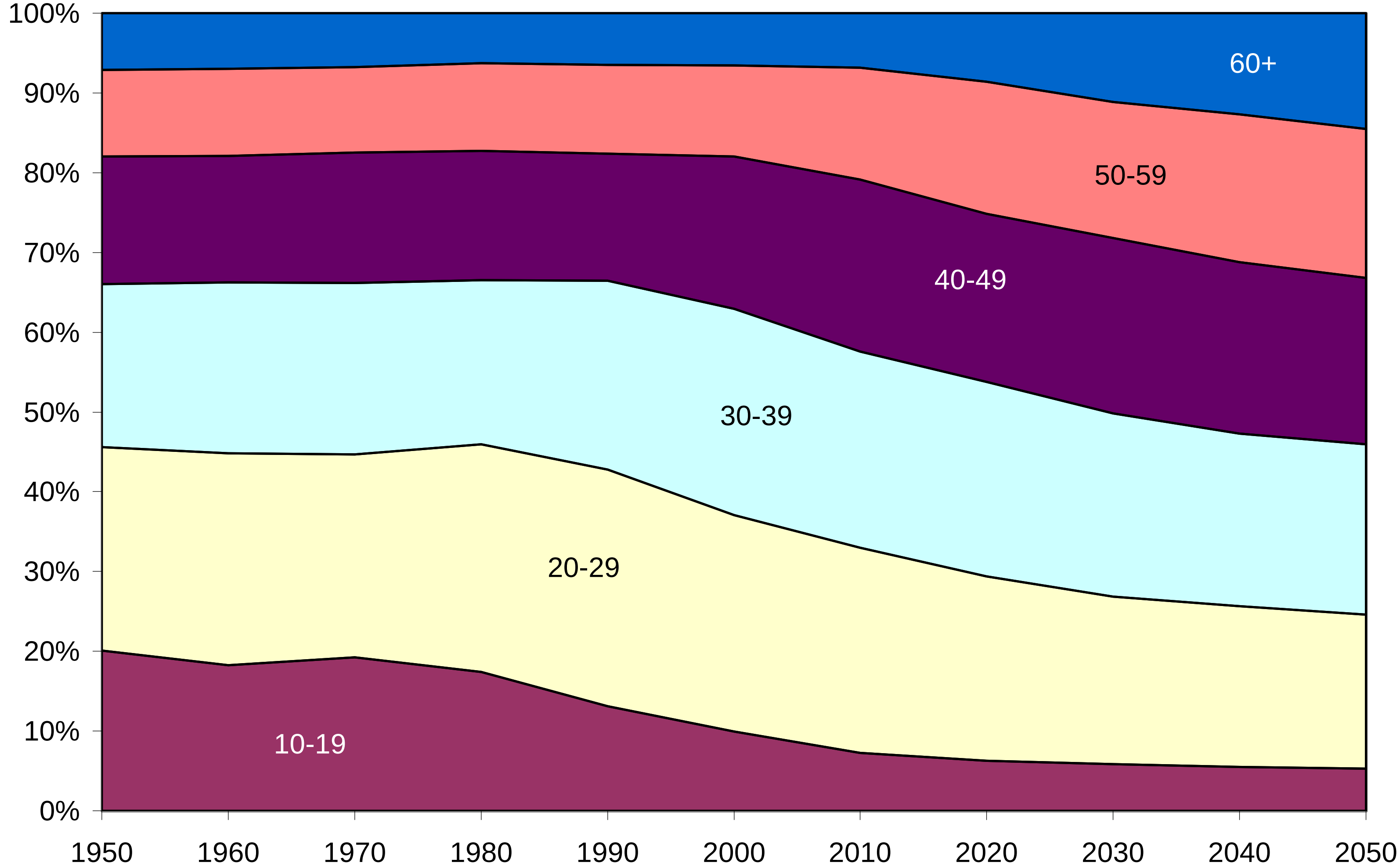


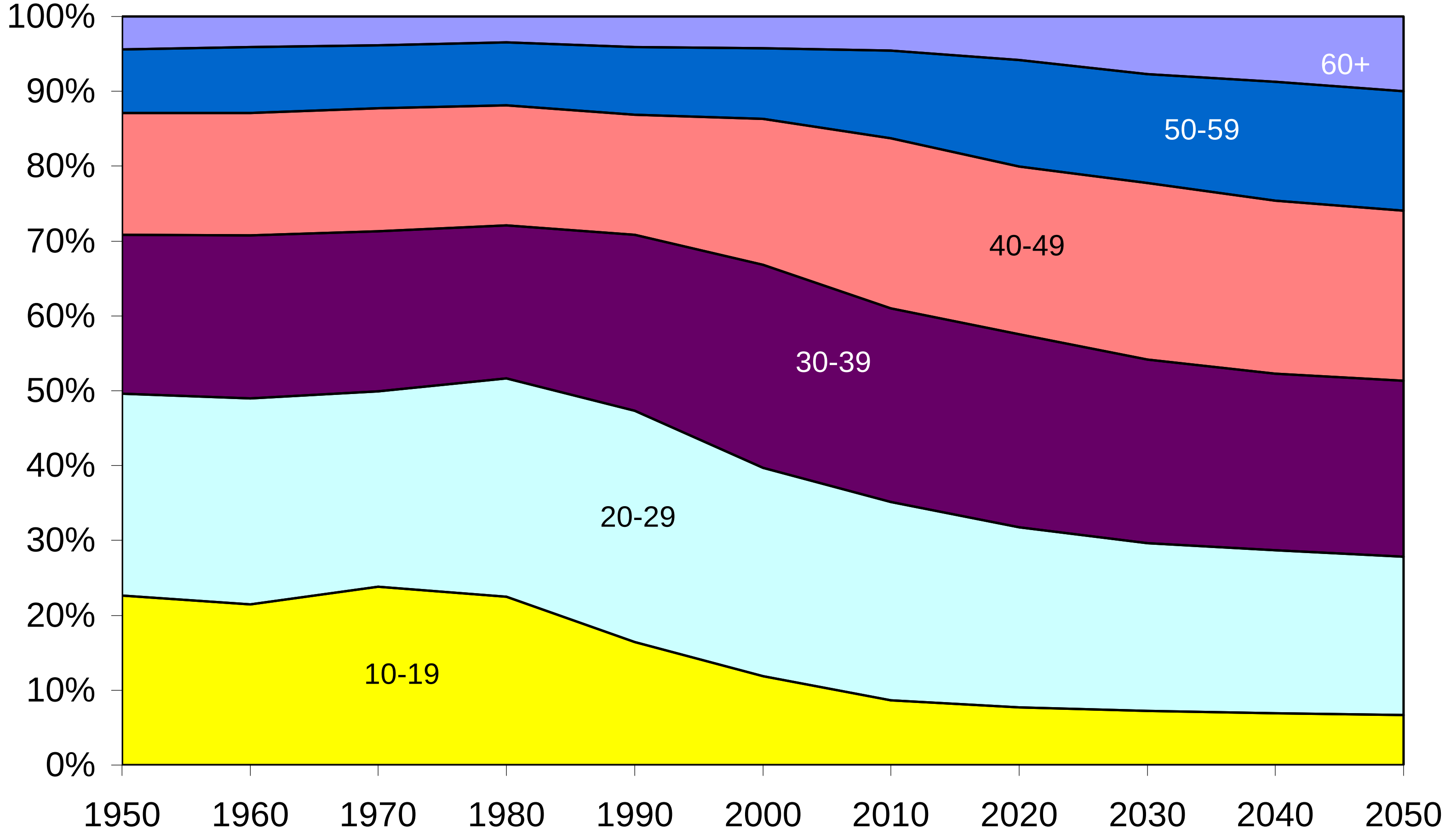
Figure 7. Female labor force participation rates of Asia by age group
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65 +
1950
1970
1990
2010
Source: ILO, 1996.

Figure 8. Male labor force transition in Asia



Source: ILO, 1996. UN, 1999. Calculations by authors.

Figure 9. Female labor force transition of Asia



Source: ILO, 1996. UN, 1999. Calculations by authors.

Figure 10A. Projections of proportion widowed, South Korea

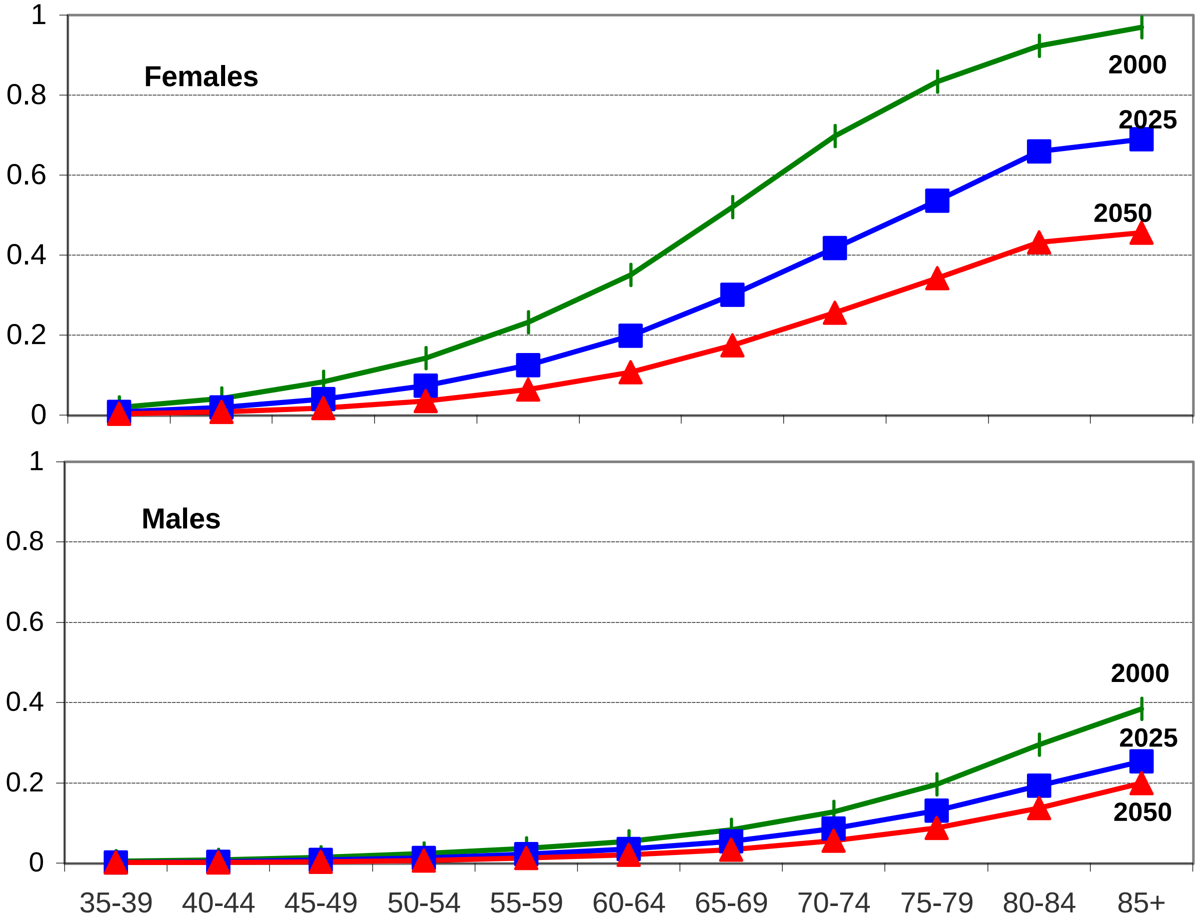


Figure 10B. Projections of proportion widowed, The Philippines

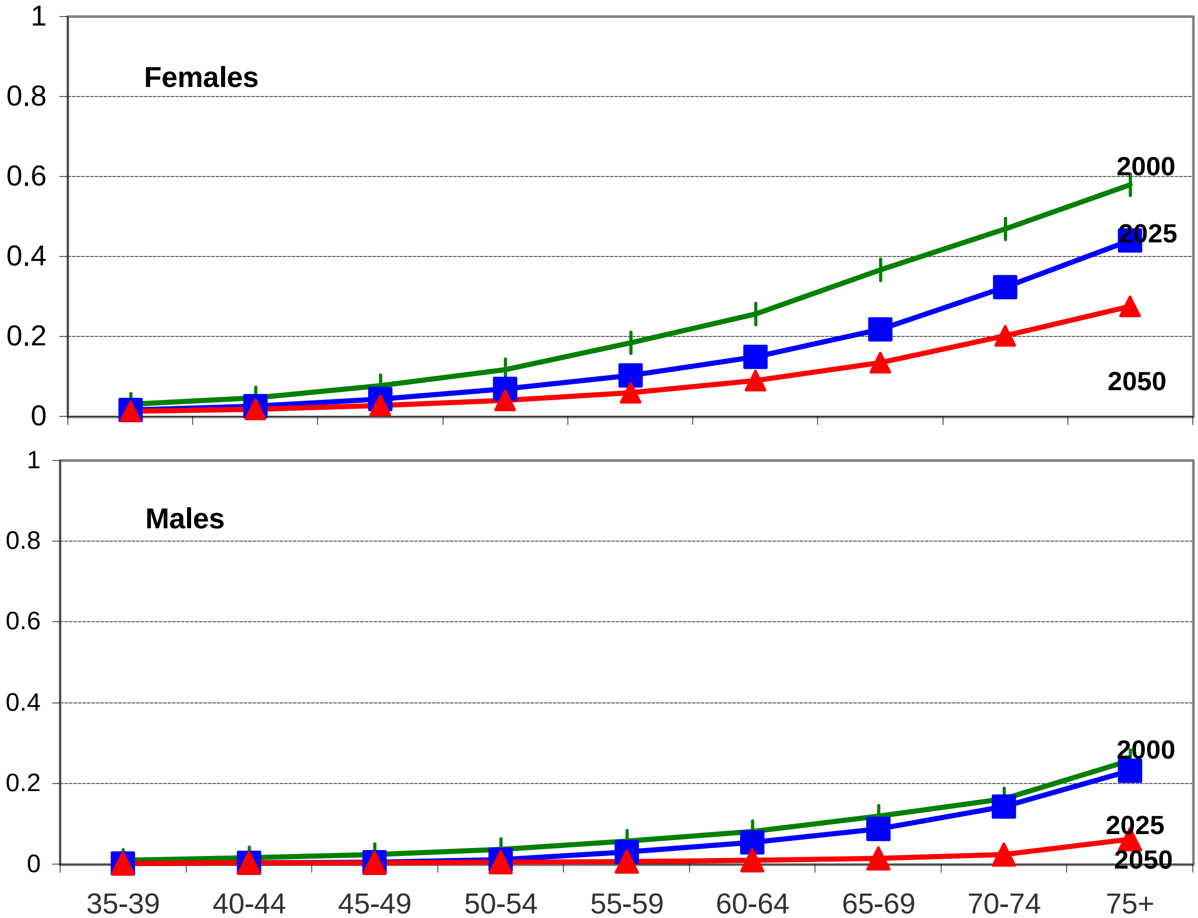


Figure 10C. Projections of proportion widowed, Indonesia

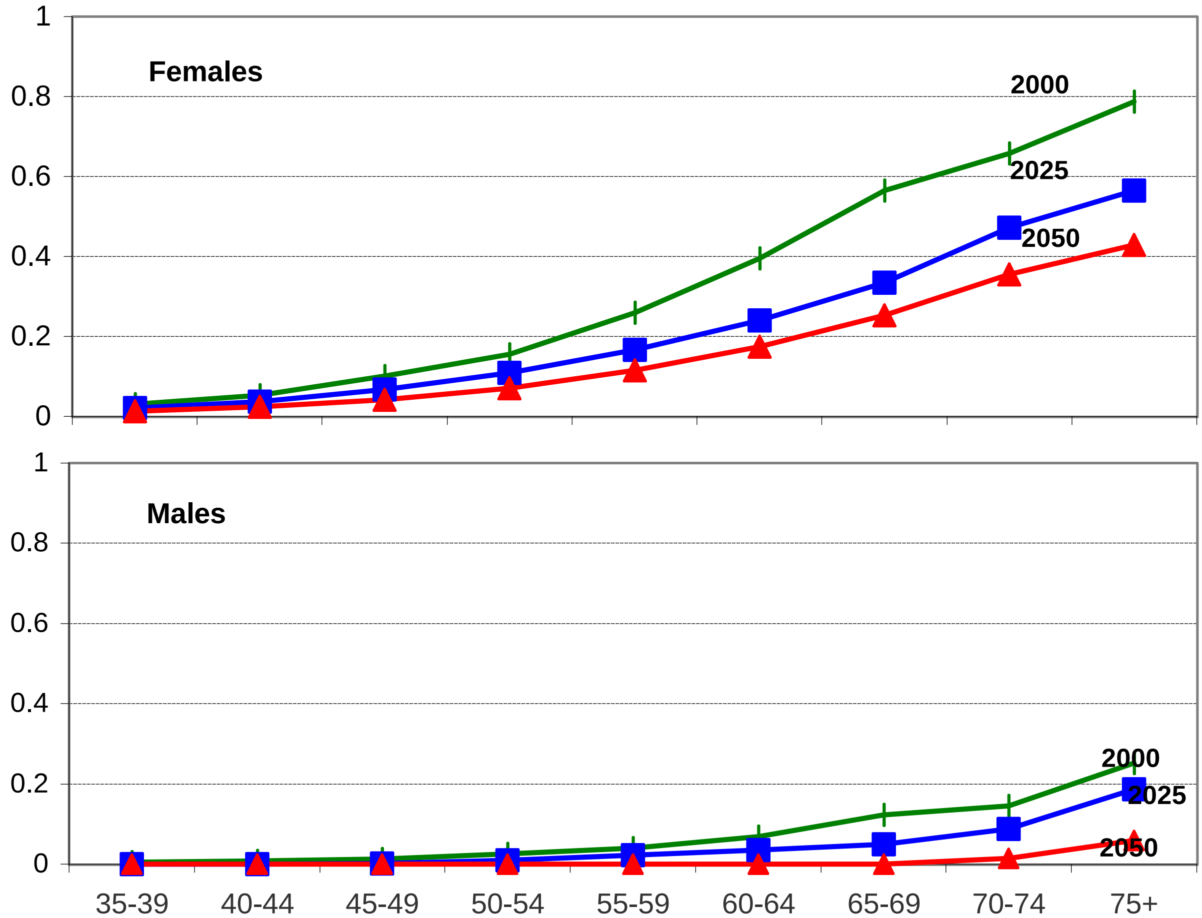


Figure 10C. Projections of proportion widowed, Indonesia

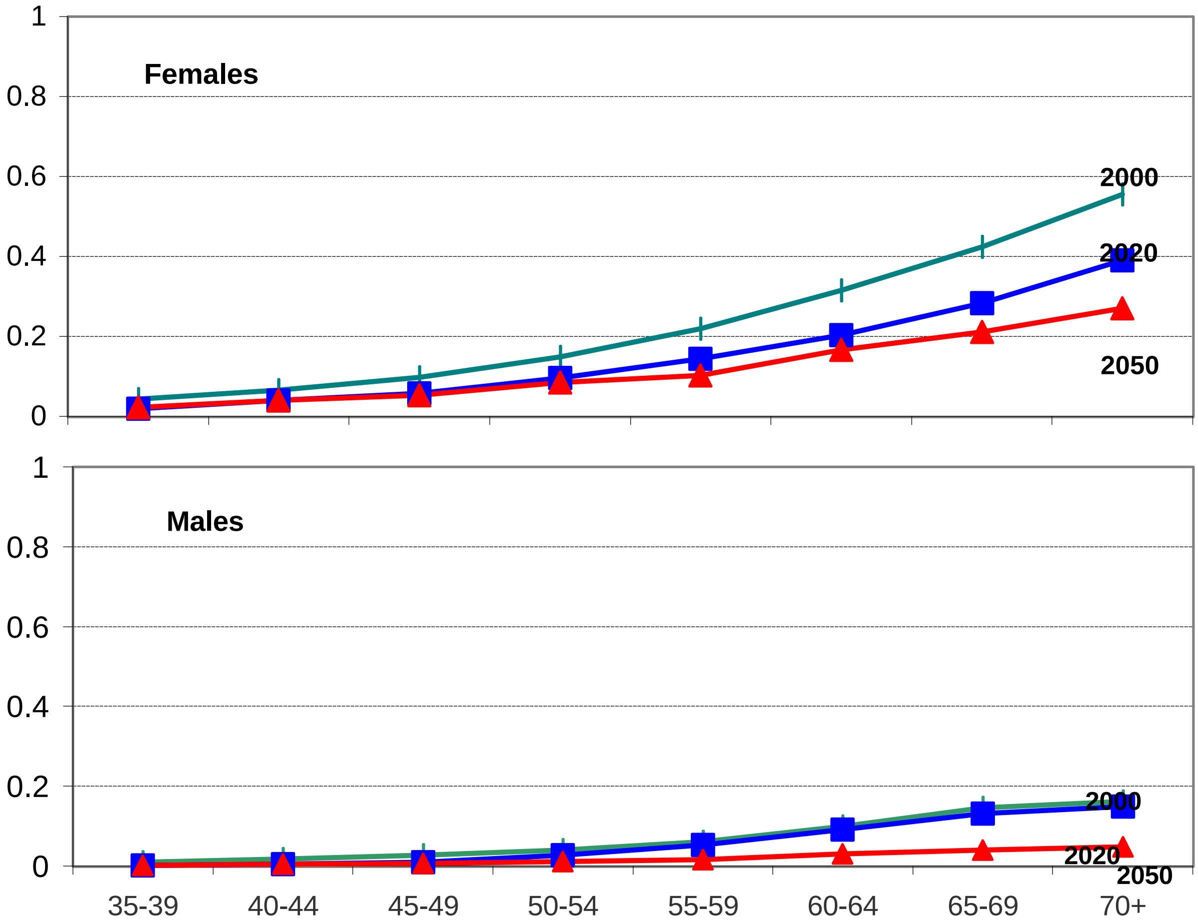


Figure 11. Global fertility transition
UN 1998 revision, medium variant

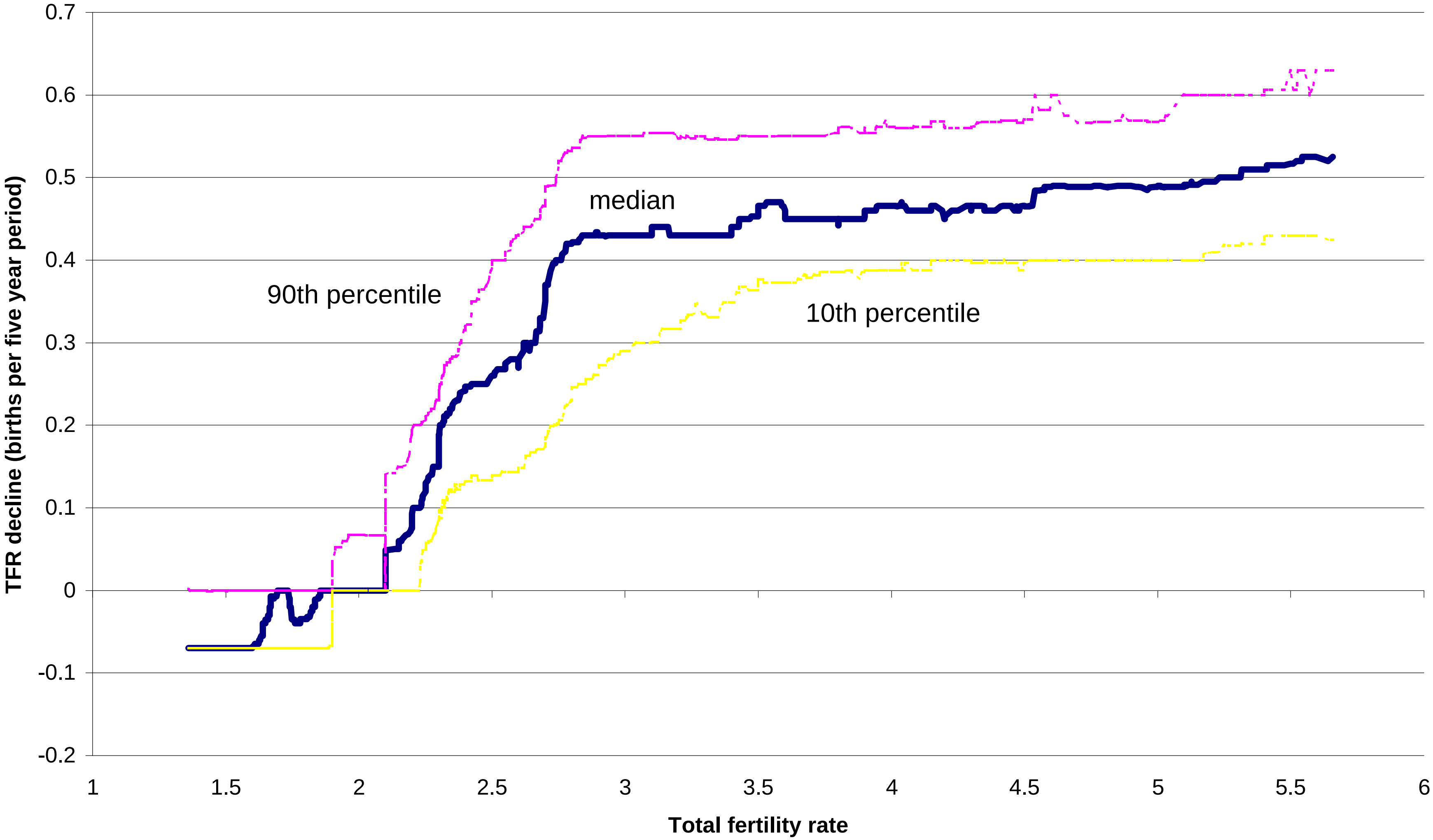


Figure 12. Analysis of TFR projection
comparison of medium variant to global historical pattern

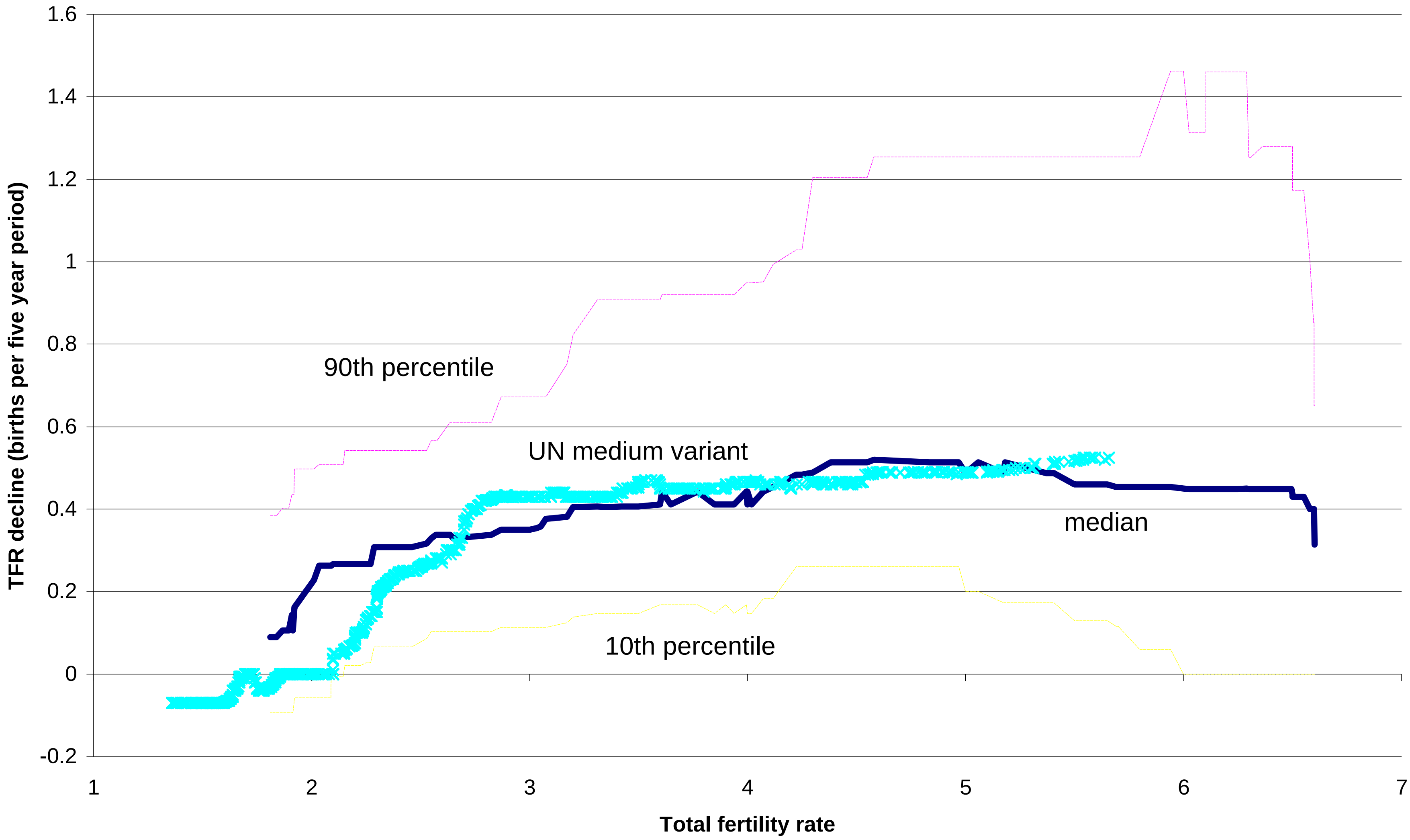


Figure 13. Analysis of TFR projection comparison of high and low variants to global historical pattern

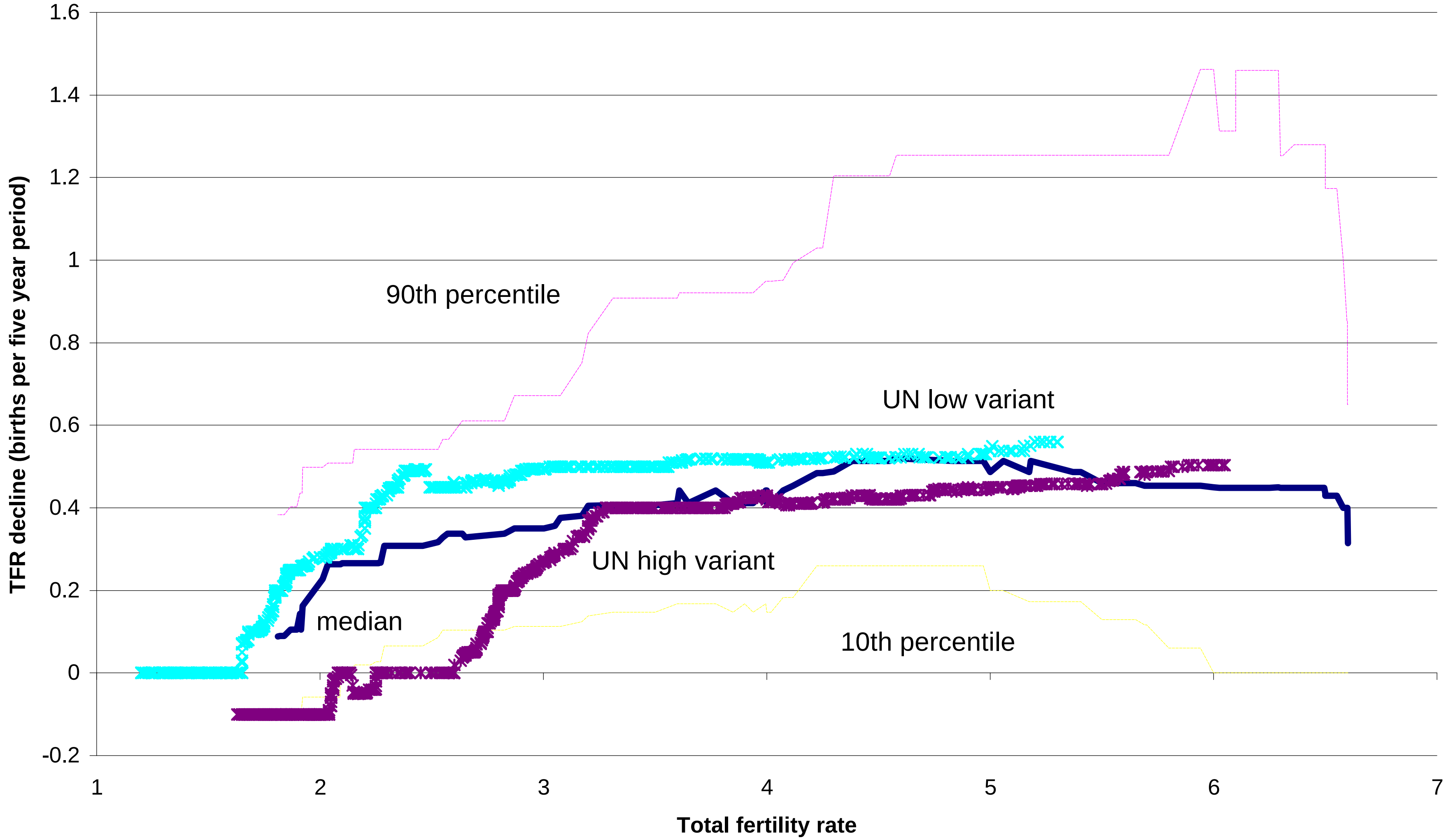
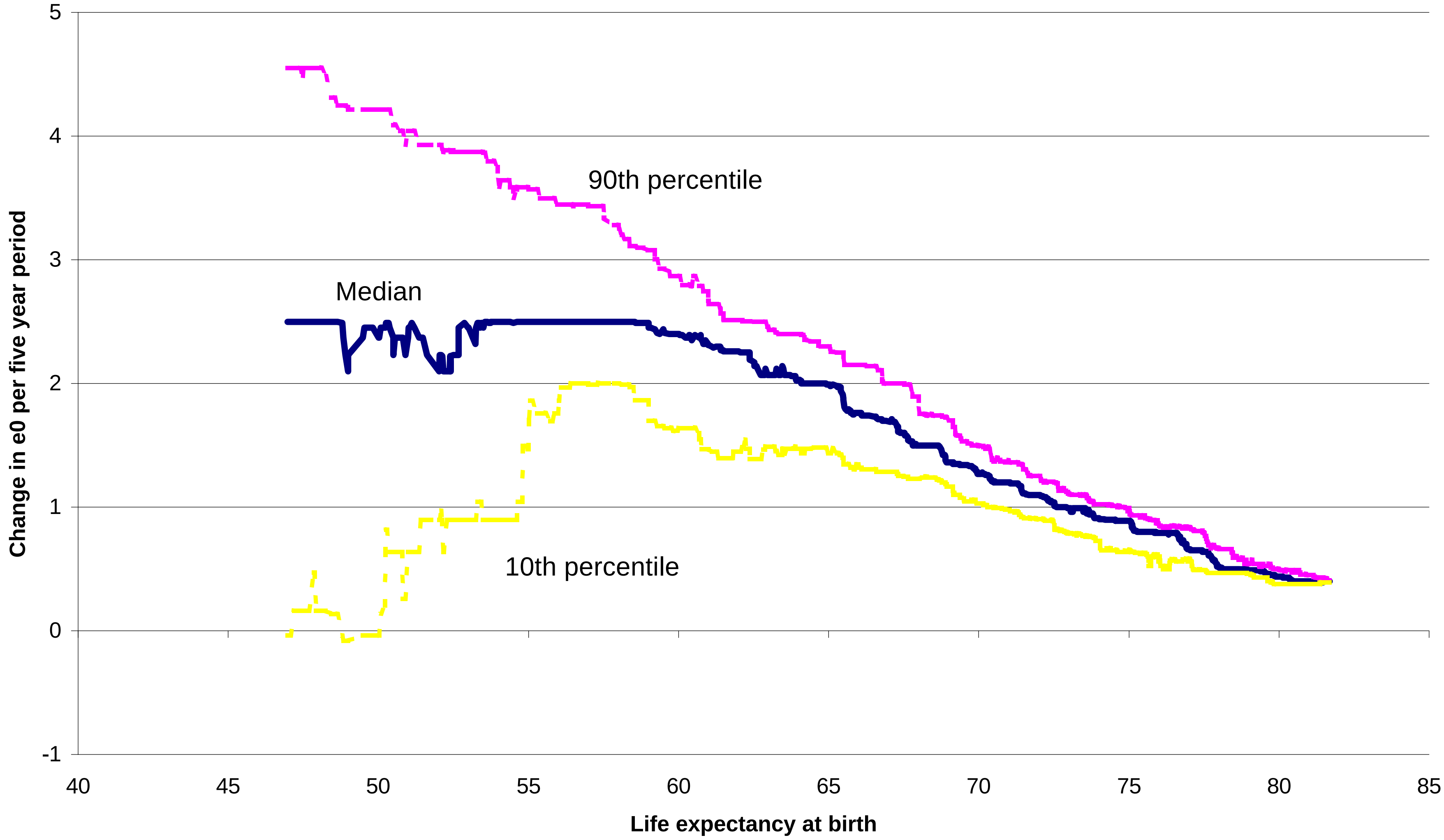
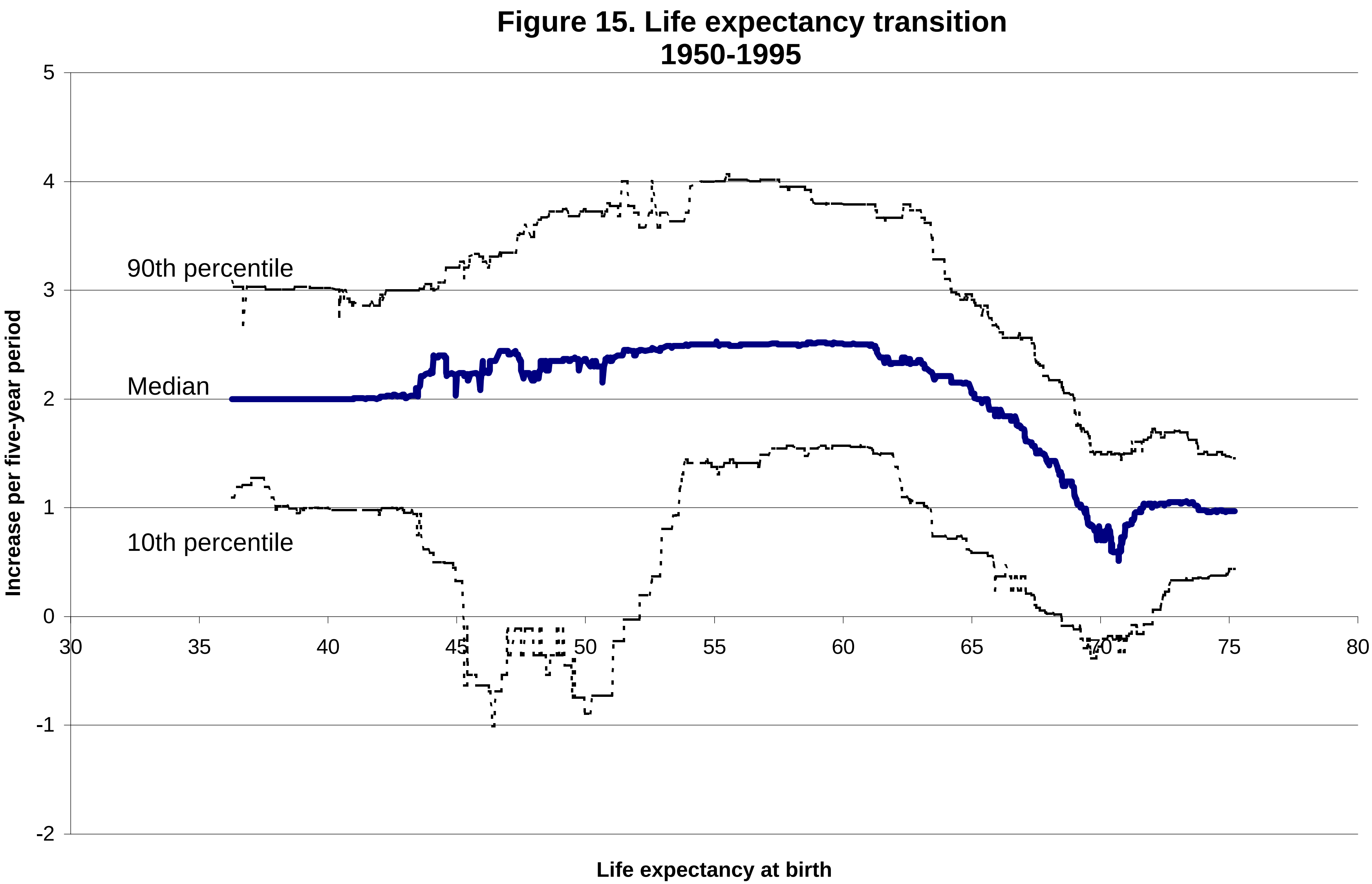


Figure 14. Global mortality transition
UN population projections





Note: Countries with 1990 population exceeding 2 million.

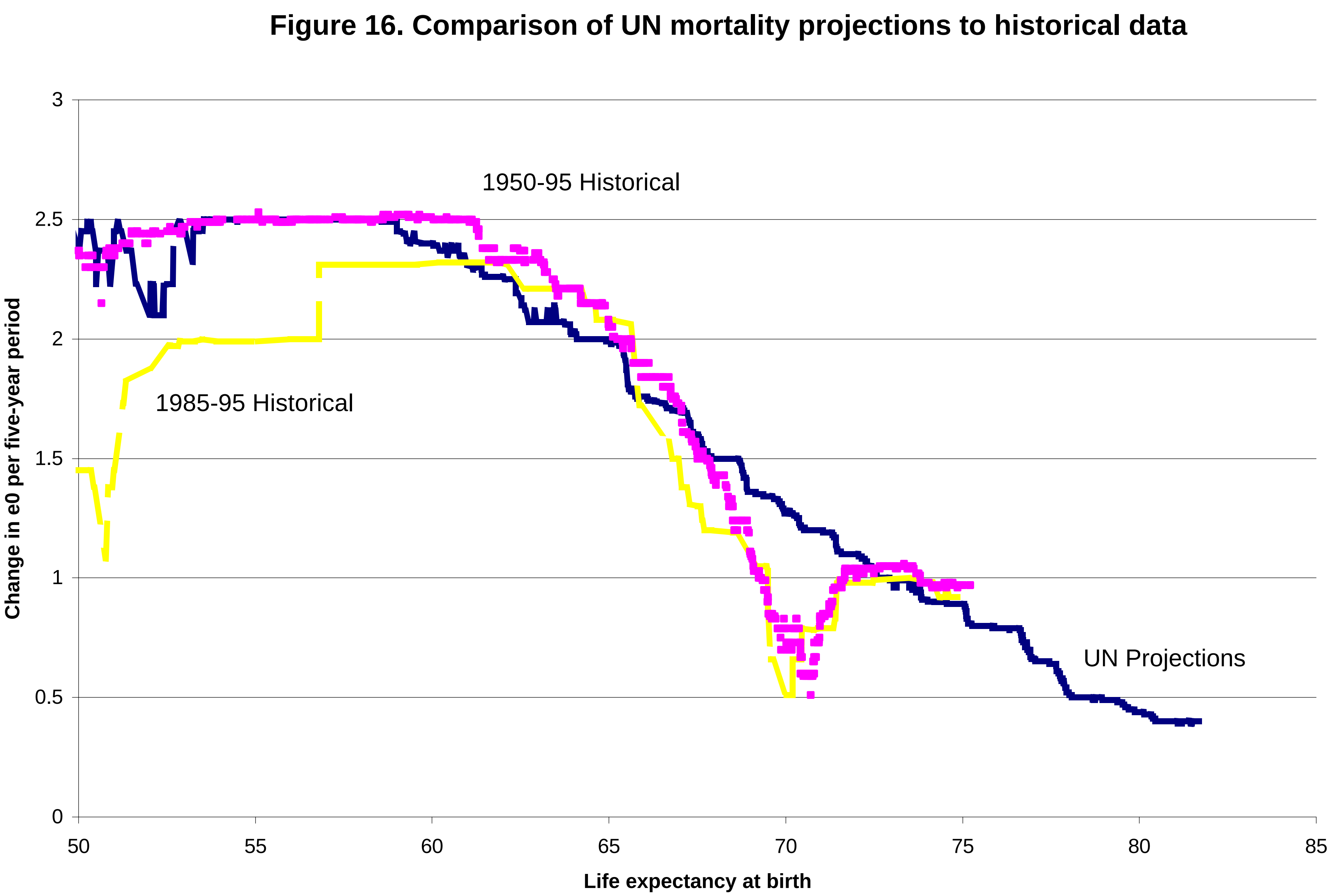


Figure 16. Comparison of UN mortality projections to historical data
1950-95 Historical
1985-95 Historical
UN Projections
Change in e0 per five-year period
Life expectancy at birth
0
0.5
1
1.5
2
2.5
3
50
55
60
65
70
75
80
85

Figure 17. Economic support ratio, Southeast Asia

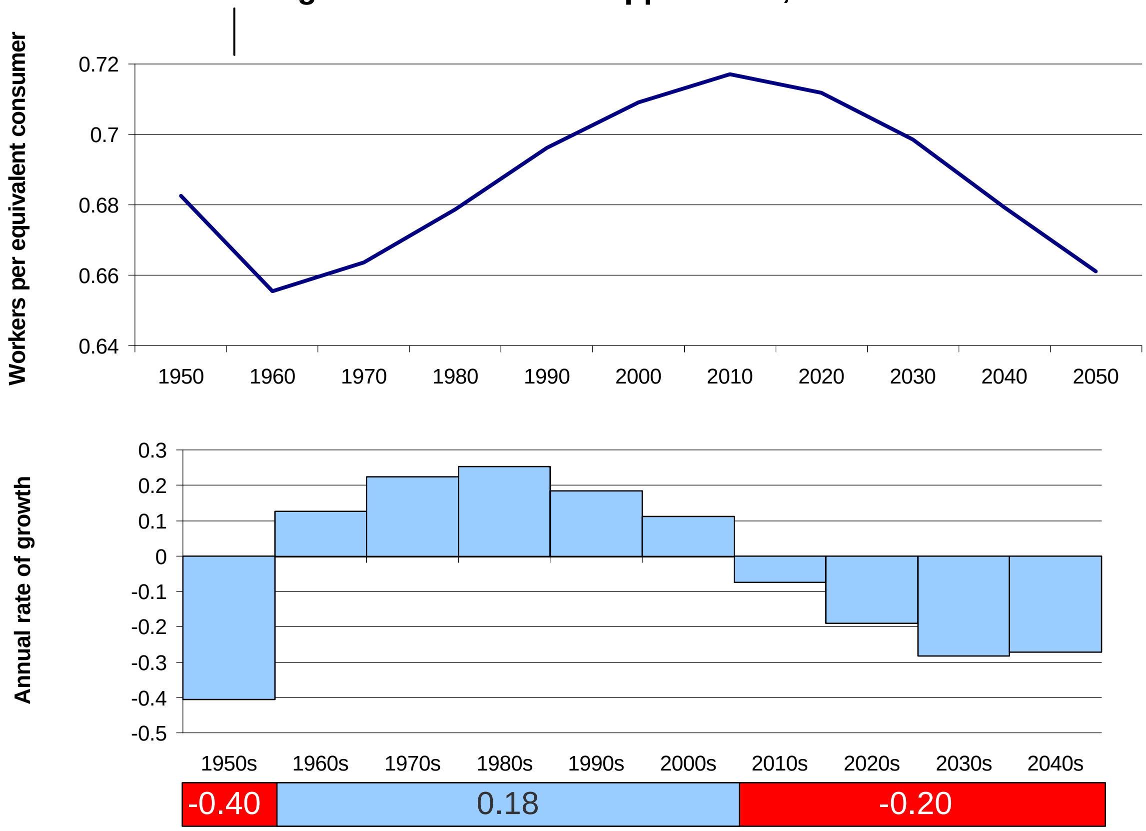
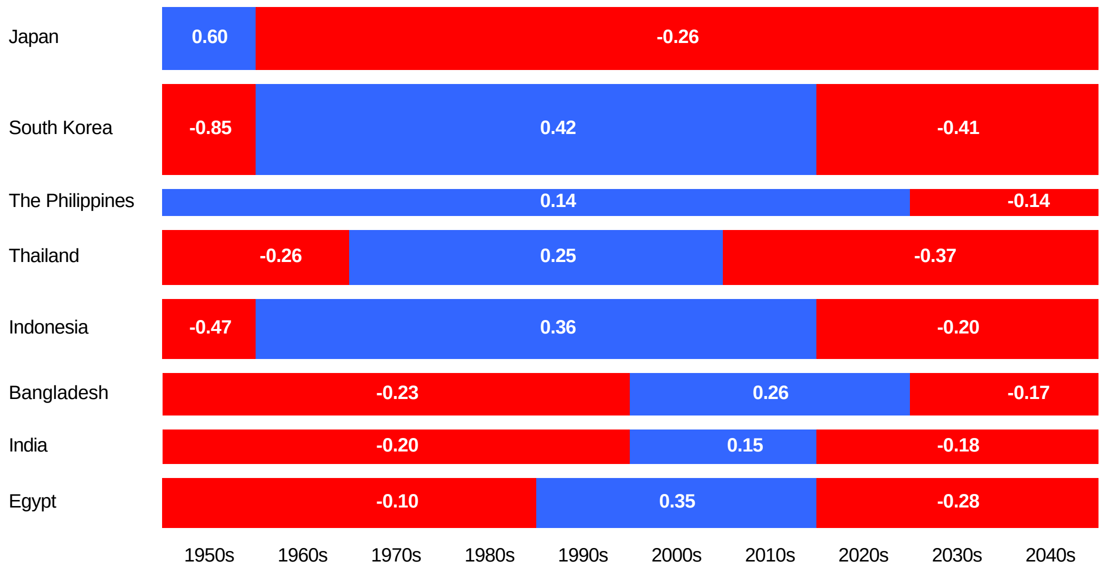


Figure 18. Growth Rates (%) of Economic Support Ratios by Countries



Growth Rates (%) of Economic Support Ratios by Regions

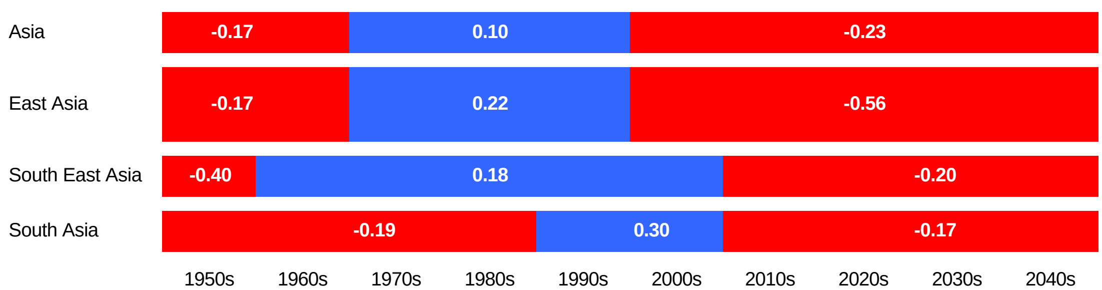


Figure 19. Wealth/Output : Taiwan, US, & France, 1800-2100

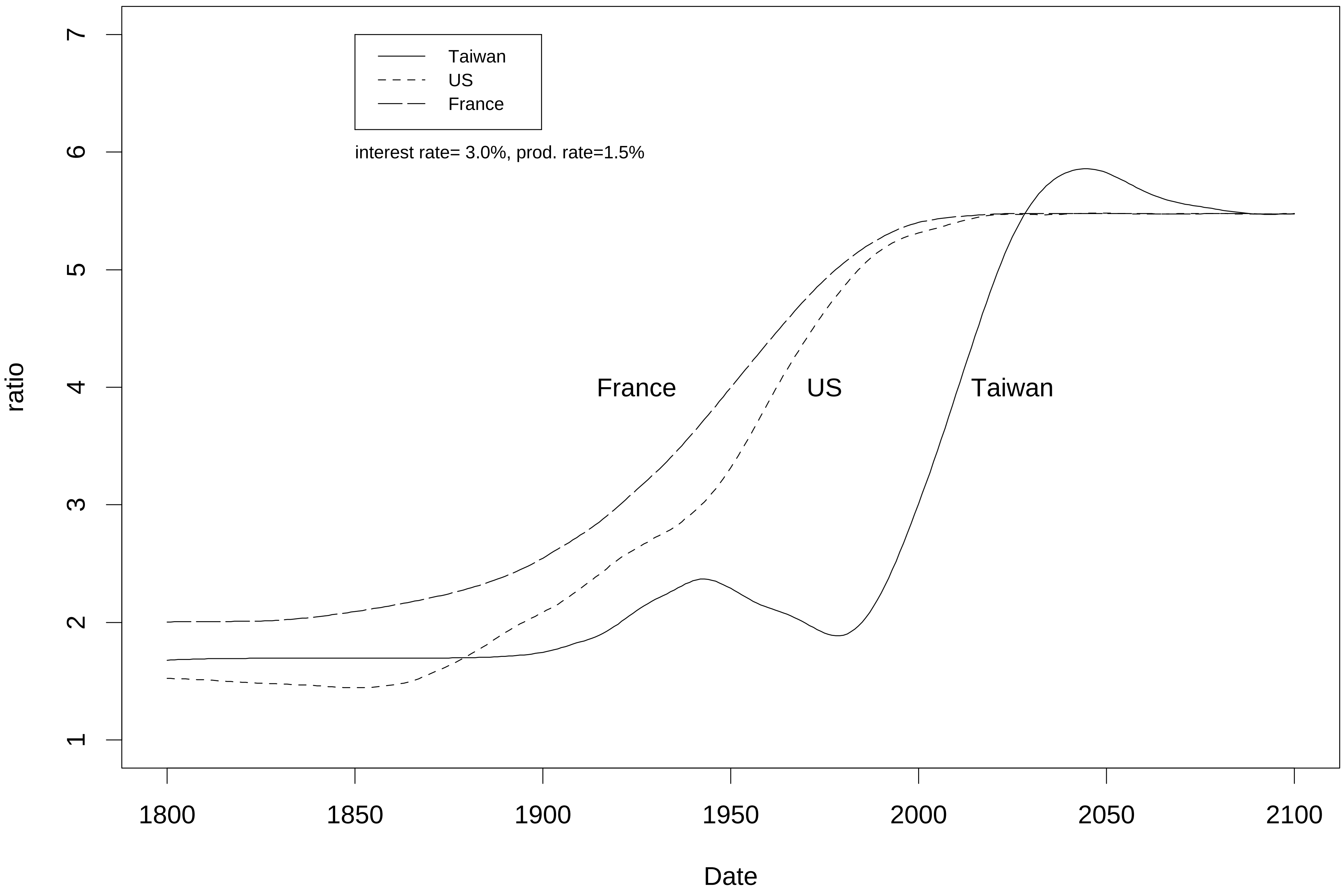


Figure 20. Savings Rate: Taiwan, US, & France, 1800-2100

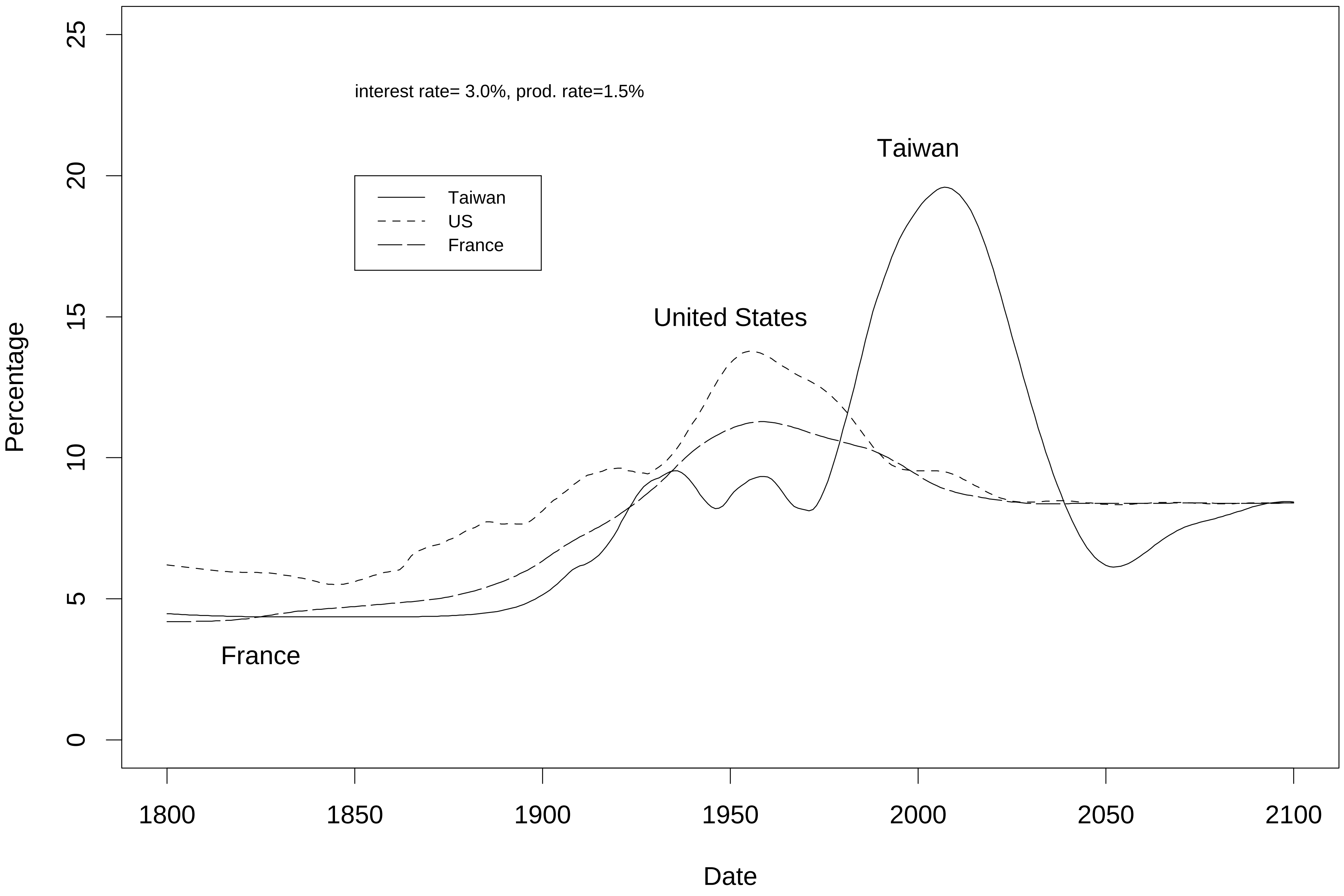
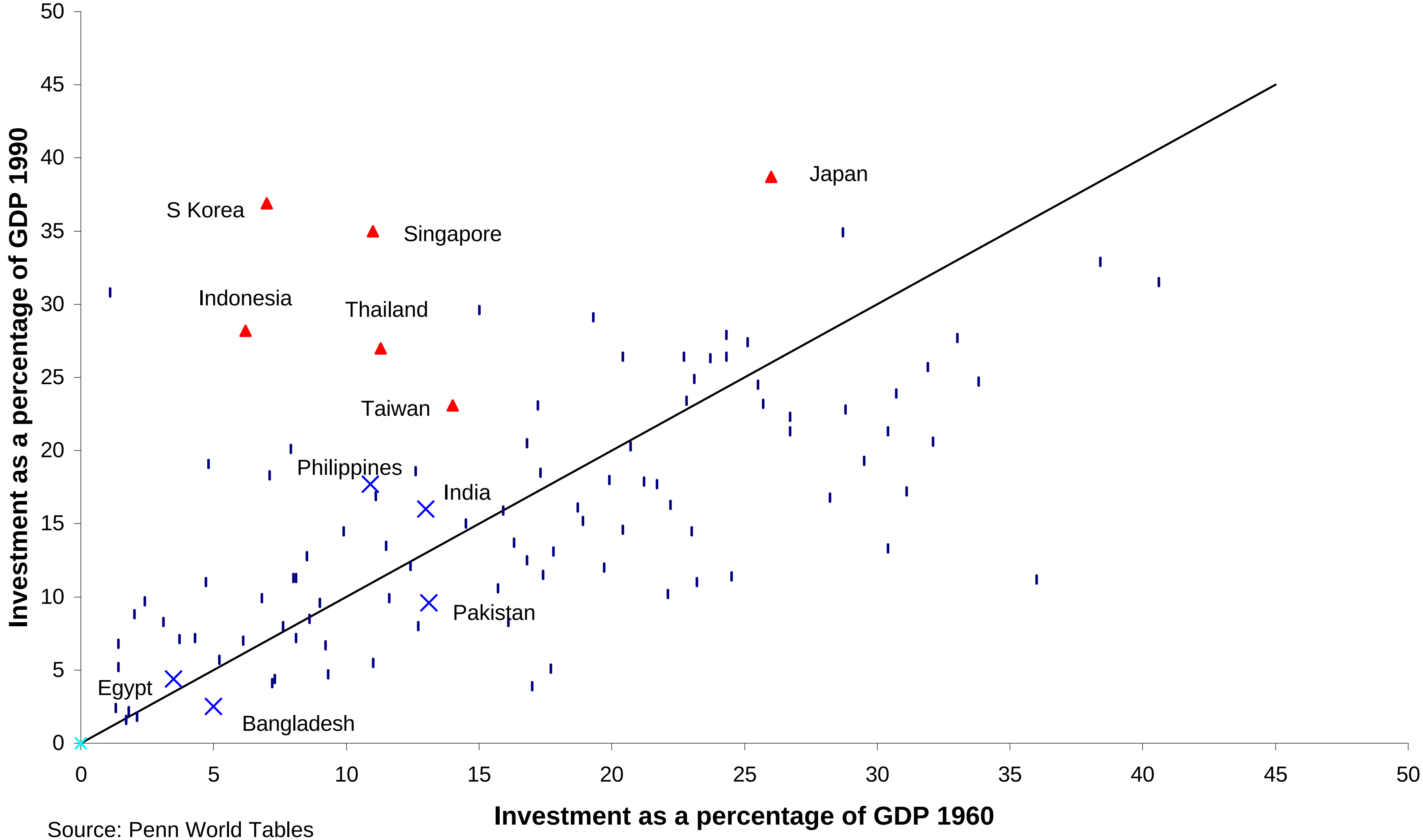
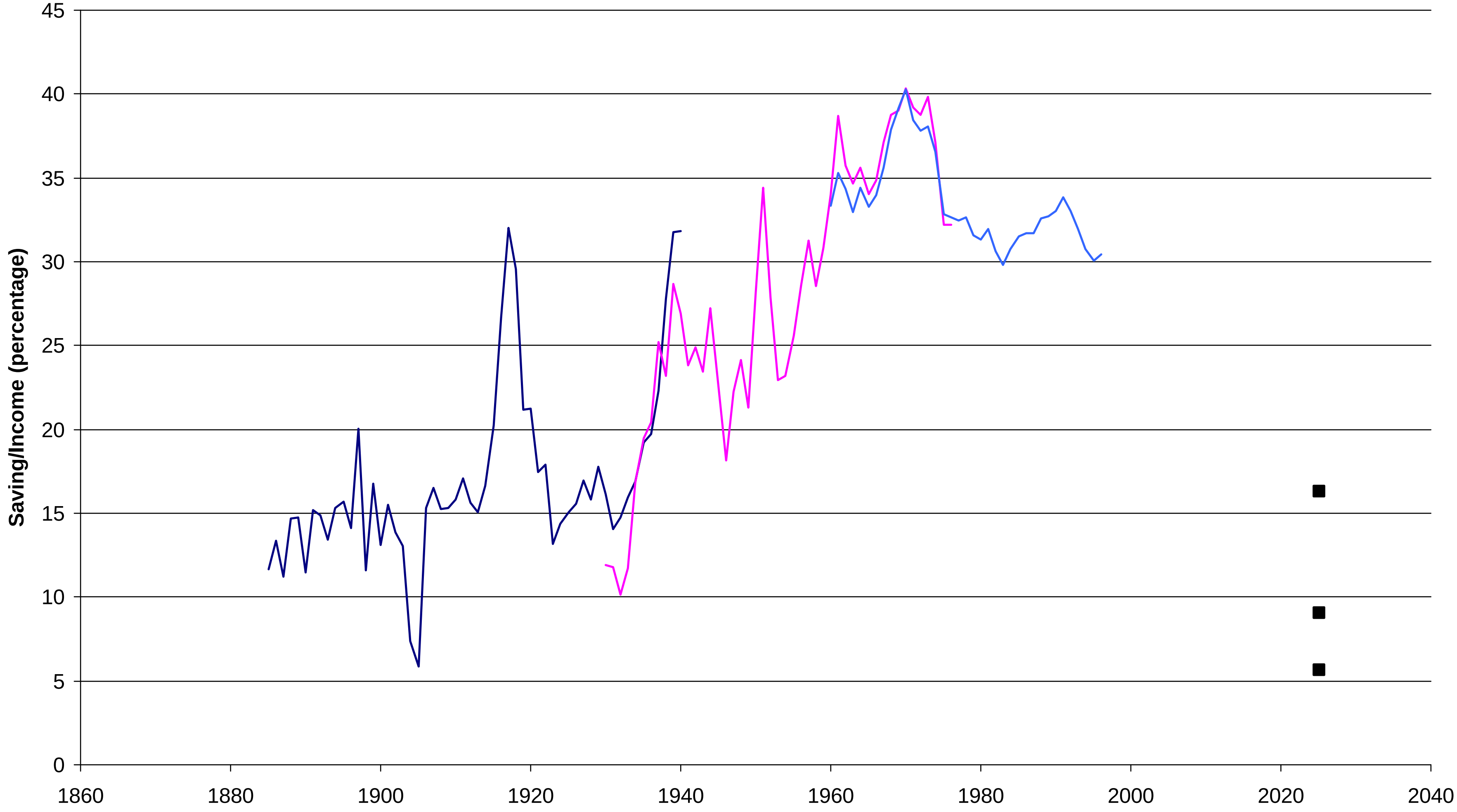


Figure 21. Investment, 1960 vs. 1990
Slow and fast transition populations



Source: Penn World Tables

**Figure 22. Gross National Saving
Japan, 1885-1997, 2025 forecasts**



Source: Mason and Ogawa, forthcoming.

Figure 23. Rates of total expenditure on health by GDP

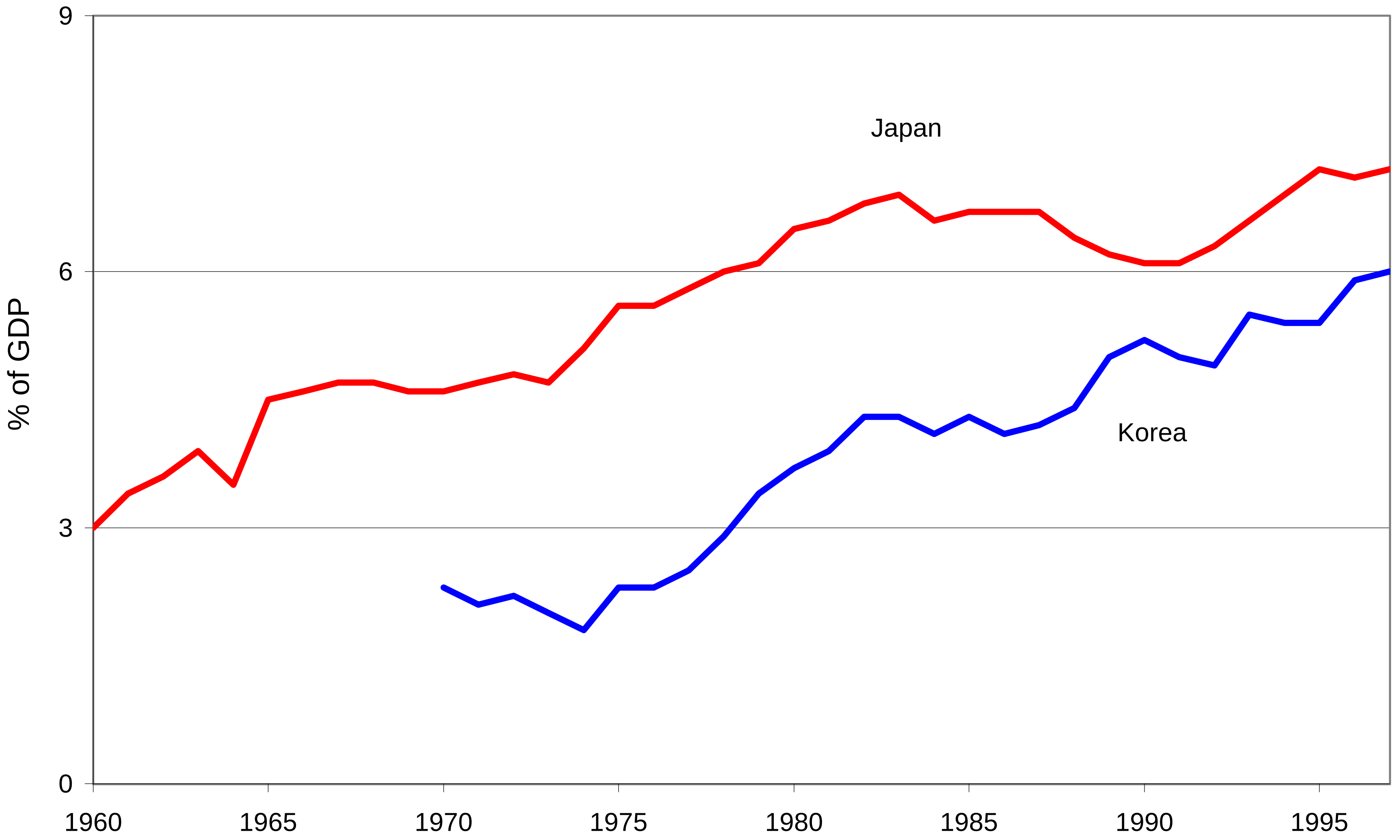


Figure 24. Burden of death

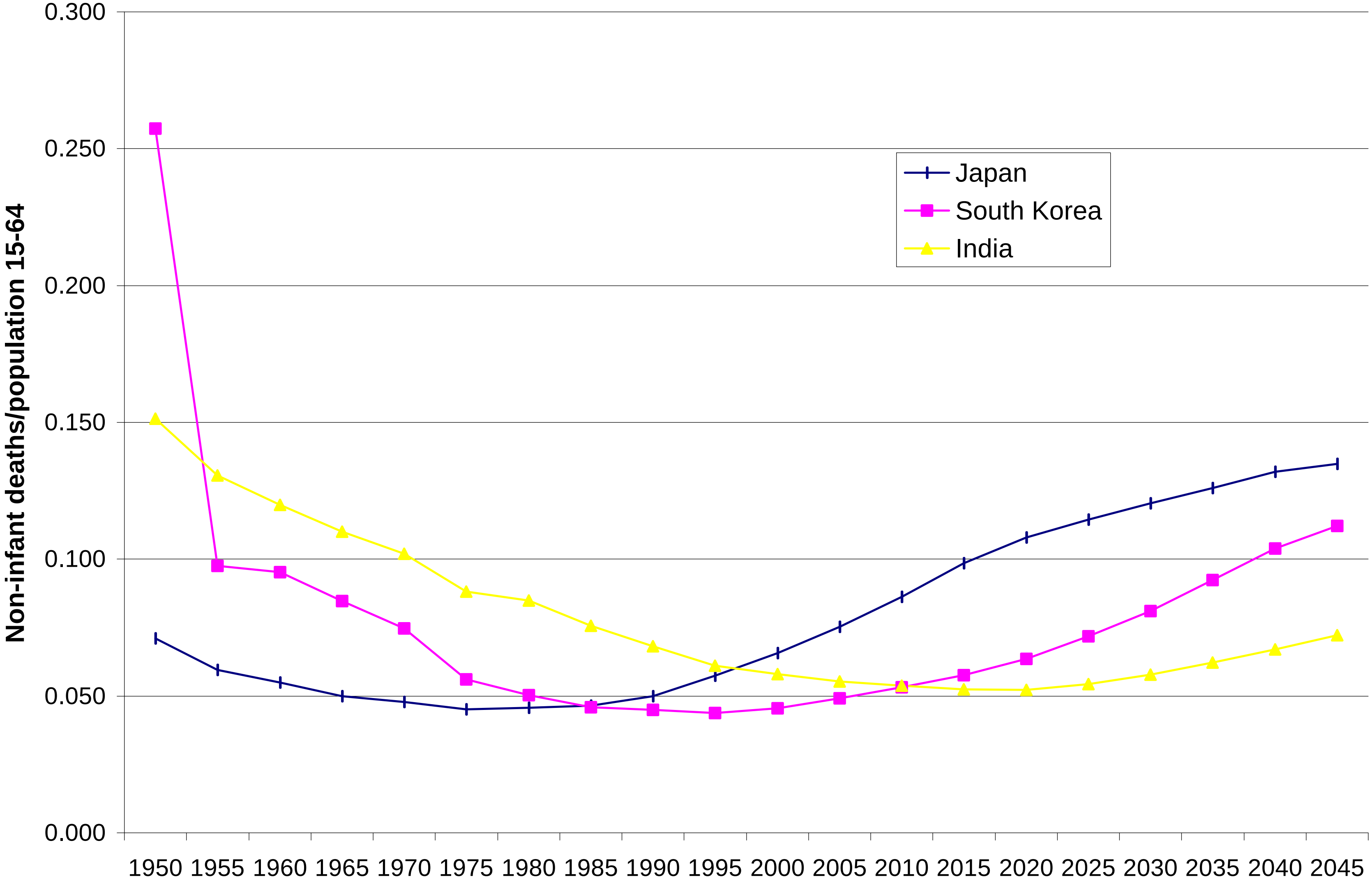
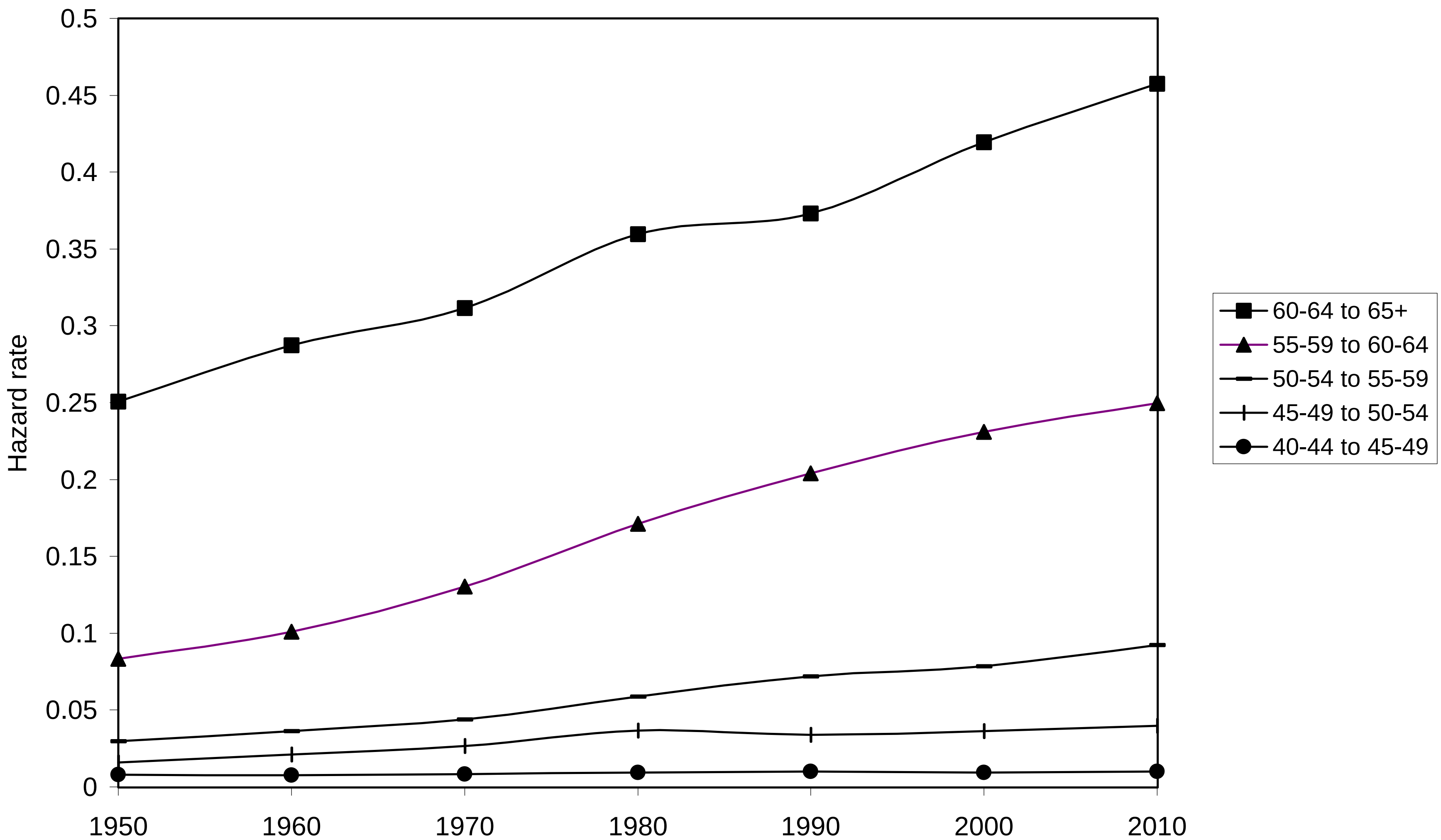
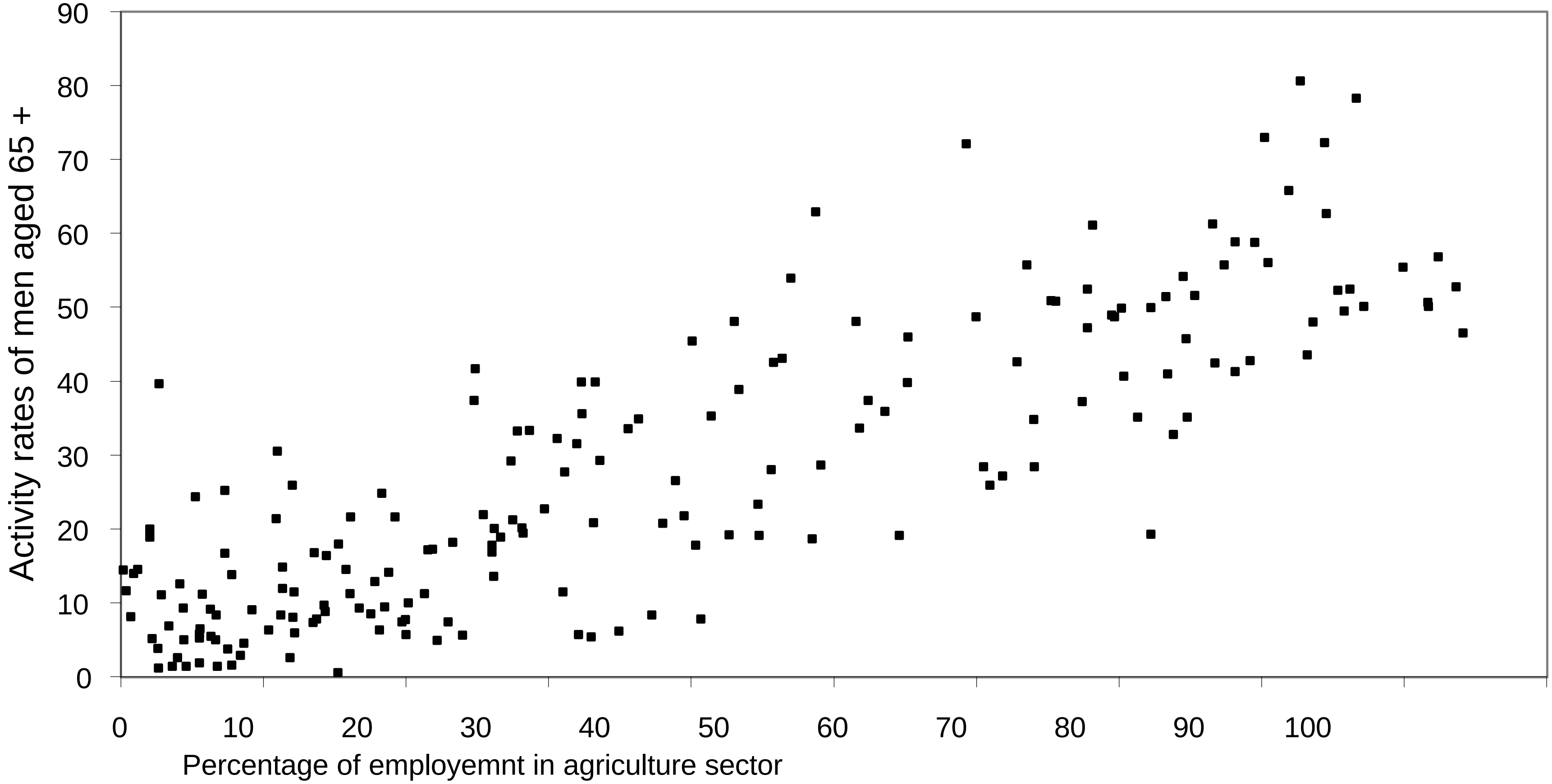


Figure 25. Retirement hazard rates, Asian men 1950-2010



Source: ILO (1996), UN (1998).

Figure 26: Relationship between activity rates of elderly men and the percentage of employment in agriculture sector,1990



Source: ILO (1996).

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Appendix A. Population projections – technical notes

The United Nations Population Division published updated population projections in 1999. Three variants are provided that make different assumptions about fertility trends as discussed in the text. The UN projections do not consider the implications of different mortality trends. Alternative scenarios were prepared so as to assess the impact of changes in the pace of mortality change.

For each of the three UN variants (high, medium and low fertility), two new projections were constructed – a high and a low mortality variant. The high mortality variant assumes that projected increases in life expectancy occur half as rapidly as in the UN projections. The low mortality variant assumes that increases occur twice as rapidly as in the UN projections. In both cases, changes in the age structure of survival follow the same pattern as in the UN projections. The chief advantages of this approach are its simplicity, the variants could be constructed using information that is publicly available, and its consistency with the UN methodology. There are several disadvantages. More complex mortality variants are not considered. For example, the implications of more rapid improvements in survival chances at older ages and slower improvements at younger ages are not considered. Also, for the low mortality variant we can construct projections only to 2025.

The alternative variants are constructed using a simple device. Survival rates were calculated from the population and birth data that are available in the UN variants. All variants assume that the survival rates for 1995-2000 are the same. Increases in survival rates that occur during a five-year period in the UN variants, require ten years in the high mortality variant. Increases in survival rates that occur over a ten-year period in the UN variants require only five years in the low mortality variants. Hence, life expectancy in the high mortality variant in years

2015-20 is the same as life expectancy in 2005-10 in the standard mortality variant. Life expectancy in the low mortality variant in years 2020-25 is the same as life expectancy in the 2045-50 in the standard mortality variant. For the high mortality variant, survival rates are linearly interpolated as is necessary.

Varying survival rates also influences the number of births because of changes in the number of women in the childbearing ages. The number of births was adjusted so as to maintain the ratio of the number of births to the population aged 25-39 across alternative mortality variants. A summary of the alternative projections is provided below for the regions of Asia and for seven ANE countries. More detailed results are available.

Appendix B. Economically Active Population Estimates and Projections

Historical estimates and projections of the economically active population rely on the ILO, *1996 Economically Active Population Estimates and Projections* (EAPEP). The EAPEP provides estimates and projections of labor force participation rates (activity rates) by sex and five-year age group for the period 1950-2010 at ten-year intervals and for 1995.

The economically active population comprises all men and women who supply labor for the production of economic goods and services as defined by the UN systems of national accounts and balances, during a specified time period. Activity rates for each age group are the ratio, expressed as a percentage, of the economically active population in a given age group to the population in that age group.

Data on labor force are drawn from population censuses and especially from sample surveys of the economically active population. The labor force data are adjusted where necessary, to conform to a standard concept of economically active population, which consists of all employed and unemployed persons. Historical estimates and projections of the labor force are obtained by applying ILO estimates of activity rates to the population estimates and projections prepared by the UN Population Division. The most recent ILO results rely on the UN's 1996 population estimates and projections. The labor force results presented here are updated using activity rates from the ILO and more recent population data, the *1998 Revision.*

ILO projections are based on projected activity rates for men and women in five-year age groups. The youngest age group is 10-14 and the oldest age group is 65 and older. Activity rates were projected for 1995, 2000, and 2010 by extrapolating trends in the historical data. A variety of functional forms were used. However, the trends were constrained by assumptions about the likely course of activity rates. The assumptions are summarized by ILO as follows (ILO, 1996):

> Men: Activity rates for all age groups continue to decrease, more markedly in the 15-19 age group and 55 years and over. However, in the more developed countries, which registered sharp drops in activity rates in both age groups concerned over the last two decades, the rate of decrease should gradually slow down.
>
> Women: Activity rates increase in the great majority of countries or territories concerned in the 25-54 age group, irrespective of the trend registered over the period as a whole or in the last decade. The assumption also predicts that the profile of women's activity rates will move closer to that of men, although female levels will not exceed male levels. For a very small number of countries and/or territories in Asia, characterized by very high female activity rates, the decline registered between 1950 and 1990 continues but a much slower rate of decrease.

Two problems were addressed in employing the EAPEP projections of activity rates in this work. The first is that the EAPEP does not provide estimates and projections of activity rates for the period 2020-2050. Because the assumptions made by ILO were designed to work only until 2010, it is unlikely that the projections of activity rates for the period 2020-2050 would follow the same patterns as those for the period 1950-2010. One obvious difficulty of projecting beyond 2010 is that the rate of decrease/increase must slow as they reach low/high levels, but these natural constraints are not incorporated into the ILO methodology. Of course, there are many other possibilities that are not considered. To prepare long-term projections, we made a strong, but simple assumption, that age- and sex-specific activity rates remain constant after 2010. Thus, changes in projected labor force aggregates after 2010 are due entirely to changes in the age- and sex-distributions of the populations, not due to changes in activity rates.

The second problem is the use of 65 and older as the upper age group by the ILO. This is problem for countries experiencing substantial changes in the age-distributions of their elderly populations because activity rates drop rapidly with age. As a simple expedient, we assume that labor force participation rates of the elderly decrease linearly beginning at age 65 and reaches zero at age 90. Thus, changes in the age distribution of the 65 and older population influence the average activity rate of that population. Given the crude approximation of this approach, however, we report labor force values only for the 65 and older group and not for sub-groups of the elderly population.

Our projections for the period 2020-2050 will overestimate or underestimate the actual labor force participation to the extent that the trends in activity rates between 1950 and the early 1990s persist into the future. It seems likely that the errors for prime age males will be relatively small. The young and the elderly, however, have registered substantial drops in their activity rates that may persist into the future. For the elderly, much will depend on employment opportunities, improvements in standards of living, health conditions, and the evolution of public and private pension programs.

Young females have also experienced declining activity rates that may drop below levels projected here. Activity rates among women in the prime working ages have increased. If this continues, our long-range projections will understate the female labor force in these ages.

Activity rates for older women will be governed by the same forces that apply to men. In addition, as women more actively participate in the labor force at younger ages, their labor force behavior at older ages may become similar to that of the behavior of men. Hence, the trend in participation by older women is very much an open question.

Appendix C. Methodology for forecasting the proportion widowed.

Forecasts of the proportion widowed are based on a model first applied to Japan (Mason, Ogawa, and Fukui, 1992). The variable analyzed is the transition rate, Δw_{at}^{s}, where

$$\Delta w_{at}^{s} = w_{a+5,t+5}^{s} - w_{at}^{s}$$

The change in the proportion currently widowed during a five-year span for a cohort of men or women (s), age a, in year t. If mortality rates were independent of marital status and neglecting remarriage, the change in the proportion widowed could be calculated directly knowing only the proportion married at the beginning of a period and the proportion experiencing the death of a spouse during any subsequent time period. The latter could be calculated from the joint age distribution of husbands and wives at the beginning of the period and age- and sex-specific mortality rates.

The change in the proportion widowed differs from the directly calculated value for several reasons. First, mortality rates may not be independent of marital status. In particular, the probability of dying may be elevated for those who have recently experienced the loss of a spouse. Under these circumstances the proportion widowed will increase by less than the proportion experiencing the death of a spouse. Second, some widows or widowers will remarry. Again, the proportion widowed will increase by less than the proportion experiencing the death of a spouse. The forecasting model used here allows for the impacts of marital-status-dependent mortality and remarriage using regression techniques.

To simplify the analysis, we assume no remarriage for the moment, thus, the change in the absolute number of widows, can be represented by the following accounting identity.

$$W_{a+5,t+5} = q_{at}^{1} W_{at} + q_{at}^{2} d_{at} M_{at}$$

where W_{at}^{1} and M_{at}^{1} are the number of widows and married women aged a in year t, q_{at}^{1} is the probability that a widow aged a in year t will survive five additional years, q_{at}^{2}, is the survival probability for a woman who is widowed during the five year period, and d_{at} is the five year death rate for husbands of women aged *a* in year .

Dividing both sides by the total number of women aged *a* in year *t* and representing the survival rate for women in general by q_{at}, this yields

$$q_{at} w_{a+5,t+5} = q^1_{at} w_{at} + q^2_{at} d_{at} m_{at}$$

where $q_{at} = N_{a+5,t+5} / N_{at}$, *w* and *m* are the proportions widowed and married, respectively, and N_{at} is a population aged *a* in year *t*. Finally letting $e_{at} = q^1_{at} - q_{at}$ and rearranging terms, the transition rate is given by:

$$\Delta w_{at} = \frac{e_{at}}{q_{at}} w_{at} + \frac{q^2_{at}}{q_{at}} d_{at} m_{at}$$

The transition rate can be represented, then, as a homogeneous linear function of the proportion widowed and the product of the proportion married and the death rate for husbands. If mortality is not systematically related to marital status, i.e., $q_{at} = q^1_{at} = q^2_{at}$, then the expression for the transition rate simplifies to $\Delta w_{at} = d_{at} m_{at}$. A similar expression is used to model the transition rate for men.

The death rates for husbands and wives are not available but can be approximated using information about the mortality rates for men and women and the age distribution of husbands and wives. Death rates for men and women, d^s_{at}, are approximated using intercensal survival techniques, i.e., the death rate for persons aged *a* and sex *s* between *t* and *t+5* is calculated as:

$$d^s_{at} = \frac{N^s_{at} - N^s_{a+5,t+5}}{N^s_{at}}$$

The joint age distributions of husbands and wives are based on tabulations of the joint distributions of husbands and wives heading intact households at the beginning of each intercensal period. Letting h_{axt} represent the proportion of married men aged *x* who have wives aged *a*, then the death rate for wives of men aged *x* is given by :

$$\hat{d}_{xt}^{m} = \sum_{a=u-u+5}^{v+} h_{axt} d_{at}^{f}$$

where $u \sim u+5$ is the youngest intercensal age group applicable to the model, and $v+$ is the oldest (open ended) age group. The death rate of husbands can be calculated in a symmetrical way.

Estimation of the transition equation requires the imposition of restrictions on the age pattern of marital status related mortality differences. In particular, we will assume that the relative differences in survival between marital status groups do not vary with age. In the case of the mortality of spouses, we assume that $a = e_{at} / q_{a1}$ and anticipate that a will be greater than zero, and $d_{at} = g\hat{d}_{at}$ while anticipating that g will be greater than one. And in the case of survival of those who become widowed during the period and survival in general, we assume that $b = q_{at}^{2} / q_{at}$ and anticipate a value substantially less than one but greater than zero. Our final estimation is arrived at by substituting into the transition rate equation mentioned before yielding :

$$\Delta w_{at}^{s} = a w_{at}^{s} + bg\hat{d}_{at}^{s} m_{at}^{s}$$

The equation is estimated separately for men and women, in each country for the periods for which data are available. (For Thailand, due to data availability, the model is estimated for 10-year rather than 5-year periods. The model is estimated using ordinary least squares regression.

The model does not yield transition rates for the uppermost age category. Consequently, we rely on a crude approximation, assuming the transition rate to the oldest age interval is a constant proportion of the transition rate to the oldest closed interval. The proportions used are the average values for the period analyzed. For example, in most instances the upper age interval is 85+ in which case:

$$\Delta w_{80\sim84,t}^{s} = \hat{a} w_{75\sim79,t}^{s}$$

The estimated parameters for the four countries for which forecasts were prepared are:

		a	bg	$\hat{a}$
Indonesia	Males	0.469	0.000	1.140
	Female	0.123	0.485	0.188
South Korea	Males	0.091	0.418	0.457
	Female	0.030	0.741	0.056
Philippines	Males	0.422	0.000	0.820
	Female	0.126	0.486	0.328
Thailand	Males	1.009	0.179	2.449
	Female	0.411	0.672	0.948

The forecast uses intercensal survival rates calculated from UN population projections and the most recently available data on the joint age-distributions of household heads and their wives.

Table A1

Summary of Alternative Population Projections — Asia
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,036,240	2,250,946	207,301	29.7	64.4	5.9
2005	1,008,070	2,459,522	238,532	27.2	66.4	6.4
2010	990,796	2,644,998	269,518	25.4	67.7	6.9
2015	978,901	2,800,305	315,118	23.9	68.4	7.7
2020	972,384	2,914,904	383,936	22.8	68.2	9.0
2025	963,176	3,010,679	454,718	21.7	68.0	10.3
2030	947,630	3,073,198	542,084	20.8	67.3	11.9
2035	931,674	3,099,758	645,479	19.9	66.3	13.8
2040	922,368	3,109,737	738,446	19.3	65.2	15.5
2045	918,890	3,123,276	800,035	19.0	64.5	16.5
2050	913,671	3,113,548	863,601	18.7	63.6	17.7
			High Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,036,240	2,250,946	207,301	29.7	64.4	5.9
2005	1,006,207	2,457,291	236,949	27.2	66.4	6.4
2010	984,275	2,638,992	264,688	25.3	67.9	6.8
2015	967,863	2,788,150	305,139	23.8	68.7	7.5
2020	958,376	2,893,151	366,691	22.7	68.6	8.7
2025	946,337	2,975,593	428,612	21.8	68.4	9.9
2030	927,625	3,024,796	504,424	20.8	67.9	11.3
2035	907,431	3,039,731	592,789	20.0	67.0	13.1
2040	893,609	3,038,353	669,413	19.4	66.0	14.5
2045	885,971	3,039,565	716,682	19.1	65.5	15.4
2050	877,942	3,018,109	766,636	18.8	64.7	16.4
			Low Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,036,240	2,250,946	207,301	29.7	64.4	5.9
2005	1,012,712	2,463,057	241,661	27.2	66.3	6.5
2010	1,000,197	2,656,072	278,752	25.4	67.5	7.1
2015	993,654	2,822,603	332,764	23.9	68.0	8.0
2020	991,221	2,949,849	412,879	22.8	67.8	9.5
2025	984,334	3,057,071	496,731	21.7	67.4	10.9

Table A2

Summary of Alternative Population Projections — Asia

High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,049,734	2,250,946	207,301	29.9	64.2	5.9
2005	1,052,794	2,459,522	238,532	28.1	65.6	6.4
2010	1,081,465	2,644,998	269,518	27.1	66.2	6.7
2015	1,115,274	2,813,492	315,118	26.3	66.3	7.4
2020	1,149,251	2,958,890	383,936	25.6	65.9	8.5
2025	1,180,011	3,100,155	454,718	24.9	65.5	9.6
2030	1,207,120	3,221,076	542,084	24.3	64.8	10.9
2035	1,237,872	3,318,450	645,479	23.8	63.8	12.4
2040	1,277,252	3,413,288	738,446	23.5	62.9	13.6
2045	1,323,067	3,527,065	800,035	23.4	62.4	14.2
2050	1,366,965	3,633,705	863,601	23.3	62.0	14.7
			High Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,049,734	2,250,946	207,301	29.9	64.2	5.9
2005	1,050,759	2,457,291	236,949	28.1	65.6	6.3
2010	1,074,218	2,638,992	264,688	27.0	66.3	6.7
2015	1,102,611	2,801,240	305,139	26.2	66.6	7.2
2020	1,132,642	2,936,587	366,691	25.5	66.2	8.3
2025	1,159,229	3,063,612	428,612	24.9	65.9	9.2
2030	1,181,302	3,169,780	504,424	24.3	65.3	10.4
2035	1,205,130	3,253,433	592,789	23.9	64.4	11.7
2040	1,236,764	3,333,905	669,413	23.6	63.6	12.8
2045	1,274,961	3,431,202	716,682	23.5	63.3	13.2
2050	1,312,711	3,520,447	766,636	23.4	62.9	13.7
			Low Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,049,734	2,250,946	207,301	29.9	64.2	5.9
2005	1,057,747	2,463,057	241,661	28.1	65.5	6.4
2010	1,091,902	2,656,127	278,752	27.1	66.0	6.9
2015	1,132,217	2,836,109	332,764	26.3	65.9	7.7
2020	1,171,722	2,994,919	412,879	25.6	65.4	9.0
2025	1,206,194	3,149,052	496,731	24.9	64.9	10.2

Table A3

Summary of Alternative Population Projections — Asia
Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,022,125	2,250,946	207,301	29.4	64.7	6.0
2005	958,581	2,459,522	238,532	26.2	67.3	6.5
2010	886,467	2,644,998	269,518	23.3	69.6	7.1
2015	820,698	2,786,541	315,118	20.9	71.0	8.0
2020	775,793	2,866,209	383,936	19.3	71.2	9.5
2025	739,401	2,907,647	454,718	18.0	70.9	11.1
2030	698,028	2,903,053	542,084	16.8	70.1	13.1
2035	649,758	2,856,763	645,479	15.6	68.8	15.5
2040	606,277	2,785,794	738,446	14.7	67.4	17.9
2045	572,770	2,707,176	800,035	14.0	66.3	19.6
2050	543,577	2,593,419	863,601	13.6	64.8	21.6
			High Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,022,125	2,250,946	207,301	29.4	64.7	6.0
2005	956,961	2,457,291	236,949	26.2	67.3	6.5
2010	880,955	2,638,992	264,688	23.3	69.7	7.0
2015	811,817	2,774,468	305,139	20.9	71.3	7.8
2020	764,804	2,845,172	366,691	19.2	71.5	9.2
2025	726,493	2,874,510	428,612	18.0	71.3	10.6
2030	683,303	2,858,345	504,424	16.9	70.6	12.5
2035	633,098	2,802,592	592,789	15.7	69.6	14.7
2040	587,935	2,723,145	669,413	14.8	68.4	16.8
2045	552,973	2,636,117	716,682	14.2	67.5	18.3
2050	523,073	2,515,941	766,636	13.7	66.1	20.1
			Low Mortality Scenario			
1995	1,029,982	2,061,447	176,471	31.5	63.1	5.4
2000	1,022,125	2,250,946	207,301	29.4	64.7	6.0
2005	962,745	2,463,057	241,661	26.3	67.2	6.6
2010	894,541	2,656,005	278,752	23.4	69.4	7.3
2015	832,997	2,808,294	332,764	21.0	70.7	8.4
2020	790,800	2,899,462	412,879	19.3	70.7	10.1
2025	755,318	2,950,568	496,731	18.0	70.2	11.8

Table A4

Summary of Aging, Alternative Mortality Scenarios Asia

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	5.4	5.4	5.4	0.086	0.086	0.086
2000	5.9	5.9	5.9	0.092	0.092	0.092
2005	6.4	6.4	6.5	0.097	0.096	0.098
2010	6.9	6.8	7.1	0.102	0.100	0.105
2015	7.7	7.5	8.0	0.113	0.109	0.118
2020	9.0	8.7	9.5	0.132	0.127	0.140
2025	10.3	9.9	10.9	0.151	0.144	0.162
2030	11.9	11.3		0.176	0.167	
2035	13.8	13.1		0.208	0.195	
2040	15.5	14.5		0.237	0.220	
2045	16.5	15.4		0.256	0.236	
2050	17.7	16.4		0.277	0.254	
			High Fertility Scenario			
1995	5.4	5.4	5.4	0.086	0.086	0.086
2000	5.9	5.9	5.9	0.092	0.092	0.092
2005	6.4	6.3	6.4	0.097	0.096	0.098
2010	6.7	6.7	6.9	0.102	0.100	0.105
2015	7.4	7.2	7.7	0.112	0.109	0.117
2020	8.5	8.3	9.0	0.130	0.125	0.138
2025	9.6	9.2	10.2	0.147	0.140	0.158
2030	10.9	10.4		0.168	0.159	
2035	12.4	11.7		0.195	0.182	
2040	13.6	12.8		0.216	0.201	
2045	14.2	13.2		0.227	0.209	
2050	14.7	13.7		0.238	0.218	
			Low Fertility Scenario			
1995	5.4	5.4	5.4	0.086	0.086	0.086
2000	6.0	6.0	6.0	0.092	0.092	0.092
2005	6.5	6.5	6.6	0.097	0.096	0.098
2010	7.1	7.0	7.3	0.102	0.100	0.105
2015	8.0	7.8	8.4	0.113	0.110	0.118
2020	9.5	9.2	10.1	0.134	0.129	0.142
2025	11.1	10.6	11.8	0.156	0.149	0.168
2030	13.1	12.5		0.187	0.176	
2035	15.5	14.7		0.226	0.212	
2040	17.9	16.8		0.265	0.246	
2045	19.6	18.3		0.296	0.272	
2050	21.6	20.1		0.333	0.305	

Table A5

Total Dependency Ratio Asia

Fertility:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality:	High	High	High	Med	Med	Med	Low	Low	Low
1995	0.585	0.585	0.585	0.585	0.585	0.585	0.585	0.585	0.585
2000	0.558	0.552	0.546	0.558	0.552	0.546	0.558	0.552	0.546
2005	0.524	0.506	0.486	0.525	0.507	0.487	0.528	0.509	0.489
2010	0.507	0.473	0.434	0.511	0.476	0.437	0.516	0.482	0.442
2015	0.503	0.457	0.403	0.508	0.462	0.408	0.519	0.470	0.415
2020	0.511	0.458	0.398	0.518	0.465	0.405	0.537	0.476	0.415
2025	0.518	0.462	0.402	0.527	0.471	0.411	0.557	0.484	0.424
2030	0.532	0.473	0.416	0.543	0.485	0.427			
2035	0.553	0.494	0.437	0.568	0.509	0.453			
2040	0.572	0.514	0.462	0.591	0.534	0.483			
2045	0.580	0.527	0.482	0.602	0.550	0.507			
2050	0.591	0.545	0.513	0.614	0.571	0.543			

Table A6

Summary of Alternative Population Projections — East Asia

Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	354,957	1,015,871	114,366	23.9	68.4	7.7
2005	327,599	1,080,483	130,440	21.3	70.2	8.5
2010	316,241	1,125,580	145,916	19.9	70.9	9.2
2015	312,869	1,149,265	171,496	19.2	70.3	10.5
2020	311,515	1,148,553	210,223	18.6	68.8	12.6
2025	304,358	1,149,867	241,040	18.0	67.8	14.2
2030	291,858	1,134,311	282,797	17.1	66.4	16.5
2035	282,187	1,095,974	335,677	16.5	63.9	19.6
2040	277,990	1,057,304	375,746	16.2	61.8	22.0
2045	275,472	1,037,877	384,743	16.2	61.1	22.7
2050	270,398	1,016,758	388,315	16.1	60.7	23.2
			High Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	354,957	1,015,871	114,366	23.9	68.4	7.7
2005	327,276	1,079,904	129,540	21.3	70.3	8.4
2010	315,396	1,123,905	143,386	19.9	71.0	9.1
2015	311,321	1,146,306	166,430	19.2	70.6	10.2
2020	309,381	1,143,817	201,897	18.7	69.1	12.2
2025	301,682	1,142,683	228,674	18.0	68.3	13.7
2030	288,753	1,124,791	265,542	17.2	67.0	15.8
2035	278,599	1,084,833	311,962	16.6	64.8	18.6
2040	273,788	1,044,896	344,518	16.5	62.8	20.7
2045	270,675	1,023,939	347,610	16.5	62.4	21.2
2050	265,181	1,001,392	346,556	16.4	62.1	21.5
			Low Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	354,957	1,015,871	114,366	23.9	68.4	7.7
2005	328,119	1,081,576	132,051	21.3	70.2	8.6
2010	317,660	1,128,340	150,516	19.9	70.7	9.4
2015	315,388	1,154,531	179,999	19.1	70.0	10.9
2020	314,760	1,156,364	224,474	18.6	68.2	13.2
2025	307,728	1,159,871	261,456	17.8	67.1	15.1

Table A7

Summary of Alternative Population Projections — East Asia
High Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	356,805	1,015,871	114,366	24.0	68.3	7.7
2005	336,329	1,080,483	130,440	21.7	69.8	8.4
2010	334,398	1,125,580	145,916	20.8	70.1	9.1
2015	343,110	1,151,099	171,496	20.6	69.1	10.3
2020	353,688	1,157,226	210,223	20.5	67.2	12.2
2025	359,200	1,167,923	241,040	20.3	66.0	13.6
2030	357,581	1,166,223	282,797	19.8	64.5	15.7
2035	357,635	1,146,578	335,677	19.4	62.3	18.2
2040	364,025	1,129,866	375,746	19.5	60.4	20.1
2045	373,381	1,135,048	384,743	19.7	59.9	20.3
2050	379,632	1,142,162	388,315	19.9	59.8	20.3
			High Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	356,805	1,015,871	114,366	24.0	68.3	7.7
2005	335,986	1,079,904	129,540	21.7	69.9	8.4
2010	333,489	1,123,905	143,386	20.8	70.2	9.0
2015	341,407	1,148,137	166,430	20.6	69.3	10.1
2020	351,270	1,152,450	201,897	20.6	67.6	11.8
2025	356,052	1,160,623	228,674	20.4	66.5	13.1
2030	353,766	1,156,431	265,542	19.9	65.1	15.0
2035	353,029	1,134,908	311,962	19.6	63.1	17.3
2040	358,406	1,116,553	344,518	19.7	61.4	18.9
2045	366,726	1,119,694	347,610	20.0	61.1	19.0
2050	372,127	1,124,679	346,556	20.2	61.0	18.8
			Low Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	356,805	1,015,871	114,366	24.0	68.3	7.7
2005	336,877	1,081,576	132,051	21.7	69.8	8.5
2010	335,915	1,128,347	150,516	20.8	69.9	9.3
2015	345,880	1,156,409	179,999	20.6	68.7	10.7
2020	357,405	1,165,192	224,474	20.5	66.7	12.8
2025	363,253	1,178,294	261,456	20.1	65.4	14.5

Table A8

Summary of Alternative Population Projections — East Asia

Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	353,112	1,015,871	114,366	23.8	68.5	7.7
2005	315,287	1,080,483	130,440	20.7	70.8	8.5
2010	285,985	1,125,580	145,916	18.4	72.3	9.4
2015	262,698	1,147,434	171,496	16.6	72.5	10.8
2020	250,116	1,136,322	210,223	15.7	71.2	13.2
2025	238,327	1,119,778	241,040	14.9	70.0	15.1
2030	221,670	1,082,565	282,797	14.0	68.2	17.8
2035	203,342	1,022,690	335,677	13.0	65.5	21.5
2040	188,265	961,640	375,746	12.3	63.0	24.6
2045	177,179	916,552	384,743	12.0	62.0	26.0
2050	167,489	865,469	388,315	11.8	60.9	27.3
			High Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	353,112	1,015,871	114,366	23.8	68.5	7.7
2005	314,988	1,079,904	129,540	20.7	70.8	8.5
2010	285,241	1,123,905	143,386	18.4	72.4	9.2
2015	261,404	1,144,479	166,430	16.6	72.8	10.6
2020	248,417	1,131,639	201,897	15.7	71.5	12.8
2025	236,264	1,112,782	228,674	15.0	70.5	14.5
2030	219,364	1,073,491	265,542	14.1	68.9	17.0
2035	200,833	1,012,350	311,962	13.2	66.4	20.5
2040	185,529	950,483	344,518	12.5	64.2	23.3
2045	174,233	904,445	347,610	12.2	63.4	24.4
2050	164,426	852,709	346,556	12.1	62.5	25.4
			Low Mortality Scenario			
1995	361,439	963,686	97,140	25.4	67.8	6.8
2000	353,112	1,015,871	114,366	23.8	68.5	7.7
2005	315,771	1,081,576	132,051	20.6	70.7	8.6
2010	287,204	1,128,329	150,516	18.3	72.0	9.6
2015	264,767	1,152,616	179,999	16.6	72.2	11.3
2020	252,660	1,143,846	224,474	15.6	70.6	13.8
2025	240,866	1,129,083	261,456	14.8	69.2	16.0

Table A9

Summary of Aging, Alternative Mortality Scenarios East Asia

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	6.8	6.8	6.8	0.101	0.101	0.101
2000	7.7	7.7	7.7	0.113	0.113	0.113
2005	8.5	8.4	8.6	0.121	0.120	0.122
2010	9.2	9.1	9.4	0.130	0.128	0.133
2015	10.5	10.2	10.9	0.149	0.145	0.156
2020	12.6	12.2	13.2	0.183	0.177	0.194
2025	14.2	13.7	15.1	0.210	0.200	0.225
2030	16.5	15.8		0.249	0.236	
2035	19.6	18.6		0.306	0.288	
2040	22.0	20.7		0.355	0.330	
2045	22.7	21.2		0.371	0.339	
2050	23.2	21.5		0.382	0.346	
			High Fertility Scenario			
1995	6.8	6.8	6.8	0.101	0.101	0.101
2000	7.7	7.7	7.7	0.113	0.113	0.113
2005	8.4	8.4	8.5	0.121	0.120	0.122
2010	9.1	9.0	9.3	0.130	0.128	0.133
2015	10.3	10.1	10.7	0.149	0.145	0.156
2020	12.2	11.8	12.8	0.182	0.175	0.193
2025	13.6	13.1	14.5	0.206	0.197	0.222
2030	15.7	15.0		0.242	0.230	
2035	18.2	17.3		0.293	0.275	
2040	20.1	18.9		0.333	0.309	
2045	20.3	19.0		0.339	0.310	
2050	20.3	18.8		0.340	0.308	
			Low Fertility Scenario			
1995	6.8	6.8	6.8	0.101	0.101	0.101
2000	7.7	7.7	7.7	0.113	0.113	0.113
2005	8.5	8.5	8.6	0.121	0.120	0.122
2010	9.4	9.2	9.6	0.130	0.128	0.133
2015	10.8	10.6	11.3	0.149	0.145	0.156
2020	13.2	12.8	13.8	0.185	0.178	0.196
2025	15.1	14.5	16.0	0.215	0.205	0.232
2030	17.8	17.0		0.261	0.247	
2035	21.5	20.5		0.328	0.308	
2040	24.6	23.3		0.391	0.362	
2045	26.0	24.4		0.420	0.384	
2050	27.3	25.4		0.449	0.406	

Table A10

Total Dependency Ratio East Asia

Fertility:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality:	High	High	High	Med	Med	Med	Low	Low	Low
1995	0.476	0.476	0.476	0.476	0.476	0.476	0.476	0.476	0.476
2000	0.464	0.462	0.460	0.464	0.462	0.460	0.464	0.462	0.460
2005	0.431	0.423	0.412	0.432	0.424	0.413	0.434	0.425	0.414
2010	0.424	0.408	0.381	0.427	0.411	0.384	0.431	0.415	0.388
2015	0.442	0.417	0.374	0.447	0.421	0.378	0.455	0.429	0.386
2020	0.480	0.447	0.398	0.487	0.454	0.405	0.503	0.466	0.417
2025	0.504	0.464	0.418	0.514	0.474	0.428	0.539	0.491	0.445
2030	0.536	0.493	0.452	0.549	0.507	0.466			
2035	0.586	0.544	0.507	0.605	0.564	0.527			
2040	0.630	0.592	0.558	0.655	0.618	0.587			
2045	0.638	0.604	0.577	0.668	0.636	0.613			
2050	0.639	0.611	0.599	0.672	0.648	0.642			

Table A11

Summary of Alternative Population Projections — Southeast Asia

Medium Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	163,276	330,762	24,499	31.5	63.8	4.7
2005	160,964	364,308	28,810	29.1	65.7	5.2
2010	158,354	396,836	32,956	26.9	67.5	5.6
2015	156,616	426,776	38,004	25.2	68.7	6.1
2020	156,544	450,483	46,347	24.0	68.9	7.1
2025	157,235	468,040	58,241	23.0	68.5	8.5
2030	156,887	481,935	71,918	22.1	67.8	10.1
2035	155,859	491,305	87,409	21.2	66.9	11.9
2040	154,670	497,301	102,944	20.5	65.9	13.6
2045	154,146	500,181	117,510	20.0	64.8	15.2
2050	154,164	500,281	131,080	19.6	63.7	16.7
			High Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	163,276	330,762	24,499	31.5	63.8	4.7
2005	160,597	363,912	28,641	29.0	65.8	5.2
2010	157,379	395,256	32,403	26.9	67.6	5.5
2015	154,953	423,636	36,837	25.2	68.8	6.0
2020	154,321	445,453	44,197	24.0	69.2	6.9
2025	154,426	460,925	54,588	23.1	68.8	8.1
2030	153,561	472,687	66,191	22.2	68.3	9.6
2035	152,021	480,027	79,079	21.4	67.5	11.1
2040	150,319	484,174	91,609	20.7	66.7	12.6
2045	149,285	485,418	102,931	20.2	65.8	14.0
2050	148,840	484,041	113,187	19.9	64.9	15.2
			Low Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	163,276	330,762	24,499	31.5	63.8	4.7
2005	161,587	365,381	29,165	29.1	65.7	5.2
2010	159,787	399,398	34,057	26.9	67.3	5.7
2015	158,929	431,143	40,399	25.2	68.4	6.4
2020	159,382	456,890	50,542	23.9	68.5	7.6
2025	160,215	476,485	64,754	22.8	67.9	9.2

Table A12

Summary of Alternative Population Projections — Southeast Asia
High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	166,674	330,762	24,499	31.9	63.4	4.7
2005	171,938	364,308	28,810	30.4	64.5	5.1
2010	179,623	396,836	32,956	29.5	65.1	5.4
2015	185,881	430,117	38,004	28.4	65.8	5.8
2020	191,136	461,309	46,347	27.4	66.0	6.6
2025	197,073	489,074	58,241	26.5	65.7	7.8
2030	204,214	514,222	71,918	25.8	65.1	9.1
2035	212,341	536,310	87,409	25.4	64.1	10.5
2040	220,406	557,637	102,944	25.0	63.3	11.7
2045	228,525	579,099	117,510	24.7	62.6	12.7
2050	236,965	600,849	131,080	24.5	62.0	13.5
High Mortality Scenario						
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	166,674	330,762	24,499	31.9	63.4	4.7
2005	171,527	363,912	28,641	30.4	64.5	5.1
2010	178,480	395,256	32,403	29.4	65.2	5.3
2015	183,862	426,942	36,837	28.4	65.9	5.7
2020	188,366	456,127	44,197	27.4	66.2	6.4
2025	193,490	481,577	54,588	26.5	66.0	7.5
2030	199,795	504,249	66,191	25.9	65.5	8.6
2035	206,945	523,850	79,079	25.6	64.7	9.8
2040	213,939	542,707	91,609	25.2	64.0	10.8
2045	220,964	561,677	102,931	25.0	63.4	11.6
2050	228,374	580,806	113,187	24.8	63.0	12.3
Low Mortality Scenario						
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	166,674	330,762	24,499	31.9	63.4	4.7
2005	172,641	365,381	29,165	30.4	64.4	5.1
2010	181,317	399,426	34,057	29.5	65.0	5.5
2015	188,673	434,605	40,399	28.4	65.5	6.1
2020	194,676	468,059	50,542	27.3	65.6	7.1
2025	200,962	498,236	64,754	26.3	65.2	8.5

Table A13

Summary of Alternative Population Projections — Southeast Asia

Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	159,730	330,762	24,499	31.0	64.2	4.8
2005	149,405	364,308	28,810	27.5	67.2	5.3
2010	136,502	396,836	32,956	24.1	70.1	5.8
2015	126,698	423,294	38,004	21.5	72.0	6.5
2020	121,751	439,081	46,347	20.1	72.3	7.6
2025	118,278	446,428	58,241	19.0	71.7	9.3
2030	113,048	448,858	71,918	17.8	70.8	11.3
2035	106,457	445,528	87,409	16.6	69.7	13.7
2040	99,666	437,263	102,944	15.6	68.3	16.1
2045	94,152	423,943	117,510	14.8	66.7	18.5
2050	89,816	405,987	131,080	14.3	64.8	20.9
			High Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	159,730	330,762	24,499	31.0	64.2	4.8
2005	149,085	363,912	28,641	27.5	67.2	5.3
2010	135,706	395,256	32,403	24.1	70.2	5.8
2015	125,417	420,188	36,837	21.5	72.1	6.3
2020	120,104	434,216	44,197	20.1	72.5	7.4
2025	116,245	439,721	54,588	19.0	72.0	8.9
2030	110,734	440,385	66,191	17.9	71.3	10.7
2035	103,959	435,502	79,079	16.8	70.4	12.8
2040	97,061	425,994	91,609	15.8	69.3	14.9
2045	91,449	411,824	102,931	15.1	67.9	17.0
2050	87,022	393,404	113,187	14.7	66.3	19.1
			Low Mortality Scenario			
1995	163,217	296,477	20,768	34.0	61.7	4.3
2000	159,730	330,762	24,499	31.0	64.2	4.8
2005	149,936	365,381	29,165	27.5	67.1	5.4
2010	137,639	399,364	34,057	24.1	69.9	6.0
2015	128,499	427,491	40,399	21.5	71.7	6.8
2020	123,865	445,022	50,542	20.0	71.8	8.2
2025	120,341	453,934	64,754	18.8	71.0	10.1

Table A14

Summary of Aging, Alternative Mortality Scenarios — Southeast Asia

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	4.3	4.3	4.3	0.070	0.070	0.070
2000	4.7	4.7	4.7	0.074	0.074	0.074
2005	5.2	5.2	5.2	0.079	0.079	0.080
2010	5.6	5.5	5.7	0.083	0.082	0.085
2015	6.1	6.0	6.4	0.089	0.087	0.094
2020	7.1	6.9	7.6	0.103	0.099	0.111
2025	8.5	8.1	9.2	0.124	0.118	0.136
2030	10.1	9.6		0.149	0.140	
2035	11.9	11.1		0.178	0.165	
2040	13.6	12.6		0.207	0.189	
2045	15.2	14.0		0.235	0.212	
2050	16.7	15.2		0.262	0.234	
			High Fertility Scenario			
1995	4.3	4.3	4.3	0.070	0.070	0.070
2000	4.7	4.7	4.7	0.074	0.074	0.074
2005	5.1	5.1	5.1	0.079	0.079	0.080
2010	5.4	5.3	5.5	0.083	0.082	0.085
2015	5.8	5.7	6.1	0.088	0.086	0.093
2020	6.6	6.4	7.1	0.100	0.097	0.108
2025	7.8	7.5	8.5	0.119	0.113	0.130
2030	9.1	8.6		0.140	0.131	
2035	10.5	9.8		0.163	0.151	
2040	11.7	10.8		0.185	0.169	
2045	12.7	11.6		0.203	0.183	
2050	13.5	12.3		0.218	0.195	
			Low Fertility Scenario			
1995	4.3	4.3	4.3	0.070	0.070	0.070
2000	4.8	4.8	4.8	0.074	0.074	0.074
2005	5.3	5.3	5.4	0.079	0.079	0.080
2010	5.8	5.8	6.0	0.083	0.082	0.085
2015	6.5	6.3	6.8	0.090	0.088	0.095
2020	7.6	7.4	8.2	0.106	0.102	0.114
2025	9.3	8.9	10.1	0.130	0.124	0.143
2030	11.3	10.7		0.160	0.150	
2035	13.7	12.8		0.196	0.182	
2040	16.1	14.9		0.235	0.215	
2045	18.5	17.0		0.277	0.250	
2050	20.9	19.1		0.323	0.288	

Table A15

Total Dependency Ratio — Southeast Asia

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621	0.621
2000	0.578	0.568	0.557	0.578	0.568	0.557	0.578	0.568	0.557
2005	0.550	0.520	0.488	0.551	0.521	0.489	0.552	0.522	0.490
2010	0.534	0.480	0.425	0.536	0.482	0.427	0.539	0.485	0.430
2015	0.517	0.453	0.386	0.521	0.456	0.389	0.531	0.462	0.395
2020	0.510	0.446	0.378	0.515	0.450	0.383	0.537	0.459	0.392
2025	0.515	0.453	0.389	0.522	0.460	0.395	0.558	0.472	0.408
2030	0.527	0.465	0.402	0.537	0.475	0.412			
2035	0.546	0.481	0.420	0.559	0.495	0.435			
2040	0.563	0.500	0.443	0.580	0.518	0.463			
2045	0.577	0.520	0.472	0.598	0.543	0.499			
2050	0.588	0.541	0.509	0.613	0.570	0.544			

Table A16

Summary of Alternative Population Projections — South Asia
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	518,008	904,313	68,435	34.7	60.7	4.6
2005	519,506	1,014,732	79,282	32.2	62.9	4.9
2010	516,201	1,122,582	90,645	29.8	64.9	5.2
2015	509,415	1,224,264	105,618	27.7	66.6	5.7
2020	504,325	1,315,868	127,366	25.9	67.6	6.5
2025	501,584	1,392,773	155,438	24.5	67.9	7.6
2030	498,884	1,456,953	187,368	23.3	68.0	8.7
2035	493,628	1,512,478	222,393	22.1	67.9	10.0
2040	489,708	1,555,132	259,757	21.2	67.5	11.3
2045	489,273	1,585,218	297,782	20.6	66.8	12.6
2050	489,108	1,596,509	344,206	20.1	65.7	14.2
			High Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	518,008	904,313	68,435	34.7	60.7	4.6
2005	518,173	1,013,331	78,746	32.2	62.9	4.9
2010	511,300	1,119,354	88,812	29.7	65.1	5.2
2015	501,478	1,216,963	101,887	27.5	66.9	5.6
2020	494,649	1,301,347	120,828	25.8	67.9	6.3
2025	489,952	1,368,888	144,931	24.5	68.3	7.2
2030	484,446	1,423,219	171,878	23.3	68.4	8.3
2035	475,621	1,468,865	200,881	22.2	68.5	9.4
2040	468,317	1,501,696	231,542	21.3	68.2	10.5
2045	465,056	1,522,227	261,932	20.7	67.7	11.6
2050	463,030	1,525,102	299,410	20.2	66.7	13.1
			Low Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	518,008	904,313	68,435	34.7	60.7	4.6
2005	522,993	1,016,394	80,499	32.3	62.7	5.0
2010	522,721	1,129,388	94,169	29.9	64.7	5.4
2015	519,481	1,238,680	112,562	27.8	66.2	6.0
2020	517,597	1,338,939	138,659	25.9	67.1	6.9
2025	517,101	1,423,957	172,301	24.5	67.4	8.2

Table A17

Summary of Alternative Population Projections — South Asia

High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	526,254	904,313	68,435	35.1	60.3	4.6
2005	544,528	1,014,732	79,282	33.2	61.9	4.8
2010	567,444	1,122,582	90,645	31.9	63.0	5.1
2015	586,283	1,232,275	105,618	30.5	64.0	5.5
2020	604,427	1,340,354	127,366	29.2	64.7	6.1
2025	623,739	1,443,158	155,438	28.1	64.9	7.0
2030	645,325	1,540,630	187,368	27.2	64.9	7.9
2035	667,896	1,635,562	222,393	26.4	64.8	8.8
2040	692,821	1,725,785	259,757	25.9	64.4	9.7
2045	721,161	1,812,918	297,782	25.5	64.0	10.5
2050	750,369	1,890,694	344,206	25.1	63.3	11.5
High Mortality Scenario						
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	526,254	904,313	68,435	35.1	60.3	4.6
2005	543,071	1,013,331	78,746	33.2	62.0	4.8
2010	561,928	1,119,354	88,812	31.7	63.2	5.0
2015	577,040	1,224,859	101,887	30.3	64.3	5.4
2020	592,726	1,325,386	120,828	29.1	65.0	5.9
2025	609,152	1,418,052	144,931	28.0	65.3	6.7
2030	626,480	1,504,569	171,878	27.2	65.3	7.5
2035	643,246	1,588,117	200,881	26.4	65.3	8.3
2040	662,223	1,666,288	231,542	25.9	65.1	9.0
2045	685,130	1,740,692	261,932	25.5	64.8	9.7
2050	710,021	1,805,682	299,410	25.2	64.1	10.6
Low Mortality Scenario						
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	526,254	904,313	68,435	35.1	60.3	4.6
2005	548,287	1,016,394	80,499	33.3	61.8	4.9
2010	574,738	1,129,435	94,169	32.0	62.8	5.2
2015	597,965	1,246,906	112,562	30.5	63.7	5.8
2020	620,374	1,364,185	138,659	29.2	64.3	6.5
2025	643,068	1,475,995	172,301	28.1	64.4	7.5

Table A18

Summary of Alternative Population Projections South Asia
Low Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	509,282	904,313	68,435	34.4	61.0	4.6
2005	493,889	1,014,732	79,282	31.1	63.9	5.0
2010	463,980	1,122,582	90,645	27.7	66.9	5.4
2015	431,302	1,215,813	105,618	24.6	69.4	6.0
2020	403,926	1,290,805	127,366	22.2	70.8	7.0
2025	382,797	1,341,441	155,438	20.4	71.4	8.3
2030	363,310	1,371,629	187,368	18.9	71.4	9.7
2035	339,959	1,388,545	222,393	17.4	71.2	11.4
2040	318,346	1,386,890	259,757	16.2	70.6	13.2
2045	301,439	1,366,681	297,782	15.3	69.5	15.1
2050	286,272	1,321,962	344,206	14.7	67.7	17.6
			High Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	509,282	904,313	68,435	34.4	61.0	4.6
2005	492,697	1,013,331	78,746	31.1	63.9	5.0
2010	459,743	1,119,354	88,812	27.6	67.1	5.3
2015	424,766	1,208,618	101,887	24.5	69.7	5.9
2020	396,328	1,276,769	120,828	22.1	71.2	6.7
2025	374,049	1,318,843	144,931	20.4	71.8	7.9
2030	352,914	1,340,340	171,878	18.9	71.9	9.2
2035	327,747	1,348,884	200,881	17.5	71.8	10.7
2040	304,693	1,339,521	231,542	16.2	71.4	12.3
2045	286,810	1,312,635	261,932	15.4	70.5	14.1
2050	271,325	1,263,308	299,410	14.8	68.9	16.3
			Low Mortality Scenario			
1995	505,326	801,284	58,563	37.0	58.7	4.3
2000	509,282	904,313	68,435	34.4	61.0	4.6
2005	497,069	1,016,394	80,499	31.2	63.8	5.1
2010	469,656	1,129,339	94,169	27.7	66.7	5.6
2015	439,691	1,229,949	112,562	24.7	69.0	6.3
2020	414,492	1,312,951	138,659	22.2	70.4	7.4
2025	394,549	1,370,669	172,301	20.4	70.7	8.9

Table A19

Summary of Aging, Alternative Mortality Scenarios South Asia

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
	Medium Fertility Scenario					
1995	4.3	4.3	4.3	0.073	0.073	0.073
2000	4.6	4.6	4.6	0.076	0.076	0.076
2005	4.9	4.9	5.0	0.078	0.078	0.079
2010	5.2	5.2	5.4	0.081	0.079	0.083
2015	5.7	5.6	6.0	0.086	0.084	0.091
2020	6.5	6.3	6.9	0.097	0.093	0.104
2025	7.6	7.2	8.2	0.112	0.106	0.121
2030	8.7	8.3		0.129	0.121	
2035	10.0	9.4		0.147	0.137	
2040	11.3	10.5		0.167	0.154	
2045	12.6	11.6		0.188	0.172	
2050	14.2	13.1		0.216	0.196	
	High Fertility Scenario					
1995	4.3	4.3	4.3	0.073	0.073	0.073
2000	4.6	4.6	4.6	0.076	0.076	0.076
2005	4.8	4.8	4.9	0.078	0.078	0.079
2010	5.1	5.0	5.2	0.081	0.079	0.083
2015	5.5	5.4	5.8	0.086	0.083	0.090
2020	6.1	5.9	6.5	0.095	0.091	0.102
2025	7.0	6.7	7.5	0.108	0.102	0.117
2030	7.9	7.5		0.122	0.114	
2035	8.8	8.3		0.136	0.126	
2040	9.7	9.0		0.151	0.139	
2045	10.5	9.7		0.164	0.150	
2050	11.5	10.6		0.182	0.166	
	Low Fertility Scenario					
1995	4.3	4.3	4.3	0.073	0.073	0.073
2000	4.6	4.6	4.6	0.076	0.076	0.076
2005	5.0	5.0	5.1	0.078	0.078	0.079
2010	5.4	5.3	5.6	0.081	0.079	0.083
2015	6.0	5.9	6.3	0.087	0.084	0.092
2020	7.0	6.7	7.4	0.099	0.095	0.106
2025	8.3	7.9	8.9	0.116	0.110	0.126
2030	9.7	9.2		0.137	0.128	
2035	11.4	10.7		0.160	0.149	
2040	13.2	12.3		0.187	0.173	
2045	15.1	14.1		0.218	0.200	
2050	17.6	16.3		0.260	0.237	

Table A20

Total Dependency Ratio — South Asia

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.704
2000	0.658	0.648	0.639	0.658	0.648	0.639	0.658	0.648	0.639
2005	0.614	0.589	0.564	0.615	0.590	0.565	0.619	0.594	0.568
2010	0.581	0.536	0.490	0.586	0.541	0.494	0.592	0.546	0.499
2015	0.554	0.496	0.436	0.561	0.502	0.442	0.574	0.510	0.449
2020	0.538	0.473	0.405	0.546	0.480	0.412	0.567	0.490	0.421
2025	0.532	0.464	0.394	0.540	0.472	0.401	0.573	0.484	0.414
2030	0.531	0.461	0.392	0.540	0.471	0.401			
2035	0.532	0.461	0.392	0.544	0.473	0.405			
2040	0.536	0.466	0.400	0.552	0.482	0.417			
2045	0.544	0.478	0.418	0.562	0.496	0.438			
2050	0.559	0.500	0.452	0.579	0.522	0.477			

Table A21

Summary of Alternative Population Projections — South Korea
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,068	33,623	3,152	21.5	71.8	6.7
2005	10,118	34,496	3,934	20.8	71.1	8.1
2010	9,882	35,455	4,639	19.8	70.9	9.3
2015	9,558	36,106	5,387	18.7	70.7	10.6
2020	9,213	36,314	6,366	17.8	70.0	12.3
2025	8,956	35,557	8,020	17.0	67.7	15.3
2030	8,827	34,506	9,564	16.7	65.2	18.1
2035	8,733	33,379	10,865	16.5	63.0	20.5
2040	8,592	32,083	12,020	16.3	60.9	22.8
2045	8,404	31,205	12,482	16.1	59.9	24.0
2050	8,209	30,401	12,656	16.0	59.3	24.7
High Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,068	33,623	3,152	21.5	71.8	6.7
2005	10,114	34,462	3,908	20.9	71.1	8.1
2010	9,872	35,362	4,562	19.8	71.0	9.2
2015	9,539	35,936	5,234	18.8	70.9	10.3
2020	9,178	36,017	6,097	17.9	70.2	11.9
2025	8,898	35,120	7,563	17.3	68.1	14.7
2030	8,746	33,955	8,870	17.0	65.8	17.2
2035	8,634	32,754	9,887	16.8	63.9	19.3
2040	8,479	31,442	10,757	16.7	62.0	21.2
2045	8,282	30,557	10,980	16.6	61.3	22.0
2050	8,084	29,772	10,966	16.6	61.0	22.5
Low Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,068	33,623	3,152	21.5	71.8	6.7
2005	10,124	34,553	3,981	20.8	71.0	8.2
2010	9,907	35,642	4,782	19.7	70.8	9.5
2015	9,609	36,468	5,687	18.6	70.4	11.0
2020	9,279	36,790	6,884	17.5	69.5	13.0
2025	9,027	36,060	8,817	16.7	66.9	16.4

Table A22

Summary of Alternative Population Projections — South Korea

High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,212	33,623	3,152	21.7	71.6	6.7
2005	10,547	34,496	3,934	21.5	70.4	8.0
2010	10,632	35,455	4,639	21.0	69.9	9.1
2015	10,508	36,249	5,387	20.2	69.5	10.3
2020	10,272	36,742	6,366	19.2	68.8	11.9
2025	10,297	36,303	8,020	18.9	66.5	14.7
2030	10,618	35,595	9,564	19.0	63.8	17.1
2035	11,039	34,859	10,865	19.4	61.4	19.1
2040	11,245	34,161	12,020	19.6	59.5	20.9
2045	11,263	34,070	12,482	19.5	58.9	21.6
2050	11,283	34,166	12,656	19.4	58.8	21.8
High Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,212	33,623	3,152	21.7	71.6	6.7
2005	10,543	34,462	3,908	21.6	70.5	8.0
2010	10,621	35,362	4,562	21.0	70.0	9.0
2015	10,486	36,078	5,234	20.2	69.7	10.1
2020	10,233	36,441	6,097	19.4	69.1	11.6
2025	10,231	35,860	7,563	19.1	66.8	14.1
2030	10,522	35,033	8,870	19.3	64.4	16.3
2035	10,914	34,217	9,887	19.8	62.2	18.0
2040	11,097	33,494	10,757	20.0	60.5	19.4
2045	11,101	33,384	10,980	20.0	60.2	19.8
2050	11,114	33,482	10,966	20.0	60.3	19.7
Low Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	10,212	33,623	3,152	21.7	71.6	6.7
2005	10,554	34,553	3,981	21.5	70.4	8.1
2010	10,659	35,642	4,782	20.9	69.8	9.4
2015	10,563	36,613	5,687	20.0	69.3	10.8
2020	10,344	37,220	6,884	19.0	68.4	12.6
2025	10,377	36,810	8,817	18.5	65.7	15.7

Table A23

Summary of Alternative Population Projections — South Korea
Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	9,925	33,623	3,152	21.3	72.0	6.7
2005	9,609	34,496	3,934	20.0	71.8	8.2
2010	8,907	35,455	4,639	18.2	72.4	9.5
2015	8,182	35,963	5,387	16.5	72.6	10.9
2020	7,577	35,808	6,366	15.2	72.0	12.8
2025	7,099	34,585	8,020	14.3	69.6	16.1
2030	6,728	32,994	9,564	13.7	66.9	19.4
2035	6,380	31,245	10,865	13.2	64.4	22.4
2040	5,986	29,267	12,020	12.7	61.9	25.4
2045	5,597	27,611	12,482	12.2	60.4	27.3
2050	5,251	25,940	12,656	12.0	59.1	28.9
High Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	9,925	33,623	3,152	21.3	72.0	6.7
2005	9,605	34,462	3,908	20.0	71.8	8.1
2010	8,899	35,362	4,562	18.2	72.4	9.3
2015	8,168	35,794	5,234	16.6	72.8	10.6
2020	7,549	35,514	6,097	15.4	72.2	12.4
2025	7,052	34,157	7,563	14.5	70.0	15.5
2030	6,664	32,459	8,870	13.9	67.6	18.5
2035	6,305	30,645	9,887	13.5	65.4	21.1
2040	5,906	28,662	10,757	13.0	63.2	23.7
2045	5,515	27,014	10,980	12.7	62.1	25.2
2050	5,169	25,377	10,966	12.5	61.1	26.4
Low Mortality Scenario						
1995	10,540	31,882	2,527	23.4	70.9	5.6
2000	9,925	33,623	3,152	21.3	72.0	6.7
2005	9,613	34,553	3,981	20.0	71.8	8.3
2010	8,928	35,641	4,782	18.1	72.2	9.7
2015	8,228	36,324	5,687	16.4	72.3	11.3
2020	7,634	36,280	6,884	15.0	71.4	13.6
2025	7,156	35,083	8,817	14.0	68.7	17.3

Table A24

Summary of Aging, Alternative Mortality Scenarios South Korea

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	5.6	5.6	5.6	0.079	0.079	0.079
2000	6.7	6.7	6.7	0.094	0.094	0.094
2005	8.1	8.1	8.2	0.114	0.113	0.115
2010	9.3	9.2	9.5	0.131	0.129	0.134
2015	10.6	10.3	11.0	0.149	0.146	0.156
2020	12.3	11.9	13.0	0.175	0.169	0.187
2025	15.3	14.7	16.4	0.226	0.215	0.245
2030	18.1	17.2		0.277	0.261	
2035	20.5	19.3		0.326	0.302	
2040	22.8	21.2		0.375	0.342	
2045	24.0	22.0		0.400	0.359	
2050	24.7	22.5		0.416	0.368	
			High Fertility Scenario			
1995	5.6	5.6	5.6	0.079	0.079	0.079
2000	6.7	6.7	6.7	0.094	0.094	0.094
2005	8.0	8.0	8.1	0.114	0.113	0.115
2010	9.1	9.0	9.4	0.131	0.129	0.134
2015	10.3	10.1	10.8	0.149	0.145	0.155
2020	11.9	11.6	12.6	0.173	0.167	0.185
2025	14.7	14.1	15.7	0.221	0.211	0.240
2030	17.1	16.3		0.269	0.253	
2035	19.1	18.0		0.312	0.289	
2040	20.9	19.4		0.352	0.321	
2045	21.6	19.8		0.366	0.329	
2050	21.8	19.7		0.370	0.328	
			Low Fertility Scenario			
1995	5.6	5.6	5.6	0.079	0.079	0.079
2000	6.7	6.7	6.7	0.094	0.094	0.094
2005	8.2	8.1	8.3	0.114	0.113	0.115
2010	9.5	9.3	9.7	0.131	0.129	0.134
2015	10.9	10.6	11.3	0.150	0.146	0.157
2020	12.8	12.4	13.6	0.178	0.172	0.190
2025	16.1	15.5	17.3	0.232	0.221	0.251
2030	19.4	18.5		0.290	0.273	
2035	22.4	21.1		0.348	0.323	
2040	25.4	23.7		0.411	0.375	
2045	27.3	25.2		0.452	0.406	
2050	28.9	26.4		0.488	0.432	

Table A25

Total Dependency Ratio South Korea

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410
2000	0.397	0.393	0.389	0.397	0.393	0.389	0.397	0.393	0.389
2005	0.419	0.407	0.392	0.420	0.407	0.393	0.421	0.408	0.393
2010	0.429	0.408	0.381	0.431	0.410	0.382	0.433	0.412	0.385
2015	0.436	0.411	0.374	0.438	0.414	0.377	0.446	0.419	0.383
2020	0.448	0.424	0.384	0.453	0.429	0.389	0.468	0.439	0.400
2025	0.496	0.469	0.428	0.505	0.477	0.437	0.532	0.495	0.455
2030	0.554	0.519	0.479	0.567	0.533	0.494			
2035	0.608	0.565	0.528	0.628	0.587	0.552			
2040	0.652	0.612	0.581	0.681	0.642	0.615			
2045	0.661	0.630	0.611	0.697	0.669	0.655			
2050	0.659	0.640	0.636	0.701	0.686	0.690			

Table A26

Summary of Alternative Population Projections — The Philippines
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,870	45,339	2,758	36.7	59.7	3.6
2005	28,752	51,403	3,295	34.5	61.6	3.9
2010	28,990	57,632	3,923	32.0	63.7	4.3
2015	27,971	63,887	4,874	28.9	66.0	5.0
2020	26,694	69,597	6,114	26.1	68.0	6.0
2025	26,222	74,242	7,788	24.2	68.6	7.2
2030	26,720	77,771	9,534	23.4	68.2	8.4
2035	27,436	80,315	11,565	23.0	67.3	9.7
2040	27,396	82,929	13,534	22.1	67.0	10.9
2045	26,815	84,790	16,032	21.0	66.4	12.6
2050	26,253	86,082	18,559	20.1	65.8	14.2
High Mortality Scenario						
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,870	45,339	2,758	36.7	59.7	3.6
2005	28,705	51,328	3,276	34.5	61.6	3.9
2010	28,842	57,339	3,858	32.0	63.7	4.3
2015	27,711	63,342	4,730	28.9	66.1	4.9
2020	26,361	68,775	5,839	26.1	68.1	5.8
2025	25,823	73,114	7,298	24.3	68.8	6.9
2030	26,257	76,311	8,745	23.6	68.6	7.9
2035	26,895	78,554	10,396	23.2	67.8	9.0
2040	26,787	80,869	11,932	22.4	67.6	10.0
2045	26,167	82,507	13,882	21.4	67.3	11.3
2050	25,585	83,605	15,802	20.5	66.9	12.6
Low Mortality Scenario						
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,870	45,339	2,758	36.7	59.7	3.6
2005	28,847	51,597	3,335	34.4	61.6	4.0
2010	29,199	58,038	4,053	32.0	63.6	4.4
2015	28,290	64,541	5,190	28.9	65.8	5.3
2020	27,093	70,515	6,691	26.0	67.6	6.4
2025	26,620	75,423	8,736	24.0	68.1	7.9

Table A27

Summary of Alternative Population Projections — The Philippines
High Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	28,417	45,339	2,758	37.1	59.3	3.6
2005	30,148	51,403	3,295	35.5	60.6	3.9
2010	31,598	57,632	3,923	33.9	61.9	4.2
2015	31,687	64,428	4,874	31.4	63.8	4.8
2020	31,659	70,982	6,114	29.1	65.3	5.6
2025	32,448	76,832	7,788	27.7	65.6	6.7
2030	34,213	82,000	9,534	27.2	65.2	7.6
2035	36,204	86,627	11,565	26.9	64.5	8.6
2040	37,529	91,694	13,534	26.3	64.2	9.5
2045	38,349	96,446	16,032	25.4	63.9	10.6
2050	39,235	101,071	18,559	24.7	63.6	11.7
			High Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	28,417	45,339	2,758	37.1	59.3	3.6
2005	30,096	51,328	3,276	35.5	60.6	3.9
2010	31,429	57,339	3,858	33.9	61.9	4.2
2015	31,381	63,875	4,730	31.4	63.9	4.7
2020	31,247	70,135	5,839	29.1	65.4	5.4
2025	31,926	75,644	7,298	27.8	65.9	6.4
2030	33,579	80,417	8,745	27.4	65.5	7.1
2035	35,429	84,652	10,396	27.2	64.9	8.0
2040	36,605	89,299	11,932	26.6	64.8	8.7
2045	37,294	93,670	13,882	25.7	64.7	9.6
2050	38,066	97,897	15,802	25.1	64.5	10.4
			Low Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	28,417	45,339	2,758	37.1	59.3	3.6
2005	30,253	51,597	3,335	35.5	60.6	3.9
2010	31,841	58,046	4,053	33.9	61.8	4.3
2015	32,075	65,116	5,190	31.3	63.6	5.1
2020	32,169	71,994	6,691	29.0	64.9	6.0
2025	33,002	78,198	8,736	27.5	65.2	7.3

Table A28

Summary of Alternative Population Projections — The Philippines
Low Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,596	45,339	2,758	36.5	59.9	3.6
2005	27,827	51,403	3,295	33.7	62.3	4.0
2010	26,950	57,632	3,923	30.5	65.1	4.4
2015	24,504	63,616	4,874	26.4	68.4	5.2
2020	21,803	68,680	6,114	22.6	71.1	6.3
2025	20,150	72,216	7,788	20.1	72.1	7.8
2030	19,774	74,055	9,534	19.1	71.6	9.2
2035	19,703	74,540	11,565	18.6	70.5	10.9
2040	18,812	74,874	13,534	17.5	69.8	12.6
2045	17,387	74,187	16,032	16.2	68.9	14.9
2050	16,005	72,652	18,559	14.9	67.8	17.3
			High Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,596	45,339	2,758	36.5	59.9	3.6
2005	27,784	51,328	3,276	33.7	62.3	4.0
2010	26,819	57,339	3,858	30.5	65.1	4.4
2015	24,291	63,075	4,730	26.4	68.5	5.1
2020	21,555	67,876	5,839	22.6	71.2	6.1
2025	19,876	71,138	7,298	20.2	72.4	7.4
2030	19,469	72,709	8,745	19.3	72.0	8.7
2035	19,359	72,984	10,396	18.8	71.0	10.1
2040	18,456	73,136	11,932	17.8	70.6	11.5
2045	17,058	72,371	13,882	16.5	70.1	13.4
2050	15,724	70,820	15,802	15.4	69.2	15.4
			Low Mortality Scenario			
1995	26,213	39,779	2,362	38.3	58.2	3.5
2000	27,596	45,339	2,758	36.5	59.9	3.6
2005	27,914	51,597	3,335	33.7	62.3	4.0
2010	27,119	58,033	4,053	30.4	65.1	4.5
2015	24,740	64,236	5,190	26.3	68.2	5.5
2020	22,085	69,476	6,691	22.5	70.7	6.8
2025	20,391	73,138	8,736	19.9	71.5	8.5

Table A29

Summary of Aging, Alternative Mortality Scenarios — The Philippines

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
Medium Fertility Scenario						
1995	3.5	3.5	3.5	0.059	0.059	0.059
2000	3.6	3.6	3.6	0.061	0.061	0.061
2005	3.9	3.9	4.0	0.064	0.064	0.065
2010	4.3	4.3	4.4	0.068	0.067	0.070
2015	5.0	4.9	5.3	0.076	0.075	0.080
2020	6.0	5.8	6.4	0.088	0.085	0.095
2025	7.2	6.9	7.9	0.105	0.100	0.116
2030	8.4	7.9		0.123	0.115	
2035	9.7	9.0		0.144	0.132	
2040	10.9	10.0		0.163	0.148	
2045	12.6	11.3		0.189	0.168	
2050	14.2	12.6		0.216	0.189	
High Fertility Scenario						
1995	3.5	3.5	3.5	0.059	0.059	0.059
2000	3.6	3.6	3.6	0.061	0.061	0.061
2005	3.9	3.9	3.9	0.064	0.064	0.065
2010	4.2	4.2	4.3	0.068	0.067	0.070
2015	4.8	4.7	5.1	0.076	0.074	0.080
2020	5.6	5.4	6.0	0.086	0.083	0.093
2025	6.7	6.4	7.3	0.101	0.096	0.112
2030	7.6	7.1		0.116	0.109	
2035	8.6	8.0		0.133	0.123	
2040	9.5	8.7		0.148	0.134	
2045	10.6	9.6		0.166	0.148	
2050	11.7	10.4		0.184	0.161	
Low Fertility Scenario						
1995	3.5	3.5	3.5	0.059	0.059	0.059
2000	3.6	3.6	3.6	0.061	0.061	0.061
2005	4.0	4.0	4.0	0.064	0.064	0.065
2010	4.4	4.4	4.5	0.068	0.067	0.070
2015	5.2	5.1	5.5	0.077	0.075	0.081
2020	6.3	6.1	6.8	0.089	0.086	0.096
2025	7.8	7.4	8.5	0.108	0.103	0.119
2030	9.2	8.7		0.129	0.120	
2035	10.9	10.1		0.155	0.142	
2040	12.6	11.5		0.181	0.163	
2045	14.9	13.4		0.216	0.192	
2050	17.3	15.4		0.255	0.223	

Table A30

Total Dependency Ratio | The Philippines

Fertility:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality:	High	High	High	Med	Med	Med	Low	Low	Low
1995	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.718
2000	0.688	0.676	0.669	0.688	0.676	0.669	0.688	0.676	0.669
2005	0.650	0.623	0.605	0.651	0.623	0.605	0.651	0.624	0.606
2010	0.615	0.570	0.535	0.616	0.571	0.536	0.618	0.573	0.537
2015	0.565	0.512	0.460	0.567	0.514	0.462	0.577	0.519	0.466
2020	0.529	0.468	0.404	0.532	0.471	0.406	0.551	0.479	0.414
2025	0.519	0.453	0.382	0.524	0.458	0.387	0.553	0.469	0.398
2030	0.526	0.459	0.388	0.534	0.466	0.396			
2035	0.541	0.475	0.408	0.551	0.486	0.419			
2040	0.544	0.479	0.416	0.557	0.494	0.432			
2045	0.546	0.485	0.428	0.564	0.505	0.450			
2050	0.550	0.495	0.445	0.572	0.521	0.476			

Table A31

Summary of Alternative Population Projections — Thailand
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,489	42,334	3,576	25.2	68.9	5.8
2005	14,498	45,203	4,288	22.7	70.6	6.7
2010	14,343	47,215	4,953	21.6	71.0	7.4
2015	14,259	48,792	5,821	20.7	70.8	8.5
2020	14,061	49,744	7,170	19.8	70.1	10.1
2025	13,733	50,060	8,924	18.9	68.8	12.3
2030	13,372	49,743	10,914	18.1	67.2	14.7
2035	13,091	48,615	13,155	17.5	64.9	17.6
2040	12,899	47,251	15,030	17.2	62.9	20.0
2045	12,688	45,799	16,427	16.9	61.1	21.9
2050	12,431	44,680	17,077	16.8	60.2	23.0
High Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,489	42,334	3,576	25.2	68.9	5.8
2005	14,474	45,161	4,273	22.6	70.7	6.7
2010	14,275	46,956	4,883	21.6	71.0	7.4
2015	14,142	48,256	5,663	20.8	70.9	8.3
2020	13,907	48,934	6,842	20.0	70.2	9.8
2025	13,544	49,018	8,346	19.1	69.1	11.8
2030	13,173	48,571	10,058	18.3	67.6	14.0
2035	12,887	47,425	12,030	17.8	65.6	16.6
2040	12,688	46,105	13,681	17.5	63.6	18.9
2045	12,462	44,725	14,956	17.3	62.0	20.7
2050	12,193	43,671	15,542	17.1	61.2	21.8
Low Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,489	42,334	3,576	25.2	68.9	5.8
2005	14,544	45,399	4,337	22.6	70.6	6.7
2010	14,434	47,679	5,108	21.5	70.9	7.6
2015	14,389	49,456	6,137	20.6	70.7	8.8
2020	14,207	50,492	7,636	19.6	69.8	10.6
2025	13,868	50,824	9,541	18.7	68.5	12.9

Table A32

Summary of Alternative Population Projections Thailand
High Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
	Standard Mortality Scenario					
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,935	42,334	3,576	25.8	68.5	5.8
2005	15,660	45,203	4,288	24.0	69.4	6.6
2010	16,363	47,215	4,953	23.9	68.9	7.2
2015	16,683	49,231	5,821	23.3	68.6	8.1
2020	16,715	50,892	7,170	22.4	68.1	9.6
2025	16,973	52,056	8,924	21.8	66.8	11.4
2030	17,546	52,569	10,914	21.7	64.9	13.5
2035	18,230	52,362	13,155	21.8	62.5	15.7
2040	18,608	52,406	15,030	21.6	60.9	17.5
2045	18,914	52,682	16,427	21.5	59.8	18.7
2050	19,422	53,405	17,077	21.6	59.4	19.0
	High Mortality Scenario					
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,935	42,334	3,576	25.8	68.5	5.8
2005	15,633	45,161	4,273	24.0	69.4	6.6
2010	16,286	46,956	4,883	23.9	68.9	7.2
2015	16,548	48,692	5,663	23.3	68.7	8.0
2020	16,534	50,074	6,842	22.5	68.2	9.3
2025	16,740	50,997	8,346	22.0	67.0	11.0
2030	17,286	51,365	10,058	22.0	65.3	12.8
2035	17,947	51,121	12,030	22.1	63.0	14.8
2040	18,305	51,179	13,681	22.0	61.5	16.5
2045	18,579	51,492	14,956	21.9	60.6	17.6
2050	19,050	52,243	15,542	21.9	60.2	17.9
	Low Mortality Scenario					
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,935	42,334	3,576	25.8	68.5	5.8
2005	15,710	45,399	4,337	24.0	69.4	6.6
2010	16,467	47,679	5,108	23.8	68.8	7.4
2015	16,834	49,896	6,137	23.1	68.5	8.4
2020	16,889	51,645	7,636	22.2	67.8	10.0
2025	17,140	52,837	9,541	21.6	66.4	12.0

Table A33

Summary of Alternative Population Projections — Thailand

Low Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
Standard Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,211	42,334	3,576	24.9	69.3	5.9
2005	13,640	45,203	4,288	21.6	71.6	6.8
2010	12,749	47,215	4,953	19.6	72.7	7.6
2015	12,041	48,518	5,821	18.1	73.1	8.8
2020	11,354	48,898	7,170	16.8	72.5	10.6
2025	10,589	48,486	8,924	15.6	71.3	13.1
2030	9,820	47,281	10,914	14.4	69.5	16.0
2035	9,170	45,109	13,155	13.6	66.9	19.5
2040	8,609	42,602	15,030	13.0	64.3	22.7
2045	8,076	39,884	16,427	12.5	61.9	25.5
2050	7,549	37,388	17,077	12.2	60.3	27.5
High Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,211	42,334	3,576	24.9	69.3	5.9
2005	13,618	45,161	4,273	21.6	71.6	6.8
2010	12,688	46,956	4,883	19.7	72.8	7.6
2015	11,942	47,983	5,663	18.2	73.2	8.6
2020	11,230	48,093	6,842	17.0	72.7	10.3
2025	10,443	47,456	8,346	15.8	71.6	12.6
2030	9,674	46,138	10,058	14.7	70.0	15.3
2035	9,027	43,968	12,030	13.9	67.6	18.5
2040	8,467	41,530	13,681	13.3	65.2	21.5
2045	7,933	38,910	14,956	12.8	63.0	24.2
2050	7,404	36,509	15,542	12.5	61.4	26.1
Low Mortality Scenario						
1995	16,397	39,279	2,934	28.0	67.0	5.0
2000	15,211	42,334	3,576	24.9	69.3	5.9
2005	13,684	45,399	4,337	21.6	71.6	6.8
2010	12,829	47,679	5,108	19.6	72.7	7.8
2015	12,151	49,181	6,137	18.0	72.9	9.1
2020	11,472	49,640	7,636	16.7	72.2	11.1
2025	10,694	49,235	9,541	15.4	70.9	13.7

Table A34

Summary of Aging, Alternative Mortality Scenarios — Thailand

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
Medium Fertility Scenario						
1995	5.0	5.0	5.0	0.075	0.075	0.075
2000	5.8	5.8	5.8	0.084	0.084	0.084
2005	6.7	6.7	6.7	0.095	0.095	0.096
2010	7.4	7.4	7.6	0.105	0.104	0.107
2015	8.5	8.3	8.8	0.119	0.117	0.124
2020	10.1	9.8	10.6	0.144	0.140	0.151
2025	12.3	11.8	12.9	0.178	0.170	0.188
2030	14.7	14.0		0.219	0.207	
2035	17.6	16.6		0.271	0.254	
2040	20.0	18.9		0.318	0.297	
2045	21.9	20.7		0.359	0.334	
2050	23.0	21.8		0.382	0.356	
High Fertility Scenario						
1995	5.0	5.0	5.0	0.075	0.075	0.075
2000	5.8	5.8	5.8	0.084	0.084	0.084
2005	6.6	6.6	6.6	0.095	0.095	0.096
2010	7.2	7.2	7.4	0.105	0.104	0.107
2015	8.1	8.0	8.4	0.118	0.116	0.123
2020	9.6	9.3	10.0	0.141	0.137	0.148
2025	11.4	11.0	12.0	0.171	0.164	0.181
2030	13.5	12.8		0.208	0.196	
2035	15.7	14.8		0.251	0.235	
2040	17.5	16.5		0.287	0.267	
2045	18.7	17.6		0.312	0.290	
2050	19.0	17.9		0.320	0.297	
Low Fertility Scenario						
1995	5.0	5.0	5.0	0.075	0.075	0.075
2000	5.9	5.9	5.9	0.084	0.084	0.084
2005	6.8	6.8	6.8	0.095	0.095	0.096
2010	7.6	7.6	7.8	0.105	0.104	0.107
2015	8.8	8.6	9.1	0.120	0.118	0.125
2020	10.6	10.3	11.1	0.147	0.142	0.154
2025	13.1	12.6	13.7	0.184	0.176	0.194
2030	16.0	15.3		0.231	0.218	
2035	19.5	18.5		0.292	0.274	
2040	22.7	21.5		0.353	0.329	
2045	25.5	24.2		0.412	0.384	
2050	27.5	26.1		0.457	0.426	

Table A35

Total Dependency Ratio Thailand

Fertility:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality:	High	High	High	Med	Med	Med	Low	Low	Low
1995	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492
2000	0.461	0.450	0.444	0.461	0.450	0.444	0.461	0.450	0.444
2005	0.441	0.415	0.396	0.441	0.416	0.397	0.442	0.416	0.397
2010	0.451	0.408	0.374	0.451	0.409	0.375	0.453	0.410	0.376
2015	0.456	0.410	0.367	0.457	0.412	0.368	0.464	0.415	0.372
2020	0.467	0.424	0.376	0.469	0.427	0.379	0.486	0.433	0.385
2025	0.492	0.447	0.396	0.497	0.453	0.402	0.525	0.461	0.411
2030	0.532	0.478	0.428	0.541	0.488	0.439			
2035	0.586	0.525	0.479	0.599	0.540	0.495			
2040	0.625	0.572	0.533	0.642	0.591	0.555			
2045	0.651	0.613	0.588	0.671	0.636	0.614			
2050	0.662	0.635	0.628	0.683	0.660	0.659			

Table A36

Summary of Alternative Population Projections — Indonesia

Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	64,926	137,181	10,001	30.6	64.7	4.7
2005	63,923	149,532	12,021	28.4	66.3	5.3
2010	62,753	161,275	13,984	26.4	67.8	5.9
2015	61,774	172,825	15,785	24.7	69.0	6.3
2020	61,918	181,603	18,770	23.6	69.2	7.2
2025	62,562	187,802	23,079	22.9	68.7	8.4
2030	62,538	193,034	27,950	22.1	68.1	9.9
2035	62,182	196,431	33,814	21.3	67.2	11.6
2040	61,872	197,838	40,411	20.6	65.9	13.5
2045	61,870	198,332	46,388	20.2	64.7	15.1
2050	62,050	198,307	51,495	19.9	63.6	16.5
			High Mortality Scenario			
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	64,926	137,181	10,001	30.6	64.7	4.7
2005	63,744	149,301	11,950	28.3	66.4	5.3
2010	62,291	160,551	13,743	26.3	67.9	5.8
2015	61,017	171,492	15,302	24.6	69.2	6.2
2020	60,938	179,518	17,945	23.6	69.5	6.9
2025	61,355	184,821	21,728	22.9	69.0	8.1
2030	61,139	189,074	25,809	22.1	68.5	9.4
2035	60,565	191,517	30,569	21.4	67.8	10.8
2040	60,024	192,119	35,731	20.9	66.7	12.4
2045	59,783	191,882	40,141	20.5	65.8	13.8
2050	59,764	191,192	43,598	20.3	64.9	14.8
			Low Mortality Scenario			
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	64,926	137,181	10,001	30.6	64.7	4.7
2005	64,207	149,993	12,173	28.4	66.3	5.4
2010	63,367	162,318	14,419	26.4	67.6	6.0
2015	62,740	174,672	16,743	24.7	68.7	6.6
2020	63,072	184,412	20,584	23.5	68.8	7.7
2025	63,776	191,542	26,041	22.7	68.1	9.3

Table A37

Summary of Alternative Population Projections — Indonesia
High Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
Standard Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	66,425	137,181	10,001	31.1	64.2	4.7
2005	68,805	149,532	12,021	29.9	64.9	5.2
2010	72,209	161,275	13,984	29.2	65.2	5.7
2015	74,639	174,302	15,785	28.2	65.8	6.0
2020	76,920	186,431	18,770	27.3	66.1	6.7
2025	79,601	197,169	23,079	26.5	65.8	7.7
2030	82,684	207,255	27,950	26.0	65.2	8.8
2035	86,161	216,106	33,814	25.6	64.3	10.1
2040	89,726	224,048	40,411	25.3	63.3	11.4
2045	93,303	232,449	46,388	25.1	62.5	12.5
2050	96,961	241,635	51,495	24.9	61.9	13.2
High Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	66,425	137,181	10,001	31.1	64.2	4.7
2005	68,600	149,301	11,950	29.8	65.0	5.2
2010	71,652	160,551	13,743	29.1	65.3	5.6
2015	73,697	172,948	15,302	28.1	66.0	5.8
2020	75,682	184,254	17,945	27.2	66.3	6.5
2025	78,044	193,973	21,728	26.6	66.0	7.4
2030	80,788	202,912	25,809	26.1	65.6	8.3
2035	83,818	210,595	30,569	25.8	64.8	9.4
2040	86,879	217,440	35,731	25.5	63.9	10.5
2045	89,951	224,701	40,141	25.4	63.3	11.3
2050	93,174	232,662	43,598	25.2	63.0	11.8
Low Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	66,425	137,181	10,001	31.1	64.2	4.7
2005	69,133	149,993	12,173	29.9	64.8	5.3
2010	72,948	162,336	14,419	29.2	65.0	5.8
2015	75,821	176,221	16,743	28.2	65.6	6.2
2020	78,394	189,420	20,584	27.2	65.7	7.1
2025	81,241	201,272	26,041	26.3	65.2	8.4

Table A38

Summary of Alternative Population Projections — Indonesia

Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	63,396	137,181	10,001	30.1	65.1	4.7
2005	58,793	149,532	12,021	26.7	67.9	5.5
2010	52,790	161,275	13,984	23.1	70.7	6.1
2015	48,315	171,319	15,785	20.5	72.8	6.7
2020	46,641	176,532	18,770	19.3	73.0	7.8
2025	45,954	177,932	23,079	18.6	72.0	9.3
2030	43,847	178,195	27,950	17.5	71.3	11.2
2035	40,967	176,243	33,814	16.3	70.2	13.5
2040	38,257	171,560	40,411	15.3	68.6	16.1
2045	36,260	165,051	46,388	14.6	66.6	18.7
2050	34,733	157,226	51,495	14.3	64.6	21.2
High Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	63,396	137,181	10,001	30.1	65.1	4.7
2005	58,644	149,301	11,950	26.7	67.9	5.4
2010	52,431	160,551	13,743	23.1	70.8	6.1
2015	47,756	170,006	15,302	20.5	72.9	6.6
2020	45,931	174,546	17,945	19.3	73.2	7.5
2025	45,089	175,185	21,728	18.6	72.4	9.0
2030	42,900	174,647	25,809	17.6	71.8	10.6
2035	39,977	171,960	30,569	16.5	70.9	12.6
2040	37,240	166,756	35,731	15.5	69.6	14.9
2045	35,193	159,895	40,141	15.0	68.0	17.1
2050	33,617	151,908	43,598	14.7	66.3	19.0
Low Mortality Scenario						
1995	65,041	123,892	8,532	32.9	62.7	4.3
2000	63,396	137,181	10,001	30.1	65.1	4.7
2005	59,027	149,993	12,173	26.7	67.8	5.5
2010	53,259	162,294	14,419	23.2	70.6	6.3
2015	49,049	173,061	16,743	20.5	72.5	7.0
2020	47,459	179,087	20,584	19.2	72.5	8.3
2025	46,728	181,180	26,041	18.4	71.3	10.3

Table A39

Summary of Aging, Alternative Mortality Scenarios — Indonesia

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
Medium Fertility Scenario						
1995	4.3	4.3	4.3	0.069	0.069	0.069
2000	4.7	4.7	4.7	0.073	0.073	0.073
2005	5.3	5.3	5.4	0.080	0.080	0.081
2010	5.9	5.8	6.0	0.087	0.086	0.089
2015	6.3	6.2	6.6	0.091	0.089	0.096
2020	7.2	6.9	7.7	0.103	0.100	0.112
2025	8.4	8.1	9.3	0.123	0.118	0.136
2030	9.9	9.4		0.145	0.137	
2035	11.6	10.8		0.172	0.160	
2040	13.5	12.4		0.204	0.186	
2045	15.1	13.8		0.234	0.209	
2050	16.5	14.8		0.260	0.228	
High Fertility Scenario						
1995	4.3	4.3	4.3	0.069	0.069	0.069
2000	4.7	4.7	4.7	0.073	0.073	0.073
2005	5.2	5.2	5.3	0.080	0.080	0.081
2010	5.7	5.6	5.8	0.087	0.086	0.089
2015	6.0	5.8	6.2	0.091	0.088	0.095
2020	6.7	6.5	7.1	0.101	0.097	0.109
2025	7.7	7.4	8.4	0.117	0.112	0.129
2030	8.8	8.3		0.135	0.127	
2035	10.1	9.4		0.156	0.145	
2040	11.4	10.5		0.180	0.164	
2045	12.5	11.3		0.200	0.179	
2050	13.2	11.8		0.213	0.187	
Low Fertility Scenario						
1995	4.3	4.3	4.3	0.069	0.069	0.069
2000	4.7	4.7	4.7	0.073	0.073	0.073
2005	5.5	5.4	5.5	0.080	0.080	0.081
2010	6.1	6.1	6.3	0.087	0.086	0.089
2015	6.7	6.6	7.0	0.092	0.090	0.097
2020	7.8	7.5	8.3	0.106	0.103	0.115
2025	9.3	9.0	10.3	0.130	0.124	0.144
2030	11.2	10.6		0.157	0.148	
2035	13.5	12.6		0.192	0.178	
2040	16.1	14.9		0.236	0.214	
2045	18.7	17.1		0.281	0.251	
2050	21.2	19.0		0.328	0.287	

Table A40

Total Dependency Ratio Indonesia

Fertility:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality:	High	High	High	Med	Med	Med	Low	Low	Low
1995	0.594	0.594	0.594	0.594	0.594	0.594	0.594	0.594	0.594
2000	0.557	0.546	0.535	0.557	0.546	0.535	0.557	0.546	0.535
2005	0.540	0.507	0.473	0.541	0.508	0.474	0.542	0.509	0.475
2010	0.532	0.474	0.412	0.534	0.476	0.414	0.538	0.479	0.417
2015	0.515	0.445	0.371	0.519	0.449	0.374	0.530	0.455	0.380
2020	0.508	0.439	0.366	0.513	0.444	0.371	0.537	0.454	0.380
2025	0.514	0.450	0.381	0.521	0.456	0.388	0.560	0.469	0.402
2030	0.525	0.460	0.393	0.534	0.469	0.403			
2035	0.543	0.476	0.410	0.555	0.489	0.424			
2040	0.564	0.498	0.438	0.581	0.517	0.459			
2045	0.579	0.521	0.471	0.601	0.546	0.501			
2050	0.588	0.541	0.508	0.614	0.573	0.548			

Table A41

Summary of Alternative Population Projections — India

Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	337,607	625,589	50,461	33.3	61.7	5.0
2005	335,390	693,626	58,437	30.8	63.8	5.4
2010	323,604	761,473	67,077	28.1	66.1	5.8
2015	311,090	822,753	77,808	25.7	67.9	6.4
2020	305,228	874,247	92,672	24.0	68.7	7.3
2025	306,458	912,057	111,908	23.0	68.6	8.4
2030	308,436	940,539	133,711	22.3	68.0	9.7
2035	304,976	965,757	157,236	21.4	67.6	11.0
2040	300,506	985,477	181,062	20.5	67.2	12.3
2045	298,702	998,666	203,537	19.9	66.5	13.6
2050	299,118	998,468	231,164	19.6	65.3	15.1
High Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	337,607	625,589	50,461	33.3	61.7	5.0
2005	334,428	693,321	58,028	30.8	63.9	5.3
2010	321,055	760,149	65,784	28.0	66.3	5.7
2015	307,020	819,321	75,162	25.6	68.2	6.3
2020	300,385	866,643	87,986	23.9	69.1	7.0
2025	300,568	898,857	104,390	23.1	68.9	8.0
2030	301,022	921,278	122,788	22.4	68.5	9.1
2035	295,590	940,605	142,330	21.4	68.2	10.3
2040	289,336	954,710	161,818	20.6	67.9	11.5
2045	286,110	962,730	179,548	20.0	67.4	12.6
2050	285,611	958,505	201,736	19.8	66.3	14.0
Low Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	337,607	625,589	50,461	33.3	61.7	5.0
2005	337,202	694,468	59,283	30.9	63.7	5.4
2010	326,994	765,268	69,694	28.1	65.9	6.0
2015	316,244	831,517	82,962	25.7	67.6	6.7
2020	312,031	888,315	100,818	24.0	68.3	7.7
2025	314,390	930,604	123,700	23.0	68.0	9.0

Table A42

Summary of Alternative Population Projections — India

High Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
Standard Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	342,770	625,589	50,461	33.6	61.4	5.0
2005	351,635	693,626	58,437	31.9	62.8	5.3
2010	358,059	761,473	67,077	30.2	64.2	5.7
2015	363,944	827,759	77,808	28.7	65.2	6.1
2020	373,905	890,137	92,672	27.6	65.6	6.8
2025	389,000	945,914	111,908	26.9	65.4	7.7
2030	405,857	997,544	133,711	26.4	64.9	8.7
2035	420,259	1,049,267	157,236	25.8	64.5	9.7
2040	434,472	1,100,553	181,062	25.3	64.1	10.6
2045	451,236	1,151,373	203,537	25.0	63.7	11.3
2050	470,501	1,194,977	231,164	24.8	63.0	12.2
High Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	342,770	625,589	50,461	33.6	61.4	5.0
2005	350,605	693,321	58,028	31.8	62.9	5.3
2010	355,194	760,149	65,784	30.1	64.4	5.6
2015	359,153	824,288	75,162	28.5	65.5	6.0
2020	367,952	882,317	87,986	27.5	65.9	6.6
2025	381,478	932,089	104,390	26.9	65.7	7.4
2030	396,007	977,033	122,788	26.5	65.3	8.2
2035	407,153	1,022,012	142,330	25.9	65.0	9.1
2040	418,092	1,066,409	161,818	25.4	64.8	9.8
2045	431,955	1,110,240	179,548	25.1	64.5	10.4
2050	448,948	1,147,293	201,736	25.0	63.8	11.2
Low Mortality Scenario						
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	342,770	625,589	50,461	33.6	61.4	5.0
2005	353,583	694,468	59,283	31.9	62.7	5.4
2010	361,871	765,283	69,694	30.2	63.9	5.8
2015	370,025	836,638	82,962	28.7	64.9	6.4
2020	382,309	904,608	100,818	27.5	65.2	7.3
2025	399,176	965,399	123,700	26.8	64.9	8.3

Table A43

Summary of Alternative Population Projections | India

Low Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
			Standard Mortality Scenario			
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	332,415	625,589	50,461	33.0	62.0	5.0
2005	319,001	693,626	58,437	29.8	64.8	5.5
2010	288,470	761,473	67,077	25.8	68.2	6.0
2015	256,969	817,719	77,808	22.3	71.0	6.8
2020	235,878	858,217	92,672	19.9	72.3	7.8
2025	226,205	877,534	111,908	18.6	72.2	9.2
2030	218,863	882,258	133,711	17.7	71.4	10.8
2035	204,646	881,439	157,236	16.5	70.9	12.6
2040	189,255	872,004	181,062	15.2	70.2	14.6
2045	177,201	852,474	203,537	14.4	69.1	16.5
2050	168,366	816,003	231,164	13.9	67.1	19.0
			High Mortality Scenario			
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	332,415	625,589	50,461	33.0	62.0	5.0
2005	318,108	693,321	58,028	29.7	64.8	5.4
2010	286,245	760,149	65,784	25.7	68.3	5.9
2015	253,641	814,327	75,162	22.2	71.2	6.6
2020	232,161	850,831	87,986	19.8	72.7	7.5
2025	221,902	864,976	104,390	18.6	72.6	8.8
2030	213,672	864,284	122,788	17.8	72.0	10.2
2035	198,462	858,426	142,330	16.5	71.6	11.9
2040	182,370	844,583	161,818	15.3	71.0	13.6
2045	169,905	821,516	179,548	14.5	70.2	15.3
2050	160,970	783,180	201,736	14.0	68.3	17.6
			Low Mortality Scenario			
1995	330,496	560,252	42,915	35.4	60.0	4.6
2000	332,415	625,589	50,461	33.0	62.0	5.0
2005	320,673	694,468	59,283	29.8	64.6	5.5
2010	291,418	765,251	69,694	25.9	67.9	6.2
2015	261,161	826,341	82,962	22.3	70.6	7.1
2020	241,056	871,796	100,818	19.9	71.8	8.3
2025	231,939	894,972	123,700	18.5	71.6	9.9

Table A44

Summary of Aging, Alternative Mortality Scenarios India

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
Medium Fertility Scenario						
1995	4.6	4.6	4.6	0.077	0.077	0.077
2000	5.0	5.0	5.0	0.081	0.081	0.081
2005	5.4	5.3	5.4	0.084	0.084	0.085
2010	5.8	5.7	6.0	0.088	0.087	0.091
2015	6.4	6.3	6.7	0.095	0.092	0.100
2020	7.3	7.0	7.7	0.106	0.102	0.113
2025	8.4	8.0	9.0	0.123	0.116	0.133
2030	9.7	9.1		0.142	0.133	
2035	11.0	10.3		0.163	0.151	
2040	12.3	11.5		0.184	0.169	
2045	13.6	12.6		0.204	0.186	
2050	15.1	14.0		0.232	0.210	
High Fertility Scenario						
1995	4.6	4.6	4.6	0.077	0.077	0.077
2000	5.0	5.0	5.0	0.081	0.081	0.081
2005	5.3	5.3	5.4	0.084	0.084	0.085
2010	5.7	5.6	5.8	0.088	0.087	0.091
2015	6.1	6.0	6.4	0.094	0.091	0.099
2020	6.8	6.6	7.3	0.104	0.100	0.111
2025	7.7	7.4	8.3	0.118	0.112	0.128
2030	8.7	8.2		0.134	0.126	
2035	9.7	9.1		0.150	0.139	
2040	10.6	9.8		0.165	0.152	
2045	11.3	10.4		0.177	0.162	
2050	12.2	11.2		0.193	0.176	
Low Fertility Scenario						
1995	4.6	4.6	4.6	0.077	0.077	0.077
2000	5.0	5.0	5.0	0.081	0.081	0.081
2005	5.5	5.4	5.5	0.084	0.084	0.085
2010	6.0	5.9	6.2	0.088	0.087	0.091
2015	6.8	6.6	7.1	0.095	0.092	0.100
2020	7.8	7.5	8.3	0.108	0.103	0.116
2025	9.2	8.8	9.9	0.128	0.121	0.138
2030	10.8	10.2		0.152	0.142	
2035	12.6	11.9		0.178	0.166	
2040	14.6	13.6		0.208	0.192	
2045	16.5	15.3		0.239	0.219	
2050	19.0	17.6		0.283	0.258	

Table A45

Total Dependency Ratio India

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.667	0.667	0.667	0.667	0.667	0.667	0.667	0.667	0.667
2000	0.629	0.620	0.612	0.629	0.620	0.612	0.629	0.620	0.612
2005	0.589	0.566	0.543	0.591	0.568	0.544	0.595	0.571	0.547
2010	0.554	0.509	0.463	0.558	0.513	0.467	0.564	0.518	0.472
2015	0.527	0.466	0.404	0.534	0.473	0.409	0.545	0.480	0.416
2020	0.517	0.448	0.376	0.524	0.455	0.383	0.544	0.465	0.392
2025	0.521	0.451	0.377	0.530	0.459	0.385	0.562	0.471	0.397
2030	0.531	0.460	0.389	0.541	0.470	0.400			
2035	0.538	0.466	0.397	0.550	0.479	0.411			
2040	0.544	0.473	0.408	0.559	0.489	0.425			
2045	0.551	0.484	0.425	0.569	0.503	0.447			
2050	0.567	0.508	0.463	0.587	0.531	0.490			

Table A46

Summary of Alternative Population Projections — Bangladesh

Medium Fertility Scenario

Year	Population (1000s) 0-14	15-64	65+	Percentage 0-14	15-64	65+
	Standard Mortality Scenario					
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	45,358	79,648	4,149	35.1	61.7	3.2
2005	45,009	90,743	4,813	32.0	64.6	3.4
2010	47,303	98,791	5,706	31.2	65.1	3.8
2015	46,938	107,695	6,908	29.1	66.7	4.3
2020	44,787	116,854	8,554	26.3	68.7	5.0
2025	43,050	125,207	10,497	24.1	70.0	5.9
2030	42,967	131,635	12,549	23.0	70.3	6.7
2035	43,799	136,217	15,010	22.5	69.8	7.7
2040	44,080	138,693	19,111	21.8	68.7	9.5
2045	43,697	140,156	23,822	21.0	67.5	11.5
2050	43,167	139,541	29,794	20.3	65.7	14.0
	High Mortality Scenario					
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	45,358	79,648	4,149	35.1	61.7	3.2
2005	44,817	90,564	4,781	32.0	64.6	3.4
2010	46,721	98,194	5,601	31.0	65.2	3.7
2015	45,921	106,478	6,683	28.9	66.9	4.2
2020	43,436	114,749	8,128	26.1	69.0	4.9
2025	41,420	121,986	9,777	23.9	70.4	5.6
2030	41,054	127,190	11,450	22.8	70.8	6.4
2035	41,541	130,474	13,419	22.4	70.4	7.2
2040	41,480	131,770	16,796	21.8	69.3	8.8
2045	40,790	132,084	20,533	21.1	68.3	10.6
2050	40,033	130,553	25,125	20.5	66.7	12.8
	Low Mortality Scenario					
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	45,358	79,648	4,149	35.1	61.7	3.2
2005	45,381	91,121	4,877	32.1	64.5	3.4
2010	48,259	99,779	5,909	31.3	64.8	3.8
2015	48,424	109,509	7,352	29.3	66.3	4.4
2020	46,505	119,794	9,361	26.5	68.2	5.3
2025	44,781	129,442	11,876	24.1	69.6	6.4

Table A47

Summary of Alternative Population Projections — Bangladesh

High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	46,347	79,648	4,149	35.6	61.2	3.2
2005	47,631	90,743	4,813	33.3	63.4	3.4
2010	52,187	98,791	5,706	33.3	63.1	3.6
2015	53,857	108,651	6,908	31.8	64.1	4.1
2020	53,809	119,414	8,554	29.6	65.7	4.7
2025	54,241	130,001	10,497	27.9	66.8	5.4
2030	56,371	139,390	12,549	27.1	66.9	6.0
2035	59,488	147,648	15,010	26.8	66.5	6.8
2040	62,176	154,495	19,111	26.4	65.5	8.1
2045	64,320	161,093	23,822	25.8	64.6	9.6
2050	66,469	166,384	29,794	25.3	63.4	11.3
High Mortality Scenario						
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	46,347	79,648	4,149	35.6	61.2	3.2
2005	47,420	90,564	4,781	33.2	63.4	3.3
2010	51,533	98,194	5,601	33.2	63.2	3.6
2015	52,678	107,416	6,683	31.6	64.4	4.0
2020	52,168	117,243	8,128	29.4	66.0	4.6
2025	52,164	126,618	9,777	27.7	67.2	5.2
2030	53,821	134,617	11,450	26.9	67.3	5.7
2035	56,359	141,332	13,419	26.7	66.9	6.4
2040	58,423	146,668	16,796	26.3	66.1	7.6
2045	59,936	151,673	20,533	25.8	65.3	8.8
2050	61,523	155,471	25,125	25.4	64.2	10.4
Low Mortality Scenario						
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	46,347	79,648	4,149	35.6	61.2	3.2
2005	48,037	91,121	4,877	33.4	63.3	3.4
2010	53,263	99,789	5,909	33.5	62.8	3.7
2015	55,587	110,505	7,352	32.0	63.7	4.2
2020	55,899	122,482	9,361	29.8	65.2	5.0
2025	56,462	134,521	11,876	27.8	66.3	5.9

Table A48

Summary of Alternative Population Projections — Bangladesh

Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	44,270	79,648	4,149	34.6	62.2	3.2
2005	42,236	90,743	4,813	30.7	65.9	3.5
2010	42,245	98,791	5,706	28.8	67.3	3.9
2015	39,948	106,644	6,908	26.0	69.5	4.5
2020	35,903	114,146	8,554	22.6	72.0	5.4
2025	32,434	120,243	10,497	19.9	73.7	6.4
2030	30,773	123,717	12,549	18.4	74.1	7.5
2035	30,087	124,776	15,010	17.7	73.5	8.8
2040	28,857	123,295	19,111	16.9	72.0	11.2
2045	27,116	120,261	23,822	15.8	70.2	13.9
2050	25,325	114,658	29,794	14.9	67.5	17.5
			High Mortality Scenario			
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	44,270	79,648	4,149	34.6	62.2	3.2
2005	42,064	90,564	4,781	30.6	65.9	3.5
2010	41,739	98,194	5,601	28.7	67.5	3.8
2015	39,097	105,446	6,683	25.9	69.7	4.4
2020	34,838	112,111	8,128	22.5	72.3	5.2
2025	31,232	117,191	9,777	19.7	74.1	6.2
2030	29,438	119,610	11,450	18.3	74.5	7.1
2035	28,585	119,614	13,419	17.7	74.0	8.3
2040	27,218	117,265	16,796	16.9	72.7	10.4
2045	25,387	113,484	20,533	15.9	71.2	12.9
2050	23,572	107,472	25,125	15.1	68.8	16.1
			Low Mortality Scenario			
1995	47,458	67,418	3,740	40.0	56.8	3.2
2000	44,270	79,648	4,149	34.6	62.2	3.2
2005	42,572	91,121	4,877	30.7	65.8	3.5
2010	43,076	99,768	5,909	29.0	67.1	4.0
2015	41,178	108,409	7,352	26.2	69.1	4.7
2020	37,242	116,928	9,361	22.8	71.5	5.7
2025	33,689	124,130	11,876	19.9	73.1	7.0

Table A49

Summary of Aging, Alternative Mortality Scenarios — Bangladesh

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	3.2	3.2	3.2	0.055	0.055	0.055
2000	3.2	3.2	3.2	0.052	0.052	0.052
2005	3.4	3.4	3.4	0.053	0.053	0.054
2010	3.8	3.7	3.8	0.058	0.057	0.059
2015	4.3	4.2	4.4	0.064	0.063	0.067
2020	5.0	4.9	5.3	0.073	0.071	0.078
2025	5.9	5.6	6.4	0.084	0.080	0.092
2030	6.7	6.4		0.095	0.090	
2035	7.7	7.2		0.110	0.103	
2040	9.5	8.8		0.138	0.127	
2045	11.5	10.6		0.170	0.155	
2050	14.0	12.8		0.214	0.192	
			High Fertility Scenario			
1995	3.2	3.2	3.2	0.055	0.055	0.055
2000	3.2	3.2	3.2	0.052	0.052	0.052
2005	3.4	3.3	3.4	0.053	0.053	0.054
2010	3.6	3.6	3.7	0.058	0.057	0.059
2015	4.1	4.0	4.2	0.064	0.062	0.067
2020	4.7	4.6	5.0	0.072	0.069	0.076
2025	5.4	5.2	5.9	0.081	0.077	0.088
2030	6.0	5.7		0.090	0.085	
2035	6.8	6.4		0.102	0.095	
2040	8.1	7.6		0.124	0.115	
2045	9.6	8.8		0.148	0.135	
2050	11.3	10.4		0.179	0.162	
			Low Fertility Scenario			
1995	3.2	3.2	3.2	0.055	0.055	0.055
2000	3.2	3.2	3.2	0.052	0.052	0.052
2005	3.5	3.5	3.5	0.053	0.053	0.054
2010	3.9	3.8	4.0	0.058	0.057	0.059
2015	4.5	4.4	4.7	0.065	0.063	0.068
2020	5.4	5.2	5.7	0.075	0.073	0.080
2025	6.4	6.2	7.0	0.087	0.083	0.096
2030	7.5	7.1		0.101	0.096	
2035	8.8	8.3		0.120	0.112	
2040	11.2	10.4		0.155	0.143	
2045	13.9	12.9		0.198	0.181	
2050	17.5	16.1		0.260	0.234	

Table A50

Total Dependency Ratio Bangladesh

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759
2000	0.634	0.622	0.608	0.634	0.622	0.608	0.634	0.622	0.608
2005	0.576	0.548	0.517	0.578	0.549	0.518	0.581	0.552	0.521
2010	0.582	0.533	0.482	0.586	0.537	0.485	0.593	0.543	0.491
2015	0.553	0.494	0.434	0.559	0.500	0.439	0.575	0.509	0.448
2020	0.514	0.449	0.383	0.522	0.456	0.389	0.545	0.466	0.399
2025	0.489	0.420	0.350	0.498	0.428	0.357	0.528	0.438	0.367
2030	0.485	0.413	0.342	0.494	0.422	0.350			
2035	0.494	0.421	0.351	0.505	0.432	0.361			
2040	0.513	0.442	0.375	0.526	0.456	0.389			
2045	0.531	0.464	0.405	0.547	0.482	0.424			
2050	0.557	0.499	0.453	0.579	0.523	0.481			

Table A51

Summary of Alternative Population Projections — Egypt
Medium Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
Standard Mortality Scenario						
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,195	41,460	2,814	35.3	60.6	4.1
2005	23,903	47,441	3,191	32.1	63.6	4.3
2010	23,611	52,840	3,613	29.5	66.0	4.5
2015	22,952	57,842	4,431	26.9	67.9	5.2
2020	22,696	62,028	5,769	25.1	68.5	6.4
2025	22,976	65,309	7,333	24.0	68.3	7.7
2030	23,401	68,186	8,788	23.3	67.9	8.8
2035	23,374	70,899	10,344	22.3	67.8	9.9
2040	23,171	73,382	11,821	21.4	67.7	10.9
2045	23,055	74,878	13,857	20.6	67.0	12.4
2050	23,125	75,115	16,609	20.1	65.4	14.5
High Mortality Scenario						
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,195	41,460	2,814	35.3	60.6	4.1
2005	23,830	47,369	3,166	32.0	63.7	4.3
2010	23,439	52,669	3,531	29.4	66.1	4.4
2015	22,679	57,526	4,266	26.8	68.1	5.1
2020	22,360	61,496	5,477	25.0	68.8	6.1
2025	22,592	64,528	6,831	24.0	68.7	7.3
2030	22,965	67,135	8,005	23.4	68.4	8.2
2035	22,882	69,576	9,204	22.5	68.4	9.1
2040	22,611	71,786	10,291	21.6	68.6	9.8
2045	22,428	73,033	11,860	20.9	68.1	11.1
2050	22,448	73,091	14,049	20.5	66.7	12.8
Low Mortality Scenario						
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,195	41,460	2,814	35.3	60.6	4.1
2005	24,003	47,529	3,245	32.1	63.6	4.3
2010	23,832	53,073	3,756	29.5	65.8	4.7
2015	23,278	58,262	4,755	27.0	67.5	5.5
2020	23,043	62,690	6,369	25.0	68.1	6.9
2025	23,310	66,202	8,307	23.8	67.7	8.5

Table A52

Summary of Alternative Population Projections — Egypt

High Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,643	41,460	2,814	35.8	60.2	4.1
2005	25,183	47,441	3,191	33.2	62.6	4.2
2010	26,229	52,840	3,613	31.7	63.9	4.4
2015	26,851	58,284	4,431	30.0	65.1	4.9
2020	27,734	63,297	5,769	28.7	65.4	6.0
2025	29,002	67,909	7,333	27.8	65.1	7.0
2030	30,467	72,502	8,788	27.3	64.9	7.9
2035	31,710	77,175	10,344	26.6	64.7	8.7
2040	32,889	81,967	11,821	26.0	64.7	9.3
2045	34,169	86,205	13,857	25.5	64.2	10.3
2050	35,630	89,649	16,609	25.1	63.2	11.7
			High Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,643	41,460	2,814	35.8	60.2	4.1
2005	25,103	47,369	3,166	33.2	62.6	4.2
2010	26,032	52,669	3,531	31.7	64.0	4.3
2015	26,526	57,965	4,266	29.9	65.3	4.8
2020	27,319	62,751	5,477	28.6	65.7	5.7
2025	28,512	67,086	6,831	27.8	65.5	6.7
2030	29,890	71,368	8,005	27.4	65.3	7.3
2035	31,023	75,712	9,204	26.8	65.3	7.9
2040	32,063	80,157	10,291	26.2	65.4	8.4
2045	33,197	84,046	11,860	25.7	65.1	9.2
2050	34,537	87,174	14,049	25.4	64.2	10.3
			Low Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	24,643	41,460	2,814	35.8	60.2	4.1
2005	25,293	47,529	3,245	33.3	62.5	4.3
2010	26,482	53,075	3,756	31.8	63.7	4.5
2015	27,238	58,716	4,755	30.0	64.7	5.2
2020	28,166	64,000	6,369	28.6	65.0	6.5
2025	29,441	68,889	8,307	27.6	64.6	7.8

Table A53

Summary of Alternative Population Projections — Egypt

Low Fertility Scenario

Year	Population (1000s) 0-14	Population (1000s) 15-64	Population (1000s) 65+	Percentage 0-14	Percentage 15-64	Percentage 65+
			Standard Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	23,745	41,460	2,814	34.9	61.0	4.1
2005	22,608	47,441	3,191	30.9	64.8	4.4
2010	20,937	52,840	3,613	27.1	68.3	4.7
2015	18,944	57,397	4,431	23.5	71.1	5.5
2020	17,579	60,744	5,769	20.9	72.2	6.9
2025	17,060	62,652	7,333	19.6	72.0	8.4
2030	16,812	63,758	8,788	18.8	71.4	9.8
2035	15,996	64,531	10,344	17.6	71.0	11.4
2040	14,954	64,851	11,821	16.3	70.8	12.9
2045	14,028	63,916	13,857	15.3	69.6	15.1
2050	13,354	61,444	16,609	14.6	67.2	18.2
			High Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	23,745	41,460	2,814	34.9	61.0	4.1
2005	22,542	47,369	3,166	30.8	64.8	4.3
2010	20,790	52,669	3,531	27.0	68.4	4.6
2015	18,725	57,083	4,266	23.4	71.3	5.3
2020	17,325	60,227	5,477	20.9	72.5	6.6
2025	16,781	61,913	6,831	19.6	72.4	8.0
2030	16,507	62,794	8,005	18.9	71.9	9.2
2035	15,673	63,352	9,204	17.8	71.8	10.4
2040	14,614	63,470	10,291	16.5	71.8	11.6
2045	13,676	62,379	11,860	15.6	71.0	13.5
2050	12,999	59,849	14,049	15.0	68.9	16.2
			Low Mortality Scenario			
1995	23,830	36,005	2,447	38.3	57.8	3.9
2000	23,745	41,460	2,814	34.9	61.0	4.1
2005	22,697	47,529	3,245	30.9	64.7	4.4
2010	21,123	53,070	3,756	27.1	68.1	4.8
2015	19,206	57,801	4,755	23.5	70.7	5.8
2020	17,840	61,353	6,369	20.9	71.7	7.4
2025	17,289	63,431	8,307	19.4	71.2	9.3

Table A54

Summary of Aging, Alternative Mortality Scenarios Egypt

Year	Percentage 65 and older			Old Age Dependency Ratio		
	Medium	High	Low	Medium	High	Low
			Medium Fertility Scenario			
1995	3.9	3.9	3.9	0.068	0.068	0.068
2000	4.1	4.1	4.1	0.068	0.068	0.068
2005	4.3	4.3	4.3	0.067	0.067	0.068
2010	4.5	4.4	4.7	0.068	0.067	0.071
2015	5.2	5.1	5.5	0.077	0.074	0.082
2020	6.4	6.1	6.9	0.093	0.089	0.102
2025	7.7	7.3	8.5	0.112	0.106	0.125
2030	8.8	8.2		0.129	0.119	
2035	9.9	9.1		0.146	0.132	
2040	10.9	9.8		0.161	0.143	
2045	12.4	11.1		0.185	0.162	
2050	14.5	12.8		0.221	0.192	
			High Fertility Scenario			
1995	3.9	3.9	3.9	0.068	0.068	0.068
2000	4.1	4.1	4.1	0.068	0.068	0.068
2005	4.2	4.2	4.3	0.067	0.067	0.068
2010	4.4	4.3	4.5	0.068	0.067	0.071
2015	4.9	4.8	5.2	0.076	0.074	0.081
2020	6.0	5.7	6.5	0.091	0.087	0.100
2025	7.0	6.7	7.8	0.108	0.102	0.121
2030	7.9	7.3		0.121	0.112	
2035	8.7	7.9		0.134	0.122	
2040	9.3	8.4		0.144	0.128	
2045	10.3	9.2		0.161	0.141	
2050	11.7	10.3		0.185	0.161	
			Low Fertility Scenario			
1995	3.9	3.9	3.9	0.068	0.068	0.068
2000	4.1	4.1	4.1	0.068	0.068	0.068
2005	4.4	4.3	4.4	0.067	0.067	0.068
2010	4.7	4.6	4.8	0.068	0.067	0.071
2015	5.5	5.3	5.8	0.077	0.075	0.082
2020	6.9	6.6	7.4	0.095	0.091	0.104
2025	8.4	8.0	9.3	0.117	0.110	0.131
2030	9.8	9.2		0.138	0.127	
2035	11.4	10.4		0.160	0.145	
2040	12.9	11.6		0.182	0.162	
2045	15.1	13.5		0.217	0.190	
2050	18.2	16.2		0.270	0.235	

Table A55

Total Dependency Ratio Egypt

Fertility: Mortality:	High High	Med High	Low High	High Med	Med Med	Low Med	High Low	Med Low	Low Low
1995	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730
2000	0.662	0.651	0.641	0.662	0.651	0.641	0.662	0.651	0.641
2005	0.597	0.570	0.543	0.598	0.571	0.544	0.600	0.573	0.546
2010	0.561	0.512	0.462	0.565	0.515	0.465	0.570	0.520	0.469
2015	0.531	0.468	0.403	0.537	0.473	0.407	0.549	0.481	0.415
2020	0.523	0.453	0.379	0.529	0.459	0.384	0.551	0.469	0.395
2025	0.527	0.456	0.381	0.535	0.464	0.389	0.570	0.478	0.404
2030	0.531	0.461	0.390	0.541	0.472	0.402			
2035	0.531	0.461	0.393	0.545	0.476	0.408			
2040	0.528	0.458	0.392	0.545	0.477	0.413			
2045	0.536	0.469	0.409	0.557	0.493	0.436			
2050	0.557	0.499	0.452	0.583	0.529	0.488			

Table B1. Summary of labor force and labor force participation rates Asia

Year	Labor force (1000s)			Labor force participation rates (%)		
	15-64	65 +	Combined	15-64	65 +	Combined
			Male			
1950	400,124	16,201	416,325	93.3	63.8	91.6
1960	453,736	19,584	473,320	92.4	58.9	90.2
1970	553,124	21,647	574,771	90.5	54.3	88.3
1980	698,362	24,853	723,215	88.9	46.8	86.2
1990	886,650	31,277	917,927	87.7	43.5	84.8
2000	1,054,949	37,915	1,092,864	87.0	38.4	83.3
2010	1,227,049	43,775	1,270,824	85.8	34.2	81.6
2020	1,364,996	63,524	1,428,520	86.2	34.7	80.9
2030	1,443,559	88,504	1,532,063	86.0	34.1	79.0
2040	1,473,355	117,572	1,590,927	86.1	33.3	77.1
2050	1,475,140	132,203	1,607,344	85.8	31.9	75.3
			Female			
1950	233,855	5,569	239,424	58.1	17.4	55.1
1960	271,014	6,009	277,023	57.9	15.9	54.7
1970	340,800	6,713	347,513	58.5	14.4	55.2
1980	446,173	7,921	454,094	59.9	12.5	56.1
1990	582,832	11,428	594,260	60.8	13.4	56.9
2000	713,900	14,933	728,832	62.0	12.7	57.4
2010	848,267	18,695	866,961	62.4	12.2	57.3
2020	932,894	26,848	959,742	61.9	12.3	55.6
2030	978,050	37,461	1,015,511	61.1	12.1	53.2
2040	993,960	49,562	1,043,521	61.0	11.7	50.9
2050	991,581	55,348	1,046,929	60.5	11.1	48.9
			Total			
1950	633,979	21,770	655,749	76.2	37.9	73.7
1960	724,750	25,593	750,343	75.5	36.0	72.8
1970	893,924	28,360	922,284	74.9	32.7	72.0
1980	1,144,535	32,774	1,177,309	74.8	28.1	71.5
1990	1,469,482	42,700	1,512,182	74.7	27.3	71.2
2000	1,768,848	52,848	1,821,696	74.8	24.4	70.6
2010	2,075,316	62,469	2,137,785	74.4	22.2	69.6
2020	2,297,890	90,372	2,388,262	74.4	22.5	68.4
2030	2,421,609	125,965	2,547,574	73.9	22.1	66.2
2040	2,467,315	167,133	2,634,448	73.9	21.5	64.0
2050	2,466,721	187,551	2,654,272	73.4	20.5	62.1

Table B2. Summary of labor force and labor force participation rates — East Asia

Year	Labor force (1000s) 15-64	Labor force (1000s) 65 +	Labor force (1000s) Combined	Labor force participation rates (%) 15-64	Labor force participation rates (%) 65 +	Labor force participation rates (%) Combined
			Male			
1950	200,089	7,065	207,154	94.1	56.2	92.0
1960	216,672	8,893	225,565	93.4	51.2	90.5
1970	266,894	9,027	275,921	91.8	46.4	89.0
1980	333,414	9,432	342,846	90.3	36.2	86.7
1990	415,431	12,479	427,910	88.8	33.9	84.8
2000	463,201	14,701	477,902	88.7	28.6	83.3
2010	502,191	15,692	517,883	86.8	23.9	80.4
2020	512,556	23,040	535,597	86.7	24.3	78.1
2030	498,019	29,991	528,009	85.2	23.6	74.2
2040	470,496	38,778	509,274	85.9	23.0	71.1
2050	448,992	36,699	485,691	85.2	21.2	69.4
			Female			
1950	130,825	2,051	132,876	65.6	11.8	61.3
1960	146,985	2,311	149,296	66.8	10.9	61.9
1970	187,539	2,568	190,107	68.5	10.1	63.5
1980	246,897	2,730	249,627	71.7	7.9	65.9
1990	334,962	4,551	339,513	76.4	9.9	70.1
2000	381,529	5,861	387,390	77.3	9.3	69.6
2010	415,919	7,029	422,948	76.0	8.8	67.4
2020	409,500	10,324	419,824	73.4	9.0	62.4
2030	374,270	13,528	387,798	68.1	8.7	55.0
2040	332,332	17,446	349,778	65.2	8.4	48.8
2050	291,083	16,351	307,434	59.5	7.6	43.6
			Total			
1950	330,914	9,116	340,030	80.3	30.4	76.9
1960	363,657	11,204	374,861	80.5	29.1	76.4
1970	454,433	11,595	466,028	80.5	25.8	76.5
1980	580,311	12,162	592,473	81.3	20.1	76.5
1990	750,393	17,043	767,436	82.8	20.6	77.6
2000	844,730	20,562	865,292	83.2	18.0	76.6
2010	918,110	22,720	940,831	81.6	15.6	74.0
2020	922,057	33,364	955,421	80.3	15.9	70.3
2030	872,289	43,519	915,808	76.9	15.4	64.6
2040	802,828	56,224	859,052	75.9	14.9	59.9
2050	740,074	53,051	793,125	72.8	13.6	56.4

Table B3. Summary of labor force and labor force participation rates — Southeast Asia

Year	Labor force (1000s) 15-64	65 +	Combined	Labor force participation rates (%) 15-64	65 +	Combined
			Male			
1950	48,198	2,289	50,487	92.6	74.2	91.6
1960	56,349	2,346	58,695	91.3	69.6	90.2
1970	67,169	2,655	69,824	89.0	63.1	87.7
1980	85,668	3,330	88,998	87.1	58.3	85.5
1990	111,714	4,185	115,899	85.8	53.3	84.0
2000	140,741	5,166	145,907	85.5	47.8	83.1
2010	169,097	6,115	175,212	85.2	42.4	82.3
2020	194,260	8,680	202,940	85.9	42.7	82.4
2030	208,711	13,587	222,299	86.0	42.9	81.0
2040	215,320	19,079	234,398	85.8	41.7	79.0
2050	216,985	23,411	240,397	85.7	40.2	77.2
			Female			
1950	27,012	1,166	28,178	52.2	31.6	50.9
1960	32,490	1,238	33,728	52.0	30.0	50.7
1970	41,806	1,395	43,201	53.9	27.2	52.3
1980	58,610	1,856	60,466	57.7	25.9	55.6
1990	81,728	2,537	84,265	61.6	25.9	59.2
2000	106,336	3,303	109,639	64.0	24.1	61.0
2010	131,933	4,177	136,110	66.5	22.5	62.8
2020	149,046	5,884	154,930	66.4	22.6	61.9
2030	158,012	9,094	167,106	66.1	22.6	59.8
2040	161,699	12,393	174,092	65.7	21.6	57.4
2050	161,831	15,021	176,852	65.5	20.6	55.3
			Total			
1950	75,210	3,455	78,665	72.5	51.0	71.2
1960	88,839	3,584	92,423	71.6	47.8	70.2
1970	108,975	4,050	113,025	71.3	43.4	69.6
1980	144,278	5,186	149,464	72.2	40.3	70.2
1990	193,442	6,681	200,123	73.6	37.8	71.4
2000	247,077	8,469	255,546	74.7	34.6	71.9
2010	301,030	10,291	311,321	75.9	31.2	72.4
2020	343,306	14,564	357,870	76.2	31.4	72.0
2030	366,723	22,681	389,404	76.1	31.5	70.3
2040	377,019	31,472	408,490	75.8	30.6	68.1
2050	378,816	38,433	417,249	75.7	29.3	66.1

Table B4. Summary of labor force and labor force participation rates — South Asia

Year	Labor force (1000s) 15-64	Labor force (1000s) 65 +	Labor force (1000s) Combined	Labor force participation rates (%) 15-64	Labor force participation rates (%) 65 +	Labor force participation rates (%) Combined
			Male			
1950	138,848	6,238	145,086	92.4	71.3	91.3
1960	164,349	7,633	171,982	91.6	67.2	90.1
1970	199,015	9,062	208,077	89.7	62.3	88.0
1980	252,680	11,225	263,905	88.2	58.6	86.3
1990	322,352	13,454	335,806	87.5	55.3	85.5
2000	402,834	16,566	419,400	86.3	51.0	84.0
2010	495,687	19,959	515,645	85.6	47.1	83.0
2020	585,352	28,373	613,725	86.5	47.5	83.4
2030	651,556	41,517	693,073	87.2	47.2	83.0
2040	693,632	56,171	749,804	87.2	46.1	81.8
2050	708,320	73,076	781,397	87.0	45.4	80.1
			Female			
1950	68,818	1,965	70,783	50.2	20.3	48.2
1960	83,401	2,050	85,451	49.6	18.5	47.7
1970	102,013	2,375	104,388	48.9	16.8	46.8
1980	128,772	2,991	131,763	47.9	15.5	45.8
1990	150,776	3,865	154,641	43.7	14.9	41.7
2000	217,787	5,073	222,860	49.8	14.1	47.1
2010	287,208	6,617	293,825	52.8	13.7	49.6
2020	336,058	8,623	344,681	52.6	12.7	48.7
2030	370,166	12,605	382,771	52.1	12.7	47.3
2040	389,904	16,996	406,899	51.3	12.3	45.3
2050	395,386	22,097	417,482	50.5	12.1	43.2
			Total			
1950	207,666	8,203	215,869	72.3	44.5	70.6
1960	247,750	9,683	257,433	71.3	43.2	69.6
1970	301,028	11,437	312,465	69.9	39.9	68.0
1980	381,452	14,216	395,668	68.7	37.0	66.7
1990	473,128	17,496	490,624	66.3	34.8	64.3
2000	620,621	21,640	642,260	68.6	31.6	66.0
2010	782,895	26,576	809,471	69.7	29.3	66.7
2020	921,410	36,995	958,406	70.0	29.0	66.4
2030	1,021,722	54,122	1,075,845	70.1	28.9	65.4
2040	1,083,536	73,167	1,156,703	69.7	28.2	63.7
2050	1,103,706	95,173	1,198,879	69.1	27.6	61.8

Table B5. Summary of labor force and labor force participation rates — Japan

Year	Labor force (1000s) 15-64	65 +	Combined	Labor force participation rates (%) 15-64	65 +	Combined
			Male			
1950	21,205	947	22,152	87.6	54.5	85.4
1960	25,763	1,277	27,040	87.7	54.5	85.3
1970	30,594	1,764	32,358	87.0	54.5	84.3
1980	33,497	2,047	35,544	86.1	45.8	82.0
1990	36,249	2,362	38,611	84.2	39.6	78.8
2000	36,900	3,029	39,930	85.0	33.4	76.1
2010	34,575	3,194	37,770	84.5	27.2	71.8
2020	31,562	3,669	35,230	84.1	26.1	68.3
2030	29,728	3,362	33,090	83.7	24.2	67.0
2040	26,385	3,671	30,056	83.3	25.0	64.8
2050	24,184	3,497	27,681	83.2	23.9	63.3
			Female			
1950	13,370	518	13,888	52.2	21.6	49.5
1960	16,696	641	17,337	54.0	21.0	51.0
1970	19,936	815	20,751	54.3	19.7	50.8
1980	20,743	964	21,707	52.1	15.8	47.3
1990	24,146	1,376	25,522	56.2	15.6	49.3
2000	26,426	1,808	28,234	61.6	14.4	50.9
2010	26,510	2,100	28,610	65.9	13.4	51.2
2020	24,330	2,360	26,690	66.5	12.8	48.5
2030	22,464	2,149	24,613	65.1	11.7	46.6
2040	19,830	2,266	22,096	64.8	11.9	44.5
2050	18,361	2,137	20,498	65.6	11.4	43.9
			Total			
1950	34,575	1,465	36,040	69.4	35.4	66.8
1960	42,459	1,918	44,377	70.4	35.5	67.6
1970	50,530	2,579	53,109	70.3	35.0	67.0
1980	54,240	3,011	57,251	68.9	28.5	64.1
1990	60,395	3,738	64,133	70.2	25.2	63.6
2000	63,327	4,837	68,164	73.3	22.4	63.1
2010	61,086	5,294	66,379	75.3	19.3	61.2
2020	55,892	6,029	61,921	75.4	18.6	58.1
2030	52,191	5,512	57,703	74.5	17.1	56.4
2040	46,216	5,937	52,152	74.2	17.6	54.3
2050	42,545	5,633	48,178	74.5	16.9	53.3

Table B6. Summary of labor force and labor force participation rates — South Korea

Year	Labor force (1000s)			Labor force participation rates (%)		
	15-64	65 +	Combined	15-64	65 +	Combined
			Male			
1950	5,163	172	5,335	90.5	66.7	89.4
1960	5,756	179	5,935	85.8	60.5	84.8
1970	7,237	161	7,398	83.2	40.0	81.3
1980	9,285	229	9,514	77.6	38.2	75.7
1990	11,615	293	11,908	77.4	36.3	75.3
2000	13,617	386	14,003	79.8	32.4	76.7
2010	14,486	543	15,029	80.1	29.3	75.3
2020	14,717	748	15,465	79.0	28.6	72.8
2030	14,079	1,144	15,223	78.9	28.6	69.7
2040	13,146	1,376	14,522	78.8	27.0	66.7
2050	12,495	1,360	13,855	78.7	25.4	65.3
			Female			
1950	1,519	29	1,548	27.4	8.0	26.2
1960	2,004	49	2,053	28.7	9.2	27.3
1970	3,522	68	3,590	40.3	10.5	38.2
1980	5,892	118	6,010	50.2	13.8	47.7
1990	7,485	240	7,725	51.1	17.9	48.3
2000	9,563	314	9,878	57.8	16.0	53.4
2010	11,133	403	11,535	64.1	14.5	57.3
2020	11,072	527	11,599	62.6	14.0	54.1
2030	10,311	786	11,097	61.9	14.1	49.9
2040	9,513	915	10,429	61.8	13.2	46.7
2050	9,055	879	9,934	62.3	12.0	45.5
			Total			
1950	6,682	201	6,883	59.4	32.4	57.9
1960	7,760	228	7,988	56.7	27.4	55.0
1970	10,759	229	10,988	61.7	21.8	59.4
1980	15,177	347	15,524	64.0	23.9	61.7
1990	19,100	533	19,633	64.4	24.9	61.8
2000	23,181	700	23,881	68.9	22.2	64.9
2010	25,619	946	26,564	72.3	20.4	66.3
2020	25,789	1,275	27,064	71.0	20.0	63.4
2030	24,390	1,931	26,320	70.7	20.2	59.7
2040	22,659	2,292	24,951	70.6	19.1	56.6
2050	21,550	2,239	23,789	70.9	17.7	55.2

Table B7. Summary of labor force and labor force participation rates — The Philippines

Year	Labor force (1000s) 15-64	Labor force (1000s) 65 +	Labor force (1000s) Combined	Labor force participation rates (%) 15-64	Labor force participation rates (%) 65 +	Labor force participation rates (%) Combined
			Male			
1950	5,005	199	5,204	91.7	70.7	90.7
1960	6,440	217	6,657	89.2	67.7	88.3
1970	8,435	311	8,746	86.4	64.8	85.4
1980	11,280	391	11,671	84.5	61.9	83.5
1990	14,487	572	15,059	84.6	59.0	83.2
2000	18,941	687	19,628	83.2	54.5	81.7
2010	24,211	902	25,113	83.2	50.1	81.3
2020	29,726	1,429	31,155	84.5	50.5	82.0
2030	34,042	2,168	36,210	86.5	49.7	82.8
2040	36,612	2,921	39,533	86.9	48.3	82.0
2050	38,002	3,936	41,938	86.6	47.7	80.4
			Female			
1950	2,296	80	2,376	40.8	17.0	39.0
1960	3,075	102	3,177	42.7	19.7	41.1
1970	4,261	120	4,381	43.9	22.6	42.8
1980	6,161	180	6,341	46.0	25.5	45.0
1990	8,347	325	8,672	49.2	28.4	47.9
2000	11,567	393	11,960	51.3	26.2	49.7
2010	15,561	512	16,073	54.5	24.1	52.4
2020	18,916	795	19,711	54.9	24.2	52.3
2030	21,389	1,224	22,613	55.7	23.7	51.9
2040	22,702	1,699	24,401	55.7	22.7	50.6
2050	23,357	2,261	25,617	55.4	21.9	48.8
			Total			
1950	7,301	279	7,580	65.9	37.0	64.0
1960	9,515	319	9,834	65.9	38.0	64.4
1970	12,696	431	13,127	65.2	42.7	64.1
1980	17,441	571	18,012	65.2	42.7	64.2
1990	22,834	845	23,679	67.0	40.0	65.4
2000	30,508	1,080	31,588	67.3	39.2	65.7
2010	39,772	1,414	41,186	69.0	36.0	66.9
2020	48,642	2,223	50,865	69.9	36.4	67.2
2030	55,432	3,391	58,823	71.3	35.6	67.4
2040	59,313	4,620	63,933	71.5	34.1	66.3
2050	61,358	6,196	67,555	71.3	33.4	64.6

Table B8. Summary of labor force and labor force participation rates — Thailand

Year	Labor force (1000s) 15-64	Labor force (1000s) 65 +	Labor force (1000s) Combined	Labor force participation rates (%) 15-64	Labor force participation rates (%) 65 +	Labor force participation rates (%) Combined
			Male			
1950	5,048	154	5,202	92.0	56.0	90.3
1960	6,366	170	6,536	91.5	52.0	89.8
1970	8,091	227	8,318	90.2	48.0	88.1
1980	11,762	320	12,082	89.3	44.1	87.0
1990	15,862	425	16,287	89.4	40.1	86.6
2000	19,043	581	19,624	89.8	37.5	86.3
2010	21,227	745	21,972	90.0	35.1	85.5
2020	22,300	1,095	23,395	89.7	35.4	83.7
2030	22,128	1,686	23,814	88.8	35.4	80.3
2040	20,991	2,262	23,253	88.6	34.2	76.7
2050	19,859	2,417	22,275	88.5	32.2	74.3
			Female			
1950	4,555	115	4,670	84.2	34.7	81.3
1960	5,717	123	5,840	66.0	30.9	64.4
1970	7,448	164	7,612	81.1	27.2	77.7
1980	10,527	214	10,741	79.7	23.2	76.0
1990	13,899	261	14,160	78.6	19.3	74.4
2000	16,498	351	16,849	78.0	17.3	72.7
2010	18,240	446	18,685	77.2	15.7	70.6
2020	18,878	646	19,523	75.9	15.8	67.4
2030	18,481	972	19,454	74.4	15.8	62.8
2040	17,453	1,277	18,730	74.1	15.2	58.6
2050	16,500	1,355	17,855	74.2	14.2	56.2
			Total			
1950	9,603	269	9,872	88.1	44.4	85.8
1960	12,083	293	12,376	77.4	40.4	75.7
1970	15,539	391	15,930	85.6	36.3	82.8
1980	22,289	534	22,823	84.5	32.4	81.4
1990	29,761	686	30,447	84.0	28.5	80.4
2000	35,541	932	36,473	84.0	26.1	79.4
2010	39,467	1,191	40,657	83.6	24.0	77.9
2020	41,178	1,741	42,918	82.8	24.3	75.4
2030	40,609	2,658	43,268	81.6	24.4	71.3
2040	38,444	3,539	41,983	81.4	23.5	67.4
2050	36,359	3,772	40,131	81.4	22.1	65.0

Table B9. Summary of labor force and labor force participation rates Indonesia

Year	Labor force (1000s) 15-64	65 +	Combined	Labor force participation rates (%) 15-64	65 +	Combined
			Male			
1950	21,148	1,327	22,475	92.9	88.0	92.6
1960	24,753	1,259	26,012	91.7	84.0	91.3
1970	28,861	1,247	30,108	88.9	74.1	88.2
1980	35,548	1,501	37,049	85.8	65.0	84.7
1990	46,074	1,855	47,929	84.1	56.6	82.6
2000	57,728	2,202	59,930	84.5	48.5	82.3
2010	68,679	2,508	71,187	85.2	40.4	82.0
2020	78,236	3,328	81,563	86.0	40.2	82.2
2030	83,414	5,006	88,421	86.0	40.4	80.9
2040	85,359	7,132	92,490	85.7	39.8	78.7
2050	85,844	8,662	94,506	85.7	38.3	77.0
			Female			
1950	6,866	506	7,372	30.6	30.8	30.6
1960	8,747	489	9,236	32.0	28.6	31.8
1970	12,341	482	12,823	37.1	24.1	36.3
1980	19,393	687	20,080	45.6	25.1	44.3
1990	28,992	953	29,945	52.0	25.2	50.3
2000	39,927	1,316	41,243	57.9	24.1	55.5
2010	51,470	1,794	53,264	63.8	23.1	60.2
2020	57,999	2,388	60,387	64.0	22.8	59.7
2030	61,266	3,539	64,806	63.8	22.7	58.0
2040	62,303	4,953	67,255	63.4	22.0	55.7
2050	62,177	6,011	68,189	63.3	20.8	53.7
			Total			
1950	28,014	1,833	29,847	61.9	58.2	61.7
1960	33,500	1,748	35,248	61.6	54.5	61.2
1970	41,202	1,729	42,931	62.7	46.9	61.8
1980	54,941	2,188	57,129	65.4	43.4	64.2
1990	75,066	2,808	77,874	67.9	39.8	66.2
2000	97,655	3,518	101,173	71.2	35.2	68.7
2010	120,149	4,302	124,452	74.5	30.8	71.0
2020	136,235	5,715	141,951	75.0	30.5	70.8
2030	144,681	8,546	153,226	75.0	30.6	69.3
2040	147,662	12,084	159,746	74.6	29.9	67.0
2050	148,022	14,673	162,695	74.6	28.5	65.1

Table B10. Summary of labor force and labor force participation rates India

Year	Labor force (1000s) 15-64	Labor force (1000s) 65 +	Labor force (1000s) Combined	Labor force participation rates (%) 15-64	Labor force participation rates (%) 65 +	Labor force participation rates (%) Combined
			Male			
1950	99,290	3,817	103,107	92.2	71.6	91.3
1960	118,549	5,139	123,688	91.4	67.5	90.1
1970	143,991	6,581	150,572	89.9	63.6	88.3
1980	181,362	8,468	189,830	88.6	59.9	86.7
1990	230,143	10,158	240,301	88.0	56.5	86.0
2000	282,125	12,614	294,739	86.9	52.7	84.5
2010	339,267	15,221	354,488	85.9	48.9	83.2
2020	392,255	21,275	413,530	86.9	49.1	83.6
2030	423,865	30,672	454,537	87.6	48.7	83.1
2040	440,865	40,414	481,279	87.3	47.4	81.6
2050	443,438	50,407	493,845	87.0	46.5	79.9
			Female			
1950	51,114	1,461	52,575	51.7	22.0	49.9
1960	61,478	1,497	62,975	50.6	19.8	48.8
1970	73,919	1,745	75,664	49.3	17.6	47.3
1980	91,109	2,114	93,223	47.8	15.4	45.6
1990	103,038	2,706	105,744	42.5	14.3	40.4
2000	134,264	3,585	137,849	44.6	13.5	42.1
2010	170,896	4,622	175,518	46.6	12.9	43.6
2020	197,242	6,279	203,522	46.6	12.7	43.1
2030	212,578	8,953	221,531	46.5	12.6	42.0
2040	220,818	11,805	232,623	45.9	12.3	40.3
2050	222,124	14,800	236,924	45.4	12.0	38.7
			Total			
1950	150,404	5,278	155,682	72.9	44.1	71.3
1960	180,027	6,636	186,663	71.7	43.7	70.1
1970	217,910	8,326	226,236	70.2	41.1	68.4
1980	272,471	10,582	283,053	68.9	37.9	66.9
1990	333,181	12,815	345,996	66.1	34.7	64.0
2000	416,389	16,199	432,588	66.6	32.1	64.0
2010	510,163	19,843	530,005	67.0	29.6	64.0
2020	589,497	27,555	617,052	67.4	29.7	63.8
2030	636,443	39,625	676,068	67.7	29.6	62.9
2040	661,683	52,219	713,902	67.1	28.8	61.2
2050	665,563	65,206	730,769	66.7	28.2	59.4

Table B11. Summary of labor force and labor force participation rates Bangladesh

Year	Labor force (1000s)			Labor force participation rates (%)		
	15-64	65 +	Combined	15-64	65 +	Combined
			Male			
1950	12,908	684	13,592	94.9	90.0	94.6
1960	14,415	908	15,323	94.3	87.4	93.8
1970	16,590	1,064	17,654	92.7	82.3	92.0
1980	20,834	1,123	21,957	90.9	73.0	89.7
1990	26,011	1,107	27,118	88.2	65.2	87.0
2000	35,802	1,217	37,019	87.7	59.0	86.3
2010	45,065	1,523	46,588	89.2	52.7	87.3
2020	53,782	2,230	56,012	90.0	52.6	87.5
2030	61,279	3,088	64,367	90.8	51.6	87.7
2040	64,861	4,742	69,603	91.3	52.2	86.9
2050	64,895	7,390	72,285	91.0	51.9	84.5
			Female			
1950	7,993	263	8,256	73.1	34.9	70.6
1960	9,459	301	9,760	72.0	34.6	69.6
1970	11,507	360	11,867	71.2	34.4	68.9
1980	15,193	513	15,706	70.2	34.2	67.8
1990	18,497	579	19,076	66.0	33.3	64.1
2000	26,274	686	26,960	67.7	32.9	65.9
2010	33,692	915	34,607	69.8	32.5	67.7
2020	39,955	1,417	41,372	70.0	32.9	67.4
2030	44,820	2,121	46,941	69.8	32.3	66.4
2040	47,099	3,234	50,333	69.6	32.2	64.8
2050	47,267	4,921	52,188	69.3	31.7	62.3
			Total			
1950	20,901	947	21,848	85.1	62.5	83.8
1960	23,874	1,209	25,083	84.0	63.3	82.7
1970	28,097	1,424	29,521	82.5	60.9	81.1
1980	36,027	1,636	37,663	80.8	53.9	79.1
1990	44,508	1,687	46,195	77.4	49.1	75.8
2000	62,076	1,903	63,979	77.9	45.9	76.3
2010	78,756	2,438	81,194	79.7	42.7	77.7
2020	93,737	3,647	97,384	80.2	42.6	77.7
2030	106,099	5,209	111,308	80.6	41.5	77.2
2040	111,960	7,975	119,936	80.7	41.7	76.0
2050	112,162	12,310	124,473	80.4	41.3	73.5

Table B12. Summary of labor force and labor force participation rates Egypt

Year	Labor force (1000s) 15-64	65 +	Combined	Labor force participation rates (%) 15-64	65 +	Combined
			Male			
1950	5,753	217	5,970	92.8	75.3	92.0
1960	6,826	256	7,082	90.3	62.0	88.8
1970	8,295	335	8,630	86.1	48.7	83.6
1980	10,449	280	10,729	83.5	35.4	80.7
1990	13,448	290	13,738	83.4	28.6	80.4
2000	17,328	304	17,632	82.1	24.6	78.9
2010	22,341	341	22,682	83.1	21.5	79.6
2020	26,590	576	27,165	84.3	22.3	79.6
2030	29,604	858	30,462	85.5	21.6	78.9
2040	31,633	1,111	32,744	85.0	20.9	77.0
2050	32,165	1,574	33,739	84.5	21.0	74.1
			Female			
1950	1,543	54	1,597	24.4	15.0	23.9
1960	1,957	70	2,027	25.9	13.9	25.2
1970	2,614	101	2,715	27.5	12.1	26.2
1980	3,571	94	3,665	29.3	9.8	27.9
1990	4,976	109	5,085	31.9	8.9	30.3
2000	7,562	125	7,688	37.2	8.0	35.1
2010	11,206	143	11,349	43.2	7.0	40.6
2020	13,110	224	13,335	43.0	7.0	39.6
2030	14,279	339	14,618	42.5	7.0	38.1
2040	14,812	458	15,270	40.9	7.0	35.8
2050	14,944	642	15,585	40.3	7.0	33.8
			Total			
1950	7,296	271	7,567	58.3	41.9	57.5
1960	8,783	326	9,109	58.1	35.6	56.9
1970	10,909	436	11,345	56.9	28.6	54.9
1980	14,020	374	14,394	56.7	21.3	54.4
1990	18,424	399	18,823	58.1	18.5	55.6
2000	24,891	429	25,320	60.0	15.3	57.2
2010	33,547	484	34,031	63.5	13.4	60.3
2020	39,700	800	40,500	64.0	13.9	59.7
2030	43,883	1,198	45,081	64.4	13.6	58.6
2040	46,445	1,569	48,014	63.3	13.3	56.4
2050	47,108	2,216	49,324	62.7	13.3	53.8

Table 1. Summary measures of aging for Asia, major regions, seven ANE countries.

	Elderly population (1000s)			Growth rate of Elderly Population		Old age dependency ratio		
	2000	2025	2050	2000-25	2025-50	2000	2025	2050
Asia	207,349	454,964	864,614	3.14	2.57	0.086	0.144	0.250
East Asia	114,390	241,217	389,089	2.98	1.91	0.113	0.210	0.383
Southeast Asia	24,503	58,253	131,138	3.46	3.25	0.074	0.124	0.262
South Asia	68,457	155,494	344,388	3.28	3.18	0.076	0.112	0.216
South Korea	3,152	8,020	12,665	3.74	1.83	0.094	0.226	0.417
Indonesia	10,001	23,078	51,500	3.34	3.21	0.073	0.123	0.260
Phiippines	2,758	7,786	18,558	4.15	3.47	0.061	0.105	0.216
Thailand	3,576	8,924	17,077	3.66	2.60	0.084	0.178	0.382
Egypt	2,814	7,331	16,604	3.83	3.27	0.052	0.084	0.213
Bangladesh	4,149	10,494	29,787	3.71	4.17	0.081	0.123	0.232
India	50,466	111,934	231,266	3.19	2.90	0.068	0.112	0.221

Source: UN Population Division, 1998.
Note: All data employ the medium fertility variant.

Table 2. Fertility assumptions, medium UN projections.

Country	1990-95	1995-00	2000-05	2005-10	2010-15	2015-2020
South Korea	1.65	1.69	1.76	1.83	1.89	1.90
Indonesia	2.58	2.26	2.10	2.10	2.10	2.10
Philippines	3.62	3.19	2.76	2.33	2.10	2.10
Thailand	1.74	1.74	1.78	1.85	1.90	1.90
Egypt	3.40	2.88	2.36	2.10	2.10	2.10
Bangladesh	3.11	2.82	2.53	2.24	2.10	2.10
India	3.13	2.72	2.31	2.10	2.10	2.10

Source: UN 1998.

Note: For countries included in this table TFR is constant after 2015-2020.

Table 3. Projected life expectancy, study countries.

Country	1990-95	2000-05	2010-15	2020-25	2030-35	2040-45	Projected Increase
Republic of Korea	70.9	73.5	75.4	77.1	78.4	79.4	8.5
Bangladesh	55.6	60.7	65.3	69.2	71.9	74.1	18.5
Indonesia	62.6	67.3	70.5	72.9	74.9	76.6	14.0
Thailand	68.8	69.4	72.8	75.4	76.0	76.6	7.8
Egypt	63.9	68.3	71.3	73.7	75.6	77.2	13.3
India	60.3	64.2	67.3	70.4	72.7	74.2	13.9
Philippines	66.3	69.8	72.3	74.4	76.3	77.7	11.4

Source: UN Population Division, 1998.

Table 4. Total labor force, labor force aged 65 and over, regions of Asia and eight ANE countries

	1950	2000	2050	1950	2000	2050
Asia	21,769	52,848	187,551	709,562	1,860,155	2,672,600
East Asia	9,115	20,562	53,051	366,935	874,564	853,782
Southeast Asia	3,456	8,469	45,054	84,805	260,621	426,501
South Asia	8,203	21,640	95,173	235,272	650,951	1,197,792
Japan	1,465	4,837	5,633	36,650	68,164	48,178
South Korea	201	700	2,239	7,449	23,881	23,789
The Philippines	279	1,080	6,196	8,194	32,067	67,555
Thailand	269	932	3,772	10,894	37,173	40,340
Indonesia	1,834	3,518	14,673	32,149	102,856	163,584
India	5,278	16,199	65,206	169,907	445,770	738,140
Bangladesh	946	1,903	12,310	24,153	68,471	127,918
Egypt	271	429	2,216	8,246	26,081	49,668

Source: ILO, 1996. Calculations by authors.

Table 5. Demographic characteristics of the older population and labor force, Asia

	55-59	60-64	65-74	75+	Total
	Age distribution of men 55 and older (percent)				
2000	29.0	24.7	33.2	13.1	100.0
2025	29.8	24.0	31.8	14.4	100.0
2050	22.5	21.9	32.5	23.1	100.0
2000	26.2	23.0	33.4	17.3	100.0
2025	27.1	22.4	31.8	18.6	100.0
2050	19.7	19.6	31.3	29.4	100.0
	Sex ratio (100 x men/women)				
2000	101.9	98.8	91.6	69.3	92.1
2025	100.9	98.0	91.8	71.1	91.8
2050	103.9	101.2	94.0	71.5	90.7
	Age distribution of the labor force (percent)				
2000	43.7	27.8	28.5		100.0
2025	44.2	27.5	28.5		100.0
2050	37.4	27.1	35.5		100.0
	Sex ratio of the labor force				
2000	191.9	209.3	255.9		212.8
2025	187.8	199.1	213.6		197.8
2050	198.9	207.8	221.6		209.1

Sources: UN, 1999; ILO, 1996; calculations by authors.

Table 6. Demographic characteristics of the older population, Asia and ANE countries

	Percentage 55 and older			Sex ratio, population 55+			Percentage 55+ in labor force		
	2000	2025	2050	2000	2025	2050	2000	2025	2050
Asia	12.1	20.1	29.8	92.1	91.8	90.7	38.3	31.9	31.8
East Asia	16.8	18.4	33.6	92.2	90.5	88.8	36.9	33.8	28.4
Southeast Asia	13.9	14.1	24.2	84.8	86.6	87.4	51.4	52.8	47.3
South Asia	15.4	16.6	26.6	92.1	91.5	90.7	45.8	44.3	41.1
Japan	22.9	37.5	43.1	81.6	82.7	83.7	40.7	33.8	29.2
South Korea	13.9	17.6	34.7	77.5	82.7	83.5	43.0	39.1	31.4
Philippines	13.4	13.9	21.0	90.9	91.6	89.6	55.9	53.4	49.6
Thailand	16.2	17.1	31.2	83.6	85.1	84.6	47.5	45.2	37.4
Indonesia	12.1	13.7	23.4	87.4	87.4	86.0	52.7	50.8	44.5
India	13.7	15.6	21.6	94.1	95.6	93.9	45.7	43.7	40.8
Bangladesh	12.2	12.4	17.0	106.8	96.6	96.3	65.0	64.9	57.3
Egypt	13.4	13.0	19.4	84.9	90.9	89.8	33.2	32.3	29.6

Sources: UN, 1999; ILO, 1996; calculations by authors.

Table 7. Summary of Dependency Ratios and Economic Support Ratios, Medium Variant,Asia and ANE Countries, 2000, 2025, and 2050.

	Total dependency ratio			Child dependency ratio			Old age dependency ratio			Economic support ratio		
	2000	2025	2050	2000	2025	2050	2000	2025	2050	2000	2025	2050
East Asia	0.462	0.474	0.649	0.349	0.265	0.266	0.113	0.210	0.383	0.359	0.353	0.428
Southeast Asia	0.568	0.460	0.570	0.494	0.336	0.308	0.074	0.124	0.262	0.430	0.356	0.403
South Asia	0.649	0.472	0.522	0.573	0.360	0.306	0.076	0.112	0.216	0.476	0.365	0.381
Japan	0.468	0.673	0.838	0.217	0.226	0.254	0.250	0.447	0.583	0.344	0.431	0.490
South Korea	0.393	0.477	0.678	0.299	0.252	0.270	0.094	0.226	0.417	0.316	0.353	0.437
Philippines	0.676	0.458	0.521	0.615	0.353	0.305	0.061	0.105	0.216	0.494	0.357	0.381
Thailand	0.450	0.453	0.660	0.366	0.274	0.278	0.084	0.178	0.382	0.355	0.344	0.434
Indonesia	0.546	0.456	0.573	0.473	0.333	0.313	0.073	0.123	0.260	0.417	0.354	0.405
Bangladesh	0.622	0.428	0.523	0.569	0.344	0.309	0.052	0.084	0.213	0.465	0.341	0.382
India	0.620	0.459	0.531	0.540	0.336	0.300	0.081	0.123	0.232	0.459	0.356	0.384
Egypt	0.651	0.464	0.529	0.584	0.352	0.308	0.068	0.112	0.221	0.479	0.360	0.385

Source: See text.

Table 8. Projected life expectancy among the study countries, Asia and the Near East, 1995-2050

	Average value (1995-2050)	Rate of increase (years per quinquennia)		
		Projected	Model	Difference
South Korea	76.7	0.74	0.93	-0.19
Bangladesh	68.1	1.69	1.54	0.15
Indonesia	72.3	1.23	1.11	0.13
Thailand	73.9	0.81	0.95	-0.14
Egypt	73.1	1.16	1.05	0.11
India	69.6	1.23	1.38	-0.15
Philippines	74.0	1.01	0.96	0.04

Table 9. Popuation 65 and older, three mortality variants, regions of Asia and seven ANE countries

	Population	Population 65+ in 2025			Population 65+ in 2050	
	65+ in 2000	Low	Medium	High	Medium	High
Asia	207,301	496,731	454,718	428,612	863,601	766,636
East Asia	114,390	261,742	241,217	228,807	389,089	346,968
Southeast Asia	24,503	64,773	58,253	54,599	131,138	113,214
South Asia	68,457	172,367	155,494	144,986	344,388	299,540
South Korea	3,152	8,820	8,020	7,562	12,665	10,967
Indonesia	10,001	26,042	23,078	21,728	51,500	43,595
Phiippines	2,758	8,735	7,786	7,297	18,558	15,796
Thailand	3,576	9,541	8,924	8,346	17,077	15,542
Egypt	2,814	8,305	7,331	6,829	16,604	14,041
Bangladesh	4,149	11,874	10,494	9,776	29,787	25,120
India	50,466	123,738	111,934	104,412	231,266	201,797

Table 10. Growth rate, popuation 65 and older, three mortality variants, regions of Asia and seven ANE countries

	Growth rate 2000-2025			Growth rate 2025-50	
	Low	Medium	High	Medium	High
Asia	3.50	3.14	2.91	2.57	2.33
East Asia	3.31	2.98	2.77	1.91	1.67
Southeast Asia	3.89	3.46	3.20	3.25	2.92
South Asia	3.69	3.28	3.00	3.18	2.90
South Korea	4.12	3.74	3.50	1.83	1.49
Indonesia	3.83	3.34	3.10	3.21	2.79
Philippines	4.61	4.15	3.89	3.47	3.09
Thailand	3.93	3.66	3.39	2.60	2.49
Egypt	4.33	3.83	3.55	3.27	2.88
Bangladesh	4.21	3.71	3.43	4.17	3.77
India	3.59	3.19	2.91	2.90	2.64

Table 11. Old age dependency ratio, regions of Asia and seven ANE countries

	Old age dependency ratio 2025				Old age dependency ratio 2050		
	Var1	Var5	Var6	Var9	Var1	Var5	Var6
East Asia	0.197	0.210	0.215	0.226	0.307	0.383	0.450
Southeast	0.113	0.124	0.130	0.138	0.193	0.262	0.323
South Asia	0.102	0.112	0.116	0.122	0.163	0.216	0.261
South Kore	0.211	0.226	0.232	0.246	0.326	0.417	0.488
Indonesia	0.112	0.123	0.130	0.139	0.185	0.260	0.328
Phiippines	0.096	0.105	0.108	0.117	0.160	0.216	0.255
Thailand	0.164	0.178	0.184	0.190	0.295	0.382	0.457
Egypt	0.102	0.112	0.117	0.127	0.159	0.221	0.270
Banglades	0.077	0.084	0.087	0.095	0.157	0.213	0.260
India	0.112	0.123	0.128	0.133	0.173	0.232	0.283

Old age dependency ratio is calculated as population 65 and older divided by population 15-64.
Var1 is high fertility and mortality variant; Var5 is medium fertility and mortality variant, Var6 is low fertility and medium mortality variant; Var9 is low fertility and mortality variant.

Table 12. Total dependency ratio, regions of Asia and seven ANE countries

	1	2	3	4	5	6	7	8	9
Fertility variant:	High	Med	Low	High	Med	Low	High	Med	Low
Mortality variant:	High	High	High	Med	Med	Med	Low	Low	Low
				Dependency ratio in 2025					
East Asia	0.506	0.466	0.419	0.514	0.474	0.428	0.531	0.495	0.446
Southeast Asia	0.521	0.458	0.392	0.522	0.460	0.395	0.542	0.471	0.408
South Asia	0.539	0.470	0.398	0.540	0.472	0.401	0.559	0.488	0.424
South Korea	0.497	0.470	0.429	0.505	0.477	0.437	0.529	0.501	0.462
Indonesia	0.520	0.454	0.385	0.521	0.456	0.388	0.542	0.464	0.396
Phiippines	0.524	0.458	0.385	0.524	0.458	0.387	0.541	0.476	0.416
Thailand	0.496	0.450	0.398	0.497	0.453	0.402	0.518	0.468	0.422
Egypt	0.532	0.460	0.385	0.535	0.464	0.389	0.546	0.471	0.403
Bangladesh	0.501	0.429	0.357	0.498	0.428	0.357	0.533	0.462	0.400
India	0.527	0.455	0.381	0.530	0.459	0.385	0.540	0.466	0.398
				Dependency ratio in 2050					
East Asia	0.642	0.613	0.600	0.673	0.649	0.643	-	-	-
Southeast Asia	0.595	0.546	0.511	0.613	0.570	0.544	-	-	-
South Asia	0.570	0.508	0.457	0.579	0.522	0.477	-	-	-
South Korea	0.662	0.642	0.637	0.701	0.687	0.691	-	-	-
Indonesia	0.595	0.545	0.510	0.614	0.573	0.548	-	-	-
Phiippines	0.555	0.498	0.445	0.572	0.521	0.476	-	-	-
Thailand	0.664	0.636	0.628	0.683	0.660	0.659	-	-	-
Egypt	0.563	0.503	0.453	0.583	0.529	0.488	-	-	-
Bangladesh	0.572	0.510	0.459	0.579	0.523	0.481	-	-	-
India	0.576	0.515	0.467	0.587	0.531	0.490	-	-	-

The total dependency ratio is calculated as the population under 15 or 65 and older divided by the population 15-64.

Table 13. Estimated number of adults and children with HIV/AIDS, end of 1997

	Number of adults (15-49)	Percentage of adults	Number of children
Japan	6,800	0.01	<100
South Korea	3,100	0.01	<100
Indonesia	51,000	0.05	960
Philippines	23,000	0.06	620
Thailand	770,000	2.23	14000
Bangladesh	21,000	0.03	27
India	4,100,000	0.82	48000
Egypt	8,100	0.03	27

Source: UN AIDS, various.

Table 14. Migrant populations, proportion of foreign born in population, and the growth rate of migrant population, 1965, 1975, 1985, and 1990

		1965	1975	1985	1990
	World total	75,214	84,494	105,194	119,761
	Asia	31,429	29,662	38,731	43,018
Foreign born	East and Southeast	8,136	7,723	7,678	7,931
population (1000s)	South-central	18,610	15,565	19,243	20,782
	North America	12,695	15,042	20,460	23,895
	Oceania	2,502	3,319	4,106	4,675
	World total	2.3	2.1	2.2	2.3
	Asia	1.7	1.3	1.4	1.4
Foreign born	East and Southeast	0.7	0.5	0.5	0.4
percentage of	South	2.8	1.9	1.8	1.8
total population					
(%)	North America	6	6.3	7.8	8.6
	Oceania	14.4	15.6	16.9	17.8
		1965-1975	1975-1985	1985-1990	1965-1990
	World total	1.2	2.2	2.6	1.9
Annual rate of	Asia	-0.6	2.7	2.1	1.3
Change in foreign b	East and Southeast	-0.5	-0.1	0.6	-0.1
(%)	South	-1.8	2.1	1.5	0.4
	North America	1.7	3.1	3.1	2.6
	Oceania	2.8	2.1	2.6	2.5

Source: U.N., 1998. World Population Monitoring 1997 (New York: U.N.)

Table 15. Net migration, net migration rate, population growth rate, and contribution of net migration to population growth

	Number of net migrants (1000s)			Net migration rate, per 1000 (A)		
	2000-05	2020-25	2045-50	2000-05	2020-25	2045-50
Asia	-5,463	-3,941	-4,021	-0.3	-0.2	-0.2
East Asia	-624	-820	-900	-0.1	-0.1	-0.1
Southeast Asia	-1,556	-1,295	-1,390	-0.6	-0.4	-0.4
South Asia	-3,740	-1,986	-1,891	-0.5	-0.2	-0.2
Japan	0	0	0	0	0	0
South Korea	-100	0	0	-0.4	0	0
The Philippines	-600	-500	-500	-1.5	-0.9	-0.8
Thailand	-100	0	0	-0.3	0	0
Indonesia	-900	-800	-890	-0.8	-0.6	-0.6
India	-699	-686	-691	-0.1	-0.1	-0.1
Bangladesh	-600	-500	-500	-0.9	-0.6	-0.5
Egypt	-150	-150	-150	-0.4	-0.3	-0.3
North America	4,652	4,652	4,652	3	2.6	2.4
Oceania	419	437	436	2.7	2.3	1.9

	Population growth rate, per 1,000 (B)			Percentage of population growth due to migration (contribution) (A*100)/B		
	2000-05	2020-25	2045-50	2000-05	2020-25	2045-50
Asia	12.3	7.7	2.4	-2.5	-2.6	-8.3
East Asia	7.1	3	-2.7	-1.4	-3.4	3.8
Southeast Asia	13.3	9	3.5	-4.5	-4.4	-11.4
South Asia	15.8	10.2	4.8	-3.2	-2	-4.2
Japan	1.2	-4.5	-6.4	0	0	0
South Korea	7.2	2.5	-3.2	-5.6	0	0
The Philippines	18.8	11.1	5	-8	-8.1	-15.9
Thailand	8.3	4.9	-2	-3.6	0	0
Indonesia	12.2	8.3	3.4	-6.6	-7.2	-17.6
India	14.1	9	3.7	-0.7	-1.1	-2.7
Bangladesh	16.9	9.8	4.6	-5.3	-6.1	-10.9
Egypt	17	11	5.4	-2.4	-2.7	-5.6
North America	7.3	5.4	2	41.4	48.1	120
Oceania	12	8.8	4.7	22.4	26.2	40.3

Source: U.N. 1999. The percentage of population growth due to migration is calculated as the ratio of net migration rate divided by population growth rate. If both rates are positive, net migration contributes that percentage so as to increase population growth, whereas if net migration rates are negative, net migration contributes that percentage so as to decrease population growth.

Table 16. Immigrants admitted to US per 1000 persons in the sending country, 1996-97

Age	World	Korea	The Philippines	India	Bangladesh
Total	0.15	0.36	0.77	0.04	0.07
0-4	0.06	0.53	0.18	0.01	0.04
5-9	0.09	0.18	0.32	0.02	0.03
10-14	0.14	0.36	0.53	0.03	0.03
15-19	0.17	0.46	0.82	0.04	0.05
20-24	0.16	0.17	0.56	0.04	0.11
25-29	0.24	0.4	1.03	0.08	0.16
30-34	0.24	0.36	1.13	0.07	0.13
35-39	0.19	0.42	0.99	0.05	0.1
40-44	0.16	0.56	1.01	0.06	0.08
45-49	0.16	0.48	1.15	0.06	0.06
50-54	0.15	0.32	1.3	0.07	0.07
55-59	0.15	0.24	1.7	0.08	0.09
60-64	0.15	0.24	2.03	0.08	0.11
65-69	0.14	0.26	2.08	0.07	0.09
70-74	0.11	0.22	1.67	0.05	0.06
75-79	0.09	0.21	1.08	0.04	0.04
80+	0.07	0.17	0.56	0.03	0.02

Source: U.S. Department of Justice, Immigration and Naturalization Service, 1997 and 1998. Statistical Yearbook of the Immigration and Naturalization Service. This is calculated as the ratio, of the average number of immigrants in each age group in 1996 and 1997 divided by the sending country's population in that age group in 1995.

Table 17. Macroeconomic indicators of selected Asian economies, 1994-98.

	1994	1995	1996	1997	1998
GDP growth rate (%)					
Indonesia	7.5	8.2	8	4.5	-13.2
Korea	8.3	8.9	6.8	5	-5.8
Thailand	9	8.9	5.9	-1.8	-10
Philippines	4.4	4.7	5.8	5.2	-0.5
Inflation rate (%)					
Indonesia	8.6	9.4	8	6.7	57.7
Korea	6.2	4.5	4.9	4.5	7.5
Thailand	5	5.8	5.8	5.7	8.1
Philippines	8.4	8	9	6	9.7
Unemployment rate (%)					
Indonesia	4.4	7.2	4.9	4.7	5.5
Korea	2.4	2	2	2.6	6.8
Thailand	1.3	1.1	1.1	0.9	5.3
Philippines	8.4	8.4	7.4	7.9	9.6

Source: IMF, International Financial Statistics Database.
ADB, Statistical Database System.

Table 18. National health expenditures as percentage of GDP, 1997

	Total	Public Sector	Private Sector
Bangladesh	4.9	2.3	2.6
Egypt	3.7	1.0	2.7
India	5.2	0.7	4.5
Indonesia	1.7	0.6	1.1
Japan	7.1	5.7	1.4
Philippines	3.4	1.6	1.8
South Korea	6.7	2.5	4.2
Thailand	5.7	1.9	3.8

Source : WHO

Table 19. National health expenditures as percentage of GDP

	Year	Total	Public Sector	Private Sector
Bangladesh 1995	1995	2.4	1.2	1.3
Egypt 1995	1995	3.7	1.6	2.1
India 1991	1991	5.6	1.2	4.4
Indonesia 1994	1994	1.8	0.7	1.2
Japan 1995	1995	7.2	5.6	1.6
Philippines 1991	1991	2.4	1.3	1
South Korea 1992	1992	5.4	1.8	3.6
Thailand 1992	1992	5.3	1.4	3.9

Source : Bos, et al. 1999

Table 20. National health expenditure as percentage of GDP 1960-1996, G7 countries, Australia and South Korea

	1960	1970	1980	1990	1997
Australia	4.9	5.7	7.3	8.2	8.4
Canada	5.4	7.0	7.2	9.2	9.2
France	4.2	5.8	7.6	8.9	9.6
Germany	4.8	6.3	8.8	8.7	10.7
Italy	3.6	5.2	7.0	8.1	7.6
Japan	3.0	4.6	6.5	6.1	7.2
North Korea		2.3	3.7	5.2	6.0
United Kingdom	3.9	4.5	5.6	6.0	6.8
United States	5.2	7.3	9.1	12.6	13.9

Source: OECD Health Data 1999

Table 21. Estimated income elasticities form health care expenditure data

Author	Data	Country/Region	Year	Estimated elasticity
Macro Studies				
Newhouse 1977	Cross-section	13 developped countries	1972	1.31
Parkin, et al. 1987	Cross-section	18 OECD countries	1980	0.9
Bos, et al. 1999	Cross-section	130 countries	1994	1.33
Fogel 1999	Long-run time-series	United States	1875-1995	1.6
Hitiris and Posnett 1992	Panel	20 OECD countries	1960-1987	1
Murty and Ukpolo 1994	Timeseries	USA	1960-1987	0.77
O'Connell 1996	Panel	OECD contries	1975-1990	<1
Saez and Murillo 1994	Panel	10 OECD countries	1960-1990	1
Micro Studies				
Manning et al. 1986	Panel	USA	1974-1977	0.0
Russo, et al.	Cross-section	Indonesia	1987	1.65
Russo and Herin 1993	Cross-section	Philippines	1985	1.36
Russo 1992	Cross-section	Thailand	1988	1.85

Table 22. Tuberculosis among populations 60 and older, 1990

	Incidence Rate (per 100,000)		Prevalence Rate (per 100,000)	
	Males	Females	Males	Females
India	934.0	337.0	2,247.0	672.0
China	364.9	144.4	958.0	316.0
Other Asia and Islands	701.3	488.5	1,866.0	1,157.0
Middle Eastern cresent	236.0	153.0	395.0	236.0
Latin America and the Caribbean	237.0	121.0	374.0	192.0
Sub-Saharan Africa	393.0	295.0	923.0	699.0
Former socialist economies of Europe	84.7	29.4	43.9	14.9
Established market economies	57.5	21.5	14.4	5.3

Source: Murray and Lopez 1996, Global Health Statistics

Table 23. Out-of-pocket payments as percentage of total health expenditure: South Korea

	Out-of -pocket payments
1985	60.1
1986	61.8
1987	59.5
1988	56.5
1989	56.4
1990	53.0
1991	55.8
1992	60.3
1993	55.2
1994	53.3
1995	52.0

Source: OECD Health Data 1999

Table 24. Average retirement age among men, OECD countries 1950-1995

	1950	1960	1970	1980	1990	1995	Decrease 1995-60
Australia	66.0	66.1	65.0	62.4	62.7	61.8	-4.3
Austria	66.4	63.9	62.7	60.1	58.7	58.6	-5.3
Belgium	64.8	63.3	62.6	61.1	58.3	57.6	-5.6
Canada	66.7	66.2	65.0	63.8	62.8	62.3	-3.9
Denmark	67.1	66.7	66.3	64.5	63.3	62.7	-4.0
Finland	66.8	65.1	62.7	60.1	59.6	59.0	-6.1
France	66.1	64.5	63.5	61.3	59.6	59.2	-5.3
Germany	65.7	65.2	65.3	62.2	60.3	60.5	-4.7
Greece	68.2	66.5	65.6	64.9	62.3	62.3	-4.2
Iceland	68.9	68.8	66.7	69.3	68.9	69.5	0.7
Ireland	68.3	68.1	67.5	66.2	64.0	63.4	-4.8
Italy	66.9	64.5	62.6	61.6	60.9	60.6	-3.8
Japan	66.7	67.2	67.7	67.2	66.5	66.5	-0.7
Luxembourg	65.8	63.7	62.5	59.0	57.6	58.4	-5.2
Netherlands	66.4	66.1	63.8	61.4	59.3	58.8	-7.3
New Zealand	65.8	65.1	64.7	62.9	62.2	62	-3.1
Norway	67.6	67.0	66.5	66.0	64.6	63.8	-3.2
Portugal	67.8	67.5	67.2	64.7	63.9	63.6	-4.0
Spain	68.1	67.9	65.2	63.4	61.6	61.4	-6.5
Sweden	66.8	66.0	65.3	64.6	63.9	63.3	-2.7
Switzerland	67.7	67.3	66.7	65.5	64.8	64.6	-2.7
Turkey	69.1	68.7	68.0	64.9	63.5	63.6	-5.2
United Kingdom	67.2	66.2	65.4	64.6	63.2	62.7	-3.5
United States	66.9	66.5	65.4	64.2	64.1	63.6	-2.9

Source: Blondal and Scarpetta (1998).

Table 25. Median age at retirement, Asiane workers ages 40 and over, Asia 1950-2010

	1950	1960	1970	1980	1990	1995	2000	2010
Asia	na	66.7	65.7	64.2	63.6	63.2	62.8	62.1
East Asia	66.1	65.1	64.3	62.8	62.3	62.0	61.6	61.1
Southeast Asia	na	na	na	66.7	65.5	64.9	64.4	63.5
South Asia	na	na	na	67.0	66.2	65.5	65.0	64.1
South Korea	na	na	65.1	63.2	62.6	62.4	62.2	61.8
Indonesia	na	na	na	na	66.3	65.4	64.6	63.4
Philippines	na	na	na	na	66.6	66.1	65.6	64.9
Thailand	na	65.1	64.5	63.8	63.2	63.0	62.8	62.5
Bangladesh	na	na	na	na	67.9	67.1	66.4	65.3
India	na	na	na	67.6	66.6	66.1	65.5	64.4
Egypt	na	na	64.6	62.9	62.3	62.0	61.8	61.4

Source: ILO (1996).
"na" indicates the median age at retirement exceeds age 67.

Table 26. Main reasons for leaving the job, men aged 55-64 in 1995, EU

	Austria	Belgium	Germany	Finland	France	Denmark	Italy	Luxembourg	Netherland	Portugal	Spain	Sweden	UK
Dismissed or made redundant	5.1	3.7	23.4	24.1	10.7	9.5	2.0	0.0	7.9	1.0	10.2	30.2	22.0
Job of limited duration has ended	0.2	0.7	7.0	3.8	1.5	0.7	1.7	0.5	0.1	0.4	11.1	8.2	3.6
Personal or family responsibilites	0.2	1.3	0.2	0.0	0.4	0.6	1.2	0.2	1.9	0.0	0.2	2.0	1.6
Own illness or disability	2.6	7.7	9.5	25.0	7.3	22.9	5.2	16.6	15.6	2.1	18.3	7.0	22.8
Early retirement	49.0	30.6	37.2	0.0	16.9	33.1	9.2	29.1	42.9	2.3	13.0	25.9	14.7
Normal retirement	30.2	19.6	2.3	11.7	38.6	10.9	53.4	31.7	0.0	1.2	17.8	12.5	4.8
Other reasons	12.8	36.4	20.3	35.5	24.5	22.3	27.5	22.0	31.6	93.1	29.5	14.2	30.6
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Note : 1. Refers to personsaged 55-64 who are not in the labour force, but who had been in the labour force in the 8 years preceeding the survey.
2. Other reasons include: education and training, compulsory military or community service and other reasons.

Source: The European Union Labour Survey 1995, quoted from Auer and Fortuny (2000).

Table 27. Statutory Retirement Age

	Statutory Retirement Age			Statutory Retirement Age	
	Men	Women		Men	Women
China	60	55	United Kingdom	65	60
Japan	65	65	Italy	65	60
Republic of Korea	60	60	Spain	65	65
Bangladesh	..	..	Austria	65	60
India	55	55	Belgium	65	61
Pakistan	60	55	France	60	60
Sri Lanka	55	50	Germany	63	63
Indonesia	55	55	Liechtenstein	65	62
Philippines	60	60	Luxembourg	65	65
Singapore	55	55	Monaco	65	65
Thailand	..	..	Netherlands	65	65
Vietnam	60	55	Switzerland	65	62
Denmark	67	67	Mexico	65	65
Finland	65	65	Chile	65	60
Iceland	67	67	Canada	65	65
Norway	67	67	USA	65	65
Sweden	65	65	Australia	65	61

Source: SSA (1999) and UN (1999).

Table 28. Living arrangements of the elderly

	Family households					Non-family households			
		Household head/spouse		Parent of	Other		Multi-	One	
	Combined	Intact	Not intact	head	member	Combined	person	person	Institution
	Males								
Japan, 1970	0.936	0.575	0.084	0.259	0.018	0.063	0.005	0.030	0.028
Japan, 1975	0.928	0.580	0.074	0.257	0.017	0.072	0.002	0.038	0.032
Japan, 1980	0.926	0.606	0.081	0.229	0.010	0.074	0.002	0.039	0.034
Japan, 1985	0.922	0.628	0.087	0.197	0.009	0.078	0.001	0.042	0.035
Japan, 1990	0.917	0.655	0.091	0.163	0.008	0.083	0.001	0.048	0.034
Japan, 1995	0.904	0.719	0.046	0.132	0.007	0.096	0.003	0.061	0.032
Korea, 1970	0.998	0.557	0.085	0.315	0.041	0.003	0.000	0.002	0.000
Korea, 1980	0.978	0.633	0.077	0.260	0.008	0.021	0.003	0.015	0.003
Korea, 1985	0.974	0.601	0.125	0.234	0.014	0.026	0.001	0.021	0.004
Korea, 1990	0.936	0.691	0.060	0.175	0.010	0.064	0.004	0.033	0.027
Thailand, 1970	0.976	0.651	0.137	0.085	0.103	0.024	0.001	0.023	na
Thailand, 1980	0.973	0.660	0.143	0.145	0.025	0.027	0.003	0.024	na
Thailand, 1990	0.923	0.654	0.140	0.102	0.027	0.077	0.002	0.033	0.042
Indonesia, 1980	0.974	0.646	0.158	0.138	0.033	0.026	0.001	0.025	na
Indonesia, 1990	0.970	0.653	0.150	0.117	0.050	0.030	0.001	0.029	na
	Females								
Japan, 1970	0.900	0.205	0.060	0.580	0.055	0.100	0.004	0.069	0.027
Japan, 1975	0.871	0.221	0.051	0.545	0.055	0.129	0.002	0.090	0.037
Japan, 1980	0.844	0.247	0.041	0.523	0.032	0.156	0.002	0.110	0.045
Japan, 1985	0.818	0.272	0.037	0.479	0.030	0.182	0.002	0.129	0.051
Japan, 1990	0.797	0.320	0.033	0.416	0.028	0.203	0.001	0.148	0.054
Japan, 1995	0.783	0.352	0.064	0.345	0.022	0.217	0.002	0.162	0.053
Korea, 1970	0.997	0.138	0.058	0.694	0.107	0.017	0.000	0.000	0.017
Korea, 1980	0.923	0.145	0.084	0.678	0.016	0.077	0.006	0.069	0.002
Korea, 1985	0.898	0.160	0.038	0.641	0.060	0.102	0.003	0.099	0.000
Korea, 1990	0.857	0.185	0.097	0.538	0.037	0.142	0.007	0.131	0.004
Thailand, 1970	0.961	0.413	0.219	0.140	0.190	0.039	0.002	0.037	na
Thailand, 1980	0.955	0.407	0.254	0.253	0.041	0.045	0.003	0.042	na
Thailand, 1990	0.935	0.301	0.309	0.269	0.056	0.061	0.003	0.055	0.003
Indonesia, 1980	0.852	0.190	0.052	0.496	0.115	0.148	0.004	0.144	na
Indonesia, 1990	0.845	0.232	0.050	0.438	0.125	0.155	0.002	0.153	na

Notes: Based on unpublished census tabulations. For Singapore and Indonesia proportions are of the non-institutionalized population.
Source: Natividad and Cruz (1997), Knodel and Debavalya (1997), Knodel and,Chayovan (1997), Andrews and Hennink (1992),
Casterline et. al. (1991), Domingo and Casterline (1992), Kim (1997), and Chan (1997).

Table 28. Non-Family Living Arrangements for the Elderly (65 and older) in Asia

	Family Households	Non-family households: Combined	Multi-person	One person	Institutions	Family Households	Non-family households: Combined	Multi-person	One person	Institutions
	Males					Females				
Japan, 1970	0.936	0.063	0.005	0.030	0.028	0.900	0.100	0.004	0.069	0.027
Japan, 1975	0.928	0.072	0.002	0.038	0.032	0.871	0.129	0.002	0.090	0.037
Japan, 1980	0.926	0.074	0.002	0.039	0.034	0.844	0.156	0.002	0.110	0.045
Japan, 1985	0.922	0.078	0.001	0.042	0.035	0.818	0.182	0.002	0.129	0.051
Japan, 1990	0.917	0.083	0.001	0.048	0.034	0.797	0.203	0.001	0.148	0.054
Japan, 1995	0.904	0.096	0.003	0.061	0.032	0.783	0.217	0.002	0.162	0.053
Korea, 1970	0.998	0.003	0.000	0.002	0.000	0.997	0.017	0.000	0.000	0.017
Korea, 1980	0.978	0.021	0.003	0.015	0.003	0.923	0.077	0.006	0.069	0.002
Korea, 1985	0.974	0.026	0.001	0.021	0.004	0.898	0.102	0.003	0.099	0.000
Korea, 1990	0.936	0.064	0.004	0.033	0.027	0.857	0.142	0.007	0.131	0.004
Thailand, 1970	0.976	0.024	0.001	0.023	na	0.961	0.039	0.002	0.037	na
Thailand, 1980	0.973	0.027	0.003	0.024	na	0.955	0.045	0.003	0.042	na
Thailand, 1990	0.923	0.077	0.002	0.033	0.042	0.935	0.061	0.003	0.055	0.003
Indonesia, 1980	0.974	0.026	0.001	0.025	na	0.852	0.148	0.004	0.144	na
Indonesia, 1990	0.970	0.030	0.001	0.029	na	0.845	0.155	0.002	0.153	na
Philippines, 1970	0.952	0.048	0.002	0.046	na	0.912	0.088	0.004	0.084	na
Philippines, 1980	0.965	0.035	0.002	0.034	na	0.948	0.052	0.002	0.050	na
Philippines, 1990	0.962	0.038	0.002	0.036	na	0.926	0.074	0.005	0.069	na
Bangladesh, 1981	na	na	na	na	0.041	na	na	na	na	0.022
Bangladesh, 1991	na	na	na	na	0.015	na	na	na	na	0.005

Notes: Based on unpublished census tabulations. For Singapore and Indonesia proportions are for the non-institutionalized population. Data for Bangladesh are drawn from published census reports (Bangladesh, 1984, 1994).

Table 29. Non-Family Living Arrangements for the Elderly (65 and older) in Asia

	Family Households	Non-family households			Institutions	Family Households	Non-family households			Institutions
		Combined	Multi-person	One person			Combined	Multi-person	One person	
	Males					Females				
Japan, 1970	0.936	0.063	0.005	0.030	0.028	0.900	0.100	0.004	0.069	0.027
Japan, 1975	0.928	0.072	0.002	0.038	0.032	0.871	0.129	0.002	0.090	0.037
Japan, 1980	0.926	0.074	0.002	0.039	0.034	0.844	0.156	0.002	0.110	0.045
Japan, 1985	0.922	0.078	0.001	0.042	0.035	0.818	0.182	0.002	0.129	0.051
Japan, 1990	0.917	0.083	0.001	0.048	0.034	0.797	0.203	0.001	0.148	0.054
Japan, 1995	0.904	0.096	0.003	0.061	0.032	0.783	0.217	0.002	0.162	0.053
Korea, 1970	0.998	0.003	0.000	0.002	0.000	0.997	0.017	0.000	0.000	0.017
Korea, 1980	0.978	0.021	0.003	0.015	0.003	0.923	0.077	0.006	0.069	0.002
Korea, 1985	0.974	0.026	0.001	0.021	0.004	0.898	0.102	0.003	0.099	0.000
Korea, 1990	0.936	0.064	0.004	0.033	0.027	0.857	0.142	0.007	0.131	0.004
Thailand, 1970	0.976	0.024	0.001	0.023	na	0.961	0.039	0.002	0.037	na
Thailand, 1980	0.973	0.027	0.003	0.024	na	0.955	0.045	0.003	0.042	na
Thailand, 1990	0.923	0.077	0.002	0.033	0.042	0.935	0.061	0.003	0.055	0.003
Indonesia, 1980	0.974	0.026	0.001	0.025	na	0.852	0.148	0.004	0.144	na
Indonesia, 1990	0.970	0.030	0.001	0.029	na	0.845	0.155	0.002	0.153	na
Philippines, 1970	0.952	0.048	0.002	0.046	na	0.912	0.088	0.004	0.084	na
Philippines, 1980	0.965	0.035	0.002	0.034	na	0.948	0.052	0.002	0.050	na
Philippines, 1990	0.962	0.038	0.002	0.036	na	0.926	0.074	0.005	0.069	na
Bangladesh, 1981	na	na	na	na	0.041	na	na	na	na	0.022
Bangladesh, 1991	na	na	na	na	0.015	na	na	na	na	0.005

Notes: Based on unpublished census tabulations. For Singapore and Indonesia proportions are for the non-institutionalized population. Data for Bangladesh are drawn from published census reports (Bangladesh, 1984, 1994).

Table 30. Percentage living with children by parents' age, ASEAN survey

	Philippines (1984)	Singapore (1986)	Taiwan (1989)	Thailand (1986)
Total				
60-64	84.6	94.2	77.5	84.0
65-69	82.1	93.2	76.2	80.4
70-74	81.0	93.3	72.1	76.5
75+	76.8	90.6	73.1	74.9
Male				
60-69	86.2	94.3	76.3	83.2
70+	80.8	89.7	68.5	72.7
Female				
60-69	80.9	93.4	77.9	81.8
70+	77.1	93.7	76.7	77.4

Source : Casterline et al. (1991).

Table 31. Proportion of older adults living alone by age and sex, selected Asian countries

	Males							Females						
Country (year)	55-59	60-64	65-69	70-74	75-79	80-84	85+	55-59	60-64	65-69	70-74	75-79	80-84	85+
Japan (1970)	0.020	0.024	0.026	0.036	0.033	0.041	0.023	0.062	0.068	0.077	0.074	0.069	0.057	0.036
Japan (1975)	0.027	0.028	0.036	0.040	0.042	0.046	0.040	0.080	0.093	0.098	0.100	0.092	0.076	0.050
Japan (1980)	0.027	0.031	0.035	0.041	0.045	0.056	0.051	0.083	0.110	0.123	0.123	0.105	0.091	0.061
Japan (1985)	0.037	0.034	0.037	0.046	0.050	0.058	0.056	0.078	0.109	0.140	0.145	0.139	0.102	0.069
Japan (1990)	0.050	0.041	0.047	0.047	0.055	0.069	0.065	0.077	0.110	0.140	0.172	0.173	0.142	0.091
China (1990)	0.042	0.051	0.066	0.092	0.102	0.128	0.130	0.024	0.047	0.079	0.115	0.142	0.151	0.149
Taiwan (1990)	0.056	0.060	0.068	0.084	0.101	0.129	0.157	0.038	0.051	0.064	0.074	0.078	0.075	0.071
Korea (1970)	0.002	0.001	0.003	0.002	0.002	0.000	0.011	0.001	0.001	0.000	0.001	0.001	0.002	0.000
Korea (1980)	0.010	0.014	0.013	0.015	0.023	0.018	0.022	0.048	0.069	0.077	0.071	0.064	0.045	0.050
Korea (1985)	0.022	0.024	0.027	0.030	0.024	0.031	0.016	0.060	0.091	0.111	0.100	0.085	0.067	0.048
Korea (1990)	0.022	0.027	0.032	0.034	0.039	0.032	0.047	0.067	0.121	0.146	0.144	0.125	0.098	0.060
Philippines (1970)	0.024	0.030	0.043	0.046	0.043	0.044	0.062	0.034	0.050	0.078	0.086	0.085	0.104	0.081
Philippines (1975)	0.020	0.024	0.031	0.037	0.032	0.041	0.031	0.014	0.022	0.037	0.056	0.056	0.049	0.059
Philippines (1980)	0.009	0.013	0.025	0.036	0.049	0.051	0.078	0.012	0.022	0.034	0.055	0.073	0.106	0.073
Philippines (1990)	0.019	0.023	0.025	0.039	0.043	0.061	0.046	0.021	0.036	0.059	0.062	0.086	0.088	0.080
Thailand (1970)	0.017	0.019	0.029	0.037	0.041	0.054	0.038	0.038	0.057	0.074	0.088	0.114	0.110	0.115
Thailand (1980)	0.017	0.025	0.028	0.026	0.031	0.031	0.045	0.024	0.031	0.053	0.063	0.061	0.070	0.055
Thailand (1990)	0.022	0.024	0.032	0.031	0.037	0.038	0.053	0.027	0.042	0.049	0.055	0.069	0.055	0.056
Indonesia (1976)	0.012	0.013	0.032	0.029	0.028	0.043	0.012	0.080	0.108	0.130	0.148	0.192	0.183	0.130
Indonesia (1980)	0.011	0.017	0.020	0.029	0.033	0.037	0.040	0.064	0.107	0.120	0.139	0.133	0.132	0.107
Indonesia (1990)	0.014	0.020	0.023	0.033	0.041	0.048	0.047	0.058	0.105	0.125	0.151	0.133	0.160	0.128

Source: Values tabulated from primary census data for each country.

Table 32. Household size, children and adults per household, Asian countries.

Year of Census	Average Household Size	Children per Household	Adults per Household	Year of Census	Average Household Size	Children per Household	Adults per Household
Bangladesh				Malaysia			
1974	5.64	2.71	2.93	1970	5.50	2.49	3.01
1981	5.78	2.69	3.09	1980	5.20	2.08	3.12
1991	5.48	2.47	3.01	Myanmar			
India				1983	5.49	2.12	3.37
1971	5.60	2.34	3.26	Nepal			
1981	5.60	2.21	3.39	1971	5.53	2.38	3.15
1991	5.57	2.03	3.54	1981	5.80	2.40	3.40
Indonesia				1991	5.60	2.36	3.24
1971	4.87	2.14	2.73	Pakistan			
1980	4.85	1.98	2.87	1981	6.70	2.91	3.79
1985	4.57	1.80	2.77	Philippines			
1990	4.51	1.65	2.86	1970	5.95	2.72	3.23
1995	4.27	1.44	2.82	1975	5.94	2.61	3.33
Japan				1980	5.59	2.35	3.24
1950	4.97	1.79	3.18	1990	5.32	1.94	3.38
1955	4.97	1.72	3.25	Singapore			
1960	4.54	1.43	3.11	1970	5.60	2.29	3.31
1965	4.05	1.10	2.95	1980	4.90	1.33	3.57
1970	3.69	0.93	2.76	1990	4.20	0.95	3.25
1975	3.45	0.87	2.58	Taiwan			
1980	3.33	0.81	2.52	1956	5.70	2.51	3.19
1985	3.22	0.71	2.51	1966	5.68	2.26	3.42
1990	2.99	0.57	2.42	1970	5.52	2.27	3.25
1995	2.97	0.47	2.50	1975	5.25	1.94	3.31
South Korea				1980	4.80	1.55	3.25
1955	5.50	2.34	3.16	1990	3.99	1.11	2.88
1960	5.70	2.32	3.38	Thailand			
1966	5.49	2.51	2.98	1960	5.68	2.47	3.21
1970	5.40	2.37	3.03	1970	5.82	2.62	3.20
1975	5.10	1.99	3.11	1980	5.20	2.04	3.16
1980	4.60	1.59	3.01	1990	4.40	1.29	3.11
1985	4.22	1.26	2.96	Viet Nam			
1990	3.82	0.98	2.84	1979	5.00	2.25	2.75

Source: Population censuses, details available from authors.

Table 33. Types of schemes providing cash benefits to the aged, disabled and/or survivors, 1999

	No scheme	Contributory		Non-Contributory		Mandatory private pensions	Mandatory savings	
		Flat-rate	Earnings-related	Means-related	Flat-rate universal		public	private
Africa	2	2	35	2	1	1	6	0
Egypt	-	-	yes	-	-	-	-	
Asia	2	5	26	9	1	1	6	0
Japan	-	yes	yes	-	-	-	-	-
South Korea	-	-	yes	-	-	-	-	-
Philippines	-	-	yes	-	-	-	-	-
Thailand	-	-	yes	-	-	-	-	-
Indonesia	-	-	-	-	-	-	yes	-
Bangladesh	yes	-	-	-	-	-	-	-
India	-	-	-	-	-	-	yes	-
Latin/Carribean	1	1	34	4	0	0	0	8
Europe	0	15	36	19	2	4	2	2
North America	0	0	2	2	1	0	0	0
Oceania	0	0	3	1	1	1	6	0
World Total	5	23	136	37	6	7	20	10

Source: Social Security Administration (1999)

< Definition of Terms >

Contributory flat-rate pension is a pension of uniform among or based on years of service or residence but independent of earnings that is financed by payroll-tax contributions from employees and/or employers.

Contributory earnings-related pension is a pension based on earnings which is financed by payroll-tax contributions from employees and/or employers.

Non-contributory means-tested pension is a pension paid to eligible persons whose own of family income or assets fall below designated levels that is generally financed through government contributions with no contribution from employer or employees.

Non-contributory flat-rate universal pension is a pension of uniform amount of based years of service but independent of earnings that is paid to residents who meet age or disability that is financed with no contributions from employers or employees.

Mandatory private pension system is a system requiring employers by law, to provide private/occupational pensions.

Mandatory saving system is a compulsory defined-contribution pension system which pays benefits either as a lump-sum or as an annuity based on employee and in some cases employer contributions and returns on investment funds including publicly managed provident funds and privately managed systems.

Table 34. Coverage of schemes providing cash benefits to the old aged, disabled and/or survivals

Countries (coverage rate in 1992)	Coverage of schemes (1999)	Special schemes
Japan (n.a.)	National pension program: All residents aged 20-59. Voluntary coverage for residents aged 60-64 (employees' pension insurance: employees of firm in industry and commerce)	Public employees, private school teacher, agriculture, fishery and forest sector
South Korea (25.9%)	National pension program: employers and employees in workplace with 5 or more employees. The self-employed, farmers, and fishermen aged 18-59. Voluntary coverage for residents aged 60-64	Public employees, private school teacher, military personnel
Philippines (52.6%)	All private employees under 60. House helpers or self-employed earning at least 1,000 pesos a month	Government employees, sugar industry workers, military personnel
Thailand (n.a.)	Employees of firm with 10 or more workers. Voluntary coverage for the self-employed	Civil servants, private school teacher
Indonesia (6.9%)	Employees earning less than 5,000 rupees a month from establishments with 10 or more workers or a payroll of Rp. 1 million or more a month	Public employees, military personnel
India (0.9%)	Employees of establishments with 20 or more employees in 177 categories of industries	Public employees, railway industry and coal-miners
Bangladesh (0.0%)	None	Public employees
Malaysia (95.6%)	Mandatory coverage for private sector employees, non-pensionable public sector employees and foreign sector employees. Voluntary coverage for domestic workers, self-employed, and pensionable public sector employees	Armed forces
China (21.1%)	Employees in state-run enterprises. Private, collective and foreign companies depend on local government regulations	Government and party employees, cultural, scientific, and educational institutions
Egypt (n.a.)	Employees aged 18 and over. Government employees aged 16 and over	Civil servants, casual, agricultural, and self-employed

Source: Social Security Administration (1999), ILO (1995).

Table 35. Percentages of social security expenditure and tax revenue, selected years

	1972	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996
(A) Public expenditure on social security (% of public expenditure)											
Philippines	3	2	1	2	1	2	2	2	na	na	na
South Korea	5	5	6	5	7	8	8	8	na	na	na
Singapore	0	2	1	1	2	2	2	2	na	na	na
Canada	na	30	26	27	29	32	na	na	na	na	na
Denmark	32	36	36	33	38	39	na	na	na	na	na
Luxembourg	46	46	47	49	45	48	47	na	na	na	na
Netherlands	na	34	35	34	34	34	35	na	na	na	na
Spain	47	50	54	39	36	37	na	na	na	na	na
Sweden	32	36	38	41	48	46	43	na	na	na	na
United States	27	31	28	24	20	21	22	22	na	na	na
Argentina	na	na	19	19	22	22	na	na	na	na	na
Brazil	na	50	32	21	23	33	28	na	na	na	na
Chile	30	24	31	37	34	32	31	31	na	na	na
(B) Employer's and employee's social security contributions (% of tax revenue)											
South Korea	0.7	0.8	1.1	1.5	4.5	4.9	5.5	8.2	7.5	7.5	8.8
Malaysia	0.1	0.5	0.4	0.5	0.8	0.8	0.9	1.1	1.1	1.2	1.1
Thailand	0.0	0.1	0.2	0.2	0.1	0.7	1.0	1.1	1.4	1.3	1.4
Egypt	na	13.2	8.9	13.4	14.6	10.9	8.9	9.0	9.2	9.7	na
Canada	na	10.0	10.4	14.5	14.7	16.7	18.4	19.8	18.9	na	na
Denmark	5.1	1.8	2.2	4.6	3.8	3.7	3.9	3.9	4.0	3.9	na
Luxembourg	27.7	29.1	26.0	23.9	24.6	24.7	26.6	26.7	25.9	26.8	25.8
Netherlands	na	37.2	36.3	39.6	35.5	36.1	37.2	36.8	40.6	41.6	39.7
Spain	38.8	44.6	48.0	41.0	38.1	37.8	37.8	38.9	39.5	38.6	na
Sweden	21.6	26.8	33.2	27.7	31.1	31.2	37.3	34.3	33.1	36.5	37.1
United States	23.6	28.0	28.2	32.9	34.6	35.1	35.5	34.2	34.3	33.3	33.0
Argentina	na	na	16.7	27.1	43.3	44.1	47.0	37.3	36.8	34.8	29.9
Brazil	na	na	25.0	20.6	22.4	24.6	24.9	26.4	26.5	na	na
Chile	28.6	9.9	16.9	7.3	8.3	7.0	7.0	6.6	6.5	6.1	6.1

Source: World Bank (1999). World Bank Database.

Table 36. Percentage of old-age benefit and other social security expenditure in GDP, circa 1993

	Total social security	Pension	Other social security
Bangladesh	0.02	0.00	0.02
Thailand	0.12	0.00	0.12
Philippines	3.01	0.78	2.23
Indonesia	0.06	0.01	0.05
India	0.32	0.22	0.10
Singapore	1.78	1.31	0.47
Malaysia	0.15	0.00	0.15
South Korea	2.18	0.14	2.04
Japan	17.88	8.06	9.82
China	2.55	1.63	0.92
Egypt	1.20	na	na
USA	15.45	6.26	9.19
Switzerland	20.53	6.18	14.35
UK	21.60	4.49	17.11
Canada	22.84	4.59	18.25
Austria	25.60	11.00	14.60
Germany	26.33	10.10	16.23
Netherland	31.70	7.14	24.56
Sweden	40.05	17.72	22.33
Italy	12.40	11.41	0.99
Denamrk	32.10	8.69	23.41
Spain	22.60	8.80	13.80
Chile	22.67	17.64	5.03

Source: ILO, Social Security Department database.