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ESID/HLM-MIPAA/INF. 1  
9 October 2007

ENGLISH ONLY

**ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC**

High-level Meeting on the Regional Review of the Madrid International  
Plan of Action on Ageing (MIPAA)

9-11 October 2007  
Macao, China

**FERTILITY TRANSITION AND POPULATION AGEING  
IN THE ASIAN AND PACIFIC REGION\***

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\* The paper was prepared by the ESCAP Secretariat. The document has not been formally edited.

## SUMMARY

This paper provides a general overview of population ageing in the context of fertility transition in the Asian and Pacific region. Focusing on low-fertility countries, the paper highlights the implications of low fertility on population ageing. Indicators of population ageing, such as the changes in age structure, potential support ratio and feminization of the elderly population are presented for a better understanding of the overall situation.

As the region contains over 60 per cent of the global population and has experienced a rapid decline in fertility, the absolute size of the older population is a major concern. While the overall population growth rate has been declining over time, the number of older persons is increasing at a faster rate. In addition to the increase in older persons, a gender disparity in the improvements in the life expectancy at birth is likely to result in a much higher percentage of females in the older age groups, particularly in the age group 80 years and older, many of whom being widows and likely to be illiterate and living in poverty. Providing family support, health care and financial security are some of the contentious issues ageing societies will face.

Therefore, the pressing issue for low fertility countries is the ageing of the population. It would be more difficult for families to care for their older members because families would be smaller, people would live longer and the migration of young adults would mean that families would fragment. It is, therefore, important for countries in the region to recognize the significance of ageing problems and start formulating policies for the elderly given that it takes several decades for government old-age pension insurance schemes to mature and operate at full scale.

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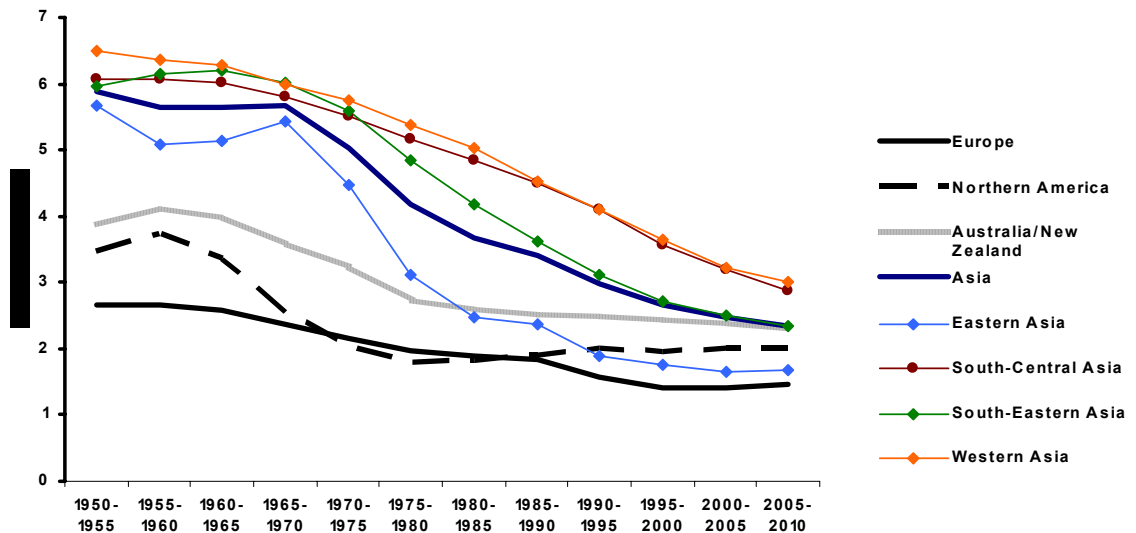
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## INTRODUCTION

During the past half century, the world has witnessed a remarkable decline in total fertility rates (TFR) from a high level of 5 children per woman in the period 1950-1955 to 2.8 in the period 2000-2005. While the fertility transition was already well under way in Europe, Northern America and Australia/New Zealand during the period 1950-1955, TFR was very high in the Asian region, at around 6 children per woman. Fertility continued to decline in Europe from 2.7 in the period 1950-1955 to replacement level (2.1 children per woman) during the 1970s. The total fertility rate has fallen far below the replacement level in Europe (figure 1).

**Figure 1. Fertility trends by major region\* of the world, 1950-2005**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.  
 \* This graph is based on the subregional groupings of the United Nations Secretariat rather than those of ESCAP.

In Northern America, TFR declined from 3.5 in the period 1950-1955 to the replacement level in the early 1970s. It had reached a low level of 1.8 in the period 1980-1985, after which it increased slightly but remained stable at below the replacement level. In Australia/New Zealand, replacement level fertility was reached in the late 1970s; although there has been some decline, TFR has levelled off at 1.8.

The Asian and Pacific region has also experienced remarkable success in reducing fertility during the past 50 years. According to the 2007 ESCAP Population Data Sheet, the TFR in the region has dropped to 2.3 births per woman from about 6 in 1950. This regional average, however, masks a considerable difference in the (TFR) observed among subregions. The TFR has plummeted to below the replacement level in East and North-East Asia and North and Central Asia (1.7 births per woman). In sharp contrast, South and South-West

Asia exhibit a total fertility rate of 2.9 births per woman. The South-East Asian and the Pacific subregions have fertility rates of 2.3 births per woman (ESCAP, 2007).

Within subregions, TFRs vary to a large extent by country. Fertility has dropped to below the replacement level (2.1 births per woman) in all the populations of East and North-East Asia. Below replacement fertility has been reached in Myanmar, Singapore, Thailand and Viet Nam in South-East Asia, while Sri Lanka is the only country in South and South-West Asia exhibiting below replacement fertility. In North and Central Asia, Armenia, Azerbaijan, Georgia and the Russian Federation have achieved below replacement fertility, while in the Pacific, below replacement fertility has been reached in Australia, New Caledonia, New Zealand and the Northern Mariana Islands.

The lowest fertility in the region has been recorded in Hong Kong, China (1.0) and Macao, China (0.9). Countries such as Armenia, Georgia, Japan, the Northern Mariana Islands, the Russian Federation and Singapore have reached TFR of 1.5 or lower. By contrast, fertility continues to remain high, with TFR exceeding 5 births per woman in Afghanistan, Marshall Islands and Timor-Leste. A large number of countries, however, have fertility rates that are at the intermediate level, ranging between 2.1 and 5.0 births per woman.

In view of the fact that countries in the region are at different levels of fertility, it is pertinent to examine the levels and trends in fertility in the region. For the purpose of this paper, countries are classified into three categories according to their level of fertility estimated during the period 2000-2005 –high, intermediate and low fertility. Intermediate fertility level is further classified as transitional and near-replacement fertility while low fertility level is classified as low and lowest-low fertility (see table 1 for the classification of countries by the level of TFR).

The ESCAP region is not only diverse in social and economic development, but also in its levels of fertility. Country experiences reveal that various factors have contributed to the decline in fertility. In some countries, socio-economic development has played a major role in reducing fertility, while in others strong family planning programme –in the absence of development– has been successful in fostering fertility decline. It has, however, been documented that sustainable fertility decline occurred mostly in countries with higher human development index. By contrast, fertility decline had slowed down or even stalled in countries where fertility transition began at lower level of human development index (Gubhaju and Moriki-Durand, 2003a).

Against this backdrop, the paper first presents the levels and trends in fertility over the past 30 years. The paper then discusses the implications of low fertility, such as the inevitable phenomenon of population ageing, decline in working age population and feminization of older persons. Finally, the paper highlights new issues and challenges faced by low-fertility countries and suggest policy recommendations for future key actions.

## I. LEVELS AND TRENDS IN FERTILITY

1. Table 1 shows the classification of countries by total fertility rates during the periods, 1970-1975, 1990-1995 and 2000-2005. A large number of countries (37 out of 58) in the ESCAP region belonged to the category of high fertility during the period 1970-1975. Japan and the Russian Federation were the two countries which had achieved below replacement fertility, while Australia; Georgia; Hong Kong, China; New Zealand and Singapore had reached near-replacement fertility during that period. As a result of fertility transition taking place since the 1970s, several countries had reached the near-replacement and low fertility level, with 12 countries and areas achieving the below replacement fertility during the period 1990-1995. Notably, Hong Kong, China; Japan and the Russian Federation had even reached the lowest-low level. By contrast, during this period, 10 countries had high fertility. Currently, a total of 18 countries and areas in the region have reached below replacement fertility, with Armenia; Georgia; Macao, China; the Northern Mariana Islands; the Republic of Korea and Singapore joining the lowest-low fertility category. By contrast, only a few countries such as Afghanistan, Marshall Islands and Timor-Leste continued to have high fertility during the recent period 2000-2005.

2. Table 2 presents the trends in total fertility rates during the past 30 years. It is interesting to note that a large number of countries experienced marked declines in fertility from a high level (5 or more) to transitional or near-replacement levels (2.2 to 4.9) during the periods 1970-1975 and 1990-1995. Prominent among these are Bangladesh, Brunei Darussalam, Cook Islands, French Polynesia, Indonesia, Malaysia, New Caledonia, Myanmar, Palau, Turkey, Turkmenistan, Uzbekistan and Viet Nam, all of which registered more than a third decline in TFR.

3. Among the low and lowest-low fertility countries, fertility remained fairly high until the period 1970-1975 in several countries such as China, the Islamic Republic of Iran, Mongolia, the Republic of Korea, Sri Lanka and Thailand. It is to be noted that Japan was the first country in this region which had completed the fertility transition from high to low by the early 1960s (Jones and Leete, 2002). Fertility transition had begun in most of the low and lowest-low fertility countries prior to the seventies, followed by a precipitous decline thereafter. Among the low-fertility countries, China, Mongolia and Thailand registered a spectacular decline in fertility between 1970-1975 and 1990-1995, a reduction of 3 children per woman in China and Thailand and a reduction of almost 4 children per woman in Mongolia. Sri Lanka and the Democratic Republic of Korea also experienced a sizable decline in fertility during this period.

4. Among lowest-low fertility countries, the Republic of Korea registered a marked decline in fertility from 4.3 in 1970-1975 to 1.7 in 1990-1995, while in the Northern Mariana Islands the TFR was reduced from a high of 5.4 to below replacement level during this period. Hong Kong, China and Macao, China continued to reduce fertility by more than half during this period. It is noteworthy that Singapore exhibited a dramatic fall in TFR to 2.6 in the period 1970-1975, down from a high level of 6.4 in the period 1950-1955. Singapore continued to experience a further decline in fertility, reaching 1.8 in 1990-1995 and 1.4 in 2000-2005.

5. Over the last 10 years, between 1990-1995 and 2000-2005, several countries exhibited rapid fertility declines. More than one quarter decline in fertility was recorded in transitional and near-replacement fertility countries such as Bhutan, Cambodia, the Lao People's Democratic Republic, Kyrgyzstan, Maldives, Myanmar, Nepal, Pakistan, Turkmenistan, Uzbekistan and Viet Nam.

6. Among low-fertility countries, the Islamic Republic of Iran experienced a dramatic fall in fertility from 4.3 to 2.1 during this period. Azerbaijan reduced its fertility by over 40 per cent while Mongolia's fertility further declined by 39 per cent during the same period. It is also to be noted that among lowest-low fertility countries, fertility dropped from 2.4 to 1.3 in Armenia and from 2.0 to 1.1 in the Northern Mariana Islands over the past 10 years. It is most striking that Macao, China further reduced its fertility by more than four fifths, registering the lowest fertility of 0.8 in the world. In the Republic of Korea and Hong Kong, China too the TFR was further reduced by more than a quarter, from 1.7 to 1.2 in the former and 1.3 to 0.9 in the latter.

## II. LOW FERTILITY AND POPULATION AGEING

7. As with fertility, there has been a remarkable improvement in mortality in the world. Worldwide, a child born today could be expected to live on average 65 years, an increase of 20 years in life span during the previous 50 years (United Nations Population Division, 2006). There is, however, a considerable difference in the expectation of life at birth by major areas and regions of the world. While a new born baby is expected to live more than 75 years in much of Europe, Northern America and Australia/New Zealand, this indicator is just a little higher than 65 years in Asia. Actually, the life expectancy at birth currently prevailing in Asia as a whole is the same as the level that had prevailed in Europe 50 years ago.

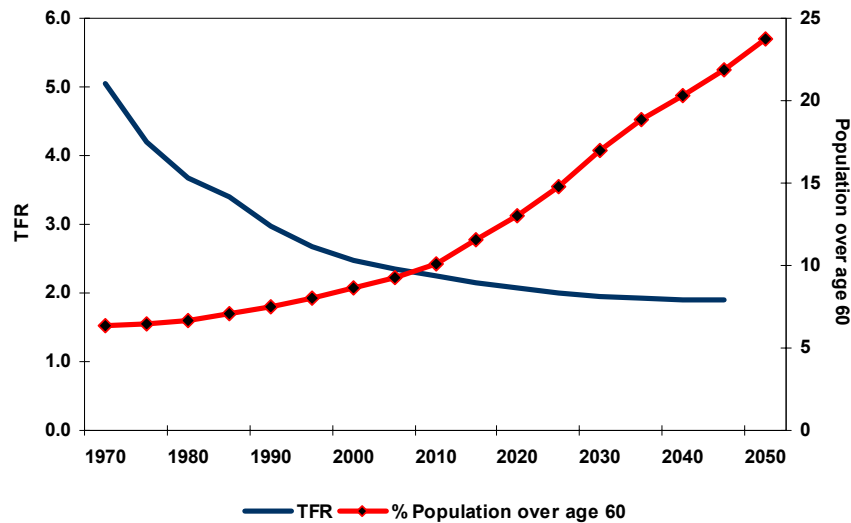
8. With the increase in the number of years a newborn baby is expected to live, a wide gender disparity in life expectancy at birth –favouring females over males– has emerged in many low-mortality countries. In general, females tend to outlive males by 5-7 years in Europe, Northern America and Australia/New Zealand. By contrast, in Asia, in general, the gender disparity in life expectancy at birth is not as wide as in developed countries. However, in South-Central Asia, owing to the high female mortality associated with the low status of women, life expectancy at birth of females was slightly lower than that of males until the period 1980-1985. With the improvement in mortality, especially among women, this trend has now been reversed. As a result, the life expectancy at birth in South-Central Asia is currently 62 years for females and 61 years for males.

9. Declining fertility, increasing longevity and the widening disparity in life expectancy at birth between females and males have brought remarkable shifts in age and sex structure of the population. Europe, Northern America and Australia/New Zealand initially experienced one of such inevitable demographic events, that is population ageing. While the transition from the young-age population to the ageing population occurred over a much longer period in the West, the speed of ageing was much faster in the low-fertility countries of Asia. For instance, it took 115 years for France and 85 years for Sweden to raise the

percentage of the population aged 65 years and older from 7 per cent to 14 per cent. By stark contrast, Japan took only a quarter of a century to complete this process. Similarly, other low-fertility countries in Asia, such as China, the Republic of Korea, Singapore and Thailand, are projected to follow the trend set by Japan. This rapid ageing process is driven largely by sharp declines in fertility in recent decades. This has now emerged as a new issue challenging many low-fertility countries in this region. The implications are profound as they affect labour force shortages, increase the elderly dependency ratios and the feminization of the elderly population. There are other contentious issues related to health care cost, social support and financial security that are likely to be faced by an ageing society (National Research Council, 2001).

10. As a result of low fertility, fewer children are born and progressively large numbers of adults move into the older age groups. Changes in age structure of the population and population ageing are inevitable consequences of low fertility. It can be seen from figure 2 that declining fertility has had a significant impact on the rising percentage of population over age 60. It is also evident that the impact of fertility decline on population ageing is much more revealing in the later stage as the high fertility cohort begins to reach the older age groups. In addition, improvement in mortality not only increases life expectancy at birth but also increases the number of additional years expected to be lived by older persons aged 60 and 80 years (United Nations Population Division, 2007). These improvements in old-age mortality have contributed to the ageing of the elderly themselves.

**Figure 2. Total fertility rate and percentage of population over age 60, ESCAP region, 1970-2050**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

11. In the long run, however, population ageing is not the only radical outcome of persistent low fertility. Increases in longevity at older ages and the widening gap between female and male life expectancies at birth will also result in a higher rate of growth of the elderly population, an increase in the old-age dependency ratio and feminization of the

elderly population. By contrast, an ageing population would eventually lead to a decline in the overall growth of the population in general and the working-age population in particular. An old-age structure provides the momentum for a decline in population, just as the young-age population provides the momentum for an accelerated growth of population (McDonald, 2000).

12. Table 3 clearly shows a very strong relationship between the total fertility rate and the percentage of population aged 60 years and older. Countries which have reached below replacement fertility have markedly higher percentage of older persons in 2007. Long-term decline in fertility would give rise to a higher percentage of older persons. The speed of ageing is also determined by the continuation of fertility decline. For example, Japan –the first country in this region to have completed the fertility transition from high to low fertility by the early 1960s– has the largest percentage of older persons in 2007 (27.9 per cent), rising further to 35.8 per cent in 2025 and 44 per cent in 2050. Similarly, a long-term decline in fertility in Australia, Georgia, New Zealand and the Russian Federation has resulted in high percentage of older persons (between 17 and 18 per cent) in 2007. These countries will exhibit a further increase in older persons exceeding 30 per cent by 2050.

13. It is also worth noting that Hong Kong, China; Macao, China; Singapore and the Republic of Korea, which have witnessed rapid declines in fertility (currently reaching lowest-low level) will experience a vast increase in older persons. Between now and 2050, Hong Kong, China will see a significant rise in older persons from 16.4 per cent to 39.4 per cent; Macao, China from 11.5 per cent to 42.8 per cent; the Republic of Korea from 14.6 per cent to 42.2 per cent; and Singapore from 13.8 per cent to 39.8 per cent. Other low fertility countries will also see a dramatic increase in older persons. In the case of the Islamic Republic of Iran and Mongolia, although the percentage of older persons is currently below 7 per cent, the speed of ageing would be much faster. The percentage of older population will, therefore, rise to about 11 per cent in 2025 and to over 25 per cent in 2050.

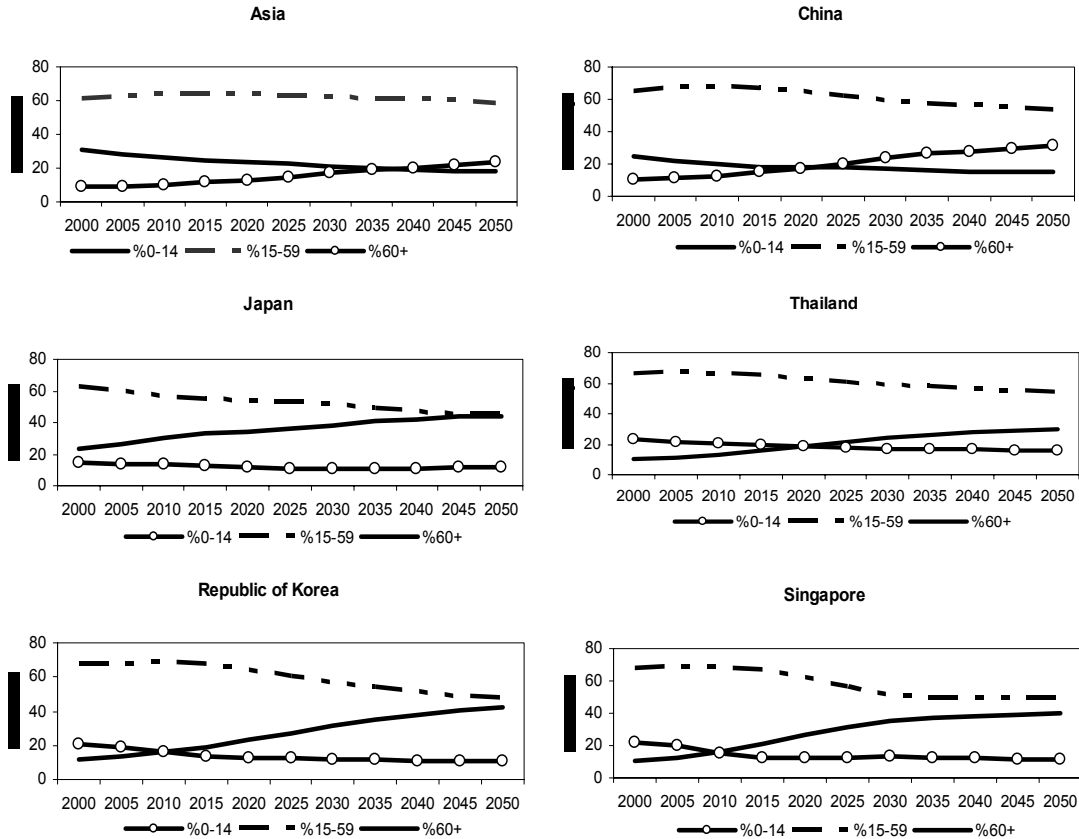
14. It is also evident from this table that by 2025 all countries in the region, except Afghanistan, Papua New Guinea, Solomon Islands and Timor-Leste, will have reached the stage of ageing population (defined as having reached the level of 7 per cent of the total population aged 60 years and older). By 2050, Afghanistan would be the only country with less than 7 per cent of the population aged 60 years and older. In all countries with lowest-low fertility, more than a third of their population will be 60 year and older. Japan will be the most aged country in the region (representing 44 per cent of older population) followed by Macao, China (42.8 per cent) and the Republic of Korea (42.2 per cent).

#### **A. Changes in age structure**

15. One of the implications brought about by the low-fertility regime is a substantial change in the age structure of the population. On one hand, the proportion of the population under age 15 will experience a continuous fall, while on the other, the proportion of the population aged 60 years and older will increase during the period 2000 to 2050. In the world as a whole, the proportion of the population under age 15 (young-age population) and that of the population aged 60 years and older (old-age population) will be converging during

the next 50 years. The timing of the crossover, however, varies depending on the timing and speed of the demographic transition: the earlier and faster the transition, the earlier the crossover.

**Figure 3. Percentage distribution of population by broad age groups, 2000-2050**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

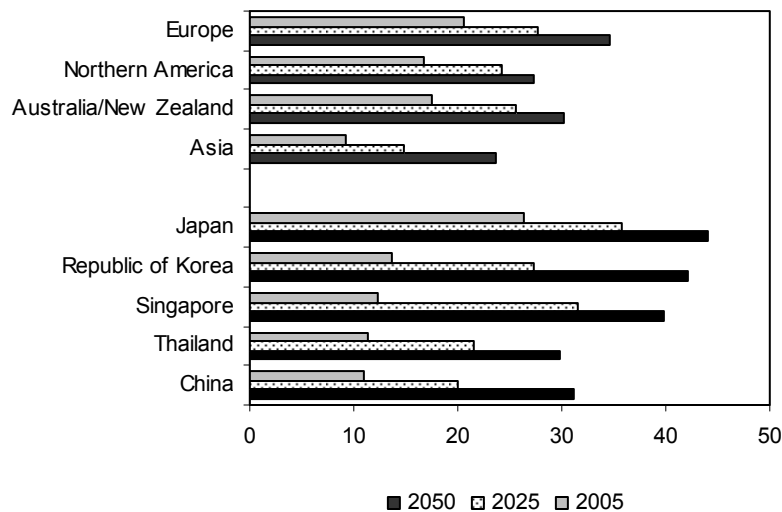
16. The Asian countries will also experience a tremendous shift in the proportion of the young-age (under 15 years of age) and the old-age populations between 2000 and 2050. During this period, the proportion of population 60 years and older is expected to increase by two and half times, from 9 to 23 per cent, while the proportion of the young-age population is likely to decline by one third, from 30 per cent to 19 per cent. In Asia as a whole, the old-age population will outnumber the young-age population by the year 2040 (figure 3). However, as a consequence of an earlier and faster fertility transition, the old-age population in Japan has already surpassed the young-age population. In Singapore and the Republic of Korea, such a crossover will occur in 2010 and 2015 respectively.

17. The impact of a long-term decline in fertility will also give rise to a substantial drop in the proportion of the population in the age group 15-59. In the world as a whole and in Asia, the proportion of the population representing this age group will remain more or less

constant at around 60 per cent during the period 2000 to 2025 and will experience a slight decline to 58 per cent in 2050. However, the changes in the age structure of the population are more revealing in countries where fertility declined rapidly. Japan will experience a considerable drop in the proportion of the population in this age group: by the year 2050, only 45 per cent of the population of Japan will be in this age group, down from 62 per cent in 2000. Populations such as the Republic of Korea and Singapore will also exhibit a lower proportion of populations in the working ages in the next 50 years.

18. As previously noted, Japan's old-age population in 2007 represented 27.9 per cent of the total population as compared with the young-age population, which represented 15 per cent of the total. The old-age population will drastically increase in the next few decades; it is projected that in 2050 Japan's old-age population will be 44 per cent of the total population, almost three and half times as high as the proportion of the young-age population. As the changing proportions of the young-age and old-age populations suggest, Japan will continue to be one of the most aged countries in the world. Other low-fertility countries in Asia will also experience a substantial increase in the proportion of older persons (figure 4).

**Figure 4. Percentage of population 60 years and older**

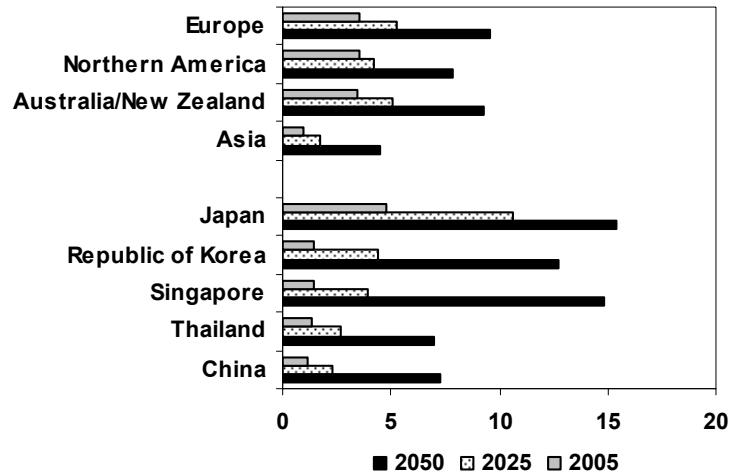


Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

19. It is worth mentioning that persons aged 80 years and older (the so-called oldest-old) currently represent more than 3 per cent of the total population in Europe and Northern America. The population of the oldest-old will increase by more than three times in the next 50 years in Europe, reaching at least 10 per cent of the total population. Similarly, the population of the oldest-old will be more than double in Northern America during the same period. The only country in Asia with a sizeable population of the oldest-old is Japan: 5.4 per cent of Japan's population in 2007 comprised people aged 80 years and older. Of all the countries in the world, Japan is projected to witness the largest proportion of the oldest-old (15.3 per cent) in the total population in 2050. Other countries such as the Republic of Korea and Singapore are also expected to experience a large growth in the population of the oldest-

old. It is noteworthy that in the Republic of Korea and Singapore, the number of oldest-old is projected to increase by almost 10 times over the next 50 years (figure 5).

**Figure 5. Percentage of population 80 years and older**

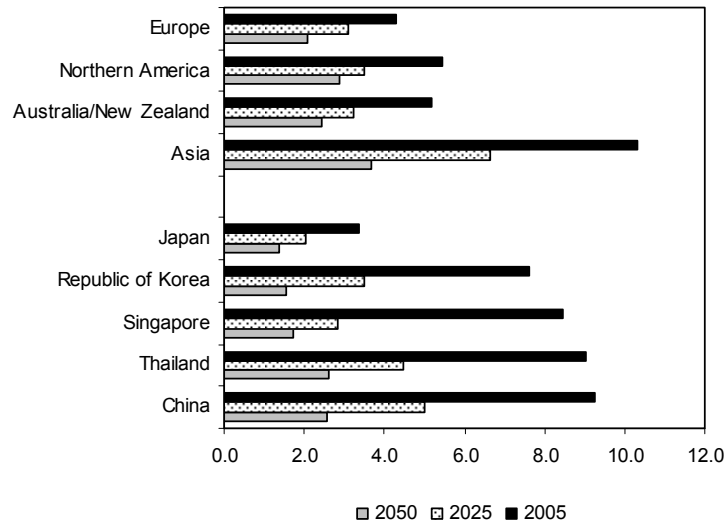


Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

### B. Potential support ratio

20. The potential support ratio, presented in figure 6, is a simplified measure showing the relationship between the number of working-age population (15-64 years) and older persons (65 years and older). Globally, there are 9 persons in the working age group per older person. However, in the next 50 years there is likely to be a vast depletion in the potential support ratio, shrinking by more than half. Currently, the potential support ratio in Europe –already low at less than 5– will further decline to less than 2 in 2050. Relatively low potential support ratios are found in Northern America (5.4) and Australia/New Zealand (5.5). Over the next half century, this ratio will drop substantially to 2.8 in Northern America and 2.7 in Australia/New Zealand.

**Figure 6. Potential support ratio (15-64 years/65 years and older)**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

21. In Asia as a whole, although the potential support ratio is relatively high at 11, important variations can be seen at the country level. In the next 50 years several low-fertility countries in Asia will experience a sharp decline in the potential support ratio, eventually falling to 2 or lower. Such countries will include Hong Kong, China; Japan; Macao, China; the Republic of Korea; and Singapore. Importantly, the potential support ratio of Japan, currently at 3.2, is already lower than that of Europe. More importantly, this ratio in Japan is projected to fall below 1.5 in 2050; the only two other countries in the world in which such a low ratio would be expected are Italy and Spain (United Nations Population Division, 2007).

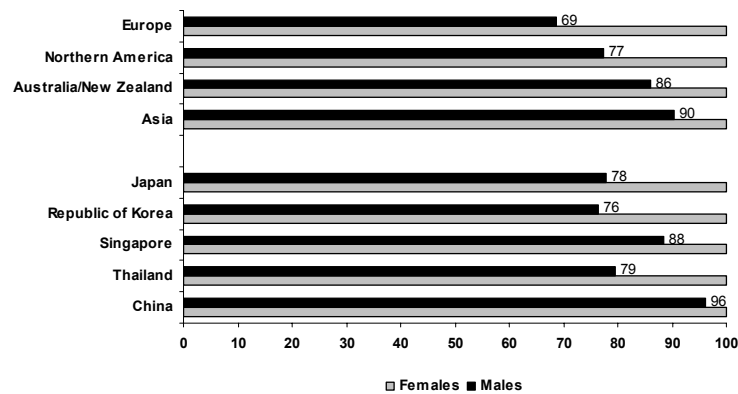
### C. Feminization of the elderly population

22. In addition to the increase in elderly dependency ratios, a large gender disparity in the improvement of life expectancy at birth has been observed in low-mortality countries, with females having higher life expectancy at birth than males. As a result, women tend to outnumber men in the older age groups. It is apparent from figures 7 and 8 that sex ratios at older ages are much lower in Europe compared with those in Northern America, Australia/New Zealand and Asia. This is attributed to the fact that there is a large gender difference in longevity in Europe, with females having a much higher life expectancy at birth than males. Currently, in Europe women outnumber men by 3 to 2 at ages 60 years and older, and by 5 to 2 at ages 80 years and older.

23. Significant differences in the sex ratios of the elderly population can be seen among lowest-low fertility countries in Asia. Feminization of the elderly population (more female elderly than male elderly) is particularly pronounced in Japan, the Republic of Korea and Thailand, where sex ratios at ages 60 years and older and 80 years and older are significantly lower. The excess of women in the older ages is typically viewed as problematic, because it reflects high levels of widowhood and the various difficulties associated with it (Mujahid, 2006a). A higher proportion of older women are likely to be widowed owing to the

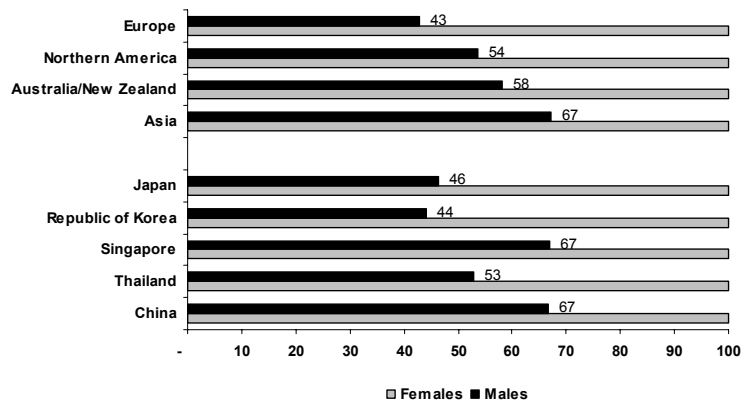
difference in the age of the spouse at the time of marriage (women tend to be younger than their spouse) and a higher life expectancy at birth for women compared with men (Neville, 2000). Percentages of women widowed increase with age as they tend to remarry less frequently upon divorce or the death of a spouse. Many older widows in industrialized countries tend to live alone. Widowed elderly women tend to live in poverty. Because women are less likely to be employed in the formal sector, they tend to have shorter working years and smaller earnings. Also, they often do not have enough pensions or occupational skills to support themselves in old age. Moreover, a majority of the institutionalized elderly are the oldest-old women who are often widowed and who usually suffer from weak health (United Nations Population Division, 2001). These realities combined with a host of gender differences, such as educational attainment, poverty and functional status, pose additional problems for elderly women (National Research Council, 2001).

**Figure 7. Feminization of the elderly population 60 years and older**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

**Figure 8. Feminization of the elderly population 80 and older**



Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

### III. IMPLICATIONS OF POPULATION AGEING

24. It has been shown that declining fertility and mortality resulting in population ageing has emerged as a new issue challenging some countries in the Asian and Pacific region. Mortality reduction will continue to be an overriding policy goal, and it will have the effect of further accelerating the ageing process. The implications of such population ageing and associated growth in the size of elderly populations are of particular concern. They are often perceived as posing serious burdens for economic and social support and health care. The rising number of elderly on the one hand, and the declining number of the younger population on the other will also mean that there will be a shortage of caregivers for the elderly population. As women will constantly outnumber men in the older ages, the social and financial security as well as the health conditions of elderly women will be one of the biggest problems faced by ageing societies. Women in many Asian countries are disadvantaged as they have lower education and work experience as compared to men and they have less income and access to assets and diminished authority within the family. Hence, women are more likely to be dependent upon family members and on public programmes, especially at advanced ages and under conditions of illness and disability (Mujahid, 2006a). These needs put extra pressure on family members for caregiving (Knodel, Ofstedal and Hermalin, 2002).

25. The rising number of older persons has important policy implications in the provision of health and social services (Mujahid, 2006b). The family continues to provide support to older people and in many societies of the region the tradition of older persons co-residing with their family members is generally the norm (Knodel and others, 1999). However, as traditional means of family support are being steadily eroded in most societies, Governments need to urgently establish a social protection system, particularly to foster old-age security.

26. In many countries of the region, the health-care infrastructure is already weak and most of the resources are utilized for addressing the needs for mother and child health services and providing reproductive health services, including family planning. Therefore, the provision of medical, public health, social services and other facilities required to address the needs of the older persons are likely to put severe strain on the economy (Knodel, Ofstedal and Hermalin, 2002). With an increasing number of younger women entering the labour force, often away from home, the availability of caregivers for older persons is also decreasing. With rapid urbanization, globalization and migration being experienced by many countries in the region, the situation is further worsening, leading many older persons to be left behind in rural areas without caregivers (Nizamuddin, 2003). These movements of younger generation, who are better educated than their rural counterparts, have led to ageing population structure in rural areas, referred to as “ageing in place” (Hermalin and Myers, 2002).

27. A majority of countries in the region do not have social security system for older persons. Even Governments which already have a social security system for their older persons are facing problems in caring for frail older persons. These older persons may have financial resources to support themselves, but they need day-to-day physical care. Although the policy trends of the Governments seem to be towards home-based community care, day-

to-day care requires a lot of time and labour from the supporting family members. The caregivers are usually women who are caught between the responsibilities for raising children, caring for ageing parents, and engaging in economic activities (United Nations Population Division, 2001). Thus, more intensive and practical government support is necessary to support successfully the frail older persons with a declining number of children. In the case of an ageing society such as Japan, it has been suggested that the expansion of institutional care as an alternative to home care may alleviate the heavy burden on middle-aged women taking care of elderly patients. However, besides the higher health-care costs for providing such care in institutions, this is likely to deteriorate the psychological and emotional well-being of the infirm elderly. In view of the negative consequences, the Government of Japan started to implement its Long-term Care Insurance Scheme in 2000. However, the effect of this new system on the well-being of the elderly and their families remains to be seen (Ogawa, 2003a).

28. The desire and the need for continued employment have been expressed in low-fertility countries. For example, the Governments of Japan, the Republic of Korea and Singapore have been trying to increase the retirement age to compensate for increasing national expenditures on the elderly (Cheung, 1994; Cho, 2002; United Nations Population Division, 2002). There is growing evidence that older persons are willing to accept continued employment, mainly to maintain good health and obtain an income (Katsumata, 2002). Thus, it is important for Governments to build more flexible work environments in which the older persons can be meaningfully employed.

29. As previously mentioned, low fertility and mortality produces the age-structure that has a high proportion of older persons. Moreover, if fertility continues to decline to below the replacement level and remains low, not only the working-age population but also the population itself will eventually start to decline. In contrast to the social and economic advantages of falling fertility rates, a constantly low rate creates the problem of an ageing society, including labour shortage and high cost of social welfare. For example, as a result of continued low fertility in Japan, that society is facing serious problems associated with ageing, and this demographic trend is depressing Japan's economic perspective. In order to recover from the demographic depression, it is necessary to increase the input of the working-age population by either increasing migration or female labour-force participation (Seetharam, 2002).

30. Hence, a pressing issue for lowest-low fertility countries is the ageing of the population. The rapidity of the process leading to low fertility has not allowed enough time for these countries to adequately prepare for the problems associated with ageing of the population. For example, some ageing countries such as Japan, the Republic of Korea and Singapore are facing the problem of increasing national expenditures for old-age social security, shrinking labour force and mounting burdens of providing care for the growing number of frail elderly. The shrinking labour force and the increase in the ageing population have also contributed to lowering potential support ratios (United Nations Population Division, 2007). Countries such as China and Thailand, where fertility declined very rapidly and which have no established social security system, will face the problem of supporting increasing proportions of elderly persons when the proportion of the younger generation is

growing smaller (Gubhaju and Moriki-Durand, 2003b; United Nations Population Fund, 2006a; 2006b).

31. Considering the experience of low fertility countries, the governments of transitional and near-replacement fertility countries need to foresee the consequences of declining fertility rates. A crucial agenda for the governments is, therefore, to plan for an ageing society before fertility drops well below the replacement level. In this regard, researchers are urging Governments to start preparing for policy measures to deal with ageing problems as soon as possible (Mason, Lee and Russo, 2002). In other words, it is particularly important for Asian countries to recognize the significance of ageing problems and start formulating policies for the elderly as it takes several decades for government old-age pension insurance schemes to mature and operate at full scale (Ogawa, 2003b). It would be more difficult for families to care for their older members because families would be smaller, people would live longer and the migration of young adults would mean that families would fragment. The present trends pose a major challenge to address the needs of families. Therefore, Governments are urged to consider the present trends in designing social policies, put the family at the centre of any future social policy development and study good national practices when designing a new approach to family policies.

32. While formulating policies, it is important also to understand the changing needs of older persons. As a result of the socio-economic development that has taken place over the past several decades, the younger generation is more educated, urban and professional than the older generation. Although these attributes are beneficial to society, they might be the source of problems, for those differences across age groups are not only a potential source of intergenerational tension and conflict, but may also mean that the future elderly will have sharply different characteristics than the current elderly. Therefore, policy makers need to take into consideration the changing socio-economic characteristics of elderly in designing policies and approaches that are suitable in the future (Hermalin and Myers, 2002: 15).

33. The momentum of population ageing in the world is likely to be the most significant demographic process of the twenty-first century, with implications for a wide range of human behaviour. In this regard, researchers have increasingly recognized the need for multidisciplinary approaches to the ageing process. Continuous changes in population age structure will require new social sensitivities and innovative policy responses (Kinsella and Phillips, 2005).

34. Finally, it is also important to recognize the benefits of changing population age structure, as decline in fertility and increase in life expectancy at birth, resulting in a slower population growth, temporarily increase the relative size of the workforce, opening an historic, one-time only “demographic window” that provides an opportunity for human and financial investment to spur economic growth. This decline in fertility leads to potential economic growth within one generation, opening a unique “demographic window” that has already been effectively taken advantage of in several East Asian countries between the 1960s and the 1990s (Bloom, Canning and Sevilla, 2003). In this regard, several countries in South-East Asia and in other developing countries are projected to have a large segment of their population in the prime working ages, with the likelihood of high economic output and savings. This “demographic dividend” has the potential for stimulating economic growth if

appropriate social and economic policies are in place (Kinsella and Phillips, 2005; Knodel, Ofstedal and Hermalin, 2002).

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**Table 1. Fertility trends in Asia and the Pacific, 1970-1975 to 2000-2005**

Fertility level	1970-1975	1990-1995	2000-2005
High TFR ≥ 5	Afghanistan	Afghanistan	Afghanistan
	American Samoa	Bhutan	Marshall Islands
	Bangladesh	Cambodia	Timor-Leste
	Bhutan	Lao People's Dem. Republic	
	Brunei Darussalam	Maldives	
	Cambodia	Marshall Islands	
	Cook Islands	Nepal	
	French Polynesia	Pakistan	
	India	Solomon Islands	
	Indonesia	Timor-Leste	
	Iran (Islamic Republic of)		
	Kiribati		
	Lao People's Dem. Republic		
	Malaysia		
	Maldives		
	Marshall Islands		
	Micronesia (Fed. States of)		
	Mongolia		
	Myanmar		
	Nepal		
	New Caledonia		
	Northern Mariana Islands		
	Pakistan		
	Palau		
	Papua New Guinea		
	Philippines		
	Samoa		
	Solomon Islands		
	Tajikistan		
	Thailand		
	Timor-Leste		
	Tonga		
	Turkey		
Turkmenistan			
Uzbekistan			
Vanuatu			
Viet Nam			
Transitional TFR 3.0 to 4.9	Azerbaijan	Kiribati	Micronesia (Fed. States of)
	China	Micronesia (Fed. States of)	Pakistan
	Fiji	Papua New Guinea	Papua New Guinea
	Guam	Samoa	Samoa
	Kyrgyzstan	Tajikistan	Solomon Islands
	Republic of Korea	Tonga	Tajikistan
	Sri Lanka	Vanuatu	Vanuatu

**Table 1. (Continued)**

<b>Fertility level</b>	<b>1970-1975</b>	<b>1990-1995</b>	<b>2000-2005</b>
Transitional TFR 3.0 to 4.9	Armenia	American Samoa	American Samoa
	Democratic People's Rep. of Korea	Bangladesh	Bangladesh
	Kazakhstan	Brunei Darussalam	Cambodia
	Macao, China	Cook Islands	Fiji
	Nauru	Fiji	India
	Niue	French Polynesia	Kiribati
	Tuvalu	Guam	Lao People's Democratic Republic
		India	Nepal
		Iran (Islamic Republic of)	Philippines
		Kyrgyzstan	Tonga
		Malaysia	Tuvalu
		Mongolia	
		Myanmar	
		Philippines	
		Turkmenistan	
		Tuvalu	
		Uzbekistan	
	Viet Nam		
Near-replacement TFR 2.2 to 2.9	Australia	Armenia	Bhutan
	Georgia	Azerbaijan	Brunei Darussalam
	Hong Kong, China	Democratic People's Rep. of Korea	Cook Islands
	New Zealand	Indonesia	French Polynesia
	Singapore	Kazakhstan	Guam
		Nauru	Indonesia
		New Caledonia	Kyrgyzstan
		Niue	Malaysia
		Palau	Maldives
		Sri Lanka	Myanmar
		Turkey	Nauru
			New Caledonia
			Niue
			Palau
		Turkey	
		Turkmenistan	
		Uzbekistan	
		Viet Nam	
Low TFR 1.6 to 2.1	Japan	Australia	Australia
	Russian Federation	China	Azerbaijan
		Georgia	China
		Macao, China	Iran (Islamic Republic of)
		New Zealand	Kazakhstan
		Northern Mariana Islands	Mongolia
		Republic of Korea	New Zealand
		Singapore	Sri Lanka
		Thailand	Thailand

**Table 1. (Continued)**

Fertility level	1970-1975	1990-1995	2000-2005
Lowest -Low TFR <=1.5		Hong Kong, China	Armenia
		Japan	Georgia
		Russian Federation	Hong Kong, China
			Japan
			Macao, China
			Northern Mariana Islands
			Republic of Korea
			Russian Federation
			Singapore

Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

**Table 2. Percentage decline in total fertility rate in Asia and the Pacific, 1970-1975 to 2000-2005**

Fertility level	Country	TFR			Percentage decline	
		1970-1975	1990-1995	2000-2005	1970-1975 to 1990-1995	1990-1995 to 2000-2005
High TFR >=5	Afghanistan	7.7	8.0	7.5	3.9	-6.5
	Timor-Leste	6.2	5.7	7.0	-7.6	22.3
	Marshall Islands	8.2	6.7	5.3	-18.3	-20.5
Transitional TFR 3.0 to 4.9	Samoa	5.7	4.7	4.4	-17.5	-6.0
	Solomon Islands	7.2	5.5	4.4	-23.5	-21.3
	Papua New Guinea	6.1	4.7	4.3	-22.7	-8.2
	Micronesia (Fed. States of)	6.9	4.8	4.2	-30.5	-11.8
	Vanuatu	6.1	4.8	4.2	-20.9	-14.0
	Pakistan	6.6	5.8	4.0	-12.1	-31.1
	Tajikistan	6.8	4.9	3.8	-28.6	-22.0
	American Samoa	5.4	4.3	3.7	-21.0	-12.3
	Tonga	5.5	4.5	3.7	-17.7	-17.6
	Nepal	5.8	5.0	3.7	-13.7	-26.3
	Tuvalu	3.2	3.4	3.7	4.7	9.0
	Cambodia	5.5	5.5	3.6	0.3	-34.5
	Lao People's Dem. Republic	6.4	5.9	3.6	-8.7	-38.8
	Kiribati	5.0	4.6	3.6	-8.9	-21.9
	Philippines	6.0	4.1	3.5	-31.0	-14.5
Bangladesh	6.2	4.1	3.2	-33.1	-21.7	
India	5.3	3.9	3.1	-26.6	-19.4	
Fiji	4.2	3.4	3.0	-20.2	-11.2	

**Table 2. (Continued)**

Fertility level	Country	TFR			Percentage decline	
		1970-1975	1990-1995	2000-2005	1970-1975 to 1990-1995	1990-1995 to 2000-2005
Near-replacement TFR 2.2 to 2.9	Bhutan	6.7	5.4	2.9	-19.2	-46.0
	Malaysia	5.2	3.5	2.9	-32.6	-17.2
	Maldives	7.0	5.6	2.8	-20.7	-49.5
	Turkmenistan	6.2	4.0	2.8	-34.9	-31.6
	Guam	4.1	3.1	2.7	-24.8	-11.6
	Uzbekistan	6.3	3.9	2.7	-38.4	-29.4
	Cook Islands	5.5	3.5	2.7	-36.4	-22.9
	Brunei Darussalam	5.4	3.1	2.5	-42.8	-19.0
	Kyrgyzstan	4.7	3.6	2.5	-23.6	-30.8
	French Polynesia	5.2	3.1	2.4	-40.8	-21.7
	Indonesia	5.3	2.9	2.4	-45.3	-18.1
	Niue	3.7	2.4	2.3	-35.1	-2.6
	Viet Nam	6.7	3.3	2.3	-50.7	-29.6
	Myanmar	5.9	3.1	2.2	-47.5	-27.4
	Turkey	5.3	2.9	2.2	-45.2	-23.2
	New Caledonia	5.2	2.9	2.2	-43.9	-23.0
	Nauru	3.5	2.2	2.2	-37.1	0.0
Palau	5.5	2.8	2.2	-48.9	-22.8	
Low TFR 1.6 to 2.1	Iran (Islamic Republic of)	6.4	4.3	2.1	-32.4	-50.9
	Mongolia	7.3	3.4	2.1	-54.0	-38.6
	Sri Lanka	4.1	2.5	2.0	-39.9	-18.5
	Kazakhstan	3.5	2.6	2.0	-26.3	-21.3
	New Zealand	2.8	2.1	2.0	-27.5	-4.7
	Dem. People's Rep. of Korea	3.7	2.4	1.9	-36.8	-18.4
	Thailand	5.0	2.0	1.8	-59.7	-8.6
	Australia	2.5	1.9	1.8	-26.6	-5.6
	China	4.9	1.9	1.7	-60.5	-11.5
	Azerbaijan	4.3	2.9	1.7	-32.4	-42.4
Lowest -Low TFR <=1.5	Georgia	2.6	2.0	1.5	-25.0	-24.2
	Singapore	2.6	1.8	1.4	-32.8	-23.2
	Armenia	3.0	2.4	1.3	-21.6	-43.5
	Russian Federation	2.0	1.5	1.3	-23.9	-16.0
	Japan	2.1	1.5	1.3	-28.0	-13.4
	Republic of Korea	4.3	1.7	1.2	-60.4	-26.8
	Northern Mariana Islands	5.4	2.0	1.1	-63.7	-43.7
	Hong Kong, China	2.9	1.3	0.9	-55.4	-27.0
	Macao, China	3.2	1.6	0.8	-51.6	-45.7

Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.

**Table 3. Percentage of population 60 years and older to total population, 2007, 2025, 2050 by fertility level**

Fertility level	Country	TFR	Percentage of population 60 years and older		
		2000-2005	2007	2025	2050
	ESCAP		10.3	15.4	24.3
Lowest-low TFR<=1.5	Macao, China	0.8	11.5	29.2	42.8
	Hong Kong, China	0.9	16.4	30.2	39.4
	Republic of Korea	1.2	14.6	27.4	42.2
	Japan	1.3	27.9	35.8	44.0
	Russian Federation	1.3	17.4	23.8	32.4
	Armenia	1.3	14.6	22.6	33.9
	Singapore	1.4	13.8	31.6	39.8
	Georgia	1.5	18.3	25.4	34.9
Low TFR 1.6 to 2.1	Azerbaijan	1.7	9.2	16.7	27.6
	China	1.7	11.6	20.0	31.1
	Australia	1.8	18.7	25.8	30.2
	Thailand	1.8	12.0	21.5	29.8
	Democratic People's Republic of Korea	1.9	13.7	16.6	24.6
	New Zealand	2.0	17.3	24.9	30.2
	Kazakhstan	2.0	10.4	15.3	24.1
	Sri Lanka	2.0	10.6	19.7	29.0
	Mongolia	2.1	5.9	10.8	25.1
	Iran (Islamic Republic of)	2.1	6.6	10.9	25.6
Near-replacement TFR 2.2 to 2.9	Turkey	2.2	8.5	13.8	24.5
	New Caledonia	2.2	10.6	16.9	26.0
	Myanmar	2.2	8.2	13.9	25.6
	Viet Nam	2.3	7.7	13.4	26.1
	Indonesia	2.4	8.6	13.7	24.8
	French Polynesia	2.4	8.5	15.0	24.7
	Kyrgyzstan	2.5	7.3	11.6	21.5
	Brunei Darussalam	2.5	5.1	11.2	20.1
	Uzbekistan	2.7	6.2	10.6	20.9
	Guam	2.7	10.1	16.6	22.3
	Turkmenistan	2.8	6.2	10.8	21.2
	Maldives	2.8	5.6	8.5	20.0
	Malaysia	2.9	7.1	13.2	22.2
	Bhutan	2.9	7.1	10.1	23.3
Transitional TFR 3.0 to 4.9	Fiji	3.0	7.4	12.7	19.6
	India	3.1	7.7	11.5	20.2
	Bangladesh	3.2	5.9	9.2	17.0
	Philippines	3.5	6.2	9.8	18.2
	Lao People's Democratic Republic	3.6	5.1	7.6	16.3
	Cambodia	3.6	5.4	7.9	15.2
	Nepal	3.7	5.9	7.8	14.0
	Tonga	3.7	9.1	9.1	15.6

**Table 3. (Continued)**

Fertility level	Country	TFR	Percentage of population 60 years and older			
		2000-2005	2007	2025	2050	
Transitional TFR 3.0 to 4.9	Tajikistan	3.8	5.1	8.1	16.1	
	Pakistan	4.0	6.0	8.6	16.5	
	Vanuatu	4.2	5.2	7.7	15.9	
	Micronesia (Fed. States of)	4.2	5.6	9.2	15.3	
	Papua New Guinea	4.3	4.0	6.3	11.2	
	Solomon Islands	4.4	4.8	6.3	13.0	
	Samoa	4.4	6.6	10.3	17.4	
High TFR =>5	Timor-Leste	7.0	4.6	5.3	7.6	
	Afghanistan	7.5	3.7	3.8	5.6	

Source: *World Population Prospects: The 2006 Revision*, United Nations Population Division, New York.