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DEMOGRAPHIC CHANGE IN THE ASIAN CENTURY: IMPLICATIONS FOR AUSTRALIA AND THE REGION

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From the demographic perspective, the 21st century is the population ageing century. Population ageing is well underway in all Asian countries as a result of the spectacular falls in both fertility and mortality rates in the second half of the 20th century.

The background to demographic change in the latter half of the 20th century

As early as the 1950s, both Japan and India had policies in place to lower the level of fertility. An influential book by Coale and Hoover published in 1958 argued that economic development in Asian countries was constrained by high levels of fertility because available capital at both the national and the household level needed to be devoted in large measure to the care and nurture of the 40 per cent of the population aged less than 15 years. Fewer children, they argued, would provide the opportunity for more productive investment of capital and enable a stronger focus on developing the human capital of the next generation of workers, both essential features of economic development. In more recent times, the argument of Coale and Hoover has become known as the 'demographic dividend' whereby, with a fall in fertility and the number of children, the population concentrates in the working ages thus providing a 'dividend' to the economy.

Interestingly, two senior American demographers who were strong proponents of this approach, Warren Thompson and Frank Lorimer, worked with the McArthur administration in Japan. Thompson had argued since the 1920s that rapid population growth in Asian countries was an obstacle to development and a potential source of insecurity (Thompson 1929) and, within the McArthur administration, he advocated for lower fertility in Japan. Lorimer was part of the same group of demographers as Coale at the Office of Population Research at Princeton University. Between 1944 and 1958, the argument against rapid population growth and in favour of lower fertility was made in a remarkable collection of books on specific countries or regions in two series stimulated by the Office of Population Research (shown in a separate list in the references section of this paper).

In the Cold War context, the Princeton demographers were able to influence the US Government to support the provision and distribution of contraceptives in developing countries in Asia and Africa and nationals were trained in the United States to return to their countries to run family planning programs.

In 1967, thirty heads of governments in developing countries signed a Declaration on Population strikingly worded as follows:

As Heads of Governments actively concerned with the population problem, we share these convictions: We believe that the population problem must be recognised as a principal element in long-range national planning if governments are to achieve their economic goals and fulfill the aspirations of their people. We believe that the great majority of parents desire to have the knowledge and the means to plan their families; that the opportunity to decide the number and spacing of children is a basic human right. We believe that lasting and meaningful peace will

depend to a considerable measure upon how the challenge of population growth is met. We believe the objective of family planning is the enrichment of human life, not its restriction; that family planning, by assuring greater opportunity to each person, frees man to attain his individual dignity and reach his full potential (Ayala and Caradon 1968: 3).

While the idea of development through fertility control was conceptualised as a support to capitalism, it was also the central rationale of China's one-child policy. Consequently, demographic change in China and Vietnam over the past 50 years, in broad terms, has mirrored demographic change in the other countries of Asia.

Variation in demographic change in the latter half of the 20th century

While all Asian countries have experienced falls in fertility and mortality in the past 60 years, this does not mean that their demographic situations today or their futures for the 21st century are the same. The key issue is the impact of past fertility trends upon the current and future age structure of the population. Age structure is affected strongly by falling fertility and, as I have described, change in age structure was and, for some countries, continues to be a rationale for fertility decline (the demographic dividend argument). Changes in mortality have a much smaller impact on the shape of age distributions but, in recent times, increased survival above age 60 has 'filled out' the older ages more than would otherwise have been the case.

Fertility

Over the past 60 years, the countries of Asia differ substantially in their levels of fertility decline and also importantly, the speed of their fertility declines. Both the level of decline and the speed of the decline affect the age structure; the more that fertility has declined and the more rapidly that fertility has declined, the faster and more severe will be the ageing of the population.

The Total Fertility Rate (TFR) is a conventional way of measuring fertility trends. It is the average number of children that a group of women would have in their lifetime if they experienced the age-specific fertility rates that applied in the given time period to which the measure applies. The measure can be affected by changing in the timing of births, particularly the timing of the first birth. A shift to earlier first births will cause a temporal rise in the TFR; a shift to later first births will cause a temporal decline in the TFR. The Republic of Korea, for example, has experienced a substantial delay in the timing of the first birth over the past 20 years and so its TFR may be artificially (temporarily) lower than its longer-term trend value.

Figure 1. Total Fertility Rates, 1950-55 to 2005-10, 14 countries

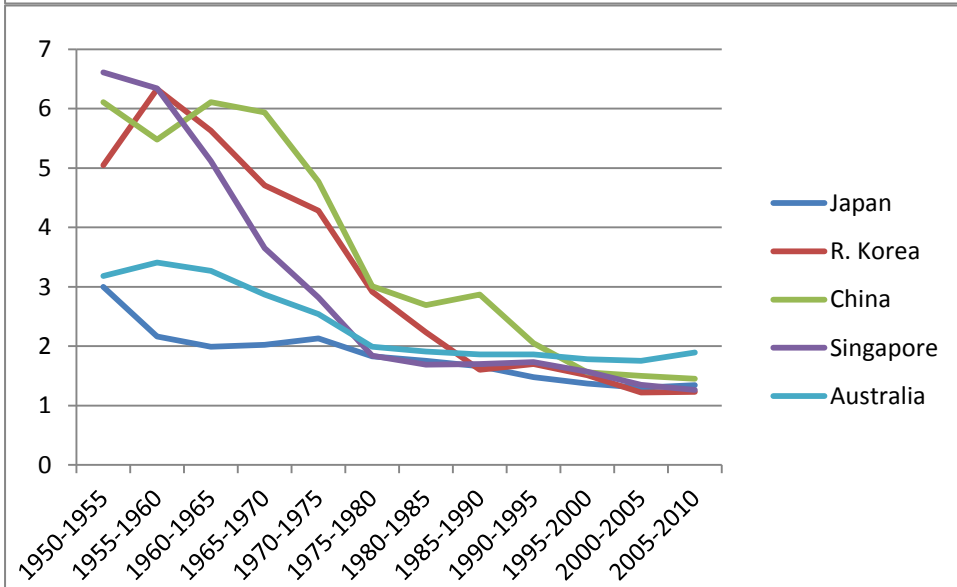
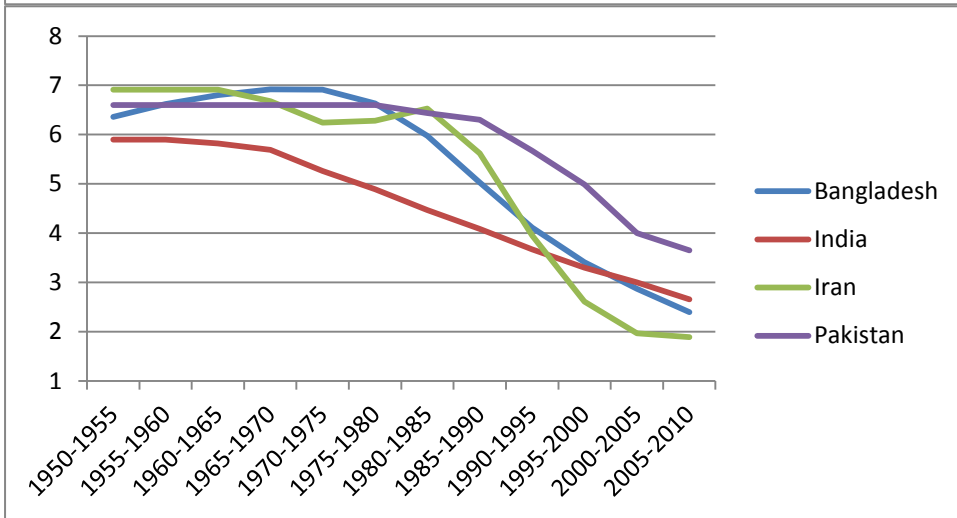
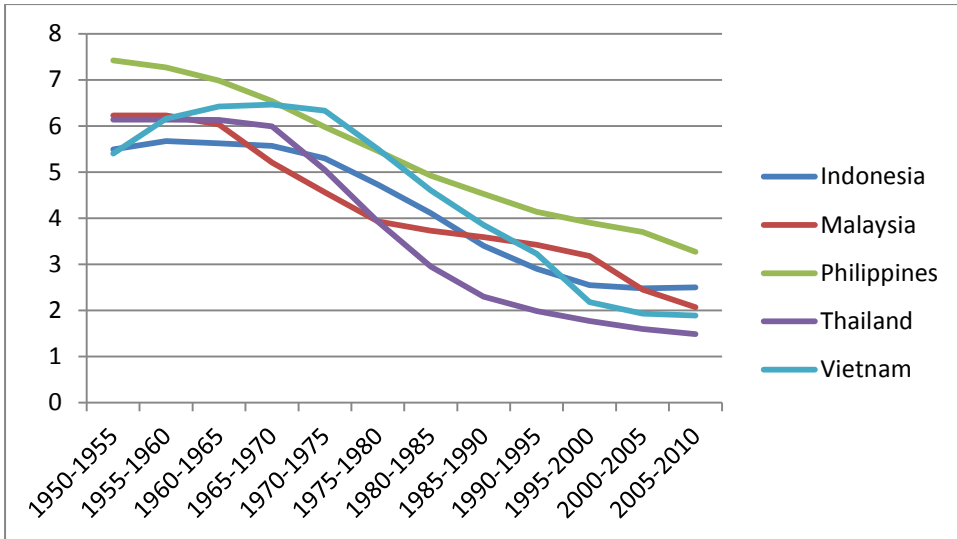


Figure 1 shows that all but two of the 14 countries, Japan and Australia, had high fertility of between five and eight births per woman in the early 1950s. By 2005-10, only two countries, the Philippines and Pakistan, had a TFR above three and, in both these cases, fertility was trending downwards strongly indicating that fertility will soon be below three in these countries as well. Evidently, the campaign to reduce fertility rates in Asia has been remarkably successful. The graphs show that most of the change took place after 1970. If the world's population growth had remained constant from 1970 to 2014, today the global population would be 12.1 billion. In what should be recognised as one of the most important changes in human history, increasing control over fertility, in just over 40 years, has reduced the world's potential population by five billion. It has also been argued that, in Asia, this increasing control over fertility did indeed contribute strongly to the favourable development outcomes predicted by Coale and Hoover in countries such as Korea, Singapore, Malaysia, Thailand, Indonesia and China (Bloom and Williamson 1998).

However, the speed and timing of the fertility declines has varied across countries. In India, the decline started in the early 1960s but has proceeded slowly. On the other end of the spectrum, the decline in Iran started in the mid-1980s but was spectacularly fast with TFR falling from around seven to two in just 15 years.¹ China's fall was also very fast in the years prior to the one-child policy (from TFR of six to a TFR of three from the mid-1960s to the end of the 1970s). Korea and Singapore also experienced rapid and relatively early declines with Singapore reaching the replacement level of two children per woman in the 1970s and Korea in the 1980s. Generally, the falls in the Southeast Asian countries proceeded more slowly than in the East Asian countries with Thailand being on the faster end and the Philippines on the slower end. Indonesia's fertility, dominated by a relatively low fertility in Java, was the lowest of all of the countries (except Japan and Australia) in 1950-55 and setting aside the temporarily low fertility in Korea and Vietnam both of which were affected in the early 1950s by war. From this only moderately high level, Indonesia's fertility decline has proceeded relatively slowly and may have ceased falling over the last decade at a level still above the replacement level.

Two totally unrelated countries, Bangladesh and Vietnam, display very similar fertility trends falling from very high levels in the 1970s to low levels by the end of the period. Finally, Pakistan has been a late starter with fertility not falling until the 1990s but, since then, the decline has been strong.

Japan and Australia had similar levels of fertility in the early 1950s as the fertility trends of the two countries crossed with Australia's fertility rising and Japan's falling. Japan's fertility fell quickly to replacement level by the end of the 1950s but Australia's fertility remained comparatively high until the mid-1970s (the baby boom years). For the past 40 years, Australia's fertility rate has been almost flat fluctuating between 2.0 and 1.7 births per woman, and it is now around 1.9 births per woman.

¹ The story of this spectacular decline is told in the book: Abbasi-Shavazi, MJ, McDonald, P. and Hosseini-Chavoshi, M. 2009. *The Fertility Transition in Iran: Revolution and Reproduction*. Dordrecht: Springer.

Almost unseen on these charts but highly significant is the fact that, in five of these countries (Japan, Korea, China, Singapore and Thailand), the fertility rate now sits at very low levels of under 1.5 births per woman. Fertility rates under 1.5 births per woman lead to substantial and rapid falls in the child population followed 20 years later by similar falls in the young working ages. At the same time, the formerly high fertility rates in previous years produce large increases in the population at older ages. The more rapidly that fertility fell in the past and the higher the level from which it fell, the more severe will be the extent of population ageing in the future.

The advocates of fertility decline in the 1950s and 1960s envisaged fertility falling to the replacement level and remaining at that level for the rest of time. Except for small increases in population due to gradually falling mortality rates, replacement level fertility would mean zero population growth and constant age structures. This was the result predicted by 'demographic transition theory' as propounded by Kingsley Davis (1945). That fertility would continue to fall to levels well below the replacement level was never on the radar of the 1950s population planners. In the short term, very low fertility increases GDP per capita because of the reduced costs associated with fewer children. In the intermediate term, however, the size of the labour force falls and the labour force and the population age dramatically. In the longer term, the population size spirals downwards. All of these trends provide a potential threat to the health of economies and the problems facing the Japanese economy are sometimes attributed to a 'demographic malaise'.

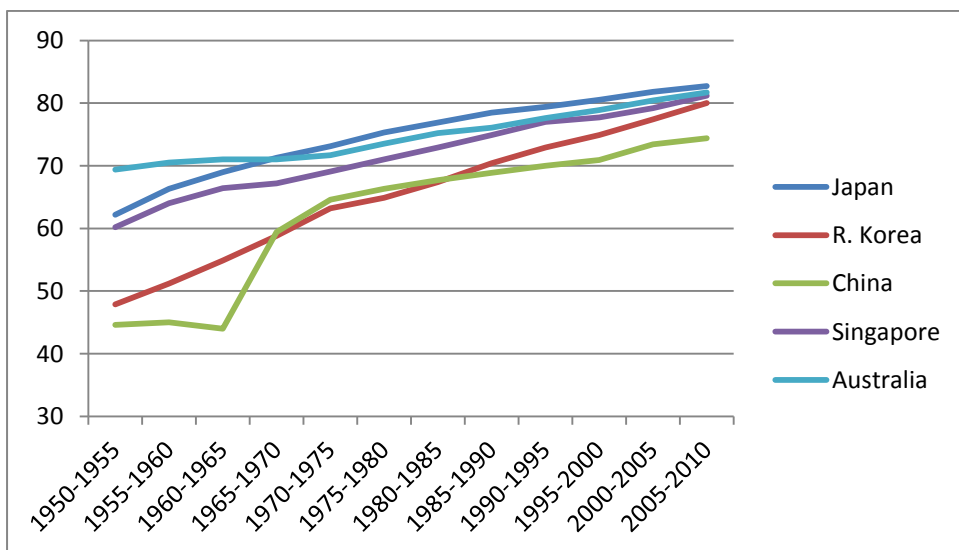
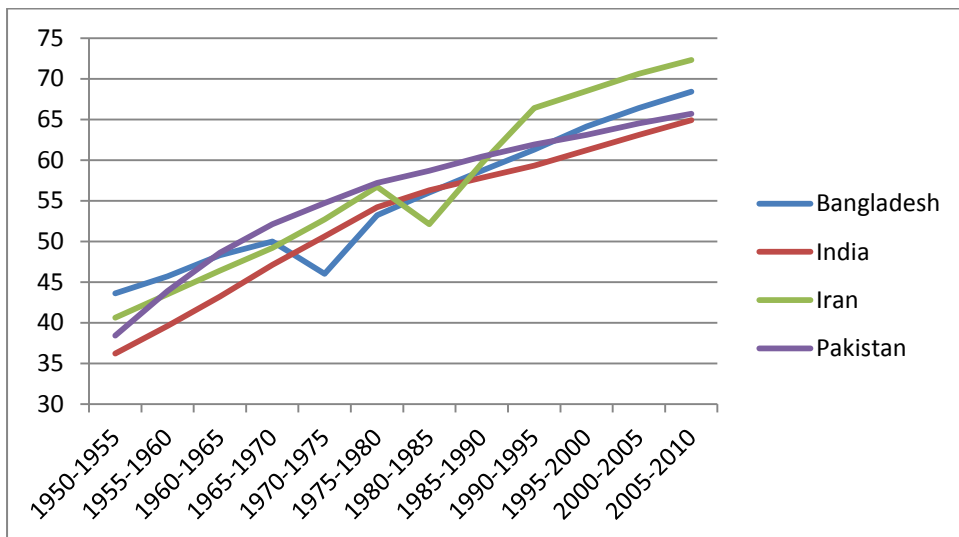
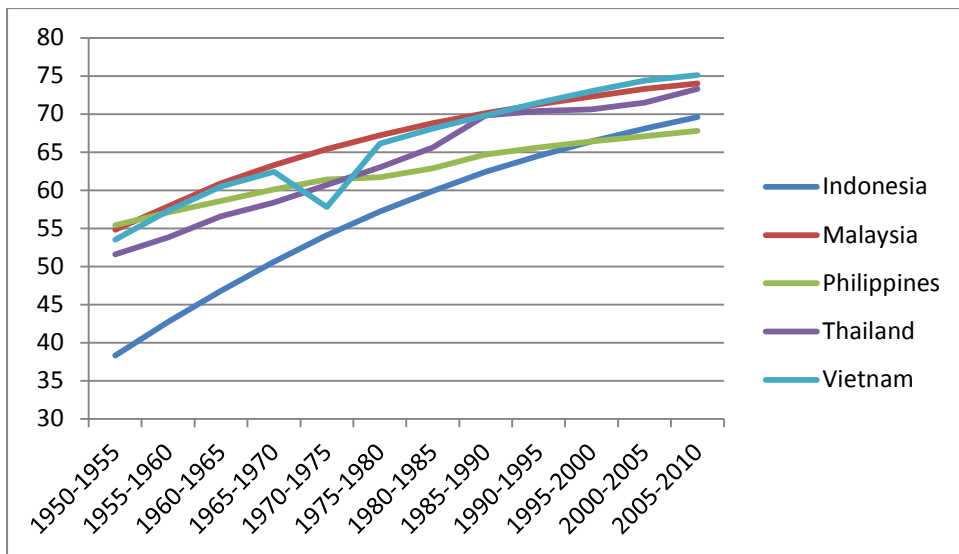
Mortality

While it is these trends in fertility rates that have the dominant effect upon age structures and population growth, the increases in expectation of life have been equally spectacular (Figure 2). Expectation of life at birth exceeded 65 years in only one of the 14 countries (Australia) in 1950-55 but in all 14 of these countries by 2005-10. This was achieved initially through the eradication of deaths from infectious diseases but more recently through control of degenerative diseases especially heart diseases. Today, Japanese women and Australian men occupy the number one global ranking in expectation of life for their respective sexes but expectation of life in all of the other countries shown in Figure 1 has increased substantially. The gap in expectation of life between the highest and lowest countries in 1950-55 was 35 years; now it is just 15 years. While increases in expectation of life contribute to the ageing of the population, probably more importantly, people are living healthier longer thus enabling them to contribute more productively to the labour force at all ages but especially in older ages. With increases in standards of living, healthier life styles and medical advances, we can expect that expectations of life will continue to increase in the future. Expectation of life at birth is the average age at death.

Population ageing

As expectation of life rises above 80 years, this means that more than 50 cent of people will live beyond age 80. Countries then face substantial increases in the demand for aged care and health services and income support for older people. This is a considerable problem for those

Figure 2. Expectation of life at birth, 1950-55 to 2005-10, 14 countries



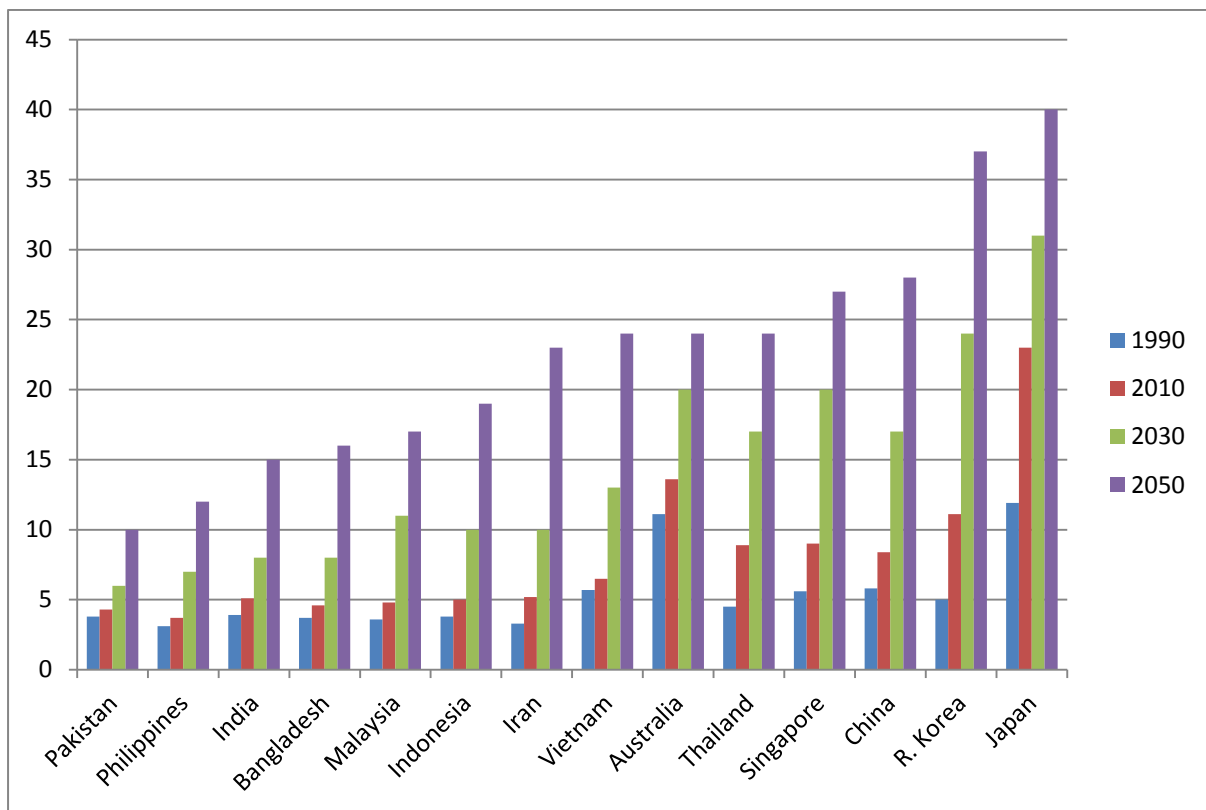
countries where ageing is occurring rapidly in the absence of policy and programs to address these challenges. The speed of ageing is shown in Figure 3. Projected changes in the age structures of individual countries between 2010 and 2060 are shown in Appendix 1.

Figure 3 shows that, in 1990, the percentage aged 65 years and over was highest in Australia and Japan with each having around 11 per cent of their populations in this age group. By 2050, however, Japan's proportion in the older ages increases to 40 per cent while Australia's percentage rises only to 24 per cent. While being much younger than Australia in 1990, by 2050, the populations of Vietnam and Thailand will be equally as old as Australia and, Singapore, China and the Republic of Korea will be much older. These five countries are all countries where fertility fell very rapidly and, aside from Vietnam, all now have fertility rates below 1.5 births per woman. Appendix 1 shows that Japan and these five countries all have 'undercut' age distributions with more people at older ages than at younger ages. This is a situation that leads to population decline and fairly substantial declines are projected for China, Japan and Korea.

In regard to the aged care, health needs and income support of older persons, Australia and Japan have had many years to develop policies. Australia has had an aged pension for over 100 years and its ageing process has been and will continue to be gradual compared to the other countries in Asia (see Figure 4). The four successive intergenerational reports in Australia have presented population ageing as a substantial fiscal challenge facing the Australian Government but it is a far lesser challenge than is faced by the other 13 countries shown in Figure 3. For Japan, the problem is greater because it will be a lot older than Australia. Singapore has policies for an ageing population in place but also faces a larger problem than Australia because of its very low fertility rate.

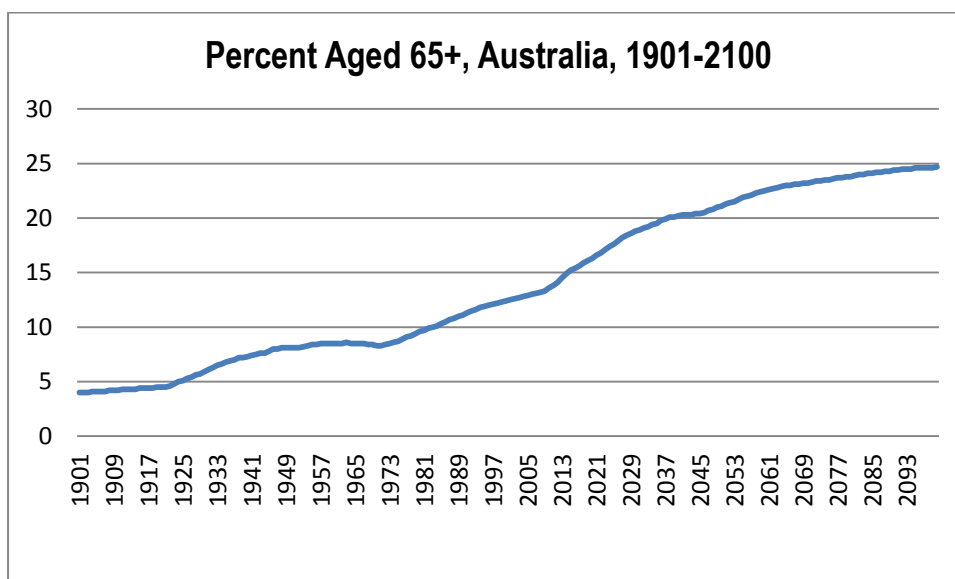
For the other 11 countries, aged care and income support policy is, at best, in an embryonic state and the health system is not well prepared to deal with the requirements of older people. All these countries have a history of support for older people being provided by families and consequently they face difficulty in moving to a system of public support or some combination of family and public support. In the present environment of much smaller family sizes and family members living at a distance from the older person, old age support is haphazard. Because of the rapidity of their fertility declines, this problem is at its greatest in China, South Korea and Thailand. Especially in Thailand and China, the problem is exacerbated by the movement of young people out of villages to the cities resulting in hyper ageing in rural areas where facilities are not good and where, because of the relative scatter of population, services are difficult to provide. These issues have been addressed in summary reports on China (Cai et al. 2012) and Thailand (Knodel and Chayovan 2008). In 2008, South Korea launched a Basic Old-Age Pension program, which provides income support for the bottom 60% of the population, and a universal Long-Term Care Insurance (LTCI) program, however, it is still too early to measure the effectiveness of these programs (Lee and Wolf 2014). In Thailand and Indonesia, the existing national plans for the aged are more philosophical than practical (The National Commission on the Elderly 2009, Republic of Indonesia, Department of Social Affairs. 2003) although more general assistance to the poor applies to older persons.

Figure 3. The percentage of the population aged 65 years and over, 1990-2050, 14 countries



Sources: 1990 and 2010, UN Population Division. 2030 and 2050, Wittgenstein Centre Data Explorer Version 1.1

Figure 4. Ageing in Australia over 200 years



Sources: Australian Bureau of Statistics

Labour supply

At the same time as population in Asia will be ageing rapidly, numbers entering the labour force at younger ages will be declining. Again, this will be a greater problem for those countries that have experienced rapid and substantial fertility decline compared to those where the decline was more gradual. Figure 5 shows the ratio of projected number of persons aged 15-24 years in 2050 compared to the number in the same age group in 2010. For China, this ratio is 0.57 meaning that the number aged 15-24 in 2050 (139 million) will be 43 per cent lower than the number in 2010 (242 million), a fall over 100 million in the labour force entry ages. And, in every year from 2010 to 2050, the number aged 15-24 will be falling continuously. As shown in Appendix 1, in China in 2050, the numbers aged 70-74 in China will be larger than in any other age group and the numbers taper down across all the labour force ages. So, not only will the labour force in China be much smaller; it will also be much older.

For seven of the 14 countries, the fall in the size of the labour force entry age group is more than 80 per cent with the falls in Thailand and Vietnam being similar to that of China. The fall is not as large in Japan between 2010 and 2050 because this ratio has been falling since 1970. It can be argued that Japan has already felt the pressure of a falling labour supply at the younger ages. There is a growing viewpoint that younger and older workers in today's economies are complementary rather than being substitutes. When technology is changing rapidly, it is the younger, more recently educated generation that is the assimilator of the new technology. Older workers, on the other hand are able to apply management experience to a greater degree (McDonald and Temple 2006). Thus, the pace of innovation and adoption of new technology is likely to be faster where the number of younger workers is balanced with the number of older workers. Singapore maintains its numbers in the 15-24 age range over the next 40 years despite its history of very low fertility. This is because Singapore has adopted an aggressive immigration strategy.

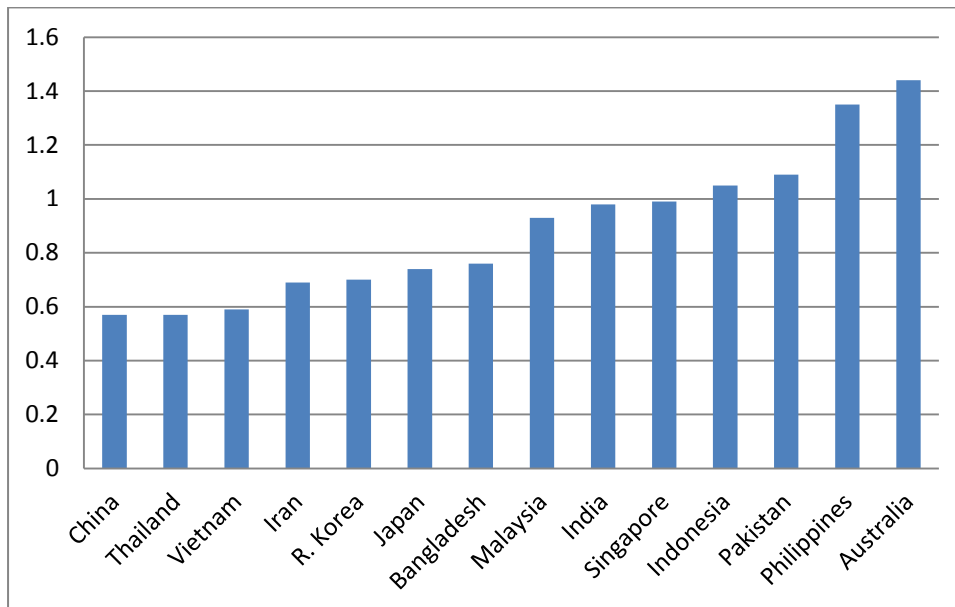
The ratio in Figure 5 is close to 1 for India and Indonesia and, in these two countries, the population aged 15-24 peaks in 2020 and 2025 respectively. Provided their young people are well educated, India and Indonesia should have a labour supply advantage over the next 40 years compared to other most Asian countries. In the Philippines, the population aged 15-24 in 2050 will be 35 per cent larger than in 2010. We can therefore expect that the Philippines will continue to be a major supplier of labour around the globe. Finally, with a 44 per cent increase in the population aged 15-24 over the years from 2010 to 2050, Australia stands out as the country with a growing supply of young workers. This is because its fertility rate has continued to remain close to the replacement level and because of its immigration program.

A central feature of labour force futures in Asia is that all future jobs will be in urban areas and employment and population in rural areas is likely to decline. The jobs growth will be concentrated in ever-mega cities like Jakarta, Manila, Bangkok, Dacca, Tehran, Beijing, Shanghai and several other cities in China, and the currently large cities in India. Singapore, Melbourne and Sydney, while not qualifying as mega-cities (10 million plus), will continue to grow strongly so long as immigration is maintained.

Population and labour supply futures in Asia and their implications for Australia

The above discussion and the age structures shown in Appendix 1 enable some speculation about population and labour supply futures for these Asian countries and, even more speculatively, the implications for Australia.

Figure 5. Ratio of Population Aged 15-24 in 2050 to Population Aged 15-24 in 2010, 14 countries.



Japan has had very low fertility for about 25 years and close to zero migration. Consequently, it has already experienced a considerable level of ageing and its labour force has been ageing. Over the same 25-year period, the economy of Japan has languished and the level of government debt has risen considerably. During these years, Japan has adopted relatively successful policies to deal with its aged population but further ageing will present even more of a fiscal challenge. Japan has attempted to raise its fertility rate but only a small rise is evident in the most recent years. It is generally agreed that countries with very low fertility rates are countries where the capacity for women to combine work and family is low (McDonald 2000, Luci-Greulich and Thevenon 2013). This is almost certainly the reason for the persistence of very low fertility in Japan where working hours are very long, child care is difficult to obtain and men provide very little assistance in household work. There is a large cohort now aged 40-44 and the population of labour force age is well educated; these have been positives for the economy. However, in coming years, the labour force will fall year upon year and the labour force will age considerably (see Appendix 1). Thus, the challenges ahead for the Japanese economy are probably greater than has been the case in the past two decades. There is little sign as yet that Japan will adopt a large migration program to mitigate the fall in its labour supply. To have any noticeable effect, the level of migration would have to be very large.

Most demographers in China and outside of China consider that China has held on to the one-child policy for far too long and this conclusion is borne out by the ratio for China shown in Figure 5. Demographers have estimated that China's fertility has been at or below 1.5 births per woman for 20 years but the official figures for China have shown higher levels. Appendix 1 shows that China is facing massive falls in its labour supply at the same time as it will experience rapid population ageing. Policies for an aged population are not well developed and additional challenges arise through the movement of younger people to the industrial areas in the east. This 'floating population' numbers 150-200 million people. The *hukou* system of population registration prevents the older generation moving to the places where their adult children are working. While many older people receive remittances from their working children, the system of family support can be haphazard. Public support programs will be expensive and a time when China's public debt is also rising. The falling labour supply presents an even greater challenge particularly as the Wittgenstein projections in Appendix 1 do not display major improvements in the education of younger Chinese workers. As with any other large population, immigration cannot be a solution to these labour shortages. China may need to look to investment in other countries that will have large labour supplies (India, Indonesia or several Sub-Saharan African countries).

The demographic situation is somewhat better in the Republic of Korea than in Japan and China because very low fertility is a relatively recent development. There is still a prospect that Korea can reverse its fertility decline and its government has designed a policy package to address low fertility but its effectiveness in relation to improving women's employment has been questioned (Lee and Baek 2014). The Wittgenstein projections also show considerable improvements in the education levels of the population of workforce age over coming years. This will tend to keep the growth rate of labour productivity relatively high. The health system in Korea is well developed and various income support programs including the National Pension are available for a majority of the aged population (Park 2011). As the population ages, however, these income support programs will be brought under increasing pressure. This has been addressed by reducing the replacement rate of the National Pension.

Fertility has been below 1.5 births per woman in Singapore for about 20 years but, unlike other countries with very low fertility, Singapore has addressed this demographic problem through large-scale immigration. This is a possibility for a small country as the number on migrants involved is reasonable. Nevertheless, the Singapore Government's White Paper on Population published in 2013 was met with considerable opposition from the general public because of their opposition to migration (National Population and Talent Division 2013). It seems the Singapore Chinese see themselves as culturally different from the Chinese Chinese who make up the majority of the migrants. As Appendix 1 shows persistent very low fertility combined with large-scale immigration produces an oddly-shaped age distribution by 2050. It becomes very old but the numbers at older ages are continually offset by large numbers of immigrants. In such a situation, the population over time 'becomes the immigrants'. The White Paper proposes only a small annual number of immigrants can become citizens of Singapore but this will mean that the citizen population ages much more than does the non-

citizen population. This is likely to be an unstable situation unless the fertility rate of the citizens was to rise in the future. The White Paper proposes a comprehensive family policy in an attempt to increase the fertility rate of Singapore's citizens. Nevertheless, in pure economic terms, supplementation of the labour force through immigration is basically effective.

It is only very recently that the fertility rate in Thailand has dropped below 1.5 births per woman and this may be a temporary phenomenon related to a trend towards later marriage. Nevertheless, the Government of Thailand has expressed concern about future ageing of the population, a declining labour supply and a shortage of skilled labour. The 11th development plan aims to stabilise the fertility rate at 1.6 through 'appropriate tax and child care assistance measures' but the plan is low on specifics (National Economic and Social Development Board 1012, p.50). More specific recommendations were made in a report published jointly by NESDB and UNFPA in 2010 (NESDB and UNFPA 2012). According to the Wittgenstein projections, while the numbers of people in the younger working ages will fall by 2060, the numbers that will be highly skilled will increase considerably. Thus, skill formation is an important policy direction for Thailand. The demographic future for Vietnam has some similarities with that of Thailand and similar approaches are likely to be required. The Wittgenstein projections show a low level of tertiary education among Vietnamese in the future and this would clearly need to be addressed if Vietnam is to compete in the technological future.

The issues for Iran are more economic than demographic, with the former heavily influenced by economic sanctions. So long as the Iran fertility rate remains near the replacement level, the only major demographic issue is a long way into the future when the huge baby boom cohort, now aged between 20 and 35, reaches the older ages. The Wittgenstein projections suggest large improvements in skill levels of the Iranian labour force from 2010 to 2060.

A number of countries (Malaysia, India, Bangladesh, Indonesia and the Philippines) are projected to have a 'beehive' shaped age structure by 2060. This is generally considered to be a favourable age structure with a relatively high concentration of population in the working ages. Again, the issues for these countries will be more economic than demographic with a strong need to improve labour productivity through education and training.

For Pakistan, with the highest level of fertility among this set of 14 countries, the central issue is the old issue of excessive population growth, but most of the growth by 2060 will be in the working ages. India also has huge growth in the working ages from 2010 to 2060. Certainly, with the exception of China, growth in the labour supplies of India and Pakistan are easily enough to compensate for the combined falls in labour force in the advanced countries of Asia and Europe. Out-sourcing of jobs to South Asia will be a growing feature of 21st century Asian economies.

Finally, what are the implications for Australia? On present trends, the Australian labour force will grow substantially over the first half of the 21st century, driven almost solely by immigration. Without immigration, the Australian labour force would be static from now.

The Wittgenstein projections also show that the Australian labour force will be highly skilled by 2060, much more so than now. This provides opportunities for Australia in a technological century especially in the export of services. Economic growth and increasing wealth across the more recent developers in Asia is likely also to lead to demand for natural resources especially iron ore as construction extends in Asia's mega cities. The demographic issues faced by the wealthier countries in Asia may mean lower demand than might otherwise have been expected for Australian natural resources. All in all, this points to Australia diversifying its trade relations in Asia in the 21st century and reducing the reliance that we have upon a single customer.

Appendix 1

Projected Changes in the Age Distributions of 14 Asian Countries, 2010 to 2060

Explanatory note.

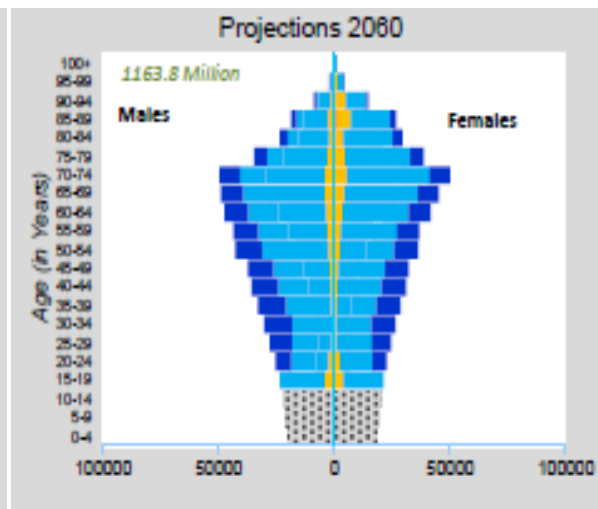
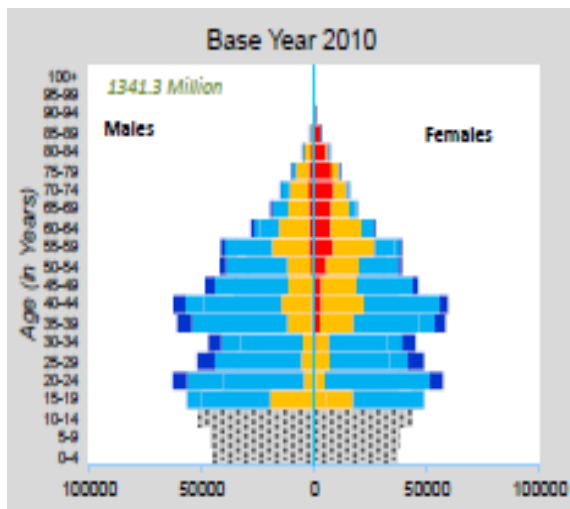
There are two main sources of population projections for all countries of the world, the United Nations Population Division (www.un.org/en/development/desa/population/) and the Wittgenstein Centre for Demography and Global Human Capital (see reference below). The two sets of projections differ and their relative merits have been debated in *Science*. The UN projections project higher levels of fertility into the future than does the Wittgenstein Centre and hence higher levels of future world population. For this appendix, I have chosen the Wittgenstein projections for two reasons: 1) their projection of the population of China is less influenced by the need to align with the views of the Chinese government and 2) their projections include projections by education level. In a context where educated people live longer and have fewer children, the Wittgenstein projections have the advantage of factoring in changes in the educational composition of the population. This does not mean that the Wittgenstein projections are always more reliable than the UN projections. For some countries like Indonesia, Thailand and Iran, I prefer the UN projections. The citation for the Wittgenstein projections is:

Wittgenstein Centre for Demography and Global Human Capital, (2014). *Wittgenstein Centre Data Explorer Version 1.1*. Available at: www.wittgensteincentre.org/dataexplorer

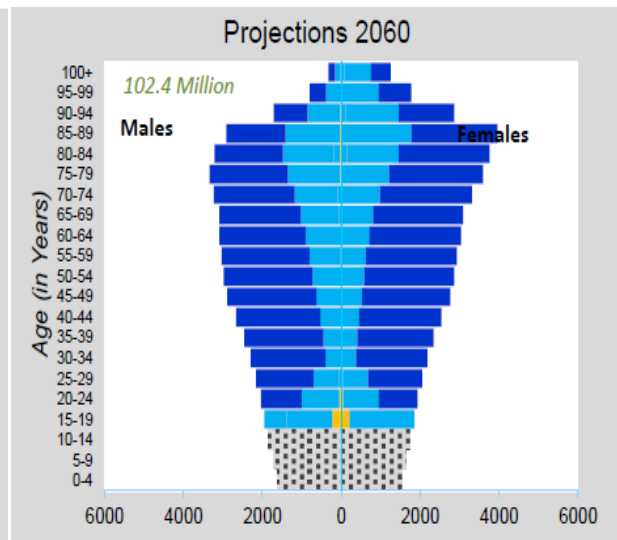
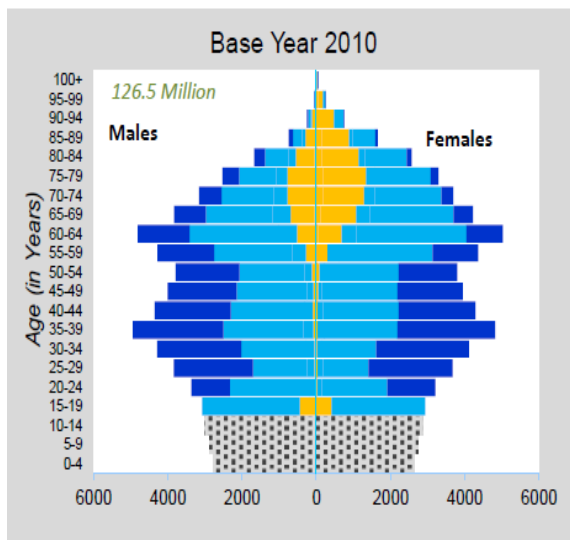
The graphs that follow show population numbers by age, sex and education level. The education levels are colour coded as follows:



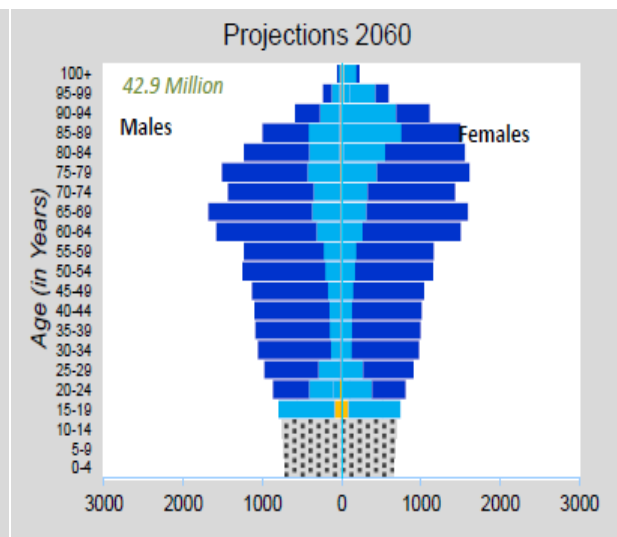
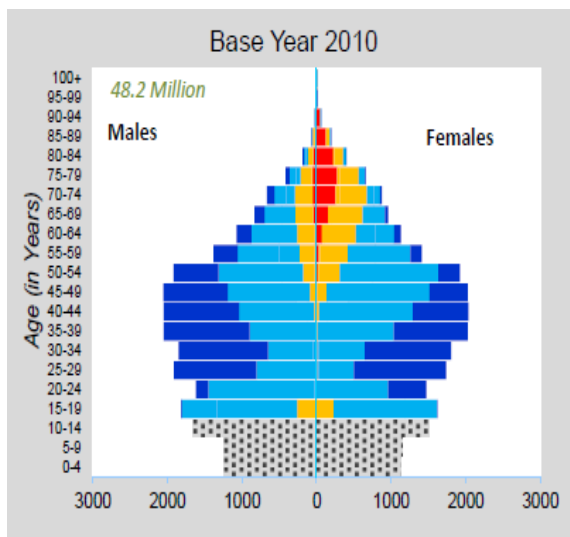
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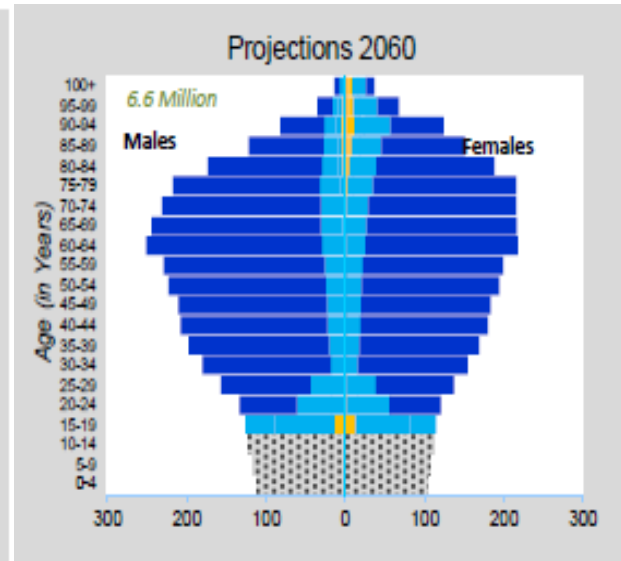
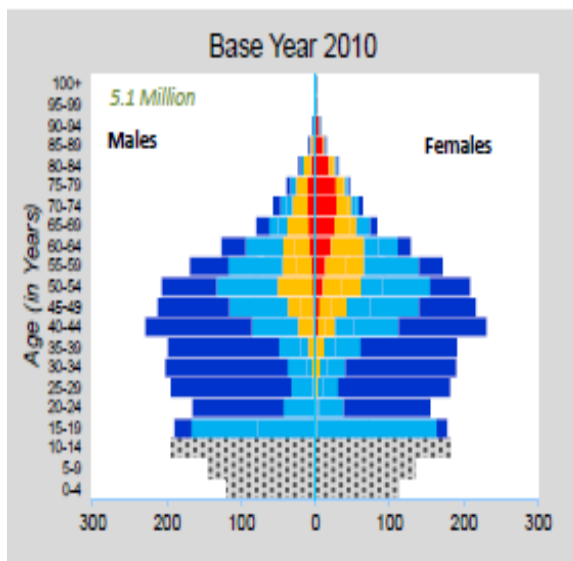
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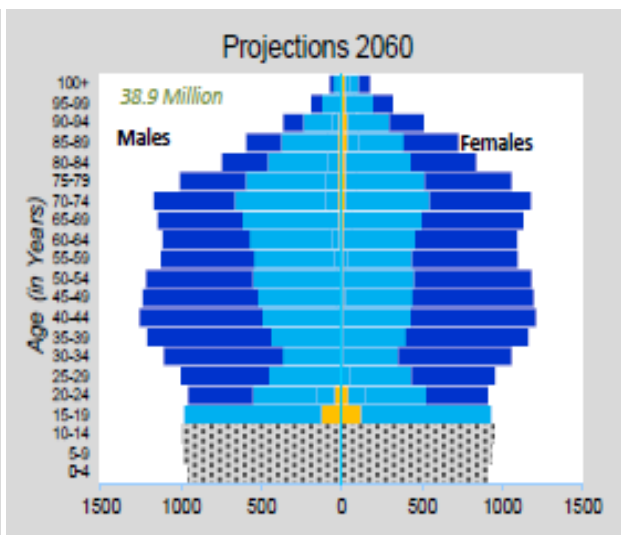
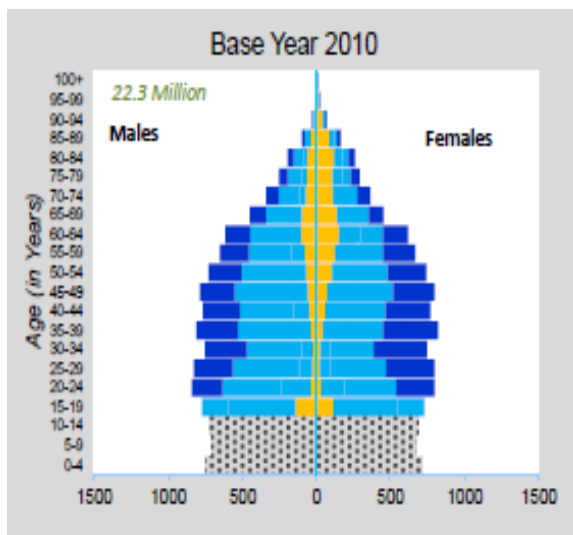
R. Korea



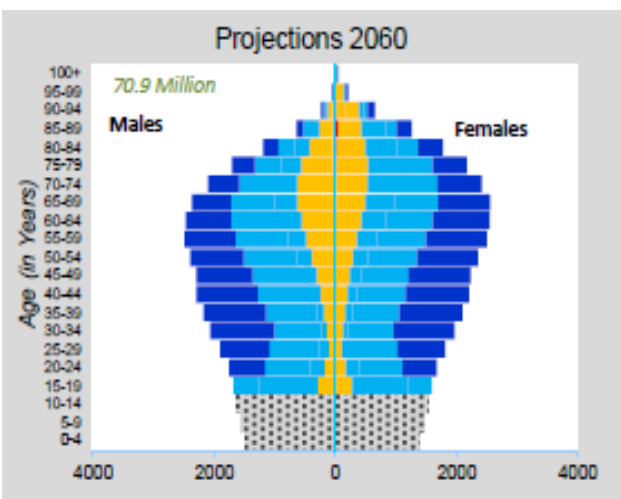
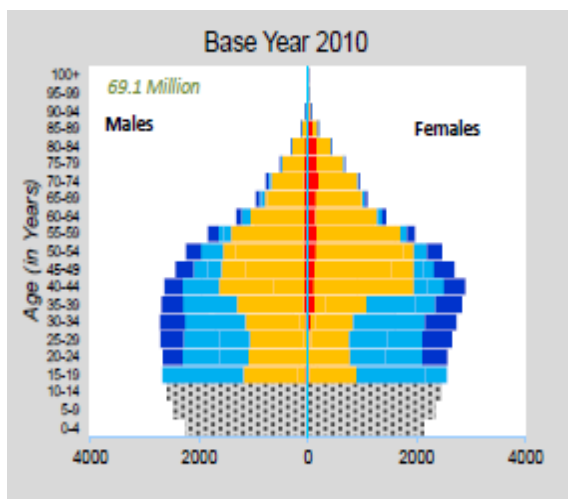
Singapore



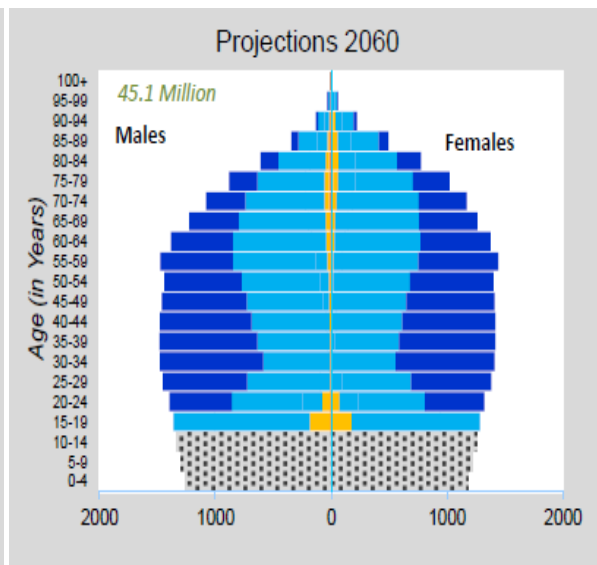
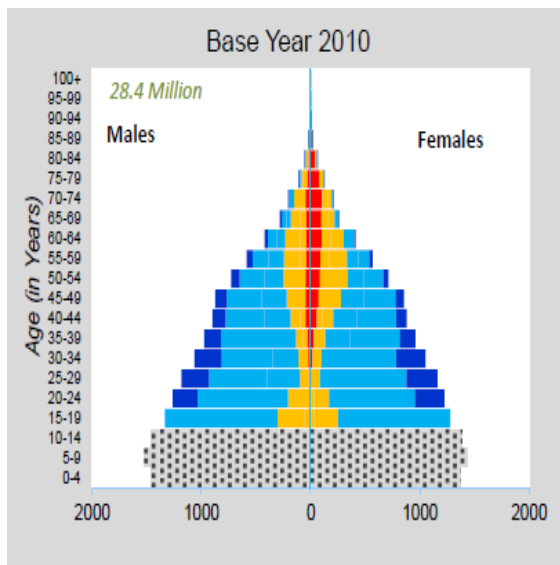
Australia



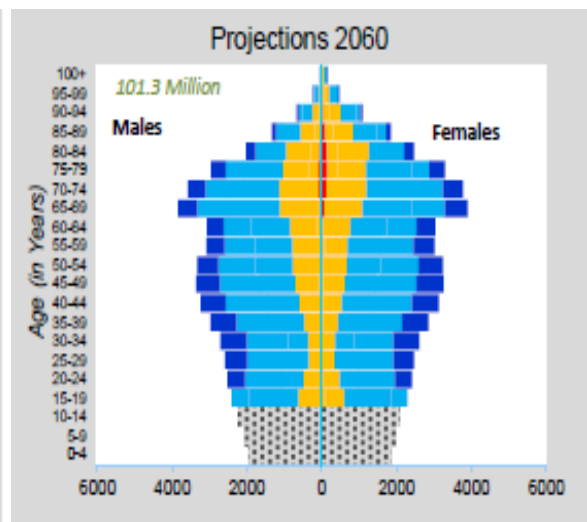
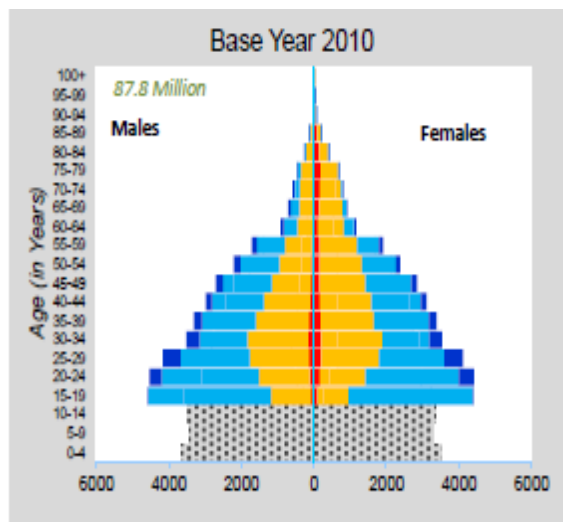
Thailand



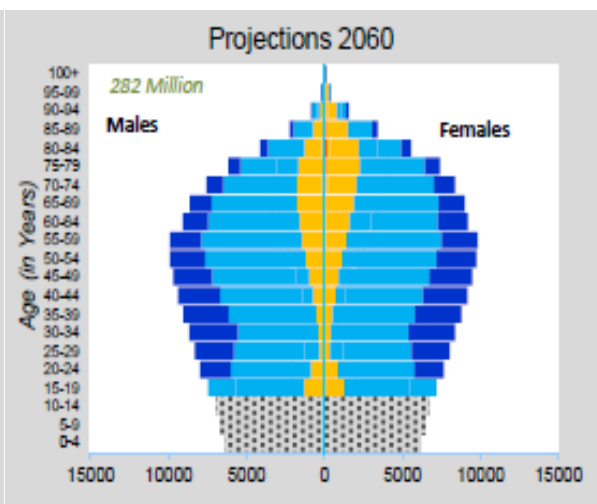
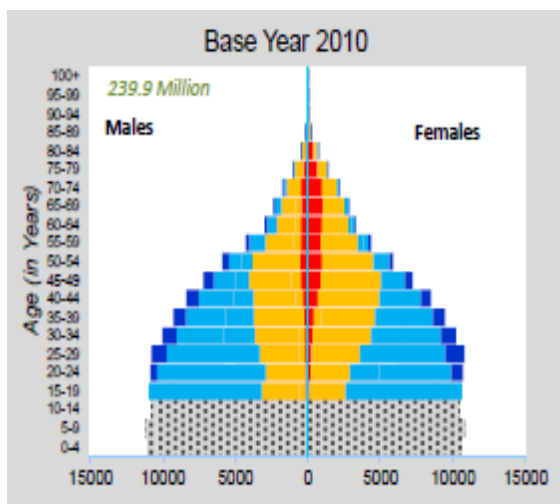
Malaysia



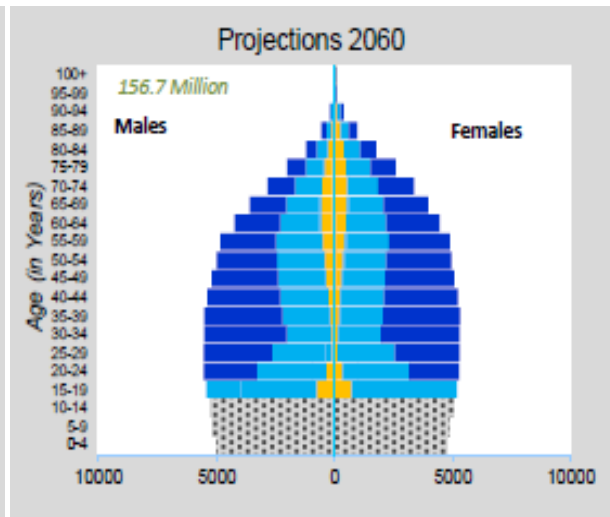
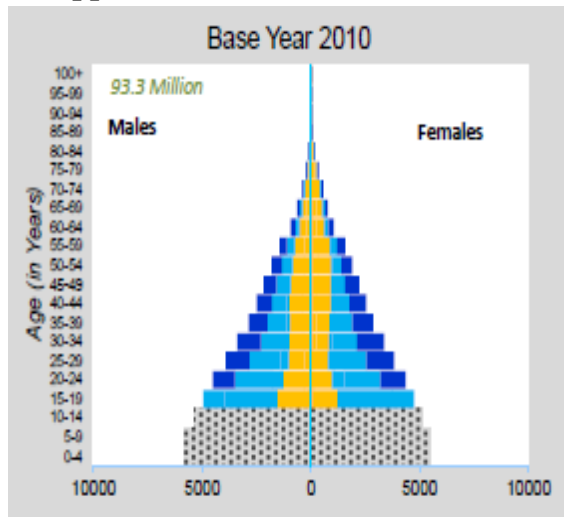
Vietnam



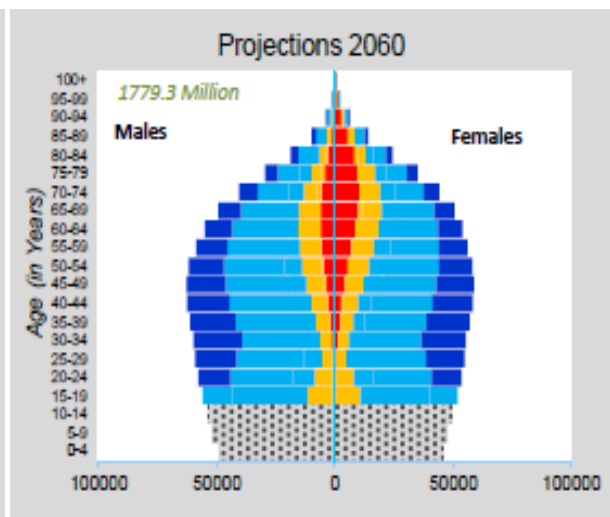
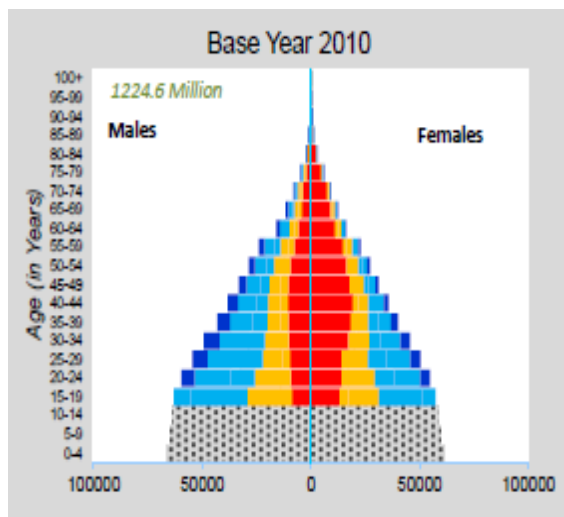
Indonesia



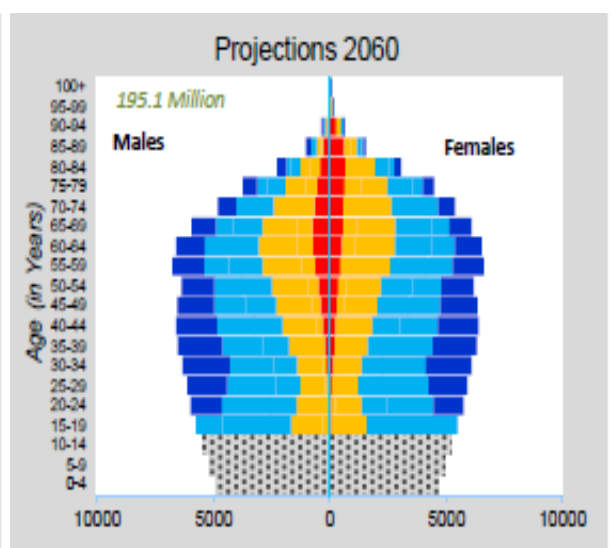
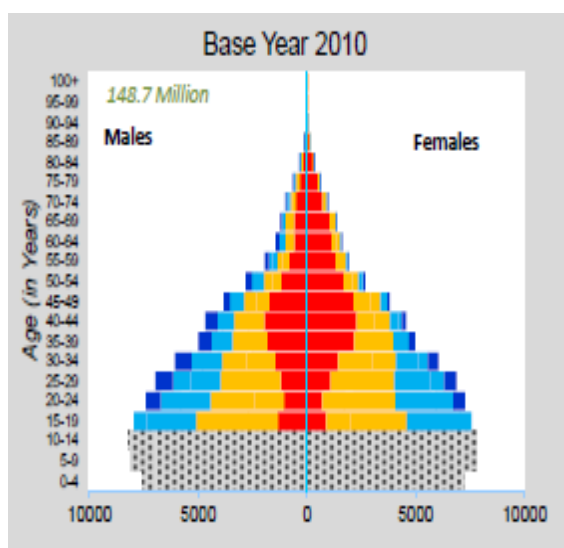
Philippines



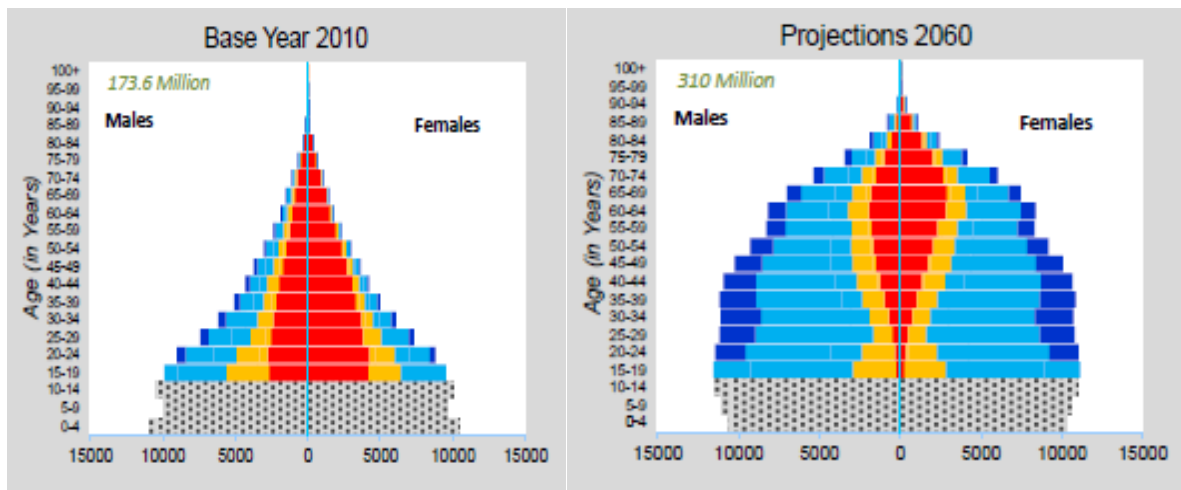
India



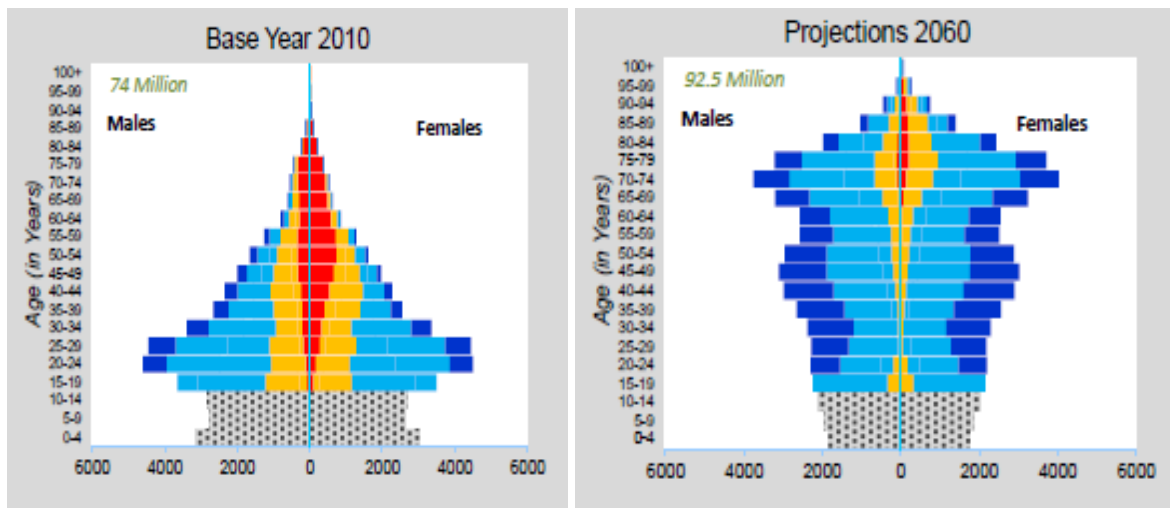
Bangladesh



Pakistan



Iran



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