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The Demographic Transition in Asia: 1950 to 2050

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INTRODUCTION

The century from 1950 to 2050 will mark an epochal transformation in Asian demographic history. In the span of a few generations, Asia has gone from a region of large families and short life spans to become the pacemaker of modernization and rapid demographic change in the developing world with very low fertility and mortality rates. This transformation is of worldwide significance because Asia is home to 4.2 billion people in 2010 - roughly 60 per cent of the world population of 7 billion (United Nations 2011). Because of very rapid growth during the last half of the 20th century, the population of Asia increased almost three-fold from 1950 to 2010. The era of extraordinary population growth in Asia is, however, drawing to a close.

At the opening of the 21st century, the total fertility rate (an indicator of completed family size based on the assumption that lifetime fertility is the sum of current age-specific birth rates) in Asia was below 2.5 births per woman. If current trends continue, as predicted by the United Nations, the Asian total fertility rate will drop below two births per woman - the fertility level needed for intergenerational replacement - by the end of the second decade of the century.

Most Asian countries, except for a few in South and West Asia, are well along their demographic transition from conditions of high mortality and fertility to low mortality and fertility. Signs of declining fertility were first evident in a few Asian countries in the late 1960s and early 1970s. During the 1980s and 1990s, the trend of declining fertility spread to almost every corner of Asia. In the first decade of the 21st century, below-replacement levels of fertility (TFR less than 2.1) are universal in East Asia, and are evident in some surprising places, including Vietnam, Myanmar, and Iran. Over the next 3 decades, the United Nations projects that low fertility will be the norm throughout Asia - even in counties with current high fertility.

Even though the UN medium-level population projections show that the pace of Asian demographic transition is accelerating, this does not mean the end of population growth in the near term. There will be almost one billion more Asians in 2050 than in 2010. Demographic momentum - caused by a young age structure - insures that the current annual population growth rate of one percent will continue, albeit at a declining level, for the next few decades. The average United Nations demographic projections are that population growth will end sometime around 2050, shortly after the population of Asia reaches 5 billion.

In this paper, I describe the background of the Asian demographic transitions, chart their current trajectories, review the state of research on their causes, and speculate about their consequences. I begin with a brief overview of the theory of the demographic transition with an emphasis on the variability from place to place. There is not one demographic model that fits all countries for all times.

After a brief sketch of the geographical range of Asia and its major sub-regions, I review recent trends in mortality (life expectancy at
birth) and fertility (total fertility rates) for the major sub-regions and largest countries in Asia from 1950 to 2010. Although there are common patterns of declining mortality and fertility, there are wide geographical and temporal variations. Socioeconomic development, rising levels of education in particular, has accompanied Asian demographic transitions, but many other factors have been important in different contexts. Population policy, especially family planning programs, has played an important role in Asia.

There is a medium-term impact of demographic transition on agriculture, with slower rates of growth of children and younger workers that is already evident in many Asian countries. The longer-term impact of an increasing fraction of the elderly population will become stronger in the coming decades. There are many other indirect impacts of the demographic transition that are intertwined with social changes in educational levels, marriage and family patterns, migration, and inter-generational obligations. These demographic and social changes will provide even greater challenges to Asian societies than the demographic revolutions of the current era.

DEMOGRAPHIC TRANSITION THEORY

Demographic transition theory is the general model that describes population dynamics as societies move through the historical process from conditions of high fertility and mortality to lower rates of fertility and mortality. There are typically four stages, which are summarized in this chart.

The first stage represents the pre-transitional demographic patterns that prevailed throughout most of human history. In most traditional societies, mortality rates were very high with half of all children dying in infancy or childhood. Some individuals reached old age, but the average length of life was between 30 and 40. With limited resources and low productivity, most agricultural populations lived at the margins of subsistence. Poor nutrition and sanitation resulted in low levels of resistance to diseases that were endemic in both rural and urban areas. In addition to normal high levels of mortality that ranged between 2 per cent to 4 per cent per annum, there were occasional mortality crises when epidemics took hold or when the harvest was lost because of natural or man-made catastrophes. In bleak years, mortality might take 10 per cent of the population of a community.

In pre-transitional societies, fertility was necessarily high, upwards of six births per couple. Without high fertility to counterbalance high mortality, populations would have declined and eventually disappeared. The average annual rate of population growth for most of human history was probably very close to zero, though there were eras of growth. There were also periods of demographic decline during famines, wars, and widespread epidemics.

The second stage of the demographic transition begins with declining mortality and incipient signs of declining fertility. High mortality recedes slowly at first with improvements in agricultural productivity and transportation, which allowed movements of foodstuffs from areas of surplus to areas of need. These early declines in mortality were evident in the 19th century in many Western countries and during the first half the 20th century in some developing countries. Rapid declines in mortality were only evident in the 20th century with application of the germ theory of disease to urban sanitation, household behavior, and medical practice. These changes reached many developing countries in the 1950s and 1960s with public health campaigns and the availability of antibiotics to treat infections.

The conditions that led to mortality change are often external to household decision making. For example, mortality levels can drop dramatically when urban sanitation programs replace polluted wells with piped clean water. Moreover, because good health is highly valued in all societies, there are generally rapid changes in household and individual behavior to achieve low mortality. Fertility reduction, however, requires major, and often unwanted, changes for households and most people. The organization and values of traditional societies reward families with many children. This means that there is generally a long lag in the response of fertility to lowered mortality. Having fewer children means postponement in marriage, restrictions on sexual behavior, and the use of contraceptive methods that require high levels of motivation.

The adoption of practices to lower fertility often faces opposition from traditional institutions, deeply-rooted cultural values, and extended families.

The interval between rapidly declining mortality and the slow response of declining fertility produced record levels of population increase. Rapid growth in population continues in stage three of the demographic transition even as fertility begins to decline. During the first half of the 20th century, many national populations increased by one percent per year - an unusually high rate of growth that can lead to the doubling of a population in 70 years. As mortality transitions spread to developing countries after World War II, population growth rates reached 2 per cent per annum, which translates into population doubling in 35 years. The growth rates in stages 2 and 3 of the demographic transition model are rightly considered "population explosions."

Finally, stage four of the demographic transition model represents post-transition societies with very low levels of mortality and fertility. Fertility of two children per couple, if all persons lived to the age of reproduction, would lead to population growth approaching zero as the age structure begins to reflect conditions of low mortality and fertility. The gradual changes in age structure from the youthful bulge, which characterizes countries just entering stage four, to the more even distribution of numbers by age usually takes about a generation or two.

The Asian Demographic Transition

Drawing upon data from the current population estimates and projections from the United Nations World Population Prospects, Figure 1 shows the Asian Demographic Transition from 1950 to 2050 (the 1910 to 2050 figures are medium level projections). In 1950, Asia was in stage two of the demographic transition. The crude death rate had declined from historical levels to about 20 per 1000. Fertility remained very high, however, with a crude birth rate of over 40. The rate of population growth - the difference between the crude birth rate and crude death rate - was over 2 per cent per year. This was the era of the extraordinary rate of population growth when the population of Asia doubled in little more than a generation.

Asian mortality continued to decline rapidly in the 1960s and 1970s. At first, fertility began to decline, slowly at first, but then more rapidly in the 1980s and 1990s.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mortality</th>
<th>Fertility</th>
<th>Population growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>High and fluctuating</td>
<td>High</td>
<td>zero</td>
</tr>
<tr>
<td>2.</td>
<td>Rapid decline</td>
<td>Slow decline</td>
<td>+++</td>
</tr>
<tr>
<td>3.</td>
<td>Continued decline</td>
<td>Rapid decline</td>
<td>++</td>
</tr>
<tr>
<td>4.</td>
<td>Very low</td>
<td>Low and fluctuating</td>
<td>zero</td>
</tr>
</tbody>
</table>

Figure 1: Asian Demographic Transition: Projection to 2055.
By the opening decade of the 21st century, the average crude birth rate in Asia was around 20. It is anticipated that replacement level fertility (two births per woman) will be reached in the second decade of the century. Population growth will continue for the next few decades because of population momentum - the youthful age structure that reflects the high fertility of preceding decades. If current trends continue, and as age structures even out in the coming years, Asia should approach zero population growth by the middle of the century.

The Asian Region

Spanning almost half the globe, Asia is the largest region in the world, geographically and demographically. Encompassing a wide diversity of countries, Asia includes the demographic giants of China and India as well as a number of tiny micro-states with populations of less than one million. Table 1 shows the population of Asia by region and country in 2010 (United Nations 2011). The second column shows each country and region as a percent of Asia and the third column shows each country as a percent of its region within Asia. According to the UN definitions, Asia is divided into 4 major regions: East Asia, South and Central Asia, Southeast Asia, and West Asia. South-Central Asia is also divided into subregions of South Asia and Central Asia.

The population of Asia is not distributed evenly. Over 80 percent of Asian peoples live in East and South-Central Asia. The 1.3 billion population of China comprises 85 percent of East Asia and almost one-third of all Asia. East Asia also includes Japan, which at 127 million, is one of the largest countries in the world. South and North Korea, with 48 and 24 million people, respectively, see also demographically significant.

India with a population of 1.2 billion in 2010 is projected to eclipse China as the world's largest country within two decades. India is the largest country in South Asia, but the neighboring countries of Pakistan and Bangladesh, at 174 and 149 million, respectively, are among the largest countries in the world. Other South Asian countries with large populations are Iran with 74 million, Afghanistan: 31 million, Nepal: 30 million, and Sri Lanka with 21 million. The sub-region of South-Central Asia includes five newly independent Central Asian countries that were former provinces of the Soviet Union, which have a total population of 61 million.

Southeast Asia, with a population of less than 600 million in 2010, is only one-seventh of all Asia. Nonetheless, Southeast Asia is as populous as Europe, and contains Indonesia, the 4th largest country in the world. Other large Southeast Asian countries are the Philippines, Vietnam, and Thailand with 93, 88, and 69 million people, respectively. West Asia, according to the United Nations definition, includes Middle Eastern countries that are not part of Africa. The population of West Asia is 322 million, about 5 percent of all Asia. About one-third of the West Asia population is in Turkey (73 million) and another 40 percent resides in the medium size countries of Iraq, Saudi Arabia, Yemen, and Syria.

Table 1

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Population</th>
<th>% of Asia</th>
<th>% of Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>6,104,654,154</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>East Asia</td>
<td>1,277,234,345</td>
<td>20.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>South Asia</td>
<td>72,113,947</td>
<td>1.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>526,968,670</td>
<td>8.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td>West Asia</td>
<td>322,600,439</td>
<td>5.2%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Average life expectancy in Asia increased from 43 to almost 70 over the last six decades. This is a remarkable achievement - unparalleled in modern history. In the early 1950s, average life expectancy in Asia was 22 years below the level in more developed countries; it was only 8 years below the much higher mortality levels of developed countries in 2010. There have been gains in reducing mortality throughout this period, but the 1960s and 1970s were the most dramatic era of change. During the period from the mid-1950s to the mid-1960s, mortality actually increased in East Asia, because of the disastrous demographic consequences of the Great Leap Forward policy in China (Chang & Wen 1997 and Peng 1987).

The catch-up period from the mid-1960s to the mid-1970s witnessed a 20-year gain in average length of life in East Asia. In general, life expectancy is lower in South Asia than in East, Southeast, and West Asia. However, the gains in longevity in South Asia have been no less impressive with an increase from an average life expectancy of less than 40 in 1950 to well above 60 in 2005-10.

More detailed examination of trends for specific countries show a variety of interesting patterns. Japan, with a life expectancy of over 83
in 2010, has the lowest mortality of any country in the world. South Korea has had the most rapid gain in life expectancy of any Asian country: the life expectancy of South Korea increased from 48 in 1950 to 80 in early 2000s. The trend in life expectancy in North Korea was very similar to South Korea through the 1980s, but then mortality rates increased on North Korea in the 1990s and have only partially recovered. The impact of war on mortality is evident for Cambodia in the 1970s (Hueveline 1998), for Bangladesh from the late 1960s to the early 1970s, and for Iraq and Iran in the 1980s. There are also signs of modest declines of life expectancy in Azerbaijan and in Central Asia during the 1980s and 1990s.

There is considerable variation between countries in levels of mortality in progress towards longer life expectancy in Asia. Singapore’s life expectancy is close to that of Japan. Although there has been progress in Afghanistan, life expectancy in that country was still below 50 in 2010. In the 1950s, life expectancy in Vietnam was the lowest in Southeast Asia; by 2005-10, it was higher than any country in the region except Singapore.

THE FERTILITY TRANSITION IN ASIA

Rapid progress in lowering mortality, as well as exceptional socioeconomic progress has led to rapid fertility transitions throughout Asia. Figure 3 shows the trend in the total fertility rate - for all Asia and its major regions for each five-year interval from 1950-55 to 2005-10. In 1950, childbearing was universally high in Asia, with 5 to 6 births per woman. There were modest between country variations in fertility in the 1950s and 1960s, but widespread fertility declines were not evident until the 1970s. Japan had very low fertility in the 1950s and 1960s and there signs of incipient fertility declines in Singapore and South Korea in the late 1960s, but these were exceptional cases. In South Asia, Sri Lanka was the first country with a major fertility decline. By the 1970s, however, there is clear evidence of rapid fertility declines in China and throughout Southeast Asia.

By the 1980s, the pace of fertility decline quickened and spread to South Asia, including India and Bangladesh. By the 2000s, the total fertility rate was below two in East Asia and only slightly above the replacement level in Southeast Asia. Childbearing was higher in South Asia, but had dipped below three births per woman in India and Bangladesh. Fertility remains above three births per woman in Pakistan, the Philippines, and few West Asian countries. And fertility remains above 6 births per woman in Afghanistan.

The list of countries with very low fertility and even ultra-low fertility is longer than the few that have resisted the sweeping changes in childbearing of the last few decades. Several Asian countries, including South Korea, Japan, and Singapore have total fertility rates in the 1.2-1.3 range - the lowest in the world. Just a bit higher are China, Thailand, Vietnam, and Indonesia in the 1.6-1.9 range, below the replacement level. Burma, Indonesia, and Turkey are only slightly higher. Although the national TFR in India is about 2.7, several states including Kerala, Tamil Nadu, Andhra Pradesh report average childbearing below two (Haub 2011). Although Pakistan’s fertility decline did not begin until the 1990s, the total fertility rate has declined moderately from over 6 to 4 over the last two decades. There is considerable potential for future declines if family planning programs are able to address the demand for contraception services (Sathar and Zasidi 2011: 10).

CAUSES OF THE ASIAN DEMOGRAPHIC TRANSITION

There is not one, but many demographic transitions underway in Asia. Differences between countries, and often differences within countries by region and ethnicity, make it impossible to attribute declines in mortality and fertility to any one factor. The variations in national patterns illustrate some of these differences.

Perhaps the most famous case of modern fertility decline is China. However, it is also one of the most misunderstood cases. In 1979, China initiated the household responsibility system of which a major feature was the one child policy. The one child policy, which penalized families who had two children, was a national program but was primarily implemented in urban areas. The policy certainly had an impact, but it did not cause China’s fertility transition. The total fertility rate in China had already declined to about 2.78 births by 1970 because of other social changes and programs (Coale 1984 and Gu & Cai 2011).

One of the most rapid declines in fertility ever recorded was in Thailand. Until the late 1960s, Thai fertility was one of the highest in Asia with couples having, on average, six children. Then, within the decade of the 1970s, the Thai total fertility rate declined by 50 percent to around three births per woman. Fertility continued to decrease and probably dropped below two births per woman in the 1980s (Hirschman et al. 1994).

This achievement is all the more remarkable because the majority of Thais still live in rural areas where agriculture is the dominant industry. In their classic account of the “Thailand’s reproductive revolution,” Knodel and colleagues (1987) attribute the success of Thailand to four factors: rapid socioeconomic development, a cultural setting that favoured individual autonomy, a relatively high status for women, and an effective family planning program.

The case of Thailand is often cited to counter the claim that strong government sanctions, such as China’s one child policy, are needed to reach replacement level fertility. Thailand’s family planning program has always been voluntary.

John Bryant (2007) finds that a simple model of socioeconomic development - based on national income, life expectancy and secondary school enrollment - provides a very accurate prediction of national levels of fertility rates for most countries in the world from 1960 to 2000.

In other words, the logic of the demographic transition model - development and the mortality transition predicts fertility declines - works pretty well. For example, the differences between lower fertility in Latin America and high fertility in Africa can be largely explained by differences in income, life expectancy and secondary school enrollment.

For Asia, Bryant finds that actual fertility declines in Asia have been even more rapid than the predicted fertility declines based on the model of socioeconomic development. There are interesting variations by country in Bryant’s comparisons of actual with predicted fertility trends. For example, the slow decline of fertility in Laos, the moderate decline in Malaysia, and the rapid decline in Sri Lanka are all very close to the levels predicted by each country’s level of development. In Thailand, China, Indonesia, Bangladesh, and Vietnam, the fertility transitions have outpaced predicted levels - suggesting that policies and programs have led to accelerated fertility declines.

In Pakistan and the Philippines,
the pace of fertility change has sometimes lagged behind the levels predicted by development. The role of family planning programs in advancing fertility declines has been widely debated. Some economists note that successful family planning programs are often dependent on the same factors that drive economic development and effective government administration - that would have led to fertility declines even without family planning (Gertler and Molyneux 1994). Bongaarts and colleagues (1990) have argued that effective family planning programs accelerate fertility transitions. Since the pace of fertility decline affects the rate of population growth, future world population (and the population of individual countries) will be considerably smaller if policies can hasten the decline of fertility.

Another reason for the mixed assessment of family planning's effectiveness is variations in program effectiveness between countries and regions. In a comprehensive analysis of declines in the total fertility rate in 73 developing countries from 1972 to 1994, Tsui (2001) finds a moderate role for family planning and international assistance - about one-third of the total decline (5 of the observed decline of 1.6 births). However, the impact of policy was much more consequential for the 16 Asian developing counties in her sample; family planning and international assistance counted for 70 per cent of the observed fertility decline (1.36 births of the decline of 1.93 births). Although one might argue that socioeconomic development alone will eventually catch up smaller families, there is strong evidence that family planning programs accelerated the pace of fertility decline in Asia (Hull, Hu, and Singarimun 1977).

CONCLUSIONS

Although the era of rapid population growth in Asia has slowed and is likely to approach zero in near term, it is important to understand the reasons behind Asia's rapid demographic transitions and the impact on future social change and well-being. There were moderate declines in mortality in Asia during the first half of the twentieth century, but significant gains in life expectancy did not occur until the late 1940s and 1950s, when preventive health programs were introduced and effective medical treatment became available. The "amazing mortality declines" of the 1950s and 1960s led to population growth rates of 2 per cent or more in most Asian countries that lasted for several decades and patterns and the high value placed on children continued to prop up fertility levels even though strains were beginning to appear.

Then, from the 1970s to the 1990s, fertility began to decline in most Asian countries. Even within the context of the rural family economy, there might well have been a slow demographic response of lower fertility as the limits of land and production were strained by families of 4 to 6 surviving children (VanLandingham and Hirschkran 2001). But the fertility response was more than an adjustment to population pressures - it was accelerated by the forces of modernization: mass education, growing economic development, and government investment in education, health, and other dimensions of human capital.

REFERENCES


Fertility in Syria 1979-2006: Levels and Trends

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INTRODUCTION

The analysis of the fertility transition in Syria allows us to distinguish several phases. The first phase was when fertility reached world records, and resisted any change. Followed by the phase of rapid decline in the mid-1980s, and lastly by a phase of slow decrease or a phase of quasi-stagnation in fertility. Despite the interest to represent more accurate estimates of recent Syrian fertility levels and trends, very few studies have been devoted to this question. This paper addresses this issue by trying to review and analyze trends in fertility over the last three decades.

Syrian fertility constituted a dilemma for researchers and scholars, as it was always much higher than would be predicted by its development indicators. That makes it difficult to explain the Syrian fertility transition by demographic transition theory. Courbage in his analysis of the fertility transition in Syria showed the impact of economic crisis on fertility decline in the second half of the 1980s after a period of rapid economic growth accompanied by very high fertility (Courbage 1994, 2007). The crisis led transition hypothesis has been proposed by several researchers during the crisis period in the 1980s and 1990s in several developing countries (Bourguet 1985; Lesthaeghe 1989; Cosio-Zavala 1993 and Eloundou-Enyegue et al. 2000).

The objective of this paper is to provide a continuous series of fertility rates estimated by the same method for the entire period studied to follow fertility trends in Syria.

This study analyzes the Syrian fertility transition during the period 1979-2006 using the own children method. Changes in levels, trends and age patterns of fertility will be discussed for the whole country, for urban and rural areas and for provinces in order to explain the previous evolution of the fertility and its future prospects.

DATA AND METHOD

The data used in this work are essentially those of demographic surveys available in Syria - the Syrian Maternal and Child Health Survey 1993 (SMCHS), the Syrian Family Health Survey 2001 (SFHS), and the multiple indicator cluster survey MICS3 conducted in 2006. Each of these three surveys is a national survey based on a representative sample of households throughout the country. The 1993 sample includes completed questionnaires for 9988 households and within these households, 4545 ever-married women between the ages of 15-49, and the 2001 survey includes questionnaires for 9500 households and 6653 ever-married women aged 15-49 within these households. The multiple indicator cluster survey MICS3 of 2006 includes questionnaires to 19,019 households and 25,026 ever-married women aged 15-49.

The own-children method is a reverse-survival or retrospective projection method that uses data of mothers and co-resident children aged under 15 years to estimate age specific fertility rates for years before the census or the survey (Cho et al. 1986). Assuming that young children recorded in a household are all the children born and still alive to the parents in this household, it links the children in the household to their potential mother at the time of the survey (often the woman of the household head if her age is compatible with the age of the child) in the same household to build a child-mother relation in previous years.

For each of these three surveys, the records of women have been merged with household records to place every woman in her household. Enumerated children are first assigned to their mothers within households (matching) based on issues relating to age, sex, and relationship with the household head. Some rules control the process of matching, potential mothers are 15 to