Asian Fertility Transition

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Introduction

For most of history, human population grew very little because there were nearly as many deaths as births each year. High birth rates were often offset by frightful mortality from wars, famines, and epidemics. Health and living conditions improved in Europe in the 17th and 18th centuries, the number of births exceeded the number of deaths, and populations began to grow. Better hygiene and public sanitation reduced the incidence of disease. Expanded commerce made food supplies more widely available and improved nutrition. The wild fluctuations in mortality of previous centuries began to recede and life expectancy began a slow rise. A consequence of the decline in mortality is an increasingly rapid rise in population growth (a "population explosion") as the gap between deaths and births grows wider.

After many years of extremely slow growth, the human population indeed grew explosively, doubling again and again; a billion people added between 1820 and 1930 (110 years); another billion added between 1930 and 1960 (30 years); another billion people were added between 1960 and 1975 (15 years); another billion were added between 1975 and 1987 (12 years) (United Nations 2000). Throughout the 20th century each additional billion has been achieved in a shorter period of time. Human population entered the 20th century with 1.6 billion people and left the century with 6.1 billion. Most of the annual growth occurs in the less developed countries, whose population growth rates are much higher than those in more developed countries. Certainly almost all the developing countries the decline in mortality is already well underway, and due to the availability of low cost medical technology is advancing more rapidly than was the case in the now more developed countries.

The population of the more developed regions more than doubled over the century, exceeding 1 billion by 2000. But the most dramatic growth was in the less developed regions, where population more than quadrupled; the total neared 5 billion by 2000. In 1900, about one - quarter of the world's population lived in Europe; by 2000, barely one-eighth lived in Europe. In contrast, the less developed countries in Africa, Latin America, and the Caribbean accounted for more than one-fifth of the world in 2000—up from one-eighth in 1900. Asia contained nearly three-fifths of the total population by century's end.

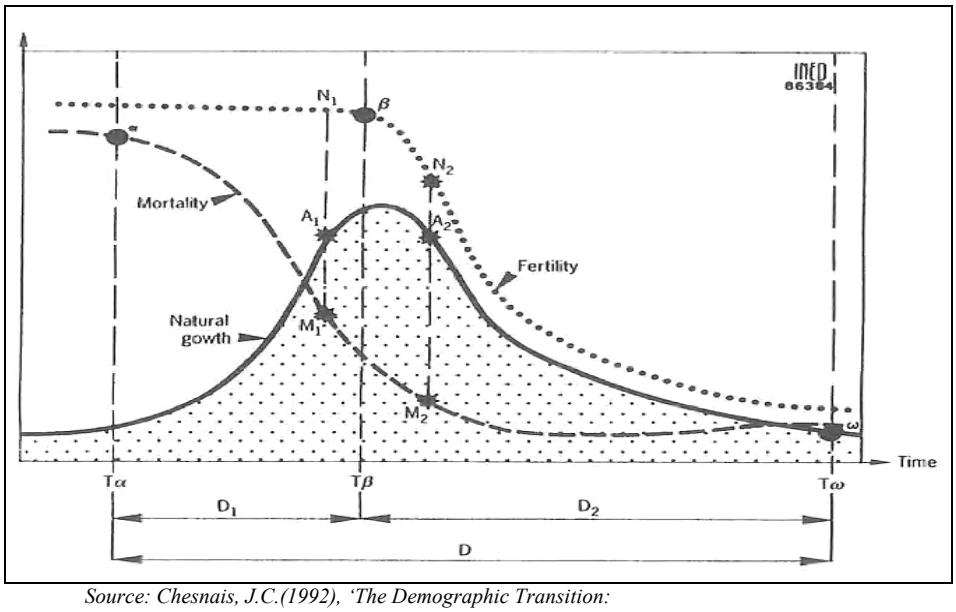
The shift from high to low mortality and fertility is known as the demographic transition or demographic revolution. This shift occurred throughout Europe, North America, and a number of other areas in the 19th and early 20th centuries, and started in many developing countries in the middle of the 20th century when this process already ended in developed countries. More developed countries have "completed" the demographic transition: fertility and mortality are at low levels, and natural increase adds little, if any, population growth. European countries went through this demographic transition over the past 150 years. Many developing countries are in a transition stage, in which mortality and fertility are falling at varying rates, but still high relative to the levels of Europe and other more developed areas.

There are two stages of demographic transition, the first characterized by consistently high fertility and declining mortality. The excess of births over deaths in this stage of the transition ignited a population explosion. In a second stage of the demographic transition, the fertility moves downward, eventually catching up with the death rate. Population growth remains relatively high during the early part of the stage, but falls to near zero in the later part.

The phases of transition occur between the stages of equilibrium are follows:

1. a phase of inflated growth, beginning at Tα, the speed of which increases in proportion to the strength of the decline in mortality;
2. a phase of contracted growth, which may begin at Tβ or later, depending on whether the decline in fertility by then initiated is faster or slower than the decline in mortality.

Figure 1. **The stages of Demographic Transition**

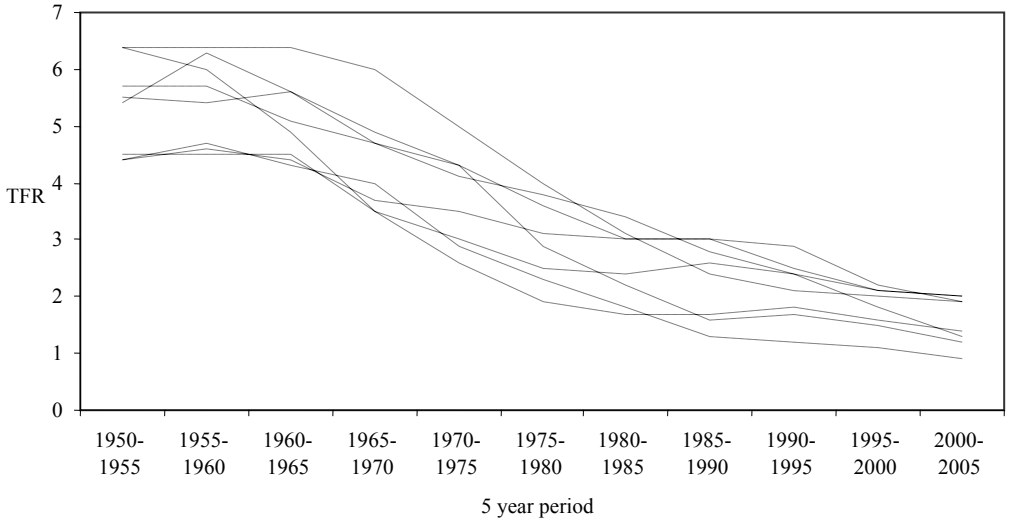


Source: Chesnais, J.C.(1992), 'The Demographic Transition: Stages, Patterns and Economic Implications", page 26

Fertility patterns in Asian countries with transition onsets

The record of Asian countries that started their transitions in the 1960's provides a starting point of transition because these transitions have been underway for at least three decades. Three key features of these transitions are evident: 1) fertility is high until the transition begins; 2) once transition gets underway fertility changes fairly rapidly and tends to continues; 3) the pace of declines decelerates as countries reach the later stages of the transition.

Figure 2. **TFR from 1950 to 2005 for Asian countries with transition onsets in the 1960s**



The average TFR in pre-transitional countries in the early 1960s was 6-7 children per women. Although countries vary in their development level of pre- transitional fertility, there is usually little trend up or down before the transition starts. The TFR can therefore be considered unresponsive to changes in development until the transition begins (Cleland, J. 2001). This pattern of fertility is consistent with the existence of natural fertility which is defined as the fertility that prevails when couples do not consciously limit the size of their families. Fertility surveys in pre-transitional countries have confirmed that only a small proportion of couples practice contraception (Curtis, S.L & Neitzel, K. 1996). In such societies differences in fertility are caused primarily by differences in proximate determinants other than contraception (Bongaarts, J. & Potter, R.G. 1983).

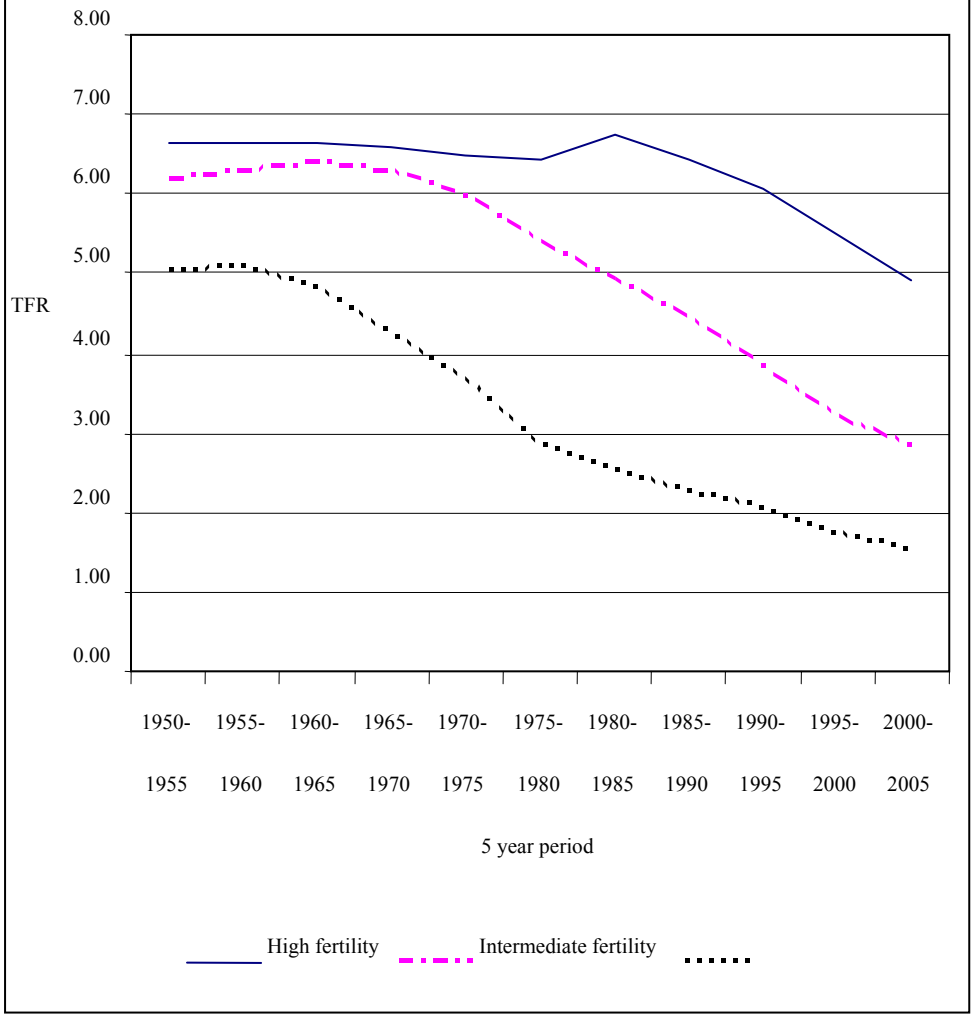
Once transition starts it tends to continue. Reversals and plateaus are very unusual in early phases of transition. The pace of decline is typically faster immediately after onset than in any other phase of the transition. Bongaarts and Watkins (1996) concluded that the initial pace of change in fertility was not associated with the pace of development. However the initial pace decline was positively associated with the level of development at the time of onset. This initial fertility decline is typically more rapid the more developed a society is at the time of onset because higher levels of development are associated with lower desired family size (Casterline, J. B. 2001).

The Figure 3 shows typical trends in fertility for three groups[1] of countries with transition starting, respectively, in the 1960s, 1970s and 1980s. For high fertility countries, the fertility transition began 1980s and its decline was slower than those low and intermediate fertility countries. During the previous 25- years, all intermediate fertility countries experienced a fertility transition and this transition began in low fertility countries in the 1960s. Most

[1] Countries and areas are classified into three categories according to their level of fertility estimated in the period 2000-2005: high, intermediate and low. The high fertility category includes countries and areas in which the TFR is 4.0 or higher. The intermediate fertility category consists of countries or areas in which the TFR ranges from 2.1 to 4.0, while the low fertility category comprises countries and areas in which the TFR is 2.1 or lower.

importantly, the speed of decline was much faster during this period compared with the earlier period.

Figure 3. **TFR from 1950 to 2005 for Asian countries, by level of fertility**



Pace and Duration of Asian Fertility Transition

Table 1 presents an overall pattern of fertility change for the 10 year periods beginning in 1950-55 and up to the most recent period 2000-2005. During the period 1950-1955 to 1960-1965, the largest decline in fertility took place in Japan and Singapore, exhibiting a decline by 28.6 and 23.4 percent.

Turkey, Sri-Lanka, China and Cyprus also experienced a drop in fertility by around 10 percent. On the other hand there were over one fourth increases in fertility in the Vietnam, followed by 23.5 and 20 percent increase in fertility in Democratic Republic of Korea and Kyrgyzstan, respectively and 13.3 percent increase in Turkmenistan and Uzbekistan. A small rise in fertility was also observed in Jordan, Tajikistan, Bangladesh, Macao China, Azerbaijan and Republic of Korea.

The pace of the decline increased in all low fertility countries during 1960-1965 to 1970-1975. Remarkable decline observed in Singapore the TFR dropped 46.9 percent, Macao, China (37.3 percent), Armenia (33.3 percent), Hong Kong China (32.6 percent), Cyprus (26.5 percent), Azerbaijan and Republic of Korea (23 percent), Sri-Lanka and Thailand around 20 percent. A small percentage of declines observed also in intermediate countries during the same period. On the other hand, a rise in fertility of 21.7 percent was observed in Mongolia and 7.9 percent in Tajikistan.

During the period 1970-1975 to 1980-1985, fertility decline observed in all low and intermediate fertility countries except Islamic Republic of Iran, which had small increase in fertility by 3.1 percent. A remarkable decline was observed in Republic of Korea (48.8 percent, China (46.9 percent), Thailand (38 percent), Hong Kong China (37.9 percent), Singapore (34.6 percent), Vietnam (32.8 percent) and Azerbaijan (30.2 percent). Most of these countries reported in fertility decline in this period had in turn experienced showing a slower decline in the period 1980-1985 to 1990-1995. Among these countries, Singapore experienced a small increase in fertility by 5.9 percent. On the other hand, a remarkable decline occurred in the period 1980-1985 to 1990-1995 in all of the intermediate fertility countries for example, Mongolia (40.4 percent), Islamic Republic of Iran (34.8 percent), Turkey (31 percent), Indonesia (29.3 percent) and Jordan 25 percent. During this period fertility decline also observed in high fertility counties: Cambodia (18.2 percent), Pakistan (13.6 percent) Lao People's Democratic Republic (13.4 percent), Maldives (11.8 percent) and Bhutan (5.8 percent).

The period between 1990-1995 and 2000-2005 is marked by a significant decline in fertility in most of the countries. It is noticeable that 45 to 50 percent decline observed in Islamic Republic of Iran, Macao China and Armenia. Azerbaijan also experienced noticeable decline in fertility by 34.5 percent. One third of drop observed in Cyprus, Jordan, Myanmar, Turkmenistan, Uzbekistan, Vietnam and Republic of Korea. At least around 20 percent decline in fertility experienced all the intermediate countries except Turkey (13.8 percent) and Israel (3.4 percent) and even all high fertility countries except Afghanistan (5.1 percent).

Overall, it is evident that percentage decline in TFR were significant during the 1960-65 to 1980-85 for low fertility countries and then the declined started to slow down. On the other hand, decline in fertility is significant in intermediate and low fertility countries during 1970-75 to 2000-2005. This finding shows that the pace of decline is typically faster immediately after onset than on any other phase of transition.

Assuming the past transition record will be repeated, at least in broad outline, in the future fertility decline will proceed relatively rapidly for high fertility countries as those countries are in the early phases of the transition. As countries approached the later stages of the transition the pace of the decline will be slow down.

Table 1. **Percentage change in Estimated Total Fertility Rates (TFRs) in Asian countries, 1950-2005**

Country	Percentage change 1950-1955 to 1960-1965	1960-1965 to 1970-1975	1970-1975 to 1980-1985	1980-1985 to 1990-1995	1990-1995 to 2000-2005
High fertility (TFR = 4.0 or higher)					
Afghanistan	0.0	0.0	+1.3	+1.3	-5.1
Bhutan	0.0	0.0	0.0	-5.1	-21.4
Cambodia	0.0	-12.7	+20.0	-18.2	-24.1
Lao. People's Dem. Rep	0.0	0.0	+8.1	-13.4	-17.2
Maldives	0.0	0.0	-2.9	-11.8	-28.3
Pakistan	0.0	0.0	0.0	-13.6	-24.6
Intermediate fertility (TFR = 2.1-4.0)					
Bangladesh	+3.0	-10.1	-14.5	-22.6	-19.5
India	-3.3	-6.9	-16.7	-15.6	-18.4
Indonesia	-1.8	-5.6	-19.6	-29.3	-17.2
Iran	0.0	-8.6	+3.1	-34.8	-51.2
Israel	-7.1	-5.1	-16.2	-6.5	-3.4
Jordan	+8.1	-2.5	-12.8	-25.0	-31.4
Kyrgyzstan	+20.0	-13.0	-12.8	-12.2	-25.0
Malaysia	-1.5	-22.4	-19.2	-14.3	-19.4
Mongolia	0.0	+21.7	-21.9	-40.4	-26.5
Myanmar	0.0	-3.3	-19.0	-19.1	-34.2
Nepal	0.0	-4.9	-5.2	-9.1	-26.0
Philippines	-5.5	-13.0	-16.7	-18.0	-22.0
Tajikistan	+5.0	+7.9	-19.1	-10.9	-22.4
Turkey	-10.1	-14.5	-20.8	-31.0	-13.8
Turkmenistan	+13.3	-8.8	-22.6	-16.7	-30.0
Uzbekistan	+13.3	-7.4	-25.4	-17.0	-30.8
Vietnam	+25.9	-8.2	-32.8	-26.7	-30.3
Low fertility (TFR = 2.1 or lower)					
Armenia	0.0	-33.3	-20.0	0.0	-45.8
Azerbaijan	+1.8	-23.2	-30.2	-3.3	-34.5
China	-8.1	-14.0	-46.9	-26.9	-10.5
Cyprus	-8.1	-26.5	-4.0	0.0	-33.3
Democratic People's Republic of Korea	+23.5	-7.1	-28.2	-17.9	-13.0
Georgia	-3.3	-10.3	-11.5	-13.0	-25.0
Hong Kong, China	-2.3	-32.6	-37.9	-33.3	-25.0
Japan	-28.6	0.0	-10.0	-16.7	-13.3
Kazakhstan	0.0	-20.5	-14.3	-16.7	-20.0
Macao, China	+2.0	-37.3	-21.9	-36.0	-50.0
Republic of Korea	+3.7	-23.2	-48.8	-22.7	-29.4
Singapore	-23.4	-46.9	-34.6	+5.9	-22.2
Sri Lanka	-10.5	-19.6	-17.1	-29.4	-16.7
Thailand	0.0	-21.9	-38.0	-32.3	-9.5

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2004 Revision, www://esa.un.org/unpp

Duration of Fertility Transition was calculated as showed in Figure 1: second stage of the Demographic Transition D2 = Tw – Tβ. These dates are intended to be fairly approximate especially with regard to starting points of fertility transition. This measure calculated only countries which reached to below replacement level as it is assumed that the fertility would stabilize at replacement level.

Table 2: Duration of Fertility Transition for Asian low fertility countries

Country	TFR		CBR			
	Starting points	Ending points	Starting points	Ending points	Period of fertility transition	Duration of fertility transition
Armenia	4.5	1.8	35.5	13.5	1955-2000	45
Azerbaijan	5.6	1.9	40.5	15.8	1960-2005	45
China	6.2	1.9	43.8	18.3	1950-1995	45
Cyprus	3.7	1.9	27.4	15.0	1950-2000	50
North Korea	4.6	2.1	35.6	18.9	1965-2000	35
Georgia	3.0	2.0	24.4	17.5	1950-1990	40
Hong Kong, China	4.7	1.8	36.3	15.7	1955-1985	30
Japan	4.6	2.1	32.5	17.2	1930-1960	30
Kazakhstan	4.4	2.1	33.2	16.9	1950-2000	50
Macao, China	5.0	2.0	37.7	17.1	1950-1980	30
Republic of Korea	6.3	1.6	45.7	16.9	1955-1990	35
Singapore	6.4	1.9	44.4	17.2	1950-1980	30
Sri Lanka	5.7	2.1	40.0	17.4	1955-2000	45
Thailand	6.4	2.1	44.2	19.4	1955-1995	35

Note from Table that in Japan is the forerunner of fertility transition. In fact Japan managed to reduce its fertility level with unprecedented rapidity (Ogawa, 1994). Hong Kong China, Macao China and Singapore succeeded to reach the replacement level in 30 years while Republic of Korea, Democratic Republic of Korea and Thailand in 35 years. Fertility level of the Cyprus and Georgia was already relatively low in the 1950s being approximately 3-4 children per women. Although the tempo of decline since then has been gradual, TFRs had been fallen below the replacement level by the early 1990s for Georgia and early 2000 for Cyprus. Except these two countries, pre-decline fertility levels in Asian countries were higher in which CBR around 33-46. It can be concluded that Asian fertility transition was completed within a much shorter period than that of the most European countries.

End of the fertility transition

As shown in Table 2 that there are 14 Asian countries that had already completed fertility transition to the replacement level and fertility continued to decline or stayed much below the replacement level already for 10 to 25 years. More countries are sure to follow them in the near future.

Considering the past trends and the current level of fertility, along with some social and economic indicators, the United Nations has projected global total fertility rates up to the year 2050. Table shows the period during which countries in the region are likely to reach the replacement level of fertility.

Table 3. **Expected period when fertility will reach replacement level: UN medium variant projection**

Period	High fertility countries	Intermediate fertility countries
2005-2010		Indonesia Islamic Republic of Iran Mongolia Myanmar Vietnam
2010-2015		Kyrgyzstan Turkey Uzbekistan
2015-2020		India Malaysia Philippines Turkmenistan
2020-2025		Israel Jordan Tajikistan
2025-2030	Lao. People's Democratic Republic	Bangladesh
2030-2035	Maldives	
2035-2040	Cambodia Pakistan	Nepal
2040-2045	Bhutan	

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2004 Revision, www://esa.un.org/unpp

According to the medium variant projections, all countries in this region, except Afghanistan, will have achieved the replacement level of fertility by the year 2050. Among the high fertility countries, Bhutan is expected to reach the replacement level of fertility in the period 2040-2045, while Cambodia and Pakistan are expected to reach this level in the period 2035-2040. Maldives is expected to reach this level in the period 2030-2035 and the Lao People's Democratic Republic will achieve the replacement level of fertility in the period 2030-2035.

Among the intermediate fertility countries, the Islamic Republic of Iran, Indonesia, Mongolia, Myanmar and Vietnam will soon complete their fertility transition. Nepal would be reached the replacement level fertility in the period 2035-2040.

I would like to conclude my paper by briefly discussing the future of fertility in Asian countries. The future course of fertility in high and intermediate fertility countries will, however, depend largely on several factors, including a high level of Governments commitment to providing good quality reproductive health information and services and making investments in social sector development.

Although low fertility countries are the region's forerunners in having reached the replacement level of fertility, a continued depression in fertility in some of these countries has made them cautious about any further fertility decline. In fact, national family planning programs in the Republic of Korea and Singapore were phased out after their fertility levels fell well below the replacement level. The experiences of European countries also confirm that the prospect for reversing fertility to the replacement level is highly unlikely (United

Nations, 2000). The governments of the low fertility Asian countries have changed their policies on population since their fertility plunged into below replacement level. Singapore changed the position by 180 degrees, from anti-natalist to pro-natalist in 1984. The government of Japan started to strengthen family policies in 1990 (Atoh, 2001). Republic of Korea and Thailand stopped fertility policy in 1996 and 1997 respectively. Only the government of China is keeping the strongest anti-natalist position.

Pressing issue for the 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 prepare adequately for the problems associated with the ageing of the population. For example, some ageing countries such as Japan, the Republic Korea and Singapore are facing the problem of increasing national expenditures for old-age social security and mounting burdens of providing care for the growing number of frail elderly and a shrinking labour force (United Nations, 2002). For example, 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, B. 2002).

It is reminded that demographic transition has been considered a convergent process which started form the Western European countries and expanded to other European and non-European regions. If there is a "second demographic transition", would it also be expanding from European countries to regions all over the world? Are the Asian low fertility countries that have completed the demographic transition will enter a stage of post demographic or second demographic transition, should this post-demographic transition or second demographic transition phase posses the same characteristics as the "European second demographic transition"?

Although Asian countries are not yet in the stage of the second demographic transition, evidence from some urban areas signifies the initiation of this second demographic transition in Asia. Superficially, the second demographic transition is still far away from the lives of most Asian people. However, one can hardly imagine how fast it would be for the people to be affected by the second transition. It would boldly assume that the second demographic transition would become a common phenomenon in Asia in the next decades. Although for the purpose of the continuity of family planning policy the government still stresses the importance of sustaining the low fertility level, some governments are actually changing the regulations to loose the strict control over births since there are already many young people do not want to have children. But almost all the efforts of stimulating fertility by the governments of European countries could hardly exert the effect in the long run.

Finally, I assume the expansions of second demographic transition in Asia, it should be noted that this transition may not exactly follow the path of that in European countries. A comparative study in Japan and the Netherlands shows that while the overall changes of demographic events for the same direction are clearly confirmed, in Japan cohabitation and childbearing outside of marital union is not as common as in the Dutch society (Matsuo 2001). Diversity is commonly observed in different cultures. It is always important to take into account the cultural personalities while we would mainly focus on the convergence of human population changes.

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Most commonly used websites:

www.esa.un.org.unpp - United Nations Population Division, World Population Prospects: the 2004 Revision Population Database

www.demonetasia.org - DemoNetAsia is a collaborative network of population research institutes in Asia. This website reports of Network activities, and an extensive collection of quality links online resources in the field of population.

www.unescap.org - United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) is the biggest of the UN's five regional commissions in terms of population served and area covered.

www.unfpa.org - UNFPA, the United Nations Population Fund-the population “outreach“ arm of the UN. They publish an informatuve annual report that is avialable at this site and rexebt volumes have all focused on inssues reproductuve rights and gender equity and their relationship (implied or explicit) to the fertility transition.

www.prb.org - The Population Reference Bureau informs people around the world about population, health, and the environment, and empowers them to use that information to advance the well-being of current and future generations.