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Health Expenditures and Ageing in Selected Asian Countries

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Introduction

Over the past few decades, population aging has been emerging as a major demographic worldwide trend (Kinsella and Wan, 2009). However, the process of population aging has been far more advanced in industrialized countries than in developing countries. In recent years, the majority of the developed countries have been facing serious difficulties in financing the mushrooming healthcare costs and formidable tasks in reforming their healthcare programs to cope with the coming demographic storm. As we move through the first decade of the 21st century, there has been an increasingly grave concern that these developed countries will not be able to afford the future healthcare costs of aging societies. In Asia, Japan serves a case in point.

Although the current level of population aging in Asia is considerably lower than in developed regions in the West, due to its sheer size, Asia's share of those aged 65 and over in the world population exceeded 50 percent in 2000, and is projected to grow to 61 percent by 2050. Because of the large population size of the elderly in Asia, coupled with serious poverty problems, the provision of healthcare on a nationwide basis has been a burdensome policy issue for many Asian governments. Despite these difficulties, a number of Asian countries have been administering their public healthcare programs for a considerably long period of time (Heller, 2003). These countries include Singapore, the Republic of Korea, Malaysia, Indonesia, China, Thailand, the Philippines, etc. It should be noted, however, that the adequacy and accessibility of their healthcare programs differs markedly from country to country, and within each country. In addition, the magnitude and speed of their population aging vary substantially among them, as will be described in a later section. Hence, the financial impact of population aging on the healthcare program is likely to vary significantly with countries in the years to come.

As widely discussed in the literature (e.g., Bloom, Canning, and Jamison, 2004; Ogawa and Matsukura, 2007; Bloom and Canning, 2008; Lee and Mason, 2009), better health boosts the rate of economic growth through various channels. For instance, healthy workers are more productive than their counterparts who are not, and the availability of a healthy labor force attracts foreign direct investment, which in turn, contributes to greater economic growth performance. Moreover, healthier life leads to rising longevity, which in turn, encourages prime-age workers to save more for longer retirement life. Obviously, higher savings and the accumulation of greater capital stock facilitate faster economic growth. Furthermore, healthier children have higher rates of school attendance and better cognitive development, and a longer life span, which is brought about by the provision of healthcare programs, makes investment in education more worthwhile. Besides these conventional channels linking healthcare and

economic growth, attention should be drawn to the growth of “full income” induced by healthier lives (Viscusi and Aldy, 2003). If we choose to follow this newly-proposed concept, using full income in benefits-cost analyses of investments in health and in health-related sectors (e.g., education, water supply, sanitation, etc) would dramatically increase the rates of return.

In accordance with the view that attaches great importance to the nexus between health and economic growth performance, we will attempt to examine to what extent age structural transformations have been affecting healthcare costs in selected Asian countries, and will discuss the future prospects of financing their healthcare programs. To achieve these objectives, this paper will heavily draw upon a newly-developed analytical framework called the “National Transfer Accounts (NTA).” The NTA provides a comprehensive framework for estimating consumption, production, and resource reallocations by age. By taking advantage of a significant amount of analytical information to be generated by the NTA system, this paper sheds light on the age profile of the health expenditure in selected countries in Asia. Moreover, unlike previous empirical work in this field, this paper deals separately with public and private medical costs.

The present paper is structured as follows. The first section presents a brief review of Asia’s changing demographic landscape with emphasis on age structural shifts as well as the timing of the first demographic dividend, among selected Asian countries. The second section points out the changing pattern of health costs in these countries, and gives a cursory sketch of key healthcare policies and programs in developing Asia. The third section offers an estimated age profile of both private and public health care resources in recent years in selected Asian countries, while the fourth brings a concise description of Japan’s experience in providing healthcare, formally and informally, to its aging population. The fifth and last section contains a summary of the paper and a conclusion regarding a few policy implications.

Rapid Age Structural Transformations and the First Demographic Dividend in Asia

(a) Changing Age Structures

In 2005, Asia’s total population exceeded 3.9 billion people, which is more than double the size observed in 1965 (United Nations, 2009). The annual growth rate of the population in Asia, however, has been declining continuously during the past four decades; as opposed to its peak value of 2.39 percent during 1965-1970, the current annual growth rate is estimated at 1.14 percent. With the emergence of slower population growth in the latter half of the 20th century, Asia’s demographic outlook of today is substantially different from that only a few decades ago.

Such substantially slower population growth in Asia has been caused chiefly by a significant decline in fertility over the past few decades. In 1965-1970, there was only one country (Japan) with below-replacement fertility (a total fertility rate of less than 2.1 children per woman). By 2000-2005, the number increased to 15 countries/areas (China, Hong Kong, Macao, the Democratic People's Republic of Korea, Japan, Mongolia, the Republic of Korea, Kazakhstan, Singapore, Thailand, Armenia, Azerbaijan, Cyprus, Georgia, and Lebanon). Moreover, in terms of the population share, as shown in [Figure 1](#), only 4.9 percent of Asia's population lived in countries with below-replacement fertility in 1965-1970, as compared to 42.2 percent in 1990-1995, when China's fertility rate fell below the replacement level. It is projected that half of Asia's population will be residing in societies with below-replacement fertility by 2012, and that more than 80 percent of the Asian population will live in countries with a fertility rate below the replacement level in the late 2020s, when India is projected to attain the below-replacement level of fertility (United Nations, 2009). At present, five Asian countries/areas with below-replacement fertility (Hong Kong, Macao, Japan, the Republic of Korea, and Singapore) are classified in the category of lowest-low fertility (i.e. those with a TFR below 1.3). In fact, East Asia's fertility is now lowest in the entire world (McDonald, 2008; Gubhaju, 2008).

Parallel to the rapid decline in fertility, marked mortality improvements have been achieved in the Asian region. Particularly, the Japanese post-war experience is a salient example. When Japan joined the OECD in 1964, it still had the lowest life expectancy at birth among the member countries, but managed to achieve the highest life expectancy among the OECD member countries by the early 1980s. At present, 30 countries in Asia have life expectancies for both sexes combined higher than 70 years, and more than half (54 percent) of Asia's population had already succeeded in meeting the ICPD Action goal of reaching a higher-than-seventy-years life expectancy at birth for both sexes by the period of 2000-2005. In case of East Asia, three countries/areas (Hong Kong, Macao, and Japan) have already surpassed the 80-year level.

As a result of these rapid fertility and mortality transformations in the second half of the 20th century, we have witnessed phenomenal changes in Asia's demographic landscape in terms of population age distributions, with a relative increase in the numbers of the elderly and a relative decrease in the numbers of the young. As illustrated in [Figure 2](#), Asia's total dependency ratio, which is defined as $\{[(0-14) + (65 \text{ and over})] / (15-64)\}$, reached its peak value (0.804) in 1965, after which its projected long-term trend shows a U-shaped pattern, reaching its trough value (0.477) in 2016. This implies that in Asia as a whole, the share of the working age

population has been increasing since 1965 to date, and is quickly approaching the end of its growth in 2016. For Asia, these 50 years during which the share of the working age population continuously rises correspond to the period in which age structural transformations lead to a very direct and favorable impact on growth in per capita income called the first demographic dividend (Ogawa, Chawla, and Matsukura, 2009).

The demographic transition is a singular time period during which fertility and mortality decline from high to low levels in a particular country. In the case of Asia, the broad outlines of the demographic transition are fairly similar for almost every country in the region, although the speed and the timing of the transition vary across countries. The age composition of all the Asian countries has been changing swiftly since the mid-20th century (Ogawa, 2003). As shown in [Table 1](#), from 1975 to 2000, the total dependency ratio declined substantially in all the four sub-regions and 16 countries listed. The extent to which the total dependency ratio of a country decreased over this period is closely related to the magnitude of its fertility decline, as reflected in the inter-temporal change in the young dependency ratio, defined as $[(0-14) / (15-64)]$. Among the 16 countries in [Table 1](#), Thailand had the largest reduction by 0.399 from 0.859 to 0.460, followed by Islamic Republic of Iran (0.345), the Republic of Korea (0.321), China (0.300), Indonesia (0.276), and Mongolia (0.257). The fact that all of these Asian countries have shown substantial economic progress over the past decade or two, seems to suggest that such the steep declines in the total dependency ratio have facilitated their rapid economic growth.

The 2008 United Nations population projections, as shown in [Table 1](#), indicate that the countries with high total dependency ratios will face a considerable reduction of the burden placed upon the working-age population in the first quarter of the 21st century and beyond. In these countries, the declining total dependency ratios are likely to facilitate their developmental process. In contrast, the countries with low total dependency ratios are expected to undergo a substantial increase of burden, mainly due to a rapid rise in the proportion of the elderly, as represented by the aged dependency ratio expressed as $[(65+) / (15-64)]$. Changes in this ratio are most pronounced in the countries where the onset of fertility reduction occurred early. Clearly, Japan had the largest gain (+0.137) from 0.116 in 1975 to 0.253 in 2000. Armenia, which belongs to the region of West Asia, showed the second largest gain (+0.059) from 0.097 to 0.156 over the same time period, followed by the Republic of Korea (+0.043).

In terms of the aged dependency ratio, Japan had the highest value among the Asian countries listed in [Table 1](#) in 1975, and is expected to maintain it throughout the entire projected period.

A careful comparison of the index of ageing, however, yields a picture substantially different from the one based upon the aged dependency ratios. Because the effect of fertility decline is immediately reflected in the index of ageing, a marked increase in the value of this index is observed among several developing countries under review, as presented in [Table 1](#). Obviously, the countries which have shown a large increase in the aged dependency ratio have experienced a marked rise in the index of ageing. These countries include Japan, Armenia, the Republic of Korea, and Singapore. Among these four countries, Japan had the most aged population in 2000. Beside these countries, China, Thailand, Sri Lanka, and Kazakhstan experienced a considerable increase in the index of ageing during 1975-2000, as can be seen by inspecting [Table 1](#).

By 2000, Japan's index of ageing had already exceeded the 100-level. Over the period 2000-2025, Japan is expected to remain the oldest society not only in Asia but also in the entire world. By 2050, however, the value of the index of ageing for Macao is projected to surpass that for Japan by a narrow margin. In Asia, Japan will be closely followed by the Republic of Korea and Singapore in terms of population aging.

(b) Computation of the First Demographic Dividend in Developing Asia

One of the important linkages between demographic transformations and economic growth is the role of demographic dividends in the process of economic development (Mason, 2001, 2007; Mason and Lee, 2006). As a country develops along the stages of demographic transition, it undergoes considerable age structural shifts. When the country's fertility begins to fall, the first demographic dividend arises because changes in population age structure have led to an increase in the working ages relative to non-working ages. In other words, the first demographic dividend arises because of an increase in the share of the population at ages during which production exceeds consumption. That is, the first demographic dividend is positive when the rate of growth in output per effective consumer exceeds the rate of growth in output per effective producer (Mason, 2007).

With a view to identifying the timing and duration of the first demographic dividend for 13 selected countries in developing Asia, we have calculated the change in the support ratio over the period 1950-2050, by applying the computed age-specific results displayed in [Figure 3](#) as statistical weights. It should be borne in mind that the data for this graphical exposition has been obtained by combining the age-specific results for India (2004), Indonesia (2002), the Philippines (1999), and Thailand (2004). It is also worth remarking that we have applied the same age-specific profiles of consumption and production plotted in [Figure 3](#) to all the countries

for each year, assuming that these profiles remain unchanged throughout the entire 100-year period under review. This implies that the computational results reflect solely the effect of age structural change on the support ratio. In addition, we have used the 2008 United Nations population projection as a demographic data for computation.

The computational results are listed in **Table 2**. Among these 13 countries, there are marked differences in terms of both the timing and the duration of the first demographic dividend. A few points of interest emerge from the results reported in this table. First, Singapore and the Republic of Korea were the earliest to enter the phase of the first demographic dividend. Both began to capture the first demographic dividend in the second half of the 1960s, but Singapore's first demographic dividend period expired in 2004, while the Republic of Korea is projected to shift from the stage of the first demographic dividend to that of population aging in 2013. Second, among these 13 countries, Mongolia is expected to have the shortest duration of the first demographic dividend, i.e., 35 years from 1990 to 2025, followed by Singapore's 37 years. Thirdly, India, Malaysia, and the Philippines are projected to have an extremely long period of the first demographic dividend, i.e., more than 70 years.

Virtually all of the Asian countries listed in Table 2 are now generating an important first demographic dividend. Because the duration of the first demographic dividend is relatively short, these Asian countries should urgently make healthcare services widely available to the various segments of the population and should improve the quality of medical care.

Diversities of Healthcare Programs and Rising Health Costs in Asia

In this section, we briefly review the healthcare programs in selected Asian countries, and examine the recent change in health expenditure in Asia.

(a) Diverse Approaches to Healthcare Services

A review of health programs and planning in the world perspective documents reveals pronounced differences in approaches. In the United States, for example, the role of market forces is stressed in the development and allocation of health resources. In contrast, in Cuba, for example, the socialist welfare relies on centralized health planning by the state. Most countries, both developed and developing, lie between these two extremes; the extent to which these considerations are reflected in their health program of each of these countries is heavily dependent not only upon its economic and demographic development but also on cultural, historical and ideological factors.

Diverse approaches to the provision of healthcare services can be easily observed in Asia's healthcare systems, too. Some countries such as Malaysia and Indonesia are heavily dependent upon budget-financed system, which offer universal access to healthcare. However, the quality of services available differs considerably according to a household's income and geographical location (Heller, 2007; WHO 2004). It should be also noted that in rural China, out-of-pocket payments present a stumbling block to effective access to quality healthcare, despite the fact that medical facilities for care are available. In some countries, the private sector is a major healthcare provider. India and Thailand can be classified into this category. In the case of India, this reflects the inadequacies of the public health care system, while in the case of Thailand, this is due to an intrinsic factor in the design of the medical care system, in the case of Thailand (Heller, 2007).

In Asia, Japan was the first country that established a universal healthcare program in 1961. In recent years, both the Republic of Korea and Thailand have adopted a broad social health insurance system, and offer relatively universal coverage (Jowett, 2005; Kim, 2005). In the case of the former, a nearly universal system was implemented in 1989 (Song, 2009), and in the case of the latter while it was in 2001 (Chandoevmit, 2005). Besides these three countries, the Philippines has adopted a social insurance system but its coverage is far from universal. Caution should be exercised, however, in interpreting the universality of coverage. It does not necessarily imply full access to all possible medical services or low co-payments. In the Republic of Korea, for instance, effective co-payments are quite high and the range of medical services covered is limited. In Japan, the amount of co-payments was raised from 10 percent in 1984 to 30 percent in 2003. It is worth noting that the Republic of Korea established a scheme for long-term care insurance in 2008, by drawing upon the Japanese long-term care insurance scheme implemented in 2000 as a model.

In Singapore, the private financing of medical care, either directly by the household on an out-of-pocket basis or from an employer-financed insurance, although a part of each person's account in the Central Provident Fund has been used for the Medisave program since 1984.

In the case of China, universal medical care was provided by the government before the market reforms of the 1980s, although the quality of medical services varied considerably between rural and urban areas and depended upon the type of economic organization providing medical care (Heller 2003). As a result of the introduction of the market economy, the breakdown of the rural communes, the growing importance of private enterprises, and the

weakened state of state-owned enterprises, this universal scheme came to an end. At present, the cost, availability and the system of financing of medical care now differs dramatically, both between and within the urban and rural sectors. Medical spending has increased rapidly in China over the last two decades, mainly due to the uncontrolled acquisition of advanced medical technologies and an increase in the household income (Heller 2007).

Since we will analyze data from the Taiwan Province of China in the next section, it is worth noting that the Taiwan Province of China established the universal national health insurance scheme in 1995 (Wen et al., 2008). It should be noted that since the inception of the scheme, the coverage expanded continuously from 57 percent to 98 percent.

(b) Rising Healthcare Costs in Asia

Because of such diversity in healthcare delivery systems in Asia, both levels and trends of healthcare costs in the region vary to a pronounced extent. We have gathered data for 2005 from 19 countries, 12 of which are currently enjoying the first demographic dividend, as presented earlier in Table 2. Among these 19 selected countries, Japan had the highest percentage (8.2 percent) of total health expenditure as a share of GDP, followed by Iran (7.8 percent). In contrast, Pakistan and Indonesia had the lowest percentage (2.1 percent). Disparities in health spending relative to GDP are extremely large in contemporary Asia.

Data reported in [Figure 4](#) show the inter-temporal change in the total health expenditure as a share of GDP during the period 2000-2005. In this graphical exposition, data for the year 2000 were plotted on the horizontal axis and for the year 2005 on the vertical axis. As can be easily seen, the majority of the Asian countries (14 out of 19 countries) are above the 45-degree line, indicating an increase over the recent five-year period. Iran, which recorded the largest percentage-point, grew by 1.9 percentage-points over this time period. On the other hand, Mongolia, which experienced the largest percentage-point decline, fell by 1.3 percentage points. These results indicate that most of the countries in Asia have been devoting more resources to health.

Because total health expenditure consists of public and private components, we have gathered data on the share of public health expenditure in total healthcare expenditure and the purchasing power parity dollars (\$PPP) from the 19 countries. The correlation between these two variables is positive, as shown in [Figure 5A](#), and the simple correlation is 0.59. However, with the exclusion of the two outliers (Singapore and Mongolia) from calculation, the goodness of fit improves substantially, as presented in [Figure 5B](#).

We have also plotted data on the percentage of public health expenditure as a share of GDP for these 19 countries for these two selected years in [Figure 6](#). Similarly, we have prepared a graph on private health expenditure as a share of GDP, as depicted in [Figure 7](#). A brief comparison of these two graphs reveals that there are several countries in which public and private health expenditures changed in opposite directions. For illustrative purposes, we have prepared [Figure 8](#) which shows the change in the proportion of government and private health expenditures in total health expenditure for the 19 Asian countries during the period analyzed. In as many as 11 countries, the amount of increase in private health expenditure exceeded that in government health expenditure. Among the 11 countries are Cambodia, Laos, Myanmar, and Bangladesh. These four countries are classified in the category of the Least Developed Country, as defined by the United Nations, which implies that poverty is an extremely serious social and economic issue in them. It should be noted, however, that because all these countries will be benefitting from the first demographic dividend for the next few decades, each country should seize such opportunities for strengthening vital human resources such as health.

Moreover, as might be expected, total expenditure on health (both public and private combined) is greater in wealthier countries, even after adjusting for the cost of living by using the purchasing power parity dollars (\$PPP). As presented in [Figure 9](#), all the 19 countries recorded a considerable amount of growth in per capita total health expenditure in real and absolute terms during the recent five-year period analyzed, ranging from 562 international dollars in the Republic of Korea to 5 international dollars in Pakistan.

In light of the fact that these inter-temporal changes in the resources allocated to healthcare services are expected to boost the population health status in each of the 19 Asian countries during the period of 2000-2005, we have computed the association between life expectancy at birth and per capita total expenditure on health for them. The calculated result shows that the simple correlation between these two variables is reasonably high ($r = 0.79$), as displayed in [Figure 10A](#). In contrast, the association between life expectancy at birth and the proportion of total health expenditure as a share of GDP was rather low ($r = 0.26$) for the same samples, as plotted in [Figure 10B](#). It seems that this statistical result could be partly accounted for by the following Japanese example.

Although Japan's total healthcare expenditure as a share of GDP is relatively high among the Asian countries, it is considerably low by standards of industrialized nations. In 2005, for example, this figure was 8.2 percent in Japan, well below other industrialized nations such as

the United States (15.2 percent), Switzerland (11.4 percent), France (11.2 percent), Germany (10.7 percent), Austria (10.2 percent), and Italy (8.9 percent). It should be stressed, however, that despite Japan's relatively low health expenditure, its life expectancy at birth has been the highest in the world since the early 1980s. To account for this seemingly paradoxical observation, we need to bear in mind the following few unique aspects of the Japanese healthcare system.

First, as a result of the policy emphasis on egalitarianism, quality tends to be sacrificed as Japanese physicians try to increase their caseloads to maintain their income. This emphasis can be seen as a side-effect of the spending control mechanism that operates through price fixing by the government. Second, dissatisfactions with the system that are often voiced by patients include a long waiting time, short consultation time, insufficient explanation by doctors and lack of medical information for the patient. Although evidence is rather limited, it is generally believed that the percentage of patients who are satisfied with their health care system is lower in Japan than in North America or Western Europe (McKinsey Global Institute, 2000). Thus, it seems to be safe to assert that in Japan, the universal healthcare coverage substantially contributes to its high life expectancy while the low service quality accounts for its relatively low health expenditure.

Age Profiles of Private and Public Health Expenditures in Selected Asian Countries

With a view to obtaining some new insights into the relationship between population aging and healthcare costs in Asia, we estimate Asia's typical age profile of health expenditure by combining the age profiles of four countries. These four countries are Thailand (2004), the Republic of Korea (2000), the Philippines (1999), and Indonesia (2004). Detailed information pertaining to the data sources and computational assumptions is available on the NTA home page (<http://www.ntaaccounts.org>).

Figure 11 show the age-specific profiles of per capita public and private health expenditure, standardized by mean labor income aged 30-49, for Asia's representative case. A brief glance at this graph reveals that the age profiles of per capita total health spending in the representative Asian case are similar in broad respects to those found in most countries in the world, both developed and developing. Young children, particularly those 0-14 years old, are much more costly than older children. Between the ages of 10 and 40, health spending is relatively steady and low. The amount of spending increases with age after age 40, rising to ever higher levels. Individuals at age 75, for example, consume 3.4 times as much health care on average as

individuals at 25.

It is also worth remarking that here, unlike the case of most of the developed countries, per capita private healthcare consumption represents more than half of the per capita total healthcare spending at all ages. Per capita private healthcare consumption as a percentage of total healthcare consumption varies with ages between 54 and 70 percent, according to our calculations. Moreover, per capita private consumption of healthcare begins to rise from about age 40 and continues growing up to age 90+. A similar growth pattern can be observed with regard to per capita public consumption of healthcare.

In order to observe inter-country differentials in the age profiles of per capita health spending in Asia, we have selected, due to availability of data at the time of writing this paper, the following three economies at different stages of development: Japan, the Taiwan Province of China, and Thailand. **Figure 12** displays the age-specific profile of per capita public and private health expenditure for Japan in 2004, standardized by mean labor income aged 30-49. The plotted results for the Taiwan Province of China (2005) and Thailand (2004) are presented in **Figure 14** and **Figure 16**, respectively. By inspecting these three graphs, one can easily note that although these economies have substantially different amount of per capita total health expenditure, the age-specific profiles are basically comparable to each other to a considerable extent. It should be observed, however, that the level of per capita health spending at ages 0-19 is flat in the case of Thailand, as distinct from the Taiwan Province of China and Japan.

More importantly, among these three economies, the composition of per capita total health expenditure is distinctively different. At all ages, Japan's relative share of per capita public health spending is the highest, followed by the Taiwan Province of China. In the case of Thailand, at all ages, per capita private health expenditure is far greater than per capita public expenditure. In addition, a quick comparison of **Figures 12-13** for Japan, **Figures 14 -15** for the Taiwan Province of China, and **Figures 16-17** for Thailand clearly reveals that these differences in the composition of per capita health spending among the three economies remained unchanged over the recent 15-year period under study.

It is also important to note that in the case of Japan, per capita public health expenditure grew dramatically between 1989 and 2004. This is mainly due to the implementation of the Long-term Care Insurance Scheme in 2000. The beneficiaries of this scheme are frail elderly persons aged 65 and over. In addition to this scheme, to cope with various problems arising from its population aging, Japan formulated and implemented a series of policies and programs

for the elderly, as listed in [Table 3](#).

In the case of the Taiwan Province of China, per capita public health expenditure shifted upward to a considerable degree at all ages. This seems to be largely attributable to the establishment of the universal national health insurance scheme in 1995, as briefly mentioned earlier. Moreover, although Thailand implemented the 30-baht scheme in 2001, per capita public health expenditure did not increase to any significant extent.

Next, on the basis of the age profiles of per capita health expenditure for Japan and the Taiwan Province of China, we have blown up to the aggregate level for these two economies by employing the population size at each age, and health expenditure data from the National Income and Product Accounts (NIPA), in order to insure consistency with NIPA. The computed results for Japan between 1989 and 2004 and for the Taiwan Province of China over the period 1990-2005 are summarized in [Table 4](#). In both Japan and the Taiwan Province of China, the share of the elderly aged 65 and over increased significantly for both public and private sectors during the 15-year period analyzed. In the Taiwan Province of China, the relative share of private and public components reversed completely during the 15-year period. In 1990, the share of public health expenditure was 40 percent, but it rose to 61 percent in 2005. In Japan, the relative share of public health spending increased from 69 to 73 percent over the period 1989-2004. As analyzed elsewhere (Mitchell, Piggot, and Shimizutani, 2008), this is mainly due to the establishment of the Long-term Care Insurance Scheme in 2000.

For the case of Japan, in order to have some insights into the magnitude of future demographic changes on aggregate health spending, we have projected Japan's total health consumption up to 2050 and computed its age profile, using NUPRI's stochastic forecasting model (Ogawa et al., 2003). The calculated results, which cover the 80-percent confidence interval, are presented in [Figures 18 and 19](#). These stochastic modeling exercises suggest that depending upon Japan's future fertility and mortality trends, the age profile of total health consumption varies considerably over time, and its impact on total health consumption is extremely large, ranging from 83 to 128 trillion yen (expressed in terms of 2000 constant prices) in 2050.

The Changing Role of Families in Providing In-home Care for the Elderly in Japan

Unlike the other developed countries in the West, extended living arrangements are still fairly common in Japan (Ogawa and Ermisch, 1996; Ogawa, Retherford, and Matsukura, 2006).

According to the 2005 round of the International Survey of Lifestyles and Attitudes of the Elderly (Cabinet Office, various years), the proportion of the elderly at ages 65 and over living in three-generation households has been on a downward trend over the last two decades. Due to rapid demographic shifts as well as changing lifestyles, the figure for Japan has been steadily declining over time, as indicated in [Figure 20](#); in 1981 it was 42 percent, twice as high as the level for 2005. Similarly, the data gathered by the Ministry of Health, Labour, and Welfare (various years) shows, as plotted in [Figure 21](#), that the proportion of those aged 65 and over coresiding with their adult children declined from 69 percent in 1980 to 44 percent in 2007.

In addition to Japan, other Asian countries have been on a downward trend. As displayed in [Figure 20](#), in the case of the Republic of Korea, the speed of decline was even faster than that of Japan. Over the period 1990-2005, the proportion for the Republic of Korea fell from 44 percent to 21 percent. Despite such declining trends, the proportion of the elderly living in the three-generational households is still much higher in Asia than in the West. For example, in 2005, the proportion of the elderly aged 65 and over living in the three-generational households was only 3 percent in the United States, and 1 percent in Germany and France.

In recent years, Asia's marriage market has been changing dramatically (Jones and Gubhaju, 2009). The pattern of "late marriage and less marriage" has been one of the major reasons for the fertility decline in Japan. The number of single men at age 50 and over has been growing at a phenomenal rate over the past three decades in Japan, particularly in remote rural areas. Who will be their caregivers when these single men become bed-ridden or senile-demented in a couple of decades? The universal marriage pattern has been disappearing quickly in various Asian countries (Retherford, Ogawa, and Matsukura, 2001).

Furthermore, abrupt value shifts occurring in the late 1980s among the Japanese women of reproductive age below 50 with regard to taking care of their aged parents were documented by the time-series data of the *National Survey on Family Planning* undertaken by the Mainichi Newspapers (Hodge and Ogawa, 1991). Since 1963, in each round of this nation-wide survey, the following question has been included: "What is your opinion about children caring for their elderly parents?" The precoded response categories are as follows: (i) "good custom," (ii) "natural duty as children," (iii) "unavoidable due to inadequacy of public support resources," and (iv) "not a good custom." The proportion of those who chose one of the first two response categories ("good custom" and "natural duty as children") was stable over the period 1963-1986, as depicted in [Figure 22](#). However, a sudden decline occurred in this proportion occurred from 1986 to 1988 when the Japanese government began to shift the costs of caring for the elderly

back to families. In the subsequent years, the corresponding proportion remained, by and large, on a downward trend. It should be noted, however, that the proportion of currently married women at reproductive age who agree to this traditional value has been rising in the recent past, as can be seen from [Figure 22](#). The proportion conforming to the Confucian value increased from 46 percent in 2004 to 52 percent in 2007.

Aside from the above time-series data from the *National Survey on Family Planning*, time-series data gathered by the government also indicate that the long-term trend in traditional family values has been reversed in recent years. For instance, the proportion of those aged 20 and over who reacted positively to the question: “The world outside the home is for the husband, the world inside it is for the wife. What do you think of this view?” declined from 85 percent in 1972 to 51 percent in 2007 for men and from 84 percent in 1972 to 40 percent in 2007 for women. It should be noted, however, that the young respondents, both men and women, have begun to show a different time trend in the recent years. In the case of men in their 20s, the proportion agreeing to the view declined from 78 percent in 1972 to 41 percent in 2004, but it increased to 43 percent in 2007. Similarly, as depicted in [Figure 23](#), the proportion in support of this view among women aged 20-29 dropped from 79 percent in 1972 to 33 percent in 2002, but it rose to 35 percent in 2004 and 40 percent in 2007. Although a careful multivariate analysis is called for to gain some insights into these newly-emerging trends, it seems to be safe to tentatively hypothesize that these reversed trends have been closely related to the rapidly changing labor market which puts young workers and middle-aged women of reproductive age at disadvantage (Clark, Ogawa, Kondo, and Matsukura, 2009).

These rapid changes in living arrangements for the elderly, coupled with normative shifts, are already well under way in Japan, as well as a few other Asian countries. It is conceivable that many developing Asian countries will encounter these sudden transformations in the years to come.

Concluding Remarks

In the first half of this paper, we discussed changing age structures and healthcare spending in recent Asia. In the latter half, we examined, by heavily drawing upon data generated from the NTA project, to what extent age structural transformations have been affecting public and private healthcare costs in Thailand, the Taiwan Province of China, and Japan. In addition, in order to shed light on Asia’s future direction in population aging and the impact of aging on healthcare spending, we have analyzed Japan’s future prospect of financing the healthcare

program, using the stochastic modeling approach.

As has been clearly revealed by the United Nations population projection prepared in 2008, many Asian countries, both developed and developing, will be aging at a fast pace in the next few decades. We have also found that among these Asian countries, there is a strong positive association between the level of economic growth and the share of public health expenditure. Thus, as Asia's population aging process advances in the years ahead, it is very likely that the share of government health spending in total health expenditure will increase over time.

Caution should be exercised, however, in interpreting this future scenario for developing Asia. As often pointed out in the literature (for example see Heller, 2007), it is expected that, when they attain the level of population aging currently observed among industrialized nations, most of the developing countries in Asia will have a per capita income level that is substantially lower than the current income level of their industrialized counterparts. Thus, there is certain possibility that the share of government health spending may not keep on increasing in Asia's developing countries in the future, as clearly distinct from the trends previously observed in industrialized nations. In addition, depending upon how they utilize their first demographic dividend, the future healthcare systems in Asian developing countries and their spending pattern will be considerably affected. Many of these countries are currently making strenuous efforts to achieve health-related targets set in the Millennium Development Goals, and for them, the role of the first demographic dividend in improving their healthcare system is extremely important. Moreover, besides massive demographic changes, health spending in Asia's developing countries may be severely affected by such factors as the pattern of living arrangements for the elderly and filial normative shifts.

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