

ADULT MORTALITY PATTERNS IN SOUTHEAST ASIA

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ABSTRACT

This paper looks at the mortality consequences of the demographic and epidemiological transitions in Southeast Asia, with particular emphasis on patterns of adult mortality. Countries and territories covered include People's Republic of China, Hongkong, Indonesia, Japan, Republic of Korea, Peninsular Malaysia, the Philippines, Singapore, and Thailand. Findings support only in part the argument that the demographic transitions in Southeast Asia are proceeding at a much faster pace and that they have in fact already exceeded those in Europe and the United States. Countries and territories such as Japan, Hongkong, and Singapore seem to have virtually completed their transition stages, while the Philippines, Korea, Indonesia and Thailand are moving quickly in that direction.

The transitions from high to low death and birth rates and from infectious and parasitic to chronic and degenerative causes of death, observed in the history of now-developed nations, have been wending their way in most areas of Southeast Asia during the past several decades. These latter transitions have not been identical from place to place nor have they mirrored the course followed by developed nations in other parts of the world, but they have indeed been proceeding.

This paper looks at the mortality consequences of demographic and epidemiological transitions in Southeast Asia, with particular emphasis on patterns of adult mortality and the extent of conformity to patterns found for similar transition stages in more developed nations. The analysis makes use of data compiled by the United Nations, the U.S. Bureau of the Census, national statistical offices and other public and private organizations. Sources are specified in footnotes to each of the statistical tables.

The discussion is organized into three sections. Section I explores briefly the nature of the transitions in nine Southeast Asian countries and examines the impact of these transitions on each country's adult age composition. Section II analyzes available recent data on adult mortality patterns for each country, and compares these patterns with those of selected developed countries. Section III focuses attention on urban-rural and sex differentials in mortality and changing medical causes of death for adults in a few of the countries. The nine areas covered include the People's Republic of

China, Hong Kong, Indonesia, Japan, Republic of Korea, Peninsular Malaysia, the Philippines, Singapore, and Thailand. The three countries for further analysis are the Philippines, Thailand, and Japan.

DEMOGRAPHIC TRANSITIONS AND AGING

The demographic transition has been evolving with unanticipated swiftness in Southeast Asia. Leete (1987) has suggested that it has not only been much faster than in Europe but that the transition in these countries has, in fact, overtaken European countries in which the transition occurred much earlier. We will return to that argument at a later point in the paper.

Let us first look at some data that indicate the pace of demographic transitions. Tables 1 to 3 summarize some of the indicators of the overall mortality and fertility transitions for the nine Southeast Asian areas and compare them with past transitions in Sweden and the United States.

In the early 1950s, Japan had an infant mortality rate (IMR) that was roughly twice that of Sweden and the U.S. but much less than that of its Asian neighbors (Table 1). All of the countries have reduced their infant mortality rates from then until now. Japan has matched that of Sweden (6 infant deaths per 1000 births), and Hong Kong and Singapore have roughly equaled that of the United States (10 per 1000). Meanwhile, China's gains

have been most dramatic, its rate in the late 1980s being one-sixth of what it was in the early 1950s. During the same period, Malaysia, Korea, and Thailand have reduced their rates by more than two-thirds; and the Philippines and Indonesia have cut theirs in half. Projections show that, as we approach the next century, only Indonesia and the Philippines will have rates exceeding 28 infant deaths per 1,000 births. In other words, by 1995-2000, most of Southeast Asia will have attained the general level of the U.S. in the early 1950s.

The rapid improvement in infant mortality levels in the range of Southeast nations is notable. In the cases of Sweden and the U.S., you would have to trace back to before the turn of the century to find an IMR in excess of 100. In Japan's case, you would have to go back to 1939 to find an IMR above 100 and back to 1921 to find one comparable to Indonesia's in the early 1950s. One can conclude, therefore, that the Southeast Asian area as a whole has been undergoing its mortality transition (as reflected in the infant mortality rate decline) much more rapidly than did both Sweden and the U.S. at earlier stages.

A similar picture emerges when life expectancy at birth (e_0) is used as an indicator of the mortality transition (Table 2). Japan, Hong Kong, and Singapore were all approaching the e_0 levels of Sweden and the U.S. by the 1950s and had reached them generally by the late 1980s. China, Malaysia, and Korea had low levels of e_0 by the 1950s but were closing ground on the more developed countries as of the 1980s. The mortality reduction pace for Thailand and the Philippines was not as rapid but their life expectancy figures had attained moderately high levels by the 1980s. Only Indonesia lagged in e_0 progress and even it had risen from 37.5 to 56.0 years over the past thirty-five years. Since life expectancies at birth for Sweden and the U.S. were about 55.2 and 47.0 years, respectively, at the beginning of the century, we can conclude that Southeast Asian countries have raised their e_0 levels in considerably less time than did Sweden and the United States.

With respect to fertility (Table 3), the experience of the past thirty-five years has been even more dramatic for these Asian nations than has their mortality situation. In the 1950s, seven of the Asian areas

Table 1. --Infant Mortality Rates for Selected Countries: 1950-55 and Estimated for 1985-90 and 1995-2000

(Medium variant for 1985-90 and 1995-2000)

Country	Period		
	1950-55	1985-90	1995-2000
Sweden	20	6	6
United States	28	10	7
Japan	51	6	6
Hong Kong	79	9	7
Singapore	66	9	7
China	195	32	23
Malaysia	99	26	19
Rep. of Korea	115	24	17
Thailand	132	39	27
Indonesia	160	74	55
Philippines	100	45	35

Source: United Nations. 1986. *World Population Prospects: Estimates and Projections as Assessed in 1987* New York: United Nations, Table A-16.

had total fertility rates (TFRs) in excess of 5 children per mother. Hong Kong's TFR was then about the same as that of the U.S. (3-4) while Japan's was nearing that of Sweden (2-3). At present, all of the countries within the region have TFRs below 4, and within ten years they are expected to drop below 3. The fertility levels of Japan, Hong Kong, Singapore, and China are now at a point considered to be at the low end of the transition, and Korea is moving quickly in that direction.

The high fertility levels of most of the Asian countries in the 1950s (TFRs of 5-7) were surpassed by Sweden and the U.S. in the mid-19th century. Hence, the decline in fertility that had been

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Table 2.--Life Expectancy at Birth (years) in Selected Countries: 1950-55 and Estimated for 1985-90 and 1995-2000

(Medium variant for 1985-90 and 1995-2000)

Country	Period		
	1950-55	1985-90	1995-2000
Sweden	71.8	76.8	77.3
United States	69.0	75.0	76.3
Japan	63.9	77.2	77.7
Hong Kong	61.0	75.7	76.1
Singapore	60.4	72.8	74.5
China	40.8	69.4	71.9
Malaysia	48.5	66.6	71.3
Rep. of Korea	47.5	69.4	71.9
Thailand	47.0	64.2	66.8
Indonesia	37.5	56.0	61.0
Philippines	47.5	63.5	66.6

Source: United Nations. 1986. op. cit., Table A-15.

Table 3. --Total Fertility Rate in Selected Countries: 1950-55 and Estimated for 1985-90 and 1995-2000

(Medium variant for 1985-90 and 1995-2000)

Country	Period		
	1950-55	1985-90	1995-2000
Sweden	2.22	1.47	1.45
United States	3.45	1.91	2.09
Japan	2.77	1.83	1.92
Hong Kong	3.60	1.86	1.86
Singapore	6.32	1.65	1.75
China	6.21	2.11	1.91
Malaysia	6.80	3.30	2.47
Rep. of Korea	5.15	2.50	2.16
Thailand	6.62	2.73	2.54
Indonesia	5.49	3.48	2.66
Philippines	7.25	3.91	3.09

Source: United Nations. 1986. op. cit., Table A-12.

experienced by Sweden and the U.S. over a 100-year span was achieved by many of the Southeast Asian nations within thirty-five years or less and will probably have been achieved by even the slowest of them within 50 years.

Given the rapid pace of demographic change in Asia, is the relative increase in adult age segments of the population keeping up with that of Western nations? Sweden and the United States are among those countries that are associated with a high level of population aging. How much have Southeast Asian nations lagged in the aging process and is the gap now being closed?

Table 4 shows percentages of the national population at ages 45 and over for the different countries

in 1950 and 1985 and as projected to the year 2000. In 1950, Sweden and the U.S. had 33 and 29 percent, respectively, of their populations at ages 45 and over. Japan and China had close to 20 percent, and the remaining Southeast Asian countries ranged down to 13 percent. By 1985, Sweden had increased its percentage 45 and over to 39 percent and the U.S. to 31 percent. Remarkably, Japan's percentage had risen to 34 percent, past that of the U.S., while Hong Kong had doubled its percentage to 25. Singapore, China, Korea, and Indonesia showed modest gains but still did not exceed 20 percent of their populations at ages 45 and over. Finally, for Malaysia, Thailand, and the Philippines, the percentages in fact declined! It is clear that the variable timing of fertility decreases in these countries greatly influenced their patterns of population aging. By the

Table 4. --Percent of Population 45 Years and Older and 60 Years and Older, Selected Countries: 1950 and Estimated for 1985 and 2000

(Medium variant for 1985 and 2000)

Country	45 and older			60 and older		
	1950	1985	2000	1950	1985	2000
Sweden	33.4	39.0	44.2	14.9	22.8	22.5
United States	28.5	30.6	37.0	12.2	16.3	18.0
Japan	19.9	33.8	43.0	7.7	14.5	20.9
Hong Kong	13.0	25.3	31.2	3.7	11.2	13.6
Singapore	12.7	20.2	30.2	3.5	7.7	10.9
China	19.5	20.2	25.3	7.5	8.2	10.5
Malaysia	18.5	15.3	19.2	9.5	5.7	7.0
Rep. of Korea	15.7	18.6	23.8	5.5	6.0	9.2
Thailand	15.3	15.1	20.3	6.2	5.7	7.4
Indonesia	16.0	16.6	19.5	6.2	5.7	7.8
Philippines	15.4	14.4	17.9	6.9	5.3	6.1

Source: United Nations. 1985. *World Population Prospects: Estimates and Projections as Assessed in 1982*. New York: United Nations.

year 2000, increases in the population 45 and over will be observed for all of Southeast Asia; however, Japan will still have twice the percentage of older adults than will the Philippines, Malaysia, Indonesia, and Thailand.

If the population 60 and over is substituted for that 45 and over (Table 4), the percentages are smaller but the geographic and time patterns are very similar. The elderly aging process is a bit slower in the Southeast Asian nations but, by 2000, Japan is expected to match the percentage 60 and over found in the Western countries, while the other Asian areas are also projected to experience a rapid increase in their older populations.

Even so, the countries that are still proceeding through the demographic transition will have relatively small percentages at ages 60 and over by the year 2000. Estimates show that the Philippines, Indonesia, Thailand, Malaysia, and Korea will have less than 10 percent of their populations in that age category. At the same time, and as Martin (1987) has pointed out, the number of adults and elderly in the Asian countries are already significantly high and will continue to increase, thereby creating a demand for various programmatic responses.

ADULT MORTALITY PATTERNS

As greater percentages and numbers of persons have been reaching older ages in Southeast Asian nations, what levels of adult mortality have they been experiencing? Moreover, are these countries achieving the adult mortality levels of Western nations? In order to study these questions, we have compiled a set of life expectancy figures for ages 45, 55, 65, and 75, by sex, for the countries involved at various dates.

It is important to understand at this point the nature of the data being used and the kinds of interpretations one might make from them. All of the sources are life tables that have been generated by combining what has been reported to date about the mortality experience of each country along with mortality schedules. (In some cases, figures for about the same dates are shown for two different sources in order to examine their consistency.) As a consequence, life expectancies shown are best approximations of existing mortality conditions, but they may not reflect real mortality conditions that deviate greatly from model assumptions (Murray, 1987). Nevertheless, to the extent that each country being studied is going through a mortality transition in a fairly standard way, the life expectancies for the several countries and ages can be regarded as reasonable estimates of the underlying values.

Until a decade or two ago, empirical data for developed countries like Sweden showed that most of the gains in life expectancy at birth were due to reductions in infant and childhood mortality and that little improvement in life expectancy took place at adult ages. More recently, observable gains in life expectancy at the older ages have been reported, presumably as a result of the way in which changing adult life styles and medical advancements have lowered the incidence of stroke and heart disease, at the same time increasing survival probabilities from them.

The data in Table 5 show the levels of life expectancy at adult ages for each sex in different countries at selected points in time. Looking first at Sweden, we can see that a life expectancy of 27.3 years at age 45 (e_{45}) for males was reached as early as 1911. By 1951, it was at 29.6 years, and by 1981 it had

advanced one more year to 30.5. These gains are significant but not spectacular. The comparable picture for the United States put e_{45} at 24.0 in the year 1900, roughly three years behind that of Sweden. By 1950, it had attained Sweden's level of 1911, and by 1982 it was only a year behind Sweden's 1981 level. The pattern for females was similar, although gains in e_{45} levels over time were somewhat greater. Also, the United States seems to have closed the gap for females by 1982.

How do the Southeast Asian nations fare in comparison with the Swedish experience? We might ask when an e_{45} of 27 for males, the figure for Sweden in 1911 and the U.S. just after 1950, was reached in each of the countries. The data reveal that it was attained in Japan by 1960; in Hong Kong by 1970; in the Philippines by 1975; in China, Singapore, and Malaysia by 1980. This particular standard, however, had not yet been attained by Thailand, Korea, and Indonesia by the mid-to-late 1970s.

If we ask when an e_{45} of 29 for females, the level for Sweden in 1911 and the U.S. in the 1940s, was reached by the different countries, the data show it was achieved by the 1940s in Hong Kong; by 1950 in Japan; by 1960 in Singapore and the Philippines; by 1965 in Korea; and by 1970-75 in China, Thailand, and Malaysia. Indonesia was still far below that level by the mid-1970s.

Are those relative patterns duplicated when we look at life expectancy at age 65 (e_{65})? First, we note that Swedish males aged 65 in 1911 had 13.2 more years of life left, on the average. That number rose only to 13.7 by 1951 and 14.3 by 1981. In the United States, males aged 65 in 1900 had an average of 11.3 more years of life, as compared to 12.8 by 1950 and 14.4 by 1982. Thus, the Swedish-U.S. gap, which was about two years at the turn of the century and one year by mid-century, had closed by 1980.

An e_{65} of about 13, the mark for Swedish males in 1911 and for U.S. males in the 1950s, was reached in Hong Kong by 1970; in Japan and the Philippines by the early 1970s; and in Singapore by the mid-1980s. It had not yet been attained in China, Korea, Malaysia, Thailand, or Indonesia by the mid-to-late 1970s.

Swedish females had an e_{65} of 14.1 in 1911, with

Table 5. --Estimated Life Expectancy for Selected Adult Ages, by Sex: Selected Countries At Various Dates

Country, sex, date, and source	SOURCE	AGE (Years)				
		45	55	65	75	
SWEDEN						
Males	1911	(6)	27.3	19.8	13.2	7.8
	1951	(6)	29.6	21.1	13.7	7.7
	1981	(5)	30.5	21.9	14.3	8.4
Females	1911	(6)	29.1	21.2	14.1	8.3
	1951	(6)	31.1	22.4	14.5	8.1
	1981	(5)	35.6	26.5	18.0	10.6
UNITED STATES						
Males	1900	(6)	24.0	17.2	11.3	6.7
	1950	(6)	26.7	19.1	12.8	7.9
	1982	(5)	29.6	21.4	14.4	9.1
Females	1900	(6)	25.1	18.1	12.0	7.1
	1950	(6)	30.8	22.5	15.1	9.1
	1982	(5)	35.5	26.7	18.8	11.9
CHINA						
Males	1973-75	(1)	26.7	18.7	12.0	7.0
	1981	(1)	27.2	18.9	12.0	7.0
Females	1973-75	(1)	29.2	21.0	13.8	8.3
	1981	(1)	29.3	20.8	13.5	7.9
HONG KONG						
Males	1960-62	(2)	25.3	17.5	11.3	6.8
	1970-72	(2)	27.3	19.2	12.9	8.6
	1981	(2)	29.9	21.5	14.4	8.9
Females	1960-62	(2)	32.3	23.8	16.2	9.8
	1970-72	(2)	33.6	24.9	17.0	10.5
	1981	(2)	35.0	26.0	17.9	11.2
INDONESIA						
Males	1961-71	(1)	18.0	11.9	7.2	4.1
	mid-1970s	(3)	21.6	15.0	9.8	5.9
	1976	(1)	22.3	15.6	10.3	6.1
Females	1961-71	(3)	20.0	13.7	9.0	5.6
	mid-1970s	(3)	23.1	15.8	10.3	6.2
	1976	(1)	23.8	16.4	10.8	6.4

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Table 5.--Estimated Life Expectancy for Selected Adult Ages, by Sex: Selected Countries At Various Dates

Country, sex, date, and source	SOURCE	AGE (Years)				
		45	55	65	75	
JAPAN						
Males	1955	(4)	26.5	18.5	11.8	7.0
	1965	(4)	27.3	18.9	11.0	6.6
	1975	(4)	29.9	21.4	13.7	7.9
	1984-85	(1)	32.0	23.4	15.6	9.0
Females	1955	(4)	30.0	21.6	14.1	8.3
	1965	(4)	31.3	22.5	14.6	8.1
	1975	(4)	34.1	25.0	16.6	9.5
	1984-85	(1)	37.0	27.7	18.9	11.2
REP. OF KOREA						
Males	1966	(1)	25.3	17.7	11.4	6.6
	1970	(1)	25.9	18.2	11.6	6.7
	1971-75	(2)	22.4	15.3	9.8	5.8
	1978-79	(1)	24.0	16.2	9.9	5.8
Females	1966	(1)	29.3	21.0	13.6	7.8
	1970	(1)	29.7	21.4	13.9	7.9
	1971-75	(2)	29.6	21.7	14.6	8.8
	1978-79	(1)	30.6	21.9	14.1	8.2
PENINSULAR MALAYSIA						
Males	1969-71	(2)	24.7	17.1	11.3	7.0
	1970	(1)	24.3	16.8	11.0	6.5
	1980	(1)	26.8	18.8	12.2	7.3
Females	1969-71	(2)	28.3	20.3	13.8	8.7
	1970	(1)	27.3	19.5	12.9	7.6
	1980	(1)	30.1	21.5	14.1	8.4
PHILIPPINES						
Males	1960	(1)	27.4	20.1	13.5	7.7
	1969-71	(2)	27.4	20.1	13.9	8.8
	1970	(1)	26.4	19.2	13.0	7.5
	1974-76	(2)	25.8	18.5	12.2	7.0
	1975	(1)	27.2	19.7	13.2	7.4

Table 5.--Estimated Life Expectancy for Selected Adult Ages, by Sex: Selected Countries At Various Dates

Country, sex, date, and source	SOURCE	AGE (Years)				
		45	55	65	75	
Females	1960	(1)	28.8	21.1	14.1	8.2
	1969-71	(2)	30.2	22.2	15.1	9.5
	1970	(1)	29.4	21.4	14.2	8.2
	1974-76	(2)	28.2	20.2	13.2	7.7
	1975	(1)	29.7	21.4	14.2	8.1
SINGAPORE						
Males	1956-58	(2)	23.0	15.5	9.8	5.9
	1969-71	(2)	25.4	17.4	11.1	6.9
	1970	(1)	25.4	17.5	11.3	7.2
	1979-81	(2)	27.0	18.8	12.3	7.5
	1982	(1)	27.6	19.3	12.7	7.9
Females	1956-58	(2)	28.7	20.7	13.7	8.3
	1969-71	(2)	30.7	22.1	14.6	8.7
	1970	(1)	30.9	22.4	15.0	9.4
	1979-81	(2)	31.7	23.0	15.3	9.2
	1982	(1)	32.5	23.7	15.9	9.9
THAILAND						
Males	1969-71	(2)	25.1	18.0	11.8	7.0
	1974-76	(1)	25.9	18.7	12.4	8.7
Females	1969-71	(2)	28.1	20.5	13.7	8.1
	1974-76	(1)	30.2	22.5	15.5	9.8

SOURCES: (1) U.S. Bureau of the Census, International Demographic Statistics data files.

(2) United Nations, 1986. *Age Structure of Mortality in Developing Countries; A Data Base for Cross-Sectional and Time Series Research*. New York: United Nations.

(3) National Research Council, 1987. *Recent Trends in Fertility and Mortality in Indonesia*. Washington: National Research Council.

(4) Japan Statistical Yearbook, 1979.

(5) United Nations, 1985. *Demographic Yearbook 1983*. New York, NY: United Nations, Table 22.

(6) Samuel H. Preston et al 1972. *Causes of Death; Life Tables for National Populations*. New York: Seminar Press.

this figure increasing to 14.5 by 1951 and 18.0 by 1981. For U.S. women age 65, a mark of 12.0 in 1900 rose to 15.1 by 1950 and 18.8 by 1982. Thus, an advantage of two years at the turn of the century for Swedish women turned into a half-year advantage for U.S. women by mid-century and almost a year advantage for U.S. women by 1980.

When was the 1911 mark of 14 years of remaining life for Swedish females at age 65 reached by Asian countries? Hong Kong achieved it by about 1950; Japan by 1955; Singapore by 1960; Thailand, Korea, and perhaps the Philippines by 1970 or soon after; and China and Malaysia by 1980. Again, only Indonesia had not yet attained that level by the mid-

1970s.

The overall picture that emerges from these data is one of differential progress toward mortality reduction and extended life expectancy among adults in Southeast Asia. Some of the countries seem to have virtually completed the mortality transition, while others are well on their way toward that point. Finally, a few of the countries are as yet lagging in mortality improvements. Lee's claim of demographic progress in Southeast Asia that is exceeding that of Europe may be correct for a few of the countries in the region but does not apply to all.

ADULT MORTALITY IN THE PHILIPPINES, THAILAND, AND JAPAN

We now focus on other aspects of adult mortality in three Southeast Asian countries--the Philippines, Thailand and Japan. The former two countries still have considerable room for progress in mortality reduction, while the latter has essentially completed the mortality transition. Our discussion is focused on urban-rural differences and medical causes of death, by sex. Estimates are presented for countries and dates depending on the availability and adequacy of data.

Rural and urban mortality estimates for the Philippines and Thailand are based on corrected death registration data. The correction factors used were derived by applying the Brass Growth Balance equation to the appropriate death registration data sets. These correction factors are found to be consistent with estimates produced by dual-record studies and each country's civil registration system.

The data on causes of death were taken from the World Health Statistical Annual of 1985, the Demographic Yearbook of 1982, Japan Statistical Yearbook of 1982, and the Philippine Health Statistics of 1980. All of these sources classified cause-of-death data based on the A-list from the 9th edition of the International Classification of Diseases (ICD-9) provided by the World Health Organization. Categories were combined from this detailed classification of cause of death in order to adhere to the cause groupings used by Preston et al. (1972) in their derivation of cause-of-death life tables for selected national populations. This

permitted comparisons of data for 1980 with the 1964 estimates presented by Preston and his associates, adjusted for ICD changes where possible.

Rural and Urban Adult Mortality Differences. Numerous studies have shown that residence strongly influences mortality. Table 6 shows the life expectancies of adult males and females in rural and urban areas of Thailand and the Philippines. Thailand in 1980 showed the greatest urban-rural difference. This differential remained substantial even after controlling for sex of the deceased. For adults in the Philippines, age-specific life expectancies were higher than in Thailand but did not change in urban areas between 1975 and 1980. In rural areas, only the male population gained significantly in life expectancy between these two dates. As a consequence, Philippine urban-rural differentials narrowed slightly between these dates.

Table 6 also shows that differentials by sex were greater than those found for urban and rural adult populations in the Philippines. This is true for all ages as well as in both 1975 and 1980. The sex differentials were somewhat more pronounced in Thailand than in the Philippines. For example, an adult Thai female at age 45 in 1980 could expect to live three years longer than her male counterpart, whereas a Philippine woman of the same age could expect to outlive her male counterpart by one year. This pattern is also observed at ages 50, 55, and 60.

Causes of Deaths. -- What types of illnesses are causing the deaths of the adult population? What changes are occurring in the cause-of-death structures of the adult population? What differences exist between Japan and the Philippines in cause-of-death patterns? Answers to these questions can be drawn from Table 7.

Among the two countries studied in this analysis, Japan had the lowest cause-specific death rates and the cause patterns most characteristic of countries in the later stage of the demographic transition. Both the 1964 and 1980 data show neoplasms and cardiovascular diseases as the primary causes of death among the older Japanese population. Death rates for respiratory-tuberculosis and other parasitic and infectious diseases were already very low even as far

Table 6.--Estimated Life Expectancy for Selected Adult Ages, by Place of Residence and Sex: Philippines, 1975 and 1980, and Thailand, 1980

Date, place of residence, and sex	A G E (Years)							
	45	50	55	60	65	70	75	80
Philippines								
1975 Total	28.4	24.4	20.6	16.9	13.7	10.6	7.7	5.4
Urban	29.4	25.4	21.5	17.7	14.4	11.2	8.3	5.7
Male	28.2	24.3	20.6	20.0	13.8	10.8	7.9	5.5
Female	30.6	26.4	22.3	18.4	14.9	11.6	8.6	6.0
Rural	27.9	24.0	20.2	16.5	13.4	10.3	7.5	5.3
Male	26.7	23.0	19.3	15.9	13.0	9.9	7.1	5.0
Female	29.2	25.0	21.0	17.1	13.9	10.6	7.8	5.5
1980 Total	29.3	25.3	21.5	17.8	14.4	11.1	8.2	5.6
Urban	29.4	25.4	21.6	18.0	14.5	11.2	8.4	5.7
Male	28.5	24.6	21.0	17.5	14.2	11.2	8.3	5.6
Female	30.5	26.3	22.3	18.4	14.7	11.3	8.4	5.9
Rural	29.2	25.2	21.4	17.7	14.3	11.0	8.1	5.6
Male	28.0	24.2	20.6	17.1	13.9	10.7	8.0	5.4
Female	29.2	25.3	21.4	17.7	14.3	11.0	8.1	5.6
Thailand								
1980 Total	26.6	22.8	19.3	15.9	12.8	10.0	7.5	5.2
Urban	28.6	24.6	20.8	17.2	13.9	10.9	8.1	5.6
Male	27.0	23.3	19.5	16.1	13.0	10.2	7.6	5.3
Female	30.3	26.2	22.2	18.4	14.9	11.6	8.7	6.0
Rural	26.5	22.7	19.2	15.8	12.7	9.9	7.4	5.2
Male	25.1	22.4	18.1	14.8	11.9	9.3	7.0	4.9
Female	28.1	24.2	20.4	16.8	13.6	10.5	7.9	5.5

back as 1964. Influenza and pneumonia are major causes of death at the oldest ages but these may be masking degenerative causes, a pattern that could be examined in multiple-cause statistics. Data for strokes are included with cardiovascular diseases in this table, so that it is not possible to separate out the levels and trends of that cause.

Male-female differentials in mortality are quite substantial in Japan. Regardless of age, date, and cause, males show higher mortality rates than females. Moreover, a comparison of 1964 and 1980 data indicates that the declines in mortality have

been much greater for women than men.

Compared with Japan, relatively more adults in the Philippines died of respiratory-tuberculosis, and other infectious and parasitic diseases. While these diseases have been declining sharply, they still account for a sizable proportion of all deaths. Neoplasms and cardiovascular diseases have been accounting for an increasing share of deaths since 1964 and, combined with other degenerative diseases, were responsible for a majority of adult deaths with known causes by 1980.

ADULT MORTALITY PATTERNS IN SOUTHEAST ASIA

Table 7. --Age-Specific Death Rates by Cause (per 100,000 Population in the Age Group), by Sex: Japan and the Philippines, 1964 and 1980

Country, sex and cause category	Age group and date							
	45-49		55-59		65-69		75+	
	1964	1980	1964	1980	1964	1980	1980	
<u>Japan-Males</u>								
All Causes	569	527	1499	1171	3913	3301	10513	
Respiratory-TB	48	8	82	19	155	50	100	
Other infectious and parasitic diseases	10	4	22	8	36	17	34	
Neoplasms	130	168	398	441	905	1047	1767	
Cardiovascular	161	161	593	405	1869	1404	5356	
Influenza/bronchitis and pneumonia	9	15	27	52	126	261	1214	
Diarrheal	3	0.3	7	0.8	36	3	25	
Cert. degenerative	49	60	111	85	237	154	412	
Violence	99	81	127	92	165	135	257	
Other/unknown	61	31	132	67	384	230	1348	
<u>Japan-Females</u>								
All Causes	385	264	851	617	2337	1832	8056	
Respiratory-TB	24	3	28	6	50	12	25	
Other infectious and parasitic diseases	8	3	12	4	24	11	25	
Neoplasms	134	117	267	252	509	520	914	
Cardiovascular	109	74	341	214	1191	855	4497	
Influenza/bronchitis and pneumonia	6	6	17	21	68	107	662	
Diarrheal	3	0.2	7	0.5	35	3	30	
Cert. degenerative	25	15	55	38	137	88	280	
Violence	29	26	37	34	73	71	183	
Other/unknown	46	19	87	47	249	165	1440	

Source: Death rates for 1964 taken from Preston et al. 1972. *Causes of Death: Life Tables for National Populations*. New York: Seminar Press. See text for sources of 1980 data.

Note: Data for ages 75 and over in 1964 not available.

The sex differential in mortality was quite substantial in the Philippines, regardless of age, date, and cause. A comparison of 1964 and 1980 data indicates that in this case too, a much larger decline in mortality has occurred among women.

The epidemiological transition has been significant for both countries. For example, for Japanese males

at ages 45 to 49, the death rate per 100,000 from respiratory-tuberculosis causes was 48 in 1964, thereupon dropping to 8 by 1980. For Japanese females in the same age-cause category, the decline per 100,000 was from 24 to 3. In the Philippines, a reduction in death rates due to respiratory infections was also significant. However, the death rates for this cause were still much higher for adult women at

Table 7. --(continued)-

Country, sex and cause category	Age group and date						
	45-49		55-59		65-69		75+
	1964	1980	1964	1980	1964	1980	1980
<u>Philippines-Males</u>							
All Causes	702	838	1144	1444	1868	2814	7401
Respiratory-TB	203	186	314	299	452	524	781
Other infectious and pasitic diseases	37	22	50	27	59	48	71
Neoplasms	55	86	114	165	161	292	411
Cardiovascular	102	191	229	418	455	940	2638
Influenza/bronchitis and pncumonia	42	64	54	126	92	294	974
Diarrheal	25	15	25	26	45	43	101
Cert. degenerative	62	102	118	177	187	338	651
Motor vehicle	4	8	6	10	5	13	24
Other violence	71	74	56	64	49	46	111
Other/unknown	101	90	179	132	363	276	1639
<u>Philippines-Females</u>							
All Causes	544	416	820	770	1424	1791	6454
Respiratory-TB	205	98	284	157	414	332	599
Other infectious and pasitic diseases	21	11	28	14	32	27	46
Neoplasms	62	73	108	127	142	217	325
Cardiovascular	73	102	136	210	278	611	2374
Influ./bronch. and pncum.	33	36	42	75	68	194	909
Diarrheal	16	7	24	14	27	27	78
Cert. degener.	33	37	58	75	130	182	418
Motor vehicle	2	3	2	5	6	5	12
Other violence	12	9	11	11	19	16	36
Other/unknown	80	40	128	82	307	180	1657

Source: Death rates for 1964 taken from Preston et al. 1972 *op. cit.* See text for sources of 1980 data.

Note: Data for ages 75 and over in 1964 not available.

each age level in the Philippines than in Japan. In 1980, the comparisons per 100,000 were 98 vs. 3 at ages 45-49, 157 vs. 6 at ages 55-59, 332 vs. 12 at ages 65-69, and 599 vs. 25 at ages 75 and over. Comparisons for Filipino and Japanese adult males showed a similar pattern. However, the rates for males

declined very slowly in the Philippines between 1964 and 1980. Relatively more Japanese than Filipino adults died of neoplasms, cardiovascular diseases, and other degenerative diseases. Nevertheless, degenerative diseases seem to be replacing infectious and parasitic diseases in the Philippines

as well. Among 45-to-49-year-olds and 55-to-59-year olds in Japan, the death rate was higher for cancer than for cardiovascular diseases, whereas the reverse was true for Filipinos in the same age categories.

The magnitude of adult mortality differences between urban and rural populations, between the sexes, and among the various causes of death is a matter of great importance to health and development planners. It is obvious that future reductions in overall adult mortality are partially dependent on reducing these differential patterns.

One can expect that a much higher proportion of adult deaths will be caused by cancer, heart disease and other degenerative diseases in the future in these countries, particularly as their economies continue to develop. Japan has already developed Western cause-of-death patterns, and the Philippines and their other neighbors are rapidly moving in the same direction.

In all of Southeast Asia, the mortality transition has been occurring, although at different rates among the various countries which make up this region. It must be understood, however, that the transition itself is not inevitable. It is a process resulting from improvement in a variety of conditions including health and medical factors, level of living, nutrition, environmental conditions and life styles. The degree to which reductions in mortality will be sustained among adults in the region will therefore depend heavily upon the extent to which social institutions (political, economic, educational, cultural, and the family) in every area marshal the resources and will necessary to create those conditions most favorable for extending adult life.

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