The statistics of population behavior in the mass are a dry topic treated in isolation, though they possess their own fascination and rational structure. But they measure events which are central to the life of men and women in all ages. Once attention is turned outward from the events themselves to the social and economic environment in which they occur, the appeal and importance of demography is apparent. The pressures of hard times and the opportunities of happier periods are reflected in historical demography like images in a camera obscura. The picture always needs interpretation and may lack the polychrome fullness of historical reality but it forms a clear and dependable outline to which colour may be added as the population characteristics are related to their setting.

E.A. Wrigley, Population and History

Introduction

By the end of the twentieth century, only a few years hence, the population of Southeast Asia will be about 530 million. Less than 100 years ago, in 1900, the population of Southeast Asia was probably around 80 million people, with almost one-third of the total in Java alone. Although there were a number of very large cities in the region and densely settled rice-growing areas in Java, the Red River Delta, and a few other areas, most of mainland and insular Southeast Asia remained a sparsely settled frontier region in 1900.

It is instructive to contrast the twentieth-century demographic and political fortunes of Southeast Asia and Europe. The land area of Europe, excluding Russia, is only slightly larger than that of Southeast Asia. At the turn of the century, the European population numbered approximately 300 million — more than triple that of Southeast Asia. The ascendant imperial powers of France, Great Britain (including Ireland), and

An earlier version of this paper was presented at the Conference of the Northwest Regional Consortium for Southeast Asian Studies, 30 September to 2 October, 1988 at the University of Oregon, Eugene, Oregon. The paper has been extensively revised while the author was a Fellow at the Centre for Advanced Study in the Behavioral Sciences (Stanford, California) during the 1993–94 academic year and supported, in part, by grants from the National Science Foundation (SES-9022192) and the National Institute of Child Health and Human Development (HD21267). I am indebted to Peter Xenos, Norman Owen, and especially to Anthony Reid for their pioneering scholarship on the historical demography of Southeast Asia that inspired this essay. I am also grateful to George Immerwahr for his assistance and to the anonymous reader for a very constructive critique of an earlier version of this paper.

Germany had populations of more than 40 million each in 1900. Italy, trying to get into the last grab for African colonies, had a population only slightly lower at 34 million. The only European colonial power in Southeast Asia with a small demographic base at home was the Netherlands which had a little more than 5 million people in 1900. Although political and economic power are not determined by population size alone, the regional comparison in 1900 was that of large European populations expanding their dominance over relatively small Southeast Asian populations (except for the case of the Netherlands and Java).

From a demographic base of less than one-third that of Europe in 1900, Southeast Asia will have a population larger than Europe's in the year 2000. Europe's population has expanded by about 60 per cent over the century while Southeast Asia's population has grown more than sixfold. In the year 2000, the largest European country of Germany will have about 83 million people compared to the largest Southeast Asian country of Indonesia which will have a population of almost 218 million. Vietnam, Thailand, and the Philippines will each be considerably more populous than the major European countries of France, the United Kingdom, and Italy. Even tiny Laos, with a projected population of 5.6 million in the year 2000, will be larger than the European countries of Ireland, Finland, Denmark, Norway, or Albania.

These comparisons highlight the unprecedented and revolutionary demographic growth in Southeast Asia in the twentieth century. These changes in population size and growth are closely intertwined with the economic, social, and political transformations that have also occurred over the last 100 years. In this paper, I present an overview of basic demographic changes in Southeast Asia over the twentieth century with primary attention on population growth and the components of fertility and mortality. The availability of data and published research contributes to an unevenness of coverage across the countries in the region. Some of the conclusions and interpretations reported here may not be representative of the region as a whole. There is enormous diversity in all dimensions of Southeast Asian life, including demography.

In this relatively brief essay, it is not possible to provide a full account of the determinants and consequences of population trends in Southeast Asia. In the introduction, I offer some general observations on the geographical, political, and social context of Southeast Asia, circa 1900, to set the stage for the review of demographic trends. In the conclusion, I provide further speculative thoughts on the links between socioeconomic change and the demographic revolutions in twentieth-century Southeast Asia. My intention is to stimulate attention and to offer tentative interpretations for some rather complex, and much neglected, issues. If future research provides corrections to the interpretations offered here, this essay will have served a useful purpose.

7For an excellent overview of these topics, see the essays in Nicholas Tarling (ed.), The Cambridge History of Southeast Asia, Volume Two: The Nineteenth and Twentieth Centuries (Cambridge: Cambridge University Press, 1992). Except for the essay by Norman Owen, population factors are not addressed in this volume (there is more attention to the subject in the first volume, particularly in the essay by Anthony Reid).
The Geographical Setting

The traditional division between mainland and insular Southeast Asia obscures the tremendous topographical diversity within each division. Coastal plains, river valleys, highlands, and mountainous regions are found in almost every part of mainland and insular Southeast Asia. Tropical forests have been pushed back for human settlement and cultivation over the centuries, with the forest sometimes reclaiming the land as settlements were abandoned. Much of the frontier has been settled with the major wave of population growth during the twentieth century, but there still remain large expanses of forested areas (although the lucrative timber industry has taken a significant toll in recent decades).

Historically, settlement patterns in Southeast Asia were shaped by access to the sea and rivers. Fishing was a ubiquitous means of subsistence, and seaborne exchange and trade were central features of most societies throughout the region. Overland transportation was slow and a very difficult avenue for trade in most areas until well into the nineteenth and twentieth centuries when roads and railroads were constructed on a substantial scale.

The primary agricultural crop of Southeast Asia is rice, which is grown in dry fields and in rain-fed or irrigated fields. Since wet rice (grown in irrigated fields) is a more productive crop than dry rice, there has been an evolutionary drift toward wet rice cultivation accompanying population growth, although the historical process has been reversed many times. It has only been over the last century that the frontier has been pushed back, and much of the region has been brought under wet rice cultivation. The scale of human effort necessary to transform tropical forests or swampland into irrigated agricultural fields is possible only with a high population density and a centralized polity to coordinate the construction of irrigation systems. The classical civilizations of Angkor, Majapahit, and the Red River Delta — based on large expanses of irrigated rice cultivation — were not determined by favourable geographical settings alone.

For most of history, small societies and local economies, loosely knit into larger political and trading networks, were probably the most typical communities in the Southeast Asian world. Larger political units, based on irrigated agricultural fields and coastal trading cities, were exceedingly vulnerable to military conquest and destruction. The almost limitless frontier of interior rivers and rugged terrain created innumerable ecological niches for small populations with local subsistence economies.

The Political Environment Circa 1900

In the years surrounding 1900, two Southeast Asian worlds were moving past each other. Moving to the backstage was the traditional world of Southeast Asian peasants and aristocratic elites. Moving forward, ascendant in all spheres of social, economic, and political life, was European imperialism and the Southeast Asian world created to serve it. Although Southeast Asian political and commercial development had been
stunted by European naval dominance for more than two centuries, the Southeast Asian countryside and the bulk of the population had been relatively unaffected by the direct hand of European colonialism. In the last few decades of the nineteenth century and for the first half of the twentieth century, European imperialism reached beyond port cities to all corners of the region.

The new colonial world of large-scale plantations, mines, and administrative cities was constructed in every place that might conceivably yield a profit. If local powers could not be persuaded or bribed into acquiescence, military might was used to compel compliance. New political and social arrangements were institutionalized to ensure the profitable workings of the extractive economies of the colonial system. In general, the colonial economy was based upon monopolistic practices and the exploitation of cheap (and expendable) labour. Authoritarian colonial governments were legitimated by a belief in the racial superiority of the European governing class.

Cities, Rural Economies, and Population Settlements

With the growth of the colonial economies of the late nineteenth and early twentieth centuries, urban centres, including traditional Southeast Asian entrepôts and new colonial cities, began a period of growth after a long period of relative stagnation. In 1910, there were eleven Southeast Asian cities of more than 100,000 population: Mandalay, Rangoon, Bangkok, Hanoi, Saigon-Cholon, Georgetown, Singapore, Batavia, Surakarta, Surabaja, and Manila. By and large, these cities were administrative and commercial centres with only a minimal industrial base. McGee notes that colonial cities functioned as economic intermediaries between the metropolitan powers and the colonial economy: they were cities "of clerks, retailers, administrators, hawkers, retailer merchants, and transport workers". There was a lower level of urban centres — district headquarters, mining towns, and rail junction hubs — that connected the major cities with the base of the extractive economy in the rural areas. In contrast to the generative role of cities during the modernization of the West, colonial cites were thought to have only a parasitical role in economic development.

The colonial economy did little to stimulate economic development beyond the export sector. Profits from mines and plantations were returned to shareholders in the metropolitan countries, or were used to expand the incomes of local managers and administrators, whose lifestyles were geared to extravagant consumption of imported goods. Economic investments were limited to the improvement of infrastructure

15 Ibid., p. 58.
(railroads, harbours, roads) to support the development of the extractive economy. Indigenous industrial development was a very low priority.

The rural sector can be divided into three categories, although these are not mutually exclusive. The largest component was the traditional Southeast Asian peasantry who remained oriented to a subsistence economy. The relations between elites/royalty and peasants varied considerably across the region. Both payments "in kind" and corvée labour were traditional obligations of peasants to local elites. Yet the actual level of "exploitation" was probably less than what an idealized account of traditional society might suggest. Francesca Bray concludes that in long-settled areas with a well-developed technology of rice production, most peasants were independent smallholders and not serfs in a feudal system.16

The second component of the rural sector consisted of the commercialized peasantry who participated in the growing market economy stimulated by the expanding colonial system. This sector was not entirely new — many Southeast Asian agriculturalists had a long history of growing pepper and other spices for the world market while other areas had produced rice to support the urban populations in the region. This sector expanded dramatically in the late nineteenth century with the demand for rice and other foodstuffs to feed the growing numbers of wage labourers in the enclave economies and colonial cities. The settlement and development of lower Burma, the Central Thai Plain, and the Mekong Delta were direct responses to the expanding world and regional market for rice.17

Finally, the "new" developments of the nineteenth century were the enclave economies of plantations and mines. Rural, often quite remote areas, were "opened up" with Western and Chinese capital and imported wage labour to provide raw materials for the industrial development of Europe. Again, these activities were not completely new. Tin and gold had been mined for hundreds of years with local labour, and the products were shipped to China and other distant markets. But the scale of development, the massive importation of labour, and the potential profits to be made were far greater than ever before.

All of these groups influenced and were influenced by the dramatic demographic changes of the twentieth century.

**Population Growth: 1900-2000**

The basic facts of population size and growth of early modern Southeast Asia are the subjects of considerable uncertainty and debate.18 Early censuses, including most of those taken in the nineteenth century, were indirect — village leaders were asked to report the number of people living in their villages. Because population counts were

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used to assess taxes and to conscript labour, there was a strong incentive for communities to under-report their true population. In addition, there were the usual problems in accurately enumerating populations in remote rural areas and in teeming city slums. Southeast Asian populations were often mobile, and most probably had a well-founded suspicion of government inquiries. For these reasons, we must treat all population figures with caution. Modest differences or changes in population figures can be easily confounded with errors in the data. On the other hand, rough orders of magnitude can be determined, and the quality of demographic data has certainly improved in recent decades.

Table 1 provides basic data on population size and growth for twentieth-century Southeast Asia. Most of the entries are census counts (some are "official" estimates) of colonial territories and independent states. The projected population figures for the year 2000 (and some of the 1990 estimates) are drawn from a recently published United Nations compendium of international population estimates and projections. For most of the pairs of adjacent population figures for a country, I have computed average annual (percentage) growth rates (in brackets between the population counts). Even though the intervals vary from 6 to 30 years, the growth rates can be compared because they are computed as the average growth per year. I have not computed growth rates for the 1990 to 2000 interval (and other intervals for which assumed growth rates were used as the basis for population estimations and projections) and when the base population was less than one million.

The population counts in Table 1 are charted in Figure 1 with lines for each country or region (Indonesia and Malaysia are not graphed, but the major divisions of Java/Outer Islands and Peninsular Malaysia/Sabah and Sarawak are shown). In Figure 1, each census or population count is marked with a symbol, and the points are connected with interpolated values.

The list of countries in Table 1 includes 9 of the 10 contemporary states in the region, excluding only Brunei whose small population (about 257,000 in 1990) is rarely listed in most international demographic compendia. The list of contemporary states in Table 1 does not mean that national boundaries and census coverage have been consistent over the century. Although less of a problem for recent decades, census coverage over the first half of the century varied with the expansion of state (colonial) power and administration. For Indonesia, Malaysia, and Vietnam, population data are also presented for subnational areas, though the presentation varies with the availability of data for particular years.

A demographic picture of Southeast Asia at the turn of the twentieth century shows two contrasting settlement patterns. At one extreme were densely settled rice cultivation. The prototypical example was Java, which had a population of almost 30 million in 1901. Population density in Java was comparable

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21Data for Brunei Darussalam and East Timor (1990 population estimated to be 756,000) are included in the latest United Nations reports, but are not listed here because of their small size.
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Note: The average annual intercensal growth rate, \( r = \ln[P(2)/P(1)]/t \), where P(2) and P(1) are populations at times 2 and 1, respectively, and t is the number of years in the interval.

Sources:

Figure 1: Population Census Counts of Estimates (in millions) of Southeast Asian Countries
to the very populous rural areas of China and India. A closer look reveals that most of the population was even more concentrated in certain areas of east and central Java. Other wet rice cultivation areas in Southeast Asia, especially the Red River Delta (northern Vietnam) and parts of Luzon, had population densities that were similar to those in Java, but none covered such an extensive area or had such a large population. At the other end of the continuum were vast areas of insular and mainland Southeast Asia that were only sparsely settled by shifting cultivators. Much of the highlands of mainland Southeast Asia, most of the Malay peninsula, and large parts of the Indonesian and Philippine archipelagoes had very low population densities until the modern era. Almost every country or territory encompassed high and low density areas.

Around 1900, many areas were in transition from low to high population densities. The expansion of irrigated fields for rice cultivation was spreading to the remaining frontiers of Java, lower Burma, central Siam, and the Mekong Delta. As will be addressed later, these demographic and agricultural changes were in response to massive political and economic forces, including the expansion of regional and long-distance markets, the development of export economies dependent on migrant labour, and improved transportation facilities.

Burma

The first twentieth-century census (1901) of Burma covered four-fifths of the country, excluding only sparsely populated frontier areas, and enumerated 10.5 million people. Over the next 70 years, the population of Burma tripled to almost 29 million in 1973. The 1983 census revealed a population of 35 million. Over the period from 1901 to 1953, the average annual growth rate fluctuated around one per cent, and then rose to about 1.6 per cent in the 1950s. The intercensal growth rate from 1963 to 1973 rose to 2.5 per cent and then fell to 1.9 per cent for the following decade (1973–83). United Nations projections suggest that the population of Burma/Myanmar will be more than 50 million in the year 2000.

Cambodia

Very little of any certainty is known about the demographic “facts” of Cambodia. One estimate of the population of the great Khmer Empire that constructed Angkor (approximately ninth to thirteenth centuries) is about 4 million. The “collapse” of that civilization (and of the complex irrigation system that supported it) certainly led to a much reduced population. In the 1860s, French administrators working with tax rolls estimated the population of Cambodia to be less than one million. Various “census” counts of the early 1900s range from 1.7 to 2.4 million. The estimate of a

22Widjojo, Population Trends in Indonesia, p. 75.
23Zelinsky, “The Indochinese Peninsula: A Demographic Anomaly”.
25Ibid.
population growth rate of over three per cent per annum from 1911 to 1921 should be regarded with considerable skepticism.

According to the last official census in 1963, the population of Cambodia was 5.8 million. The population was estimated to be about 7 million in early 1970s. In spite of the U.S. carpet bombing of rural areas in the early 1970s, the population of Cambodia was estimated to have continued growing, but at a reduced rate. Under the Khmer Rouge rule from 1975 to 1978, when Cambodia was officially known as Democratic Kampuchea, there was a substantial population loss from executions, forced marches, undernourishment, and other state actions. Although the magnitude of mortality during the Khmer Rouge period is the subject of considerable debate, an account by Ea Meng-Try, that seems based on reasonable assumptions, suggests a population decline of about one million from April 1975 to December 1978 owing to excess mortality caused by the revolution. Natural increase during the same period (births minus “normal” deaths) added about one-half million, but this was counter-balanced by the exodus of about one-half million Khmer refugees and “repatriated” Vietnamese. The United Nations estimates that the 1990 population of Cambodia was 8.3 million and this is expected to rise to 10.6 million by the end of the decade.

Laos

With the exception of the micro-states of Brunei and Singapore, Laos has the smallest population of any country in Southeast Asia. Estimates of the population for early decades of this century by the French colonial administration were in the range of 0.6 to 0.8 million. The first modern census of Laos in 1985 counted a population of 3.6 million.

Indonesia

Indonesia is the giant of the region, both physically and demographically. In spite of the controversy over nineteenth-century population estimates, most researchers are in agreement on the following set of basic facts for the twentieth century. Growing from about 40 million in 1900 to over 180 million in 1990, the population of Indonesia accounts for nearly one-half of the Southeast Asian total (about 42% in 1990). Already considered to be overpopulated with almost 30 million in 1900, Java has a population that more than tripled over the century. The outer islands of Indonesia contained some pockets of high-density settlements, but in general, most areas of Sumatra, Kalimantan, Sulawesi, and other islands were sparsely settled in 1900.

There has consistently been a higher rate of population growth in the outer islands than in Java over the twentieth century. From 1900 to 1990, the population of the outer islands had increased more than sixfold (11 to 72 million). There have been several distinct periods of population growth in Indonesia. For the first two decades.

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30 Ibid., p. 218.
of the century, growth was only about one per cent per year; growth was slowed by cholera and influenza epidemics and by a series of poor harvests.\textsuperscript{32} During the 1920s, growth expanded to more than two per cent per year with a widening gap between Java and the outer islands. The growth rate of the outer islands was just below three per cent per year.

The thirty-one year span between the 1930 and the 1961 Indonesian censuses encompassed the erosion of the export sector during the Great Depression, the collapse of the entire economy during the Japanese occupation of World War II, and the turbulent years of the war for independence. In comparison, the 1950s were an era of recovery and modest economic improvement. For the entire period (1930–61), the Indonesian population grew at an average annual rate of 1.5 per cent with the expected gap prevailing between the outer islands and Java. The subsequent two decades saw an accelerating rate of population growth, reaching two per cent per year in Java and almost three per cent per year in the outer islands. The most recent intercensal interval (1980 to 1990) saw a slight decline in the growth rate due to a reduction in fertility. Indonesia is one of the largest countries in the world and is projected to have a population of 218 million by the end of the decade.

\textit{Malaysia and Singapore}

Peninsular Malaysia (Malaya) has been historically linked with Singapore, especially during the colonial era when Singapore became the major entrepôt for the export economy of tin and rubber. Historically, the peninsula was sparsely settled; the only densely settled areas were the wet rice agricultural zones of the northwest (Kedah) and northeast (Kelantan) regions. Dodge estimates that the mid-nineteenth-century population was about 0.75 million which grew to 2.4 million (plus 0.3 million in Singapore) in 1911.\textsuperscript{33} Much of this growth was due to the migration from China, India, and the Indonesian archipelago that supplied labour to work in the mines, plantations and smallholdings of the export economy. Over the twentieth century, the rate of population growth fluctuated — rising in the 1920s, falling in the 1930s and 1940s, and then rising again in the post-World War II era. Historically, Singapore grew faster than the peninsula, with substantial gains from net migration to the major metropolis. For recent intervals, however, the annual growth rate of Singapore has been half that of Peninsular Malaysia. This reversal is due to the rapidly falling rate of natural increase in Singapore.

International migration has always been an important component of demographic change in Malaysia. The relatively small initial population of the country meant that immigrants and their descendants soon became a substantial minority of the total population (a majority if Singapore is included). After World War II, the open immigration of labour was curtailed, and natural increase became the major source of population growth. The rapid growth of Sabah and Sarawak in recent years is primarily due to the substantial migration (primarily to Sabah) from the southern Philippines.


and Indonesian Kalimantan. There has also been a significant flow of undocumented (illegal) migration from Indonesia to Peninsular Malaysia in the last decade.

**Philippines and Thailand**

Although they differ in many respects, the Philippines and Thailand share certain demographic features, including roughly similar population size for most of the century. The first Philippine census in 1903 counted a population of 7.6 million, and the 1911 Thai census showed a population of 8.3 million. Over the twentieth century, the rates of population growth in the Philippines and Thailand exceeded those of any other Southeast Asian country with reliable data (with the exception of Singapore). In 1980, the population of the Philippines was only three million larger than that of Thailand (the census counts were 48 and 45 million, respectively). With a widening of national growth rates in the last two decades of the century, the Philippines is projected to have a population of 76 million in the year 2000 compared to 61 million in Thailand.

The population growth rate of the Philippines has averaged more than two per cent per year for every period reported here except for the interval surrounding World War II. For most of the postwar era, the average rate has been at or just below three per cent. The pace of growth for Thailand has also been very high, but with more fluctuations. The growth rate in Thailand for the initial post World War II era (1947-60) of 3.2 per cent per annum is the highest figure in Table 1 (except for Singapore and Cambodia). Population growth in Thailand slackened in the 1970s and 1980s as fertility began to fall.

**Vietnam**

With the exceptions of Laos and Cambodia, less is known about the demography of Vietnam than any of the other countries in Southeast Asia. For the pre-World War II era, there is a series of administrative counts conducted by the various units of French Indochina.\(^{34}\) Even a brief look at the data, however, suggests that the figures are of very poor quality. The data for Annam show an absolute loss of population in the 1920s — a result most likely due to inconsistent measurement.\(^{35}\) For Vietnam (and the other states of the former French Indochina), the turmoil of the 1940s did not end in 1945. The war for national independence and unification continued for three more decades. The environment was not conducive to demographic data collection (or most other normal administrative activities of modern states). Population censuses conducted in 1979 and 1989 provide the first reliable data on the population structure of Vietnam.

The fragmentary data show that Vietnam's population was about 14 million at the end of the first decade of the century, with the largest concentration in the Red River Delta of Tonkin. By 1936, twenty-five years later, the estimated population for all of Vietnam was only 17.6 million. Only in Cochinchina did the average annual rate of growth exceed one per cent during the early decades of the century. For the more than

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\(^{35}\) Ng, *The Population of Indochina*, p. 32.
four decades from 1936 to 1979, the reported population tripled to almost 53 million. In spite of almost continuous war and disrupted economic conditions, the estimated growth rate averaged 2.6 per cent per year. Even if the true figure is considerably less, it seems that the population of Vietnam continued to grow rapidly in spite of economic hardship and war. From 1979 to 1989, the population of Vietnam grew about two per cent per year — roughly comparable to other countries in the region.36

Interpreting Twentieth-Century Population Growth

The most basic observation revealed by these figures is how quickly small populations can become demographic giants within a few generations. The stark reversal of the relative demographic balance between Europe and Southeast Asia reflects the power of “compound interest” growth. Over just a few generations, the impact of growth rates of one or two per cent per annum can be spectacular. Although Europe and Southeast Asia have (or soon will) experienced demographic transitions from high to low birth and death rates, their growth rates differed dramatically during the process. In the course of the European demographic transitions, population growth rates rarely exceeded one per cent per annum while growth rates in Southeast Asia were often in the two to three per cent range.

Demographers who study population trends usually begin their search for explanations with the decomposition of growth rates into components reflecting fertility, mortality, and migration. For most of Southeast Asia, adequate national data on fertility and mortality only became available at mid-century and sometimes even later. Nonetheless, some general observations can be drawn from the very fragmentary data presented in Table 1. Our interpretation begins with a general outline of twentieth-century Southeast Asian history. While such an exercise is fraught with oversimplification, given the diversity of the region, it provides a useful template with which to read population dynamics.

The first three decades of the twentieth century continued the process of “opening up” the region to export industries (mining, plantations, smallholdings) and growing political and economic integration of the colonies with the imperial powers of Great Britain, Holland, France, and the United States. In many ways, imperialism created the conditions for improved economic welfare. Roads were built, domestic markets were expanded, modern cities with schools and hospitals were constructed, and extraordinary amounts of goods and money flowed through the economy. These developments bypassed the bulk of the agrarian population in the subsistence sector, and there is some evidence that living standards may have deteriorated in certain areas, Indonesia and Vietnam in particular. On the other hand, for many Southeast Asian peasants who grew rice for the market or became rubber smallholders and for the small, but expanding commercial and government employee classes, there were probably rising living standards, especially in the 1920s.

All signs of growth and the fragile prosperity in some sectors and regions came crashing down with the onset of the Depression of the 1930s. As the export sector stagnated, colonial governments suffered losses of revenues and tried to squeeze more taxes from the already overburdened peasantry. Migration flows of labour within the region and from other areas slowed down and may have reversed. The Depression of the 1930s was followed by even worse times in the 1940s when the Japanese military occupied most of the region. International trade dried up and much employment in the urban economy and the export sectors disappeared, forcing substantial numbers of workers to revert to a subsistence economy.

The collapse of Japanese military rule in 1945 created a political vacuum that the returning colonial powers and indigenous nationalist movements struggled to fill by whatever means available. In some countries, the transition to independence was relatively peaceful and the general trend was toward economic recovery and reconstruction, though not on the prewar colonial model. In other countries (Indonesia and Vietnam), the imperial powers fought to keep their colonies and delayed the postwar recovery for another decade or two. In a rather perverse way, the spending for Cold War conflicts in Asia (first in Korea, then in Indochina) brought considerable economic gains to several countries in Southeast Asia.

Overall, the decades of the post independence era (roughly, 1960–90) in Southeast Asia have been the most prosperous period in the modern history of the region. An expanded international economy, the oil boom, development-orientated governments, and good fortune have produced rapidly growing economies in Thailand, Malaysia, Singapore, and Indonesia and a broad base of middle class consumers. The Philippines and Burma, which appeared to be among the more successful countries in the region in the 1950s, suffered from political strife and have experienced much slower economic development. Cambodia, Laos, and Vietnam were beset with civil wars that became Cold War conflagrations from which the countries have still not recovered. It should be noted that civil wars, secessionist movements, ethnic strife, and wars of national liberation have been manifest or latent in every Southeast Asian society for much of the post World War II era. With this sketchy outline of Southeast Asian political and economic history during the twentieth century, how might the data in Table 1 be read?

It is difficult to discern clear trends for the first half of the twentieth century. The data are sparse and subject to serious problems of unreliable measurement. There are wide variations in growth rates from less than one per cent to above two per cent per annum. Some of the low values may well be due to depressed living conditions (e.g., in parts of Vietnam). The impact of the influenza epidemic of 1917–18 may be partially responsible for some of the low growth rates in Indonesia and elsewhere. In several countries, the relative prosperity of the 1920s were reflected in higher rates of population growth. International migration from China and India was a major factor in the rapid growth of the population of Peninsular Malaysia during the first three decades of the century.

Throughout Southeast Asia, we can observe a decline in population growth rates during the years surrounding World War II and a very rapid rise in population growth in the decades after the war. The hardship years of the Depression and World War II ended the significant influx of labour migration from outside the region. Although there is no direct evidence, there was probably little progress in mortality during this period.

The postwar era stands out as a unique period of extraordinarily rapid population growth. Over the second half of the century, every national population more than doubled in size and some have tripled. There are relatively few signs of regional variations in growth rates that might be directly associated with national differences in economic trends. Rapid population growth was primarily a result of record declines in mortality which were pervasive across the region. Population growth slackened in several countries during the 1970s and 1980s, as fertility declines took hold. Continued declines in mortality and the youthful age structure of Southeast Asian populations are slowing the impact of declining fertility rates on population growth rates. Sometime in the middle of the twenty-first century, population growth in the region will probably cease, but not before most Southeast Asian populations will have doubled from their present size.

Perhaps the most general pattern revealed in Table 1 is faster growth in the less densely settled regions and countries (outer islands of Indonesia, Malaya, Thailand, and the Philippines) compared with the densely settled wet rice areas of Java, Tonkin, and Annam. This trend, and the reasons behind it, are central to understanding premodern and modern Southeast Asian demographic trends. Accordingly, the next section provides a historical review of the relationship between population density and agricultural systems in the context of the debate over population growth in premodern and modern Southeast Asia.

The Debate Over Rapid Population Growth in Southeast Asian History

One of the most debated issues among demographers and historians is the reported high rates of population growth in nineteenth-century Southeast Asia. Initially, there was considerable uncertainty whether the high population growth rates during the colonial era could really be believed. Since colonial regimes did not attempt to alleviate poverty and did not put a high priority on health services, there was little basis to assume that mortality rates had been reduced. There was also an alternative explanation for the high rates of growth in colonial Southeast Asia, namely poor data. If the earlier estimates of population were too low, and the accuracy of population estimation and census enumerations improved over time, increasing rates of population growth could be explained as an artifact of improved measurement. However, even after taking these measurement problems into account, recent scholarship by Owen and Reid seems to have firmly established that population growth rates in the nineteenth century were above two per cent per annum in many areas of Southeast Asia.38 This level of growth — which exceeded that of Europe for the same period — represented

38Reid, "Low Population Growth"; Owen, "The Paradox of Nineteenth-Century Population Growth".
a clear break from the very low levels of population growth in Southeast Asia in earlier centuries.39

There are several possible reasons why mortality may have been lower and fertility higher in nineteenth-century Southeast Asia relative to historic levels. Perhaps the most important impact of colonial rule was a sharp reduction in warfare among competing indigenous elites. Although traditional Southeast Asian wars may not have directly caused great numbers of casualties, warfare undoubtedly caused disruptions in agricultural production and regional trade in foodstuffs that led to demographic crises.40 Frequent episodes of warfare certainly contributed to higher levels of mortality (or frequent periods of crisis mortality) in the precolonial era.

Another plausible explanation is that fertility may have risen with the spread of Islam and Christianity throughout insular Southeast Asia. The spread of institutional religions was probably associated with permanent settlements that increased the value of child labour. Formal religions may also have discouraged premarital sexual activity and thereby reduced the incidence of gonorrhea and other sexually transmitted diseases that contributed to high levels of sterility in the region.41

The Frontier and Population Growth

Another important factor in the second half of the nineteenth and the early decades of the twentieth centuries may have been the settlement of frontier regions. This interpretation would be consistent with the observed intercountry differences in growth rates and follows from prior interpretations of regional differences in Indonesian population growth.42 Many of the frontier areas were populated by rice cultivators, as were most of the long-settled areas in Southeast Asia, but there were significant ecological and demographic differences.

Except for the core areas of wet rice cultivation, shifting cultivation was the predominant mode of agriculture in most parts of Southeast Asia until the nineteenth century. The very high level of productivity of irrigated (wet) rice cultivation led to a transformation of the social and economic fabric of community life in many parts of Southeast Asia. According to Clifford Geertz, wet rice cultivation has the unique capacity to absorb more labour and a growing population.43 Although there are limits to the demographic absorptive capacity of rice growing communities, it is far greater than most other crops. In spite the of the ubiquitous demand for more food, the

40 Fisher (p. 69) reports that the Burmese attack on Arakan lowered the population of the province from 500,000 in 1785 to 100,000 in 1824 and that the Siamese invasion of Kedah reduced the population of the state by half. See Charles A. Fisher, “Some Comments on Population Growth in South-East Asia, with Special Reference to the Period Since 1830”, in The Economic Development of South-East Asia, ed. C.D. Cowan (London: George Allen and Unwin, 1964), pp. 48–71. It is unclear to what extent these war related population declines were due to mortality or to out-migration.
41 Reid, “Economic and Social Change, c. 1400–1800”.
42 Hugo, et al., The Demographic Dimension, p. 35.
transition from shifting cultivation to irrigated cultivation was not an automatic development or even the most likely social response to population pressure. The endless frontier in most regions offered an easier option — migration.

The construction and maintenance of irrigation facilities represented an enormous investment by a large number of farmers over many years. The scale of labour necessary for such an investment was far greater than would be available from a group of households or an extended kinship alliance. In most cases, the construction of irrigation facilities was coordinated (compelled) by a centralized political authority which had effective power to mobilize and control labour from many villages in an area. The power of strong states that led to improved agricultural productivity did not necessarily raise the living standards of the peasantry. Political power could also be used to abuse the peasant population by greater taxation and labour conscription. The need for large scale labour to maintain irrigation systems also limited the scope of geographic mobility of peasants and may have discouraged innovation.

The delicate balance in civil engineering needed to direct water flows over large expanses of landscape meant that irrigated agricultural systems were highly vulnerable to disruption. War, natural calamities, and or the decline of peasant populations for whatever reason (disease, flight) could have easily resulted in the decay of irrigated rice fields and the collapse of centralized political systems that were dependent on large numbers of peasant cultivators. Irrigated rice cultivation probably waxed and waned with the rise and fall of strong political institutions. In a provocative hypothesis, Zelinsky suggests that the low population density of much of Southeast Asia was due the region's political instability relative to East or South Asia.

The spread of wet rice agriculture to frontier areas in Southeast Asia during the late nineteenth century and early twentieth century, however, seems to have been a decisive break in Southeast Asian history and the primary reason for the accelerated rapid demographic growth in modern times. This hypothesis is sketched in a preliminary fashion here; a complete account would require much more historical investigation than is possible within the confines of the present paper.

The growing demand for rice and an increasingly sophisticated commercial and transportation system gave tremendous impetus to Southeast Asian agricultural development in the late nineteenth century. Although there is considerable debate over the incorporation of Southeast Asia into the worldwide rice market in the late nineteenth century, there is no doubt that expanded production of rice transformed the Southeast Asian socioeconomic and physical landscape. There had always been regional and long distance trade in rice and other commodities in Southeast Asia. Indeed the commercial revolution of the sixteenth century was largely based on the trade of agricultural products produced for a world market.

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44Bray, *The Rice Economies*, Ch. 2.
45Zelinsky, “The Indochinese Peninsula: A Demographic Anomaly”.
What was different about the late nineteenth century was the seemingly unlimited demand for rice—a product that was labour intensive and produced by peasant households. The enormous demand for rice stimulated production for the market among the traditional community of subsistence farmers, and more importantly led to a massive wave of migration and the settlement of frontier areas. Much of the demand for rice was from within Southeast Asia: the expanding export sector of mines and plantations brought hundreds of thousands of labourers into the region who needed to be fed, and rice was what they wanted. The growth of colonial cities also increased the demand for foodstuffs, particularly rice. But there was also enormous demand from markets worldwide, especially Europe.48

The primary major rice exporting areas were developed in lower Burma, central Siam, and Cochinchina.49 In the Burma Delta, the area under rice cultivation expanded tenfold from the 1850s to the 1930s.50 While the expansion of rice cultivation was most dramatic in these areas, there was a continued settlement of frontier areas throughout Southeast Asia during this period.

Rice production, especially in newly settled frontier areas, was accompanied by faster population growth. Permanent settlements, rather than shifting cultivation, were conducive to more frequent childbearing. Frontiers were also places of available land and new opportunities. The abundant opportunities in frontier areas probably led to a relaxation of constraints on younger age at marriage, which would also have contributed to a higher rate of population growth. And a more stable food supply probably provided sufficient nutrition to keep mortality within normal bounds. The expansion into frontier areas and the creation of additional zones of wet rice cultivation were the conditions that fostered for the demographic expansion during the nineteenth and early twentieth centuries. These frontier areas fed not only the growing working classes of the cities and the labour force producing commodities for export, but also allowed for a significant demographic expansion of the peasant populations with the expansion of wet rice cultivation.

Over the decades of the late nineteenth century and the first half of the twentieth century, the rice growing frontiers with (relatively) low population densities became regions with increasingly dense population. If the above interpretation is generally correct, then the incentives to faster population growth with very young marriage and high levels of fertility should have gradually decreased over the century as agricultural population density increased. This hypothesis remains to be tested.

**Trends and Patterns of Mortality Decline**

The greatest human achievement of the twentieth century is the control of mortality. Life expectancy is over 60 years in every Southeast Asian country with the exceptions of Laos, Cambodia, and Burma/Myanmar. The statistics, however, do not convey the human drama of the accomplishment. In much of Southeast Asia, it is now common for both husbands and wives to survive until the end of their reproductive period. Most parents can reasonably expect to live to see their grandchildren. Neither of these

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48Coclanis, “Southeast Asia’s Incorporation into the World Rice Market: A Revisionist View”.
49Bray, The Rice Economies, pp. 43, 95.
50Adas, The Burma Delta, p. 22.
outcomes were experienced by the majority of the population in any country in the world at the turn of the century. Around 1900, life expectancy was in the range of 45 to 50 years in most Western countries.\footnote{Judah Matras, Introduction to Population: A Sociological Approach (Englewood Cliffs, NJ: Prentice Hall, 1977), p. 133.} Life expectancy was probably lower in Southeast Asia although historical data on mortality levels in the region are too poor to document this point.\footnote{An excellent survey of the state of knowledge on historical patterns of mortality in Southeast Asia is presented in Norman G. Owen, "Toward a History of Health in Southeast Asia", in Death and Disease in Southeast Asia: Explorations in Social, Medical, and Demographic History, ed. Norman G. Owen (Singapore: Oxford University Press, 1987), pp. 3-30.} The gap in longevity between developed and developing countries probably widened during the first half of the century (with improvements in health and reductions in mortality occurring sooner in the West than in Asia). However, there is no doubt that international differences in mortality have narrowed dramatically in the second half of the century.

For the decades prior to 1950, there are very few sources for the systematic study of mortality levels and trends in Southeast Asia. Registration of births and deaths, the backbone of mortality measurement in developed countries, remains incomplete in most Southeast Asian countries with the exceptions of Singapore and Malaysia, although innovative methods of indirect demographic estimation based on survey and census data have yielded a substantial body of estimates of Southeast Asian mortality for recent decades. These estimates are imprecise for detecting small differences, particularly at low levels of mortality. For this reason, some of the estimates of regional variations and trends in mortality appear to be inconsistent. In spite of these measurement problems, our knowledge of recent trends in Southeast Asian mortality is much better than it was for earlier times.

In another important development, historians and demographers are beginning to sift through parish records and other archival sources to study historical patterns of Southeast Asian mortality.\footnote{Peter C. Smith, "Crisis Mortality in the Nineteenth Century Philippines: Data from Parish Records", Journal of Asian Studies 38 (1978): 51-76; Peter C. Smith and Ng Shui-Meng, "The Components of Population Change in Nineteenth Century Southeast Asia: Village Data from the Philippines", Population Studies 36 (1982): 237-55; Norman Owen (ed.), Death and Disease in Southeast Asia; Norman Owen, "The Paradox of Nineteenth-Century Population Growth in Southeast Asia".} Although this literature is just beginning to emerge, there is considerable promise that fine grained historical studies of health and mortality will provide an important new vista for studies of Southeast Asian social history.

There are few clear generalizations about levels and trends in morbidity and mortality for the early decades of the twentieth century. Population growth seems to have been exceptionally high — around one to two per cent per year — in most of Southeast Asia for the last half of the nineteenth century.\footnote{Norman Owen, "The Paradox of Nineteenth-Century Population Growth in Southeast Asia".} This would seem to imply a moderate level of mortality or at least that episodes of very high mortality were relatively rare. However, several accounts point in the opposite direction. In a compelling argument, Peper finds little evidence to support the thesis that levels of living or health services had improved enough to substantially reduce mortality.\footnote{Bram Peper, "Population Growth in Java in the Nineteenth Century"; a similar interpretation is given in Widjojo Nitisastro, Population Trends in Indonesia.} Smith observed a
rising frequency of episodes of crisis mortality in the late nineteenth century in the Philippines and concluded that the diffusion of disease from increased trade and a general deterioration of peasant livelihoods (due to the commercialization of peasant agriculture) were the primary reasons for the outbreaks of higher mortality.\textsuperscript{56}

Nonetheless, I suggest that a reasonable case can be made that mortality levels stabilized at moderately high levels in the late nineteenth and early twentieth centuries. A crude birth rate of 40–45 (moderately high) combined with a crude death rate of 20–25 would still yield a very rapid annual growth rate of about two per cent per year. This interpretation does not require an assumption of declining mortality, only that periods of exceptionally high mortality ("crisis mortality") were relatively rare. Frequent periods of crisis mortality would have reduced the overall population growth rate below the one to two per cent level. The validity of this thesis depends on the argument that the colonial era fostered conditions that stabilized mortality levels.

As noted earlier, the major premise of this argument is that colonial rule reduced the level of local warfare among Southeast Asian powers.\textsuperscript{57} There are good reasons to expect that the frequent warfare that prevailed in premodern Southeast Asia was not especially deadly. The objective of traditional Southeast Asian warfare was to capture manpower, not land, so the mass killing of enemy forces would have been counterproductive. Moreover, a strategy of massive battle casualties would also have dissipated the forces — the primary source of wealth — of the victor. Frequent warfare during the precolonial era, however, did seriously disrupt food production systems, especially irrigated rice cultivation.\textsuperscript{58} Traditional patterns of warfare may also have discouraged the expansion of agriculture.\textsuperscript{59} The colonial advance did, of course, lead to resistance by indigenous states, but most often the battles and skirmishes were of a relatively short duration and with modest losses.\textsuperscript{60}

The second premise of the argument is that the colonial era saw an expansion of transportation networks and a more secure supply of food for cities. As noted earlier, the demand created by the growing proletarian workforce on plantations and mines and in the cities stimulated an enormous expansion of production of rice and other foodstuffs for the market. The increase in commercial production meant there was a greater potential for market forces to respond to changes in demand caused by poor harvests in local areas — thus easing potential cases of crisis mortality. More efficient markets should also have stimulated production that led to higher levels of consumption and improved levels of nutrition. Again, my interpretation is not that mortality levels were substantially reduced, but that they were stabilized and periods of crisis mortality were dampened.

Even if this interpretation is generally accurate, mortality conditions remained very poor in much of Southeast Asia well into the twentieth century. Visitors to the east coast state of Kelantan on the Malayan Peninsula reported extremely unsanitary areas

\textsuperscript{56}Peter C. Smith, "Crisis Mortality in the Nineteenth Century Philippines: Data from Parish Records".


\textsuperscript{58}Anthony Reid, \textit{Southeast Asia in the Age of Commerce: 1450–1680}, vol. 1, p. 17.


\textsuperscript{60}The Java War of 1825–30 was a clear exception; see Peper, "Population Growth in Java", p. 81.
around village houses and generally unhealthy conditions. Common afflictions included pneumonia, dysentery, malaria, hookworm, yaws, and venereal disease, but the major killers were smallpox and cholera. Both diseases swept through areas on a periodic basis causing substantial mortality. Also, the influenza epidemic of 1918 had a major impact on mortality in Indonesia.

A medical system of hospitals, doctors, and nurses gradually developed in most Southeast Asian countries over the first four decades of the twentieth century. By and large, this was an urban medical system that served a very limited fraction of the population. But there were some public health initiatives that did reach out to rural populations and reduced the spread of endemic diseases.

In every country of Southeast Asia, the years of World War II were ones of extreme economic hardship. Following the difficult years of the Great Depression when the export sector declined, the 1940s saw the complete collapse of the mining and plantation sectors. Labourers from the export enclaves and cities migrated to rural areas to become subsistence farmers. Cash crops, which employed a major fraction of the workforce in many countries, could not be sold to international markets and local incomes plummeted. Imported goods, including medicines, were unavailable. All accounts suggest that mortality rose to record levels during the Japanese occupation of Southeast Asia from 1942 to 1945.

The general pattern for postwar Southeast Asia is one of dramatic declines in mortality, although the national revolutions in Indonesia and Vietnam postponed the process in these countries. Not only was there a recovery of the "normal" economy and improvement of living standards, but public health campaigns and the curative powers of modern medicine were disseminated to every part of the globe. Until the 1930s when sulfa drugs were introduced, the ability of medicine to cure disease was limited to first aid and nursing care. On the heels of sulfa drugs came penicillin and other antibiotics in the late 1940s and 1950s. For the first time in history, a relatively simple procedure — an injection — could make ill people well.

The other postwar development was the spread of massive public health campaigns. DDT spraying in the late 1940s and 1950s helped reduce the incidence of malaria. There were also large-scale programmes to inoculate school children against most of the major childhood endemic diseases. These new innovations were often sponsored by international agencies, but soon became part of national health programmes throughout Southeast Asia.

Some indications of the impact of these programmes on national levels of mortality are shown in Table 2. The top panel presents crude death rates, the middle panel, infant mortality rates, and the bottom panel contains estimates of life expectancy at birth. Most of the historical estimates from the top two panels are culled from the secondary literature. Rates from the most recent periods are based upon United

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61 Nicholas Dodge, "Population Estimates for the Malay Peninsula, with Special Reference to the East Coast States", p. 441.
62 Ibid., p. 442.
63 Hugo, et al., The Demographic Dimension in Indonesian Development, p. 108.
64 Ibid., pp. 108-109.
Nations estimates. Readers cannot necessarily assume the times series from these varied sources are comparable. Some rates are based on direct measures of mortality, while others rely upon various means of indirect estimation. In some cases, a comparison of the United Nations estimates for recent years with independent estimates from prior years suggests a rise in mortality — a most unlikely trend. In general, the figures should be considered as rough approximations and small differences are more likely to reflect problems of measurement than reality.

The bottom panel, which contains measures of life expectancy at birth for each country from 1950-55 to 1990-95, are drawn entirely from United Nations demographic estimates. While the United Nations source assures comparable methods of estimation, the data may contain more detail than is warranted. If the appropriate source data are lacking, the United Nations relies on data from similar countries and uses demographic techniques and interpolation to "create" reasonable estimates. The dates at the head of each column are also approximate; some figures refer to a span of years, while others are for a single year (the dates shown here are those used in the source publications). Note that some sources have data for Peninsular Malaysia and others for Malaysia.

The decline in mortality over the 40-year postwar era has been remarkable. Crude death rates were in the high teens and twenties (Singapore was the exception) in the late 1940s and 1950s. A generation later, most of the Crude Death Rates are in the neighbourhood of 10 per thousand or less, with the exceptions of Burma/Myanmar, Cambodia, and Laos. Because crude rates are influenced by age composition, it is difficult to interpret intercountry or across-time comparisons. Infant mortality rates, presented in the middle panel, are better indicators for comparative purposes. The infant mortality rate is often considered to be the best overall index of health conditions of a population.

Infant mortality shows the same trend from high to low levels for the region as a whole, but there are significant intercountry variations. At one end of the continuum are Singapore and Peninsular Malaysia. In 1950, these British colonies had infant mortality rates of 82 and 102, respectively — meaning that about 90 per cent of babies survived their first year of life. These figures have declined steadily over the last few decades, and the 1990-95 infant mortality rates are 7 and 14. The current level of infant mortality in Thailand is not far behind at 26. These figures compare favourably to most industrial countries and reflect very modern and effective health care systems.

The other Southeast Asian countries have higher levels of infant mortality, but the degree of progress is no less impressive. The earliest figures for Burma/Myanmar and Indonesia indicate an extremely high level of infant mortality — almost one quarter of infants dying before their first birthday. Even if somewhat unreliable, these estimates reveal very poor living standards and health conditions. By the late 1950s, however, significant declines had occurred. The initial values for Thailand and the Philippines were around 100, between the high levels of Indonesia and Burma/Myanmar and the lower levels of Malaysia and Singapore.

Throughout the 1960s and 1970s, infant mortality declined in all the countries with reported data. Some analysts claim that the pace of mortality decline in Asia slowed from 1970 to 1980.66 Without more consistent measurement, it is difficult to evaluate

### TABLE 2
TRENDS IN MORTALITY IN SOUTHEAST ASIA FOR SELECTED YEARS IN THE POSTWAR ERA

**Crude Death Rate (Deaths per 1000 Population)**

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**Infant Mortality Rate (Infant Deaths per 1000 Births)**

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Sources of Crude Death Rates and Infant Mortality Rates:

Sources of Estimates of Life Expectancy:
this hypothesis. In a few cases, the figures for the 1980s and the 1990s (which are based on United Nations estimates) are higher than for the same country in the middle to late 1970s (in particular, note the differences for Burma/Myanmar). This does not necessarily mean that there has been an actual rise in mortality. More likely, the methods of data adjustment and estimation have led to different values. This is another reminder of the imprecision of the figures.

The case of Vietnam contrasts strongly with that of Cambodia and Laos. All three countries suffered from warfare in the 1960s and 1970s and continued political and economic problems. Infant mortality has declined to a very moderate level (IMR = 36 in 1990–95) in Vietnam, but remains very high in the other two Indochina countries. Although these estimates rest on very limited (and probably unreliable) data, there is no doubt that health conditions in Laos and Cambodia are much poorer than in other countries in the region.

The broadest indicator of mortality is shown in the time series, from 1950–55 to 1990–95, of UN estimates of life expectancy at birth in the bottom panel of Table 3. In the first decade after World War II, life expectancy was only 40 years or less in most of Southeast Asia, except for the Philippines, Malaysia, and Thailand where it was in the high 40s, and in Singapore where it hit 60 years. The achievements in preventative health and curative medicine in Southeast Asia (and around the globe) over the next three decades are unprecedented in world history.

Steady progress is evident with gains from 15 to 25 years in life expectancy over the post World War II era. With contemporary levels of life expectancy over 70 years, Malaysia and Singapore have mortality conditions that are comparable to most developed countries, and Thailand is almost at the same level. Only slightly lower on the ladder are the Philippines, Indonesia, and Vietnam with life expectancies in the low to mid-sixties. The relative path of mortality decline of these countries reflects their social and economic history. In the 1950s, Indonesia had one of the shortest lifespans in the region, while the Philippines was in the upper ranks. Only 40 years later, Indonesia has shot up to become one of the more successful countries in the region with moderate levels of mortality. Although the Philippines has made significant absolute progress, her relative gains have been much less that other countries. Burma/Myanmar, and especially Laos and Cambodia, lag far behind, with life expectancies in the 50s in the 1990s.

There have been periodic episodes of crisis mortality in Southeast Asia in recent years due to political factors. The wars in Vietnam, Cambodia, and Laos during the 1960s and 1970s took a major toll of military and civilian casualties. The impact of the Indochina war in the early 1970s, and then of Khmer Rouge regime in Cambodia in the 1970s, is evident in the decline of life expectancy from 45 in the late 1960s to 40 in the early 1970s, and then to 31 in the late 1970s. The excess mortality in Cambodia during the Khmer Rouge era from 1975–78 was estimated to be over one million.67 Mortality levels in Cambodia have recovered to more modest levels in the 1980s and 1990s, but remain much higher than those of other countries in the region.

The numbers of deaths caused by the mass killings in Java and Bali in late 1965 and the struggle of East Timor in the mid-1970s have never been satisfactorily

67Ea, “Kampuchea: A Country Adrift”. 
documented, but estimates range in the hundreds of thousands. Based upon a very small household survey conducted in Vietnam in 1991, I have attempted to estimate the number of war deaths during the “American war” in Vietnam from 1965 to 1975. The results show that war deaths (military and civilian casualties) raised mortality rates of all demographic groups from 1965 to 1975, but the greatest impact was on the mortality of young men (age 15–29) who were more than six times as likely to die from war than from natural causes.

Data on sex differentials in life expectancy (data reported in the UN volume, but not shown here), show that females have lower mortality rates than men at all ages in every country in the region. While some fraction of the female advantage in longevity is certainly biological, a considerable fraction of the difference in every society reflects gender differences in behaviour and environmental influences. The single most important behavioural factor for male-female differences in mortality in most societies is smoking.

**Trends and Patterns of Fertility Decline**

There are few direct measures of Southeast Asian fertility before the last few decades. The reality of high mortality for most of history meant that high levels of childbearing were a functional necessity for the biological continuity of any population. But how high was high? And were there systematic variations over time or space? Demographic theory suggests that most preindustrial populations were conditioned to maintain a loose homeostatic balance of demographic size within the productive capacity of the environment, social organization, and the prevailing technology of food production. In most cases, mortality is thought to have been the equilibrating mechanism, but restrictions on fertility may have also been important.

There is considerable debate among demographers on whether childbearing is consciously regulated in preindustrial populations. There is general consensus, however, that all populations limit fertility by a variety of social mechanisms that are culturally sanctioned. Cultural norms about age at marriage, divorce, remarriage after widowhood or divorce, duration of breastfeeding, periods of sexual abstinence, and spousal separation are part of the cultural repertoire of keeping fertility at moderate levels in high fertility societies. In preindustrial Europe, delayed marriage and celibacy emerged as social mechanisms to constrain the potential growth of populations.

In Southeast Asia, youthful marriage seems to have been universal (or almost so). Women did not necessarily marry at puberty, but the typical range was probably between 15 and 21 years. Other cultural patterns, including frequent divorce in the Malay world and Java and long breast-feeding patterns, may have reduced fertility to

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70Reid, *Southeast Asia in an Age of Commerce*, vol. 1, p. 160.
moderate levels. Reid observes that venereal disease (which may lead to sterility) and abortion may have reduced potential fertility. Systematic data on fertility were not collected in Southeast Asia until questions on children-ever-born first appeared in censuses and surveys conducted in the 1940s and 1950s. Data for the oldest women in these censuses and surveys — whose childbearing was most distant in the past — offer some measures of traditional fertility levels. Older women, however, are somewhat prone to understate their total number of live births because children who died early in infancy or were given up for adoption are not always reported. Another problem is that the 1930s and 1940s may well have been a period of lower than "normal" fertility because of the Great Depression and World War II. Nonetheless, the available figures offer some measure of traditional fertility levels.

Women, age 49 and older, in a 1952 survey of four towns in Burma/Myanmar, had an average of 6.1 births. The earliest fertility surveys in Thailand reported a cumulative fertility measure of almost 7 births per woman. A much lower figure of about 4.3-4.5 births per woman was reported by older Malay women in the 1947 census of colonial Malaya. Smith estimates a crude birth rate in the high forties to low fifties for the Philippines around the turn of the century. These data show that traditional fertility in Southeast Asia varied considerably from region to region, and in general, to be moderately high, well below the potential levels of high fertility. As mentioned earlier, these variations may well have been associated with population density and other socioeconomic conditions.

Over the course of the twentieth century, demographic pressure built up in many Southeast Asian rural communities with annual growth rates of one to two per cent. Migration to cities or frontier agricultural areas was a frequent response. The declines of infant mortality in the 1950s and 1960s surely exacerbated population pressure in many rural areas as growth rates exceeded two per cent per year. The absorptive capacity of many rural areas was limited and the prospect of diminished per capita production (as land and other resources remained fixed) must have been seen as a growing possibility. Under these conditions, the birth control movement and national family planning programmes of the 1960s and 1970s encountered generally receptive audiences.

The international family planning movement of the 1960s was stimulated by the rapid rates of population growth in developing countries following World War II.

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72Ibid., p. 101; also see Reid, “Economic and Social Change, c. 1400-1800”.


Initially led by voluntary family planning associations and private foundations, the movement soon became a major priority of national governments and the United Nations. In several countries of the region, most notably, Singapore, Malaysia, Thailand, and Indonesia, socioeconomic conditions and family planning programmes have combined to lead to very rapid declines of fertility in the 1970s and 1980s. Fertility declines in Southeast Asia actually predated the onset of family programmes, but the pace of decline seems to have accelerated as family planning programmes expanded access to efficient and inexpensive contraceptive technology.

Table 3 shows the trend in two fertility measures from the 1950s to the early 1990s. The most recent estimates for 1985–89 and 1990–94 in Table 3 are taken from United Nations sources. Some of the figures are interpolations or projections based on the most recently available data. The crude birth rate is the measure available for the longest span of years. Total fertility rates (TFR), a more precise measure of fertility, are available in most countries from the 1950s to the 1990s. The total fertility rate is unaffected by age composition and is therefore a better indicator for comparisons across countries and over time. TFRs also have an intuitive interpretation. The TFR sums up the childbearing rates for every age group of women in a single calendar year and can be understood as the total number of children the average woman would have if all of her childbearing occurred in that year. It is a synthetic cohort measure in the same way that the expectation of life indicator mimics a lifetime experience according to the age specific mortality rates in a single year.

Fertility, as indexed by crude birth rates, remained high during the 1950s throughout Southeast Asia. The reported values for Burma/Myanmar show a decline from the early to the late 1950s, but I suspect measurement differences rather than behaviour accounts for this apparent trend (note the apparent rise in the 1960s). Most crude birth rates were in the low to mid-40s which were fairly typical of fertility in the developing world for this period. There may well have been some modern groups of the population with lower fertility, but the size of such groups was too small to have much effect on the overall level of fertility.

The 1960 values show modest, but measurable declines in the CBRs of Singapore and Peninsular Malaysia. Over the course of the 1960s, there were glimmers of incipient fertility declines in several countries. Other studies have shown these initial declines were occurring in cities and among more highly educated segments of the population. With the exception of Singapore, however, an examination in the late 1960s would have concluded that fertility remained high throughout Southeast Asia. Looking at the TFRs of the late 1960s, only Burma/Myanmar and Indonesia were below six births per woman (excluding the leading case of Singapore).

The 1970s, however, showed the emergence of real and sustained fertility declines in every country in the region. By the late 1970s and early 1980s, CBRs were in the


### TABLE 3
TRENDS IN FERTILITY IN SOUTHEAST ASIA FOR SELECTED YEARS IN THE POSTWAR ERA

**Crude Birth Rate (Births per 1000 Population)**

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**Total Fertility Rate (Period Measure of Total Births per Woman)**

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TABLE 3 (cont'd)

low thirties or below. Total fertility rates had dropped 1 or 2 births per woman in almost every country.

Several cases deserve special attention. Even granting Singapore’s special case as a city-state, its total fertility rate of 1.7 to 1.8 by the 1980s is remarkable. A TFR below 2.0 is considered below replacement level fertility because it indicates the long-term prospect of a declining population if couples do not have two children to replace themselves in the next generation. Within Singapore, all three ethnic groups — Malays, Chinese, and Indians — have below replacement level fertility.79

Of the large countries with a majority still in the rural areas, Thailand’s experience has been the most phenomenal. Within twenty years, Thai fertility has dropped from more than 6 births per woman to less than 3. A study based on the 1990 Census of Thailand reports that below-replacement level fertility was reached in Thailand in the late 1980s.80 In their excellent study, Knodel, Chamratrithirong, and Debavalya81 emphasize the unique factors of the Thai case: a favourable cultural context (Buddhism, relatively high female autonomy), an effective family planning programme, and socioeconomic changes that raised the costs of childrearing. Without denying the importance of any of these factors for Thailand, it seems that other countries in Southeast Asia are only a step or two behind Thailand.82

Peninsular Malaysia’s fertility has also experienced an exceptional decline in recent years. The fertility of Malaysian Chinese and Indians is comparable to that of Thailand, and the Malay community also shows a substantial decline.83 Perhaps most remarkable are the recent data from Indonesia. Indonesia’s initial level of fertility was lower than most of the other countries in the 1950s and 1960s. Significant declines first became evident in Bali and east Java in the early 1970s, but modest changes were evident in almost all regions.84 Recent data show a drop in the national TFR from 4.1 in the early 1980s to 3.1 in early 1990s.85 This indicates a significant acceleration in the pace of the Indonesian fertility decline during the 1980s.

81Knodel, et al., Thailand’s Reproductive Revolution.
The United Nations estimates show that Burma/Myanmar, Vietnam, and Cambodia, but not Laos, have shared in the trend toward lower fertility over the last two decades, but a paucity of data and lack of in-depth analyses make it harder to judge the accuracy of these figures and interpret these patterns. In the last few years, there have been several studies of fertility in Vietnam that have confirmed the trend in lowered fertility over the last two decades. If current patterns continue, I believe that most of Southeast Asia will have replacement level fertility by the end of the century. This would be an exceedingly rapid rate of decline, but entirely consistent with the patterns of the past two decades.

**Population and Social Change**

Two major questions, each with several parts, confront the student of demographic change in twentieth century Southeast Asia. First, why did Southeast Asia's population grow from 80 million in 1900 to 530 million in the year 2000? Second, what difference has it made for Southeast Asian development to have experienced two per cent annual growth rates (or higher) for the better part of the century? For the first question, we have data on several aspects of the empirical puzzle, although some of the key pieces are missing. The second question is not really answerable, except in a speculative way, for the counterfactual is intertwined with all of the other social and economic changes of the century. But, by examination of demographic variation within Southeast Asia and through comparison with other parts of the world, it is possible to present some informed speculation on the consequences of population size and growth.

In the introduction, I contrasted the 60 per cent expansion of the European population with the 600 per cent growth for Southeast Asia for the one hundred years from 1900 to 2000. This comparison is not just about two parts of the world, one with slow demographic growth and the other with rapid growth. The countries of Europe and Southeast Asia have been closely linked throughout the century, particularly during the first half, through colonialism, wars, and economic exchange. The social, political, and economic aspects of these relationships are central to the differences in demographic trajectories of the two World regions over the century.

There are two elements of high mortality regimes that are relevant to our discussion. One is the steady level of high mortality caused by endemic disease, poor sanitation, and an undernourished population. Even with such dire conditions, populations often continue to grow with a positive balance of births over deaths, if fertility is maintained at the high level normally found in preindustrial agricultural populations. In fact, population growth of one per cent or higher per year might well be normal under such circumstances. The other aspect of high mortality is periodic bouts of crisis mortality caused by epidemics, famines, and wars. These occasions, when deaths exceed births, are periods of population decline when the growth of previous years,
decades, or even centuries, is lost. Owing to the combination of normal high mortality and episodes of crisis mortality, the long-term demographic growth rate of mankind has oscillated around zero.

In the nineteenth and twentieth centuries, the mortality levels of both Europe and Southeast Asia were in the process of change. In both Europe and Southeast Asia, there was a reduction in the frequency of crisis mortality episodes (the 1944-45 famine in Vietnam was the single major exception). In Europe, economic growth and modernization began to produce to lower levels of "normal" mortality as well through improved levels of nutrition, urban sanitation, and some aspects of better health care. Even without a reduction in "normal" mortality in Southeast Asia (and the available evidence suggests little reduction), the decline in the frequency of crisis mortality episodes seems to have sparked an era of fairly rapid population growth beginning in the nineteenth century and continuing throughout the twentieth.

The reason that rapid population growth continued (even with crude death rates of 20 to 25) was that fertility remained high throughout Southeast Asia until the 1960s. Here is where the contrast with Europe becomes very instructive. In mid-nineteenth-century Europe, before fertility levels began to decline, European fertility was only moderately high with crude birth rates in the low to middle thirties, considerably below Southeast Asia's fertility of the 1950s. Then, as mortality was declining in Europe in the late nineteenth and early twentieth centuries, fertility also began to decline, reaching replacement levels in many countries by the 1930s. Even though European population growth continued, it was at very moderate levels — witness the moderate expansion of only 60 per cent for the century.

In Southeast Asia, fertility levels remained high for another 50 to 70 years. Why? The answer, noted a generation ago by Irene Taeuber, was "the natural dynamics of colonialism ... lowered mortality (but) perpetuated high fertility. Colonial policy did not favor the industrialization, urbanization, and advancing education that were associated historically with declining fertility among Western peoples.... In so far as the partial diffusion of the Western economy and society influenced the fertility of the East it tended toward increase rather than decrease." The colonial order tended to reinforce traditional society as the ideal for the rural peasantry. It was not just colonial ideology, but colonial policies that stifled socioeconomic change and modernization. Only a small minority of the population in colonial Southeast Asia were able to obtain more than primary level schooling and to participate in the modern urban economy. The net result was that modern incentives for smaller families did not reach the bulk of the population. The opportunities for innovation in the rural sector — movement to the frontier or planting cash crops — were labour intensive activities that reinforced the family economy. More children meant more family labour and potentially more income. In spite of 50 to 100 years

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of continued population growth, high fertility was a rational response to the circum-
stances prevailing until the end of colonialism in the post-World War II era.

The rapidity of the decline of fertility from the 1960s to the 1980s is due to a
number of factors, including the population pressure created by reduced infant and
child mortality from the 1950s onwards. Even within the context of the rural family
economy, there might well have been a slow demographic response of lower fertility
as the limits of land and production were strained by families of 4 to 6 surviving
children. But the fertility declines were accelerated by the forces of modernization:
mass education, growing consumer aspirations, and prospects for modern sector em-
ployment also contributed to a weakening of incentives for large families. The costs
of children were felt and had to be weighed against alternatives. The availability of
family planning programmes were another factor that combined with these structural
incentives to bring fertility down more rapidly than almost everyone expected.89

The consequences of population growth on society are more difficult to assess. The
Malthusian image of a race between population on the one hand and food, resources,
and living space on the other, is a misleading perspective from which to judge the
impact of population numbers and growth on the social fabric. More often, the impact
of population growth is embedded in the conflicts between resources, obligations, and
aspirations. These can be examined at the household and societal levels. Throughout
most of Southeast Asian history, the primary population problem has been one of a
labour shortage. The high levels of “normal” mortality meant that many households
and small settlements were perpetually at risk of losing the minimum supply of labour
necessary to maintain their subsistence economy. Traditional local elites always needed
more manpower to wage war or produce a greater economic surplus. Colonial ad-
ministrators expended great effort to import (cheap) labour to work in the export sec-
tor industries.

When the opposite circumstances prevailed, i.e., too many mouths to feed or not
enough land available for numerous progeny, migration was the typical path of least
resistance. As the nineteenth century progressed and communities had the potential
to double their size in 35 years to 70 years (based on assumptions of annual growth
rates of two per cent and one per cent, respectively), movement to frontier areas became
a more common pattern. These developments were not confined to Southeast Asia.
Major streams of international migration are one of the dominant worldwide patterns
of the late nineteenth and early twentieth centuries. Earlier in this paper, I suggested
that the creation of new zones of wet rice production in lower Burma, central Siam,
and Cochin China was a response to the growing demand for rice. The settlement of
these areas would not have been possible without the availability of “surplus” labour
from already densely settled areas that were strained by continued population growth.

While migration was one response, it was not an option that was available or attrac-
tive to many peasants. The relatively elastic productive limits of wet rice agriculture
meant that additional labour could be used to more carefully prepare the fields, main-
tain the irrigation system, weed the fields, and carefully harvest each rice stalk.90 In

89Knodel, et al., Thailand’s Reproductive Revolution.
90Clifford Geertz, Agricultural Involution; Anne Booth, “Accommodating a Growing Population in
such an environment, infinite subdivision of plots of land and multiple job holding in the off-season are common strategies to maintain a minimal standard of survival. Densely settled communities also seem to have lower fertility than sparsely settled areas or transitional frontier areas. Central and east Java, and the rice bowl of Kedah and Perlis, have historically had low fertility. It may not be conscious family planning, but rather patterns of high divorce, long breastfeeding, or sexual abstinence that are the social mechanisms that restrain population growth in such circumstances. More detailed research is needed to explain how these processes evolved and were reinforced by cultural traditions.

The consequences of population growth should be strongest for the post-World War II era. During the last 30 to 40 years, growth rates have regularly exceeded two per cent and sometimes three per cent per year. Yet it is difficult to point to specific outcomes that are unambiguously a response to population pressure at the household or community level. Pressures on the absorptive capacity of schools and labour markets have surely been strained. The increase of the "underemployed" (those without productive economic roles or in marginal employment) is due, at least to some degree, to the increasing numbers of youth reaching adulthood over the last 15 to 25 years.91 Part of the problem of identifying clear-cut consequences is that demographic pressures are intertwined with societal patterns of social and economic change. A slightly higher degree of poverty may be endured with 6 children rather than with 4 children, but most individuals and families find ways to cope and endure in any circumstance.

Perhaps the most visible demographic response over the last two decades has been the rapid declines in fertility throughout the region. In societies where there are no cultural barriers to family planning and contraceptives are widely available (e.g., Thailand), fertility has dropped from high (6-7 children per woman) to low (two children per woman) levels in a single generation. With similar demographic and economic pressures in other societies, I suspect that fertility patterns in the entire region are following a similar path. An important mechanism for lowered fertility has been the postponement of marriage. Higher levels of educational attainment and labour force participation by women have caused a dramatic rise in the average age at marriage in Malaysia and other countries in the region. These changes may well lead to an increase in celibacy in societies where universal marriage was deeply etched in local cultures.

Demographic change and social change are deeply intertwined. The impact of wars, crises, and economic transformations often leave their footprints on historical trends and patterns of mortality, fertility, marriage, and other demographic processes. In turn, demographic factors, including rapid population growth or decline, population density, and population structure have collective consequences on social, political, and economic outcomes. The exceedingly dramatic history of Southeast Asia over the twentieth century represents a most propitious arena to study these questions.

91Hugo, et al., The Demographic Dimension in Indonesian Development, chap. 8.