

# Results of the 1998 Population Census in Cambodia

*The first population census in Cambodia since 1962 identifies many distinctive features of that country's population and provides needed data for social and economic planning*

**By Jerrold W. Huguet, Aphichat Chamrathirong,  
Nott Rama Rao and San Sy Than\***

The population census conducted in Cambodia in March 1998 was the first since 1962. During the 36-year interval, comprehensive population data needed for social and economic planning had been lacking.

No nationwide count of the population took place during the 1970s because of civil strife and disruption. An administrative count of the

---

\* Jerrold W. Huguet, Chief, Population and Development Section, Population and Rural and Urban Development Division, ESCAP; Aphichat Chamrathirong, Adviser on Population Census and Survey Data Analysis, United Nations Population Fund, Country Technical Services Team for East and South-East Asia; Nott Rama Rao, Chief Technical Adviser for Census and Survey, National Institute of Statistics, Cambodia, and San Sy Than, Director, National Institute of Statistics, Cambodia.

population was carried out in 1980 by the Government of the People's Republic of Kampuchea, formed following the Khmer Rouge regime. That count enumerated the population by sex and age group, but not by any other characteristic (Huguet, 1991).

After 1980, the first data on economic and social characteristics of the population were provided by the Socio-Economic Survey of Cambodia, 1993/1994 (National Institute of Statistics, 1995). That survey yielded valuable estimates for the country as a whole, Phnom Penh, other urban areas, and rural areas, but not for individual provinces or lower administrative levels.

In preparation for the 1998 population census, the National Institute of Statistics conducted the Demographic Survey of Cambodia in March 1996, which covered about 20,000 households (National Institute of Statistics, 1996). Among other social indicators, the Survey enabled estimates of fertility and mortality to be made at the national level. Survey data were presented only for the country as a whole and rural and urban areas.

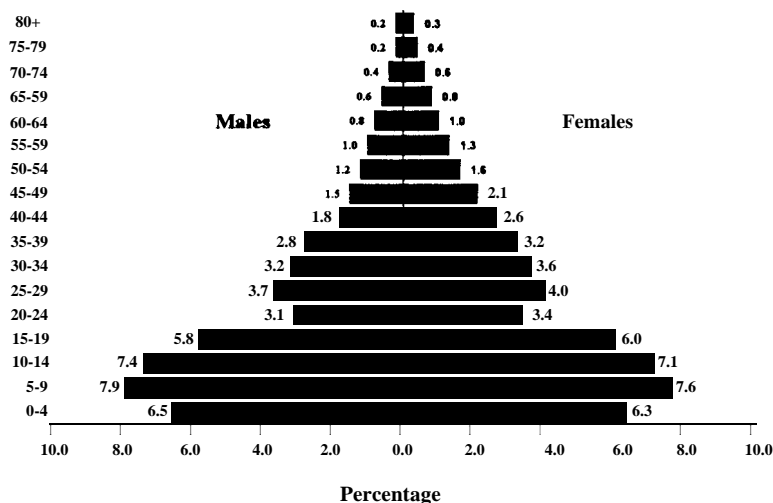
The national population total of 10.7 million persons estimated by the Demographic Survey of Cambodia in March 1996 was roughly consistent with the population count of 6.6 million at the end of 1980, with plausible assumptions regarding mortality and international migration (Huguet, 1997).

### **Population size and structure**

The census was conducted with the reference date of 2 March 1998. It enumerated a total of 11,437,656 persons. A post-enumeration survey (PES) was carried out soon after the census in 100 enumeration areas in order to estimate the completeness of coverage and the accuracy of reporting on some census questions. The PES estimated that there was a net undercount of 1.78 per cent of the population by the census (National Institute of Statistics, 1999b).

In addition to this undercount, there were some villages and districts in the provinces of Odar Mean Chey, Banteay Mean Chey, Battambang and Pursat that were not enumerated for security reasons. The National Institute of Statistics estimated that the population of these areas combined equalled 45,000. At the time of the census, there were 60,000 Cambodians temporarily displaced to camps in Thailand and they were properly not included in the census. As they all returned to Cambodia later in 1998, however, they may be considered to be part of the population of the country.

**Figure 1. Population of Cambodia by sex and age, March 1998**



*Source: National Institute of Statistics, General Population Census of Cambodia 1998 – Final Census Results (Phnom Penh, 1999), p.11.*

When the census population is presented by sex and five-year age groups, as in [figure 1](#), three distinctive features are apparent. First, there is a deficit of adults because of excess mortality from civil strife during the 1970s. Second, there is a particular deficit of males among the adult population. Third, a high proportion of the population is under age 20 because of the baby boom that began in 1980.

Heuveline (1998) carried out a detailed exercise to attempt to estimate the level of excess mortality (that above what would have been expected had Cambodia not been subject to civil war, the Khmer Rouge regime and famine). His medium estimate is that there were 2.52 million excess deaths from 1970 through 1979, of which 1.4 million were estimated to be violent deaths. He provides what he considers to be a minimum estimate of 1.17 million and a maximum estimate of 3.42 million excess deaths, but these are derived by combining extreme assumptions and the author believes the medium estimates are more plausible.

The disruptions of the 1970s have had a continuing impact on the Cambodian population not only because of excess mortality, but also

**Table 1. Population of Cambodia by sex and five-year age group, and sex ratios, March 1998**

Age group	Both sexes	Males	Females	Sex ratio
Total	11,437,656	5,511,408	5,926,248	93.0
0-4	1,466,792	747,292	719,500	103.9
5-9	1,772,820	903,976	868,844	104.0
10-14	1,658,196	851,139	807,057	105.5
15-19	1,344,258	664,184	680,074	97.7
20-24	745,687	354,100	391,587	90.4
25-29	888,540	426,968	461,572	92.5
30-34	782,682	370,090	412,592	89.7
35-39	695,868	325,331	370,537	87.8
40-44	497,067	199,722	297,345	67.2
45-49	415,931	175,052	240,879	72.7
50-54	312,463	132,413	180,050	73.5
55-59	256,930	110,189	146,741	75.1
60-64	204,994	86,602	118,392	73.1
65-69	166,928	70,660	96,268	73.4
70-74	112,213	46,769	65,444	71.5
75+	116,287	46,921	69,366	67.6

*Source: 1998 population census of Cambodia.*

because of low levels of fertility. The age group 20-24 years shown in [figure 1](#) is clearly much smaller than the next older and younger age groups. These persons were born between 1973 and 1978 when there were extensive dislocations of the population because of civil war, the bombing campaign by the United States of America, and the Khmer Rouge regime.

The sex ratios by age presented in [table 1](#) demonstrate that excess mortality during the 1970s affected males more than females. The sex ratio in the population as a whole in 1998 was only 93.0 males per 100 females. This is even lower than the sex ratio of 94.2 recorded by the 1989 population census of Viet Nam, a country that had fought wars of independence and reunification during the periods 1945-1954 and 1960-1975 (Viet Nam, Central Census Steering Committee, 1991). The sex ratio recorded in Cambodia in 1998 was much lower among the adult population. Among persons aged 20 years and older, the sex ratio was 82.3 and among those aged 60 years and older it was only 71.8.

A baby boom occurred in Cambodia during the 1980s, with a return to relatively stable political and social conditions. By projecting the population

**Table 2. Headship rates in Cambodia by sex and age**

Age group	Males	Females
Age 10 and older	41.6	12.8
10-14	0.1	0.2
15-19	1.8	1.5
20-24	25.1	5.8
25-29	56.4	10.2
30-34	73.0	14.5
35-39	81.4	18.8
40-44	85.9	23.4
45-49	88.8	28.3
50-54	89.9	32.8
55-59	89.5	34.8
60-64	85.8	33.9
65-69	79.2	30.2
70-74	67.2	25.1
75 and older	47.3	17.1

*Source:* Calculated from tables B1 and B11 from the 1998 population census of Cambodia.

*Note:* Excludes institutional, homeless, boat and transient households.

estimated by the Demographic Survey of Cambodia in 1996 backwards, Huguot (1997) estimated that the crude birth rate (CBR) between 1980 and 1985 was 52.4 births per thousand population and between 1985 and 1990 the CBR was 46.0. The 1998 population census recorded that 53 per cent of the population was age 18 and younger. In fact, the proportion age 18 and younger is somewhat greater than this. The age group 0-4 in [figure 1](#) appears to be considerably smaller than that of the age group 5-9, but that is largely because of underenumeration of young children, especially those aged 0-2. When the 0-4 age group is adjusted for underenumeration, as described in the section below on projections, it is slightly larger than the 5-9 age group.

The census recorded that 25.7 per cent of households were headed by women (National Institute of Statistics, 1999a). This is a high proportion, but not unprecedented. According to the 1989 population census of Viet Nam, 31.9 per cent of the households in that country were headed by women (Viet Nam, General Statistical Office, 1991). The Cambodian census was conducted on a *de facto* basis, counting people in a household only if they were present on the reference night. This approach could have

exaggerated the number of female heads of household somewhat. If a male head were away temporarily, as for work or business, his wife would usually have been reported as the head of household. By way of comparison, the Socio-Economic Survey of Cambodia of 1993/1994 was conducted on a *de jure* basis and found that 21.2 per cent of households were female-headed (National Institute of Statistics, 1995).

Headship rates (the percentage of a given population who are head of their household) by sex and age group are shown in [table 2](#). Between the ages of 35 and 64, well over 80 per cent of males are head of their household. From the age group 25-29 upward, over 10 per cent of females are head of their household. About a quarter of women aged 40-49 years are heads of household as are about one third of those between the ages of 50 and 69. The relatively high level of headship among women in Cambodia is largely a consequence of the deficit in adult males, as female headship rates parallel rates of widowhood up to age 60.

### Nuptiality

The deficit of males compared with females in the adult population means that the proportion of adult males who are currently married is higher than for adult females, whereas the proportion of females widowed greatly exceeds that of males. Among the population aged 30-59 years, 95 per cent of males, but only 76 per cent of females, are currently married. The disparity is much greater among older persons. Among those aged 60 years and older, 83 per cent of males and 43 per cent of females are currently married.

Conversely, women are much more likely than men to be widowed. Among the population aged 30-59 years, only 1 per cent of men but 12 per cent of women are widowed. Widowhood rises with age so that 28 per cent of women aged 50-59 years are widows. Among persons at least 60 years of age, 12 per cent of men but 48 per cent of women are widowed. Thus, women who are over 60 years old are more likely to be widowed than to be currently married. The likelihood of being divorced is also much greater among women than men, implying that divorced men are more likely to remarry or to be deceased.

There are no direct measures of the age at marriage in Cambodia, but the singulate mean age at marriage (SMAM) may be estimated from census data. SMAM is an estimate of the number of years spent in the single state based on the proportion ever-married reported by age group in the census.

**Table 3. Reported number per woman of children ever born and children born in the 12 months prior to the census, and adjusted age-specific fertility rates, by age group of women, Cambodia, March 1998**

Age group	Average number of children ever born	Average number of children born in the 12 months prior to the census	Adjusted age-specific fertility rates
15-19	0.104	0.0238	0.0466
20-24	0.873	0.1395	0.2244
25-29	1.960	0.1715	0.2596
30-34	3.165	0.1565	0.2314
35-39	4.377	0.1202	0.1753
40-44	5.129	0.0683	0.0942
45-49	5.565	0.0232	0.0281
Implied total fertility rate	5.600	3.520	5.300

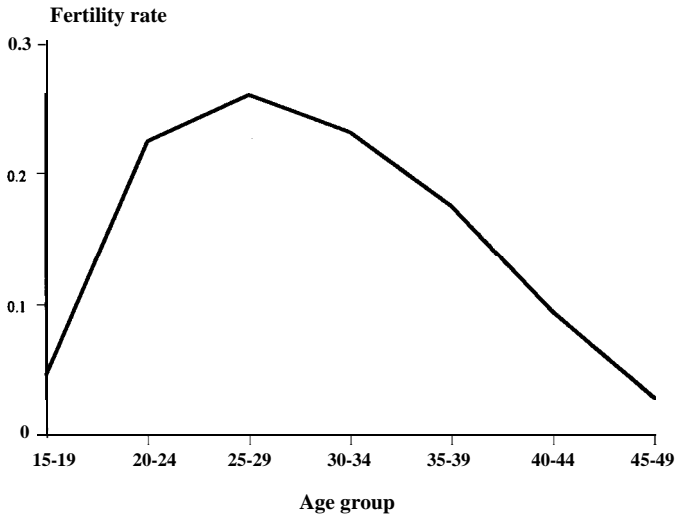
*Source: National Institute of Statistics, General Population Census of Cambodia 1998: Analysis of Census Results, Report 1, Fertility and Mortality (Phnom Penh, 1999), p. 8.*

In Cambodia, SMAM is 24.2 years for males and 22.5 years for females, based on the 1998 census. These estimates are distinctive for the relatively late age at marriage among females and the small difference in age at marriage between men and women. Both of these findings may reflect a current “marriage squeeze” affecting the potential for marriage among young women in Cambodia. The 1998 census enumerated 630,063 women aged 16-20 years, but only 438,706 men aged two years older, or 18-22 (the average difference in age at marriage between men and women is 1.7 years). Thus, for every 100 of these young women who may be contemplating marriage there are only 70 men of the appropriate age group. This marriage squeeze may be causing women to marry later than they would wish and to marry men closer to their own age than would normally be the case. The marriage squeeze will ease for women who were under 16 years of age in 1998, so that there is a potential for the age at marriage of women to decline in the near future (National Institute of Statistics, 2000a).

### Fertility

The census recorded the number of children ever born for all women aged 15 years and older. The average number of children ever born increases rapidly with age of women. Those aged 45-49 years had borne an average of 5.56 children each (table 3).

**Figure 2. Estimated age-specific fertility rates for Cambodia, March 1998**



*Source: National Institute of Statistics, General Population Census of Cambodia 1998: Analysis of Census Results, Report 1. Fertility and Mortality (Phnom Penh, 1999), p. 8.*

The census also recorded the number of children born in the 12 months prior to the date of the census, by age of mother at the time of the census. The age-specific fertility rates (ASFR) and the total fertility rate (TFR) implied by the reported number of births in the previous 12 months are also shown in [table 3](#). The direct measure of the TFR equaled 3.52 children per woman. This figure is lower than recorded by recent surveys, including the Demographic Survey of Cambodia 1996 (Huguet, 1997) and does not appear to be consistent with the contraceptive prevalence rate for modern methods of 21 per cent reported by the National Health Survey 1998 (Ministry of Health, 1999).

It is common for the number of births in the previous 12 months to be under-reported by censuses and surveys and indirect techniques of estimating the true level of fertility have been developed. In these techniques, the birth rates derived from the reported number of births in the previous 12 months are adjusted to be consistent with the reported number of children ever born. A key assumption in making such an adjustment is that fertility has not been changing. The 1998 census recorded



a higher average number of children ever born for each age group of women than did the Demographic Survey of Cambodia 1996, with the largest proportional increases reported for the younger age groups. Thus, there is no evidence that fertility has declined in the very recent past in Cambodia.

The Arriaga approach to estimating the true level of current fertility, as contained in the MORTPAK software package, was applied to the 1998 census data. The adjusted ASFRs are shown in [table 3](#) and graphed in [figure 2](#). The peak childbearing period is from age 25 to age 29, reflecting the relatively late age at marriage of 22.5 years for women. It is estimated that the TFR in Cambodia in the 12 months prior to the census was 5.30 children per woman. This is consistent with an estimate of 5.26 derived from the Demographic Survey of Cambodia 1996 (National Institute of Statistics, 1999c). While these estimates are consistent with each other, they are somewhat higher than estimates from other surveys. The Demographic and Health Survey conducted in early 2000 will yield further information on fertility levels and trends.

There are wide differences in TFR by geographical area and social groups. TFR is estimated to equal 4.42 in urban areas and 5.47 in rural areas. The TFR for literate women is 4.9, but for illiterate women it is 5.9. Among literate women, the TFR for those who have not completed primary school is 5.3, but for those who have completed primary school (but no further education) it is 4.3. Economically active women have lower fertility than those not in the labour force, with TFRs of 5.16 and 5.62 respectively. Among employed women, those in the primary sector have a TFR of 5.47, while those in the secondary sector have a TFR of 4.06, and those in the tertiary sector have a TFR of 3.67 (National Institute of Statistics, 1999c).

## Mortality

In addition to information on the number of children ever born, the census recorded the number of children surviving and the number who had died, by sex of child and age of mother. This information was used to estimate infant and child mortality rates, again employing MORTPAK.

This procedure yielded an estimated infant mortality rate (IMR) of 80 per thousand live births and a child mortality rate (probability of dying between exact age 1 and exact age 5, multiplied by 1,000) of 53, with a reference date of February 1996. This estimate of the IMR is slightly lower

than the level of 90 estimated by the Demographic Survey of Cambodia 1996 and the National Health Survey 1998, and it is to be expected that surveys would yield somewhat better reporting of infant and child deaths. There are wide disparities in estimates of the IMR by sex, residence and social groups. The estimated IMR equaled 88 for boys and 72 for girls. In urban areas, the IMR was 65, but in rural areas it was 82.

The widest disparity in IMR was observed for illiterate and literate mothers. IMR for children of illiterate women was 96, compared with 70 among children of literate mothers. IMR for children of literate women who had attended but not completed primary school was 78, while for those who had completed primary school (but no further education) it was only 57. The IMR also varied by industrial sector for employed women, equaling 82 for those in the primary sector, 65 for those in the secondary sector and 54 for those in the tertiary sector (National Institute of Statistics, 1999c).

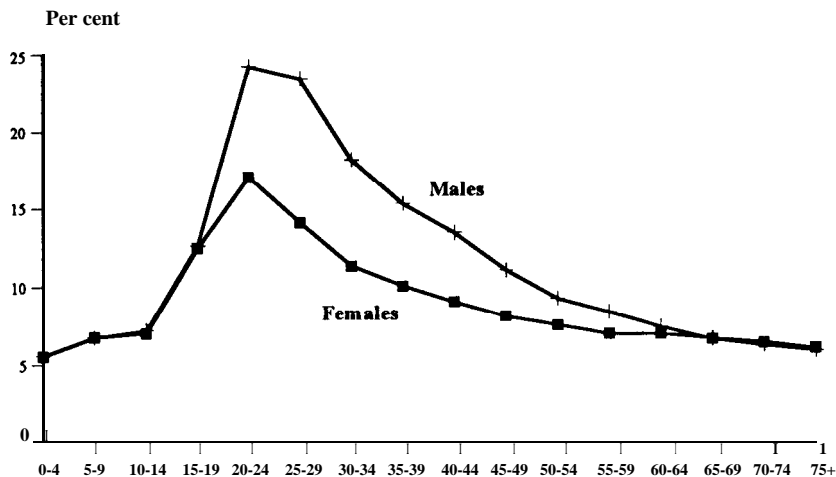
The 1998 census did not include a question on adult mortality, but it is possible to observe the expectation of life at birth in North Model Coale-Demeny Model Life Tables associated with the levels of infant mortality by sex noted above. This approach indicates an expectation of life at birth of 54.4 years for males and 58.3 years for females (National Institute of Statistics, 1999c).

## **Migration**

The 1998 population census asked questions on place of birth and place of any previous residence for the purpose of identifying migrants. The results indicated that 3.60 million persons (or 31.5 per cent of the total population) had lived in a place other than the village of enumeration and that 3.04 million persons had been born in a place other than the place of enumeration. The difference in the two figures of 555,000 is explained by return migration to the place of birth. The high level of return migration is largely attributable to the internal and international displacement of population that occurred because of civil war and strife in the 1970s (National Institute of Statistics, 2000c).

Partially because of those population displacements and return movements, the percentage of migrants in the population is relatively high, equaling 59 per cent of the urban population and 26 per cent of the rural population. Well over 80 per cent of urban residents aged 20 years and older are migrants to their city.

**Figure 3. Percentage of the Cambodian population migrating in the five years prior to the 1998 census, by sex and age**



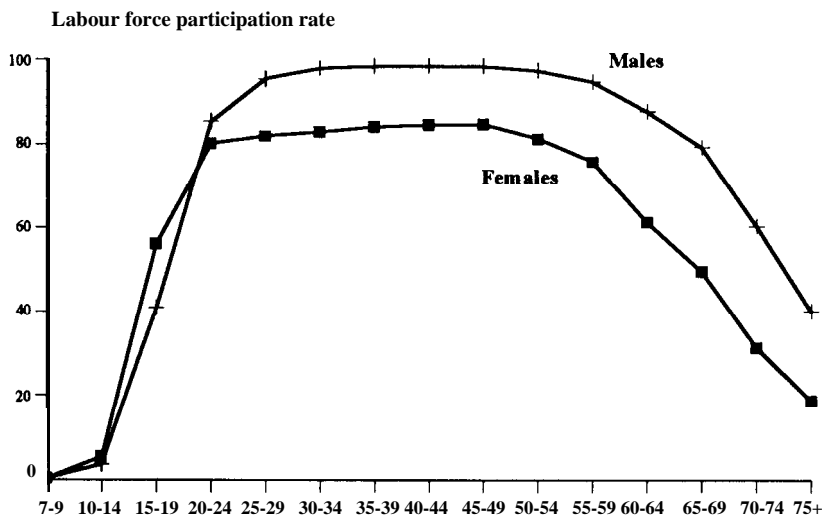
*Source:* Calculated from tables A1 and C9 of the 1998 population census of Cambodia.

Recent migration rates remain high because of economic growth since the election and formation of a new government in 1993. In the five years prior to the 1998 census, 10.4 per cent of the population had migrated, 11.5 per cent of males and 9.3 per cent of females. Age-specific five-year migration rates are presented in [figure 3](#). Male migration rates are considerably higher than female rates between the ages of 20 and 60, with the highest rates for both sexes occurring between the ages of 20 and 30.

As only 15.7 per cent of the population resided in urban areas in 1998, it is to be expected that most migratory movements involve rural areas. Among migrants in the five years prior to the census, 58.2 per cent had moved from one rural place to another rural place; 19.2 per cent of moves were from rural to urban areas, 14.5 per cent were between urban areas, and 8.1 per cent were from urban to rural areas (National Institute of Statistics, 2000c).

Cambodia's turbulent recent history is reflected in the reasons for moving. Among the 3.6 million migrants in the country, 13.4 per cent had

**Figure 4. Age-specific labour force participation rates by sex, Cambodia, March 1998**



*Source:* Calculated from table B1 of the 1998 population census of Cambodia.

made their most recent move as repatriation or a return after internal displacement and another 5.8 per cent had moved because of insecurity or natural disaster. Among all migrants, 35.6 per cent had moved because their family moved and 12.6 per cent had moved for marriage. Only 14.0 per cent had moved to seek employment, while 7.8 per cent had moved as a result of a job transfer (National Institute of Statistics, 2000c).

### **Labour force participation**

The levels of labour force participation and the structure of the labour force reflect the underdeveloped nature of the economy of Cambodia. The 1998 census collected information concerning economic activity from all persons aged 7 years and older. That was not to imply that age 7 is the usual age of entry to the labour force, but that age was used so that information on child labour could be collected. In fact, only 0.4 per cent of persons aged 7-9 years and 4.5 per cent of those aged 10-14 years were in the labour force and the great majority of those were unpaid family workers in rural areas.

**Table 4. Percentage distribution of employed persons by employment status, sex and residence, Cambodia, March 1998**

Area and employment status	Both sexes	Males	Females
<b>Cambodian</b>			
Number	4,845,762	2,360,107	2,485,655
Per cent	100.0	100.0	100.0
Employer	0.2	0.2	0.1
Paid employee	12.2	18.5	6.3
Own-account worker	45.5	61.1	30.7
Unpaid family worker	41.8	19.6	62.8
Other	0.3	0.6	0.1
<b>Urban</b>			
Number	673,612	378,080	295,532
Per cent	100.0	100.0	100.0
Employer	0.4	0.5	0.3
Paid employee	35.0	45.0	22.2
Own-account worker	44.6	44.7	44.5
Unpaid family worker	19.5	9.2	32.7
Other	0.5	0.6	0.3
<b>Rural</b>			
Number	4,172,150	1,982,027	2,190,123
Per cent	100.0	100.0	100.0
Employer	0.1	0.1	0.1
Paid employee	8.6	13.5	4.1
Own-account worker	45.6	64.3	28.8
Unpaid family worker	45.4	21.5	66.9
Other	0.3	0.6	0.1

*Source:* Table B4 from the 1998 population census of Cambodia.

*Note:* Persons for whom employment status was not reported are distributed proportionately.

As indicated by figure 4, age 15 would be a more appropriate age for measuring labour force participation. Among the population aged 15 years and older, 77.0 per cent were economically active. This general labour force participation rate equaled 81.2 per cent for men and 73.5 per cent for women. Women enter the labour force at an earlier age than men. Among persons aged 15-19 years, 56 per cent of women and 41 per cent of men are economically active. Between the ages of 20 and 54, over 80 per cent of women are in the labour force. Male labour force participation rates reach 85 per cent in the age group 20-24 and are over 95 per cent for those between the ages of 25 and 55. High percentages of older persons remain economically active. In the age group 65-69, 79 per cent of men and 50 per cent of women are still in the labour force. Even among persons aged 75 years and older, 40 per cent of men and 19 per cent of women remain in the labour force (National Institute of Statistics, 1999a and 2000b).

**Table 5. Percentage distribution of employed persons by major occupational group, Cambodia, March 1998**

Major occupational group	Both sexes	Males	Females
Number	4,845,762	2,360,107	2,485,655
Per cent	100.0	100.0	100.0
Legislators, senior officials and managers	0.3	0.6	0.1
Professionals	0.3	0.5	0.1
Technicians and associate professionals	3.1	4.5	1.8
Clerks	1.3	2.0	0.7
Service and sales workers	5.2	4.6	5.7
Skilled agricultural and fishery workers	76.6	70.5	82.4
Craft and related workers	3.4	4.5	2.4
Plant and machine operators and assemblers	2.2	3.3	1.2
Elementary occupations	5.4	5.3	5.4
Armed forces	2.2	4.3	0.2

*Source:* Table B15 from the 1998 population census of Cambodia.

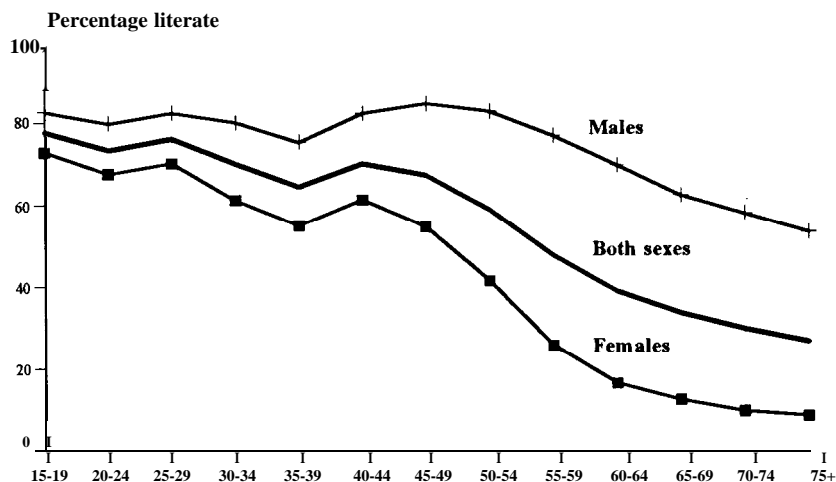
*Note:* Persons for whom occupation was not adequately described or not stated are distributed proportionately.

The underdeveloped level of the economy is indicated by the employment status of workers (table 4). Only 12 per cent of workers are paid employees, while 46 per cent are own-account workers and 42 per cent are unpaid family workers. Only 6 per cent of women workers are paid employees, while 31 per cent are own-account workers and 63 per cent are unpaid family workers. The high proportions of own-account workers and unpaid family workers result from the high percentage of the labour force in agriculture. In an agricultural family, the head of household will normally be an own-account worker while other family members are unpaid family workers. Thus, in rural areas, about two thirds of male workers are own-account workers and about two thirds of female workers are considered unpaid family workers.

In urban areas, 35 per cent of workers are paid employees, but 45 per cent are own-account workers. Women workers in urban areas are more likely to be own-account workers (44 per cent) and unpaid family workers (33 per cent) than paid employees (22 per cent).

It may be seen from table 5 that 77 per cent of employed persons are considered skilled agricultural and fishery workers. Five per cent of

**Figure 5. Percentage literate, by sex and age group, Cambodia, March 1998**



*Source:* Calculated from table B2 of the 1998 population census of Cambodia.

employed persons are service and sales workers and 5 per cent are in elementary occupations. Less than 5 per cent of the labour force is in any of the other major occupational groups. Female workers are particularly concentrated in agriculture and fishing; sales and services; and in elementary occupations, while male workers are more diffused among the occupational groups.

### **Literacy and educational attainment**

Roughly two thirds of the adult population are literate. Among persons aged 15 years and older, 67 per cent are literate — 80 per cent of males and 57 per cent of females (National Institute of Statistics, 1999a and 2000d).

Literacy rates by sex and age group are presented in [figure 5](#). Male literacy rates have been essentially stagnant for the past 30 years while female literacy rates have continued to improve with younger ages, leading to a narrowing of the difference between the sexes. The literacy rates by age

have been impacted by the recent history of Cambodia. Table 5 indicates that literacy rates improve considerably for each younger age group down to ages 45-49 for men and 40-44 for women. Taking into account the fact that school enrolment in Cambodia peaks at about age 12, these literacy rates imply that male schooling improved rapidly up to about 1965 and female schooling improved more rapidly up to 1970. A civil war fought from 1970 to 1975 appears to have arrested earlier educational progress.

Two cohorts have lower literacy rates than both their older and younger cohorts, those aged 20-24 and 35-39 at the time of the 1998 census (table 5). Those aged 20-24 were born between 1973 and 1978. This was a period of civil war and of much of the Khmer Rouge regime. Apparently, being born during this period constituted a handicap that carried over to the education of that cohort.

Literacy rates are especially low for the age group 35-39. This cohort was born between 1958 and 1963. Their peak school enrolment rates should have occurred between 1970 and 1975. That was a period of civil war and population displacements caused by the fighting between Viet Nam and the United States and by the United States bombing campaign in Cambodia. The large-scale population displacements appear to have had a significant impact on the education of children who should have been in school at the time. That period was followed by the Khmer Rouge regime from 1975 to early 1979, so that the cohort had little opportunity to make up its lost education.

The importance of at least a primary school education for reducing fertility and infant mortality has been noted above. The 1998 census calculated educational attainment only for the literate population. Thus, it was observed that 49 per cent of literate males aged 25 years and older had completed primary school or a higher level of education. The corresponding figure for females was 32 per cent. In urban areas, the proportion of the literate population aged 25 years and older who had completed at least primary school was 68 per cent for males and 51 per cent for females. In rural areas, the corresponding figures were 44 per cent for males and 27 per cent for females (National Institute of Statistics, 1999a).

Among literate persons aged 25 years and older, only 6.4 per cent of males and 2.8 per cent of females have completed secondary school or a higher level of education. These low levels of educational attainment are likely to constitute a severe obstacle to social and economic development.



## Population projections

Population projections have been prepared by the National Institute of Statistics (2000e) for the country as a whole, urban and rural areas, four geographical regions and 24 provinces/municipalities. The projections begin in January 2001 in order to be consistent with the five-year periods of the national development plans.

Four adjustments were made to the 1998 census population before projecting it forward. First, the total was adjusted for the 1.78 per cent net undercount estimated by the post-enumeration survey. Then the estimated population of 45,000 in areas that were not enumerated for security reasons was added. Next, 60,000 persons who were temporarily displaced to Thailand at the time of the census were added (see the section on population size and structure above). Finally, the population aged 0-4 years was adjusted upward in order to make it consistent with a total fertility rate of 5.3 estimated for the period prior to the census. The male population aged 0-4 years was adjusted upward by 28.55 per cent and the female population in that age group was similarly adjusted by 29.35 per cent.

The population as of March 1998, after making these four adjustments, equalled 12,186,047, or a population 6.54 per cent larger than enumerated.

The population was projected forward to 1 January 2001 (the starting date of the next five-year plan) by assuming a total fertility rate of 5.0, and male and female expectation of life of 56.4 and 60.3 years respectively. Net international migration was assumed to be nil throughout the projections.

The projections assume that the total fertility rate will decrease by 0.5 children per five-year period and that both male and female expectation of life will increase by 2.0 years per five-year period.

The projections imply that the population of Cambodia will increase from 13.10 million in January 2001 to 20.27 million in January 2021, an increase of 55 per cent. Because the very large cohorts of females aged 0-19 in 1998 (figure 1) move into childbearing ages during the course of the projection, the birth rate and growth rate remain high in spite of the assumption of a steady decline in the total fertility rate. The projected crude birth rate equals 33.7, 31.8, 29.1 and 25.8 per thousand in the four projection periods. The annual population growth rate equals 2.44, 2.31, 2.12 and 1.86 per cent in the four periods. The crude death rate would also decline, equalling 9.3, 8.8, 7.9 and 7.2 per thousand in the four projection periods.

While the rate of natural increase in rural areas exceeds that in urban areas, the urban population is projected to grow somewhat more rapidly because of net rural-to-urban migration. By 2021, the urban population is projected to equal 3.67 million, or 18.1 per cent of the total, up from 15.7 per cent in 1998.

### **Policy implications**

The 1998 population census of Cambodia constitutes an important source of data to be used for national and provincial policy formulation and programme development by government ministries, international agencies and non-governmental organizations, among others. The in-depth analysis of the census provides more detailed information concerning fertility, mortality, nuptiality, literacy and education, labour force and employment, spatial distribution, migration, women in development, housing and household amenities. Programme management, monitoring and evaluation, and sample surveys can benefit a great deal from the availability of the database at the community level and from the village gazetteer prepared by the census office. Population projections, especially of the school-age and working-age populations, based on the census can greatly assist in the development of national policies and five-year plans.

The high fertility and mortality levels indicated by the census result in relatively rapid population growth and indicate that reproductive health programmes and facilities need to be expanded in both quality and quantity throughout the country. The government should aim to increase utilization of public health services and access to quality health care facilities, especially in rural and remote areas. The census figures also show that the country needs a committed programme of human resource development not only in the health sector. Even rapid educational expansion may be barely enough to meet the country's challenges. Industrial and service employment needs to be accelerated in order to enable sustainable economic growth. Female education and more productive employment for women will be essential for economic and social development.

Rural-to-urban migration and rapid urbanization are inevitable considering the large rural-urban gap in all development indicators. These point to the need for rural and regional development plans, accommodationist policies to absorb migrants into urban areas and expanded employment opportunities in both rural and urban areas. Urban development and improvement in infrastructures as well as urban planning and regulations are immediately called for.

Cambodia faces immense challenges in all development sectors. Many of these are beyond the capacity of the government to deal with alone. Participation from the population, the private sector, international agencies and non-governmental organizations will be essential. Dynamic and strategic policy formulation and planning are urgently needed. Successful social and economic development can be achieved if the government, the international community and, most importantly, the people of Cambodia themselves, make concerted efforts to usher in the dynamic social changes and technical innovations required to move forward.

### **Acknowledgements**

Detailed census analysis was carried out in a series of workshops in which staff members of the National Institute of Statistics and other government offices participated. The participants in those workshops carried out most of the analysis on which this article is based. The authors are grateful to them for their enthusiasm and diligence. The authors are indebted to Mr Harry Lode, Data Processing Adviser with the National Institute of Statistics, for his continual cooperation in preparing requested tabulations carefully and quickly. They have also benefited greatly from the assistance of staff members of the National Institute of Statistics, too numerous to name, who solved hardware and software glitches, retrieved data, made tabulations and checked calculations used in the preparation of this article.

### **References**

- Heuveline, Patrick (1998). "'Between one and three million': towards the demographic reconstruction of a decade of Cambodian history (1970-1979)" *Population Studies* 52(1): 49-65.
- Huguet, Jerrold W. (1991). "The demographic situation in Cambodia" *Asia-Pacific Population Journal* 6(4):79-91.
- \_\_\_\_\_ (1997). *The Population of Cambodia, 1980-1996, and Projected to 2020* (Phnom Penh, National Institute of Statistics).
- Ministry of Health, National Institute of Public Health (1999). *National Health Survey 1998* (Phnom Penh).
- National Institute of Statistics (1995). *Report on the Socio-Economic Survey of Cambodia, 1993/94 (all rounds)* (Phnom Penh).
- \_\_\_\_\_ (1996). *Demographic Survey of Cambodia 1996: General Report* (Phnom Penh).

- \_\_\_\_\_ (1999a). *General Population Census of Cambodia 1998: Final Census Results* (Phnom Penh).
- \_\_\_\_\_ (1999b). *General Population Census of Cambodia 1998: Report on Post-Enumeration Survey* (Phnom Penh).
- \_\_\_\_\_ (1999c). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 1, Fertility and Mortality* (Phnom Penh).
- \_\_\_\_\_ (2000a). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 2, Nuptiality* (Phnom Penh).
- \_\_\_\_\_ (2000b). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 3, Labour Force and Employment* (Phnom Penh).
- \_\_\_\_\_ (2000c). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 5, Spatial Distribution and Migratory Movements* (Phnom Penh).
- \_\_\_\_\_ (2000d). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 7, Education* (Phnom Penh).
- \_\_\_\_\_ (2000e). *General Population Census of Cambodia 1998: Analysis of Census Results, Report 8, National and Provincial Population Projections, 2001-2021* (Phnom Penh).
- Viet Nam, Central Census Steering Committee (1991). *Completed Census Results, vol. 1* (Hanoi), p. 16.
- Viet Nam, General Statistical Office (1991). *Viet Nam Population Census. 1989, Detailed Analysis of Sample Results* (Hanoi), p. 26.