Hong Kong Population
A 20-Year Projection

November 1987

Census and Statistics Department
Hong Kong
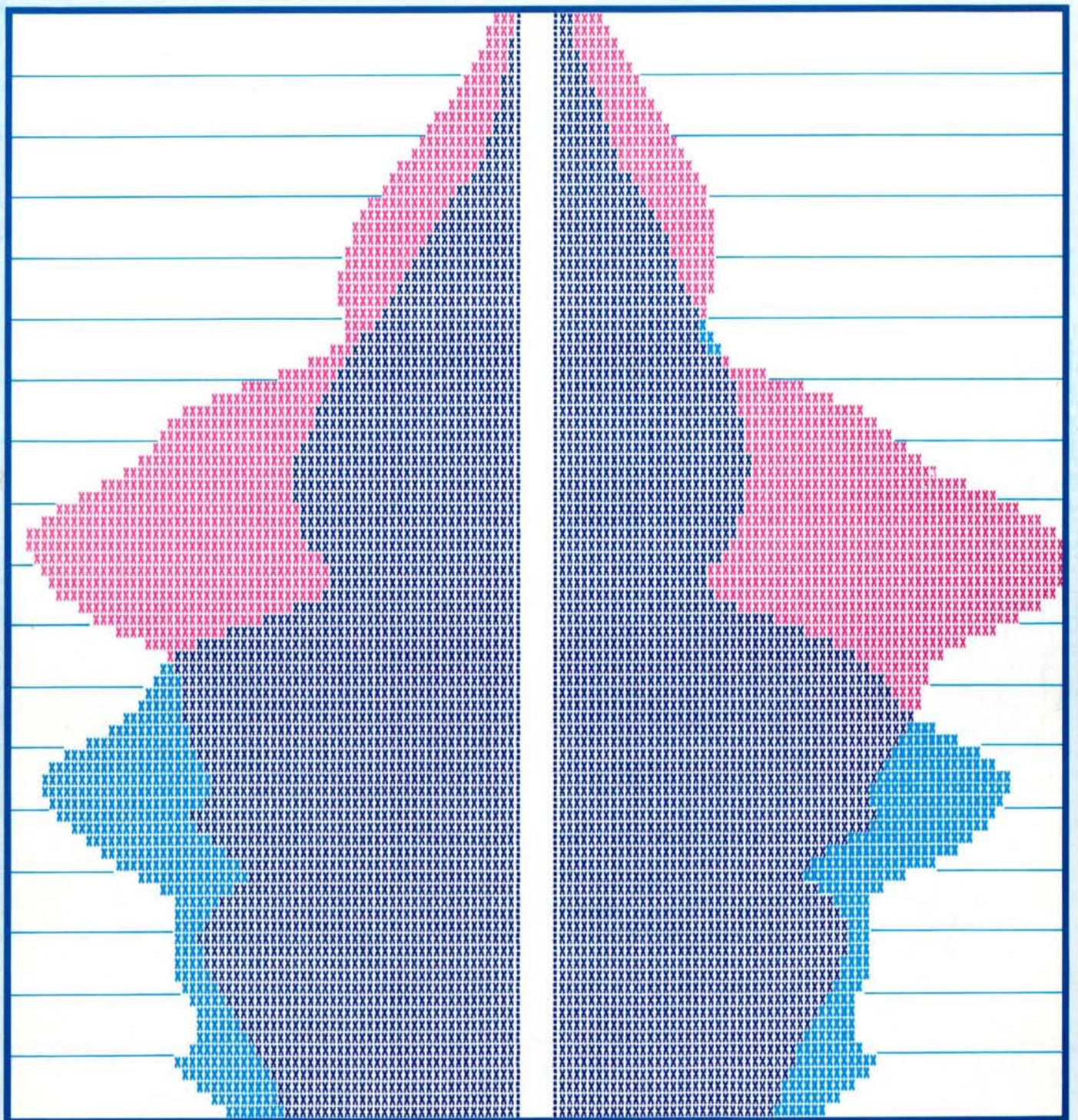
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Foreword

Projections of the population of Hong Kong by sex and age were first produced in 1961. Since then, new projections have been made every five years after each population census.

The 1986 based projection is made on a single set of assumptions about births, deaths and net migration. Although the assumptions have been formulated in the light of experience based on a long time series of data and new information that has become available, uncertainty remains about future trends in the components of population change. This is particularly so for the assumption concerning migration, but it is also so in the case of fertility which has become so low that there are difficulties in forecasting its future.

This report contains the new projections by sex and age for the period 1987-2006. A summary of the method and the detailed results are given in Part I of the report and an analysis of fertility and mortality from 1971 to 1985 is given in Part II.

Richard Butler
Commissioner for Census & Statistics

November 1987

Symbols

0.0	signifies less than 0.05 but not zero
0	signifies less than 0.5 but not zero
-	signifies not available
NA	signifies not applicable

Part I

General Account of Population Projections

1. Introduction

Population projections are essentially concerned with the future growth of a population when certain assumptions are made about fertility, mortality and migration trends. The Hong Kong population projection has been produced on a de facto basis and, as such, it is necessary to take account of those persons who are transients in the population, i.e. visitors and the armed forces. Vietnamese refugees are, however, not included.

The main purpose of the projection is to provide a common framework for all population-related planning. Projections of the population of Hong Kong have been made since 1961 and they have been heavily used by the Government for planning future requirements in housing, education, transport, medicine and the social services. They are increasingly being used by public utilities and private companies in their forward planning.

The population projection which is at present available was prepared in 1982 and was revised in 1984. The 1984 based projection incorporated a new migration assumption, following a change in Government policy on legal immigration from China at the end of 1982. Many significant changes in other demographic variables occurred during the period 1982-1986 but the revised projection takes no account of these. A new projection is therefore required, and this has been made on a set of new fertility, mortality and migration assumptions and with the age distribution obtained from the 1986 By-Census serving as input to derive the base of the projection.

The 1986 based projection incorporates only one fertility, mortality and migration variant. No implication, however, should be read into the projection that future population growth is in principle determinable. The assumptions of the projection have been formulated in the light of historical background and the new information that has become available. Consideration has also been given to the social and economic factors believed to be influencing current population trends.

Although the 1986 based projection has the advantage of incorporating the currently most realistic views and assumptions, the uncertainty remains. This is particularly so for the assumption concerning migration, but it is also so in the case of fertility which has become so low that there are difficulties in forecasting variations in future fertility patterns. Thus users of the projected data should constantly bear in mind the inherent uncertainty of the assumptions on which the projection is based.

2. The method of population projection

The standard method of population projection is the component method which takes the population by sex and age at a base year and carries it forward over time, cohort by cohort, on the basis of a separate projection of fertility, mortality and migration.

The first step in projecting is to determine the base of the projection. Mid-1986 has been selected as the base for the projection since the 1986 By-Census provides the latest information on the size and sex-age distribution of the population. In constructing the base population, the 1986 By-Census population (on 11 March 1986) has first been adjusted for misstatements of age and under-enumeration in the age group 0-4, and then brought forward to mid-1986 through an aging process. The mid-1986 base population has taken into account the actual occurrence of births, deaths and migration during the period 11.3.86-30.6.86.

Based on the assumed levels of fertility, mortality and migration in 1987-2006 and an estimated number of transients, the projection of the population and its sex-age composition from the base year is then worked out year by year, repeating the following algorithms in that order:

(i)   The projected forward survival ratios* by sex and age are applied to the population excluding transients at the beginning of the base year initially and of each projection year later to derive the surviving population aged 1 and above at the end of that year.

(ii)   The fertility factor is introduced. The projected period age-specific fertility rates are applied to the average number of women at each of the childbearing ages 15-49 to obtain the number of births in that year.   These births are first divided into male and female births by an average sex ratio at birth# and then subject to specific forward survival ratios to give the surviving population aged 0 by sex at the end of that year.

(iii)   The migration element is brought in. The assumed net migration is added to the surviving population by sex and age at the end of that year. These migrants will be subject to the surviving and reproduction processes only in the following year.

(iv)   The estimated transients are added in finally by sex and age, to give a de facto population projection.   The transients are excluded from the surviving and reproduction processes.

A further account of the methods of computation is given in Appendix A.

3. Summary of fertility and mortality assumptions

The projection method described above requires assumptions concerning future trends and levels of fertility and mortality, which are the main determinants of future population growth. Implicit in these assumptions is the principle of continuity, that is to say that any changes in the future can be seen as an extension of what has been happening in the past. A historical analysis is therefore required to determine past trends, which will form the starting point for formulating the assumptions. The assumptions so produced are further modified by subjective judgement on the basis of present experience and, where appropriate, experience of some developed countries.

The assumptions on fertility and mortality are summarized below. The historical background, the methodology of projecting these two components and a full description of the assumptions are found in Part II of this report.

(a)   Fertility assumptions

Assumptions concerning future fertility were formulated by extrapolating the age-specific period fertility rates by birth order for the years 1971-1985. Different types of curves were fitted to the past rates until the best fit, using the method of least squares, was found. For ages 15 to 19 and 40 to 49 most attention was, however, focused on the all-order age-specific fertility rates, since fertility in these ages contributed very little to total fertility. The projected period fertility rates obtained from the extrapolation were then subject to several cross checks in a cohort perspective to ensure their appropriateness and consistency.

The period fertility rates for the childbearing ages 15-49 were projected to change differently over the period 1987-2006. The rates for the younger and older childbearing ages would decrease throughout the period while those for the ages 25-39 would increase for some years before resuming their declining trends towards the latter part of the period. The overall effect of these changes was that the projected total fertility rate would increase marginally from a level of 1 360 in 1986 to 1 430 in 1991 and then decrease gradually to 1 350 in 2006.

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*   A forward survival ratio determines the proportion of persons surviving from age x to age x+1. The projected ratio, L_{x+1}/L_x, is derived from the 'L_x' column of the projected life tables.

\#   The average sex-ratio at birth is 1 067 males per 1 000 females according to births delivered during the period 1971-1985.

(b)   Mortality assumptions

Assumptions concerning future mortality were formulated by extrapolating the sex-age-specific death rates for ages 1 to 44 and the sex-age-specific death rates by major cause for ages 0 and 45 and above for the years 1971-1985. Having thus obtained the projected death rates, several cross checks - examining the gap between the projected male and female death rates and between the expectations of life - were made to ensure their appropriateness and consistency.

The death rates when projected on the above basis showed a further decline at all ages; and for both sexes the speed of decline was relatively slower at the older ages. Overall, the mortality projection gave an expectation of life at birth for males in 2006 as 77.3 and for females 82.9, representing a substantial increase from the respective levels of 74.0 and 79.8 in 1986.

4. Summary of migration assumptions

In Hong Kong, migration is a significant element affecting the growth of the population. In the past, it has been influenced by factors which could not have been accurately predicted. The possibility of such factors recurring cannot be ruled out. In the context of this long-term population projection, the projection of the migration component was based on an analysis of the past trends and of more recent developments, taking into account existing Government policies. It was assumed that these trends and policies would continue in the future.

On a trend basis it was assumed that there would be a net inflow (i.e. the balance of inward and outward movements in the population) of around 14 000 per annum over the period 1987-2006. There may, nevertheless, be variations in particular years in the size and the composition of the migration flows. For population projection purposes, it was further assumed that the sex-age distribution of the net immigrants would follow the average distribution observed during the period 1981-1986.

5. Results of the projection

The projections at single year intervals by sex and quinquennial age group for the period 1987-2006 are given in Appendix B. The population pyramids for the years 1986, 1991, 1996, 2001 and 2006 are given in Appendix C.

(a)   Population growth

The population would increase, at a decreasing rate, by about one million during the next 20 years, from a base population of 5.52 million in 1986 to 6.53 million in 2006. Some 60 percent of this population growth would occur in the first 10 years of the projection period. The population was projected to increase at an average annual growth rate of 1.1 percent during the first half of the period but at an average rate of 0.6 percent during the latter half.

Population growth is the outcome of natural increase (i.e. the balance of births and deaths) and net migration. From 1986 until 1996, natural increase would account for at least three-quarters of the projected population growth. However, from 1996 onwards the percentage of total population growth attributed to natural increase would start diminishing. By 2006, natural increase and net migration would contribute an equal share to the population growth. The projected population growth by component for the period 1987-2006 is given in Table 5.1.

(b)   Age structure

The most pervasive trend in the new projection is the overall aging of the future population. In 1986, the median age of the population was 29. It would increase steadily to 40 by 2006. This phenomenon is more evident in the changing age distribution as shown in Table 5.2. In 1986, 23 percent of the population was under 15; in 2006 the projected figure would be 16 percent. In contrast, the proportion of those aged 65 and above would increase rapidly from 8 percent to 13 percent.

The changing age structure of the population can also be measured by the dependency ratio - the ratio of the youth population and/or the elderly to the population of working age (those aged between 15 and 64). According to the various dependency ratios as shown in Table 5.3, the overall dependency would decrease gradually over the next 20 years while the nature of dependency would shift from youth to the aged.

Since changes in the age structure of the population would have important bearings on a number of social and economic facets of the community, it is worth giving an account of the projected changes in several special populations. First, the population of working age (those aged between 15 and 64) would increase from 3.8 million in 1986 to 4.6 million in 2006, or from 69 percent of the population to 71 percent. The increase is mainly attributable to the projected population growth at the prime working ages between 25 and 54, whose proportion of the population would increase from 42 percent to 49 percent. The contribution of this increase to the growth of the population of working age, however, would be partly offset by the projected decrease in the population at the younger ages 15-24, which would fall sharply from 18 percent to 12 percent over this period. The proportion of those at the older ages 55 to 64 would increase slightly from 9 percent to 10 percent.

Secondly, the population of school age would decrease, in both absolute and relative terms, over the next 20 years. At ages 6-11, the population would decrease from 506 400 in 1986 to 443 900 in 2006, or from 9 percent of the population to 7 percent. For those who would be attending secondary school, the projected population at ages 12-18 would decrease from 621 700 to 554 000, or from 11 percent of the population to 8 percent.

As regards the voter population (those aged 21 and above), a phenomenal growth is expected, from 3 692 900 (i.e. 67 percent of the population) in 1986 to 5 005 900 (i.e. 77 percent) in 2006. If the eligible age to vote were lowered to 18, the corresponding growth would be from 3 987 800 (i.e. 72 percent) to 5 219 800 (i.e. 80 percent).

Table 5.1 Projected components of annual population growth: 1987-2006

Year	Mid-year population	Live births	Deaths	Natural increase Number	Natural increase %	Net immigration Number	Net immigration %	Population growth Number	Population growth %
1987	5 585 000	74 800	28 400	46 400	77	13 800	23	60 100	100
1988	5 647 100	76 900	29 100	47 700	78	13 800	22	61 500	100
1989	5 711 000	78 700	29 900	48 800	78	13 800	22	62 600	100
1990	5 775 300	79 900	30 600	49 300	78	13 800	22	63 100	100
1991	5 840 400	80 700	31 400	49 300	78	13 800	22	63 200	100
1992	5 903 200	80 000	32 200	47 800	78	13 900	22	61 700	100
1993	5 964 300	79 000	33 100	45 900	77	13 900	23	59 800	100
1994	6 023 400	77 600	33 900	43 700	76	13 900	24	57 600	100
1995	6 080 200	76 100	34 800	41 300	75	13 900	25	55 200	100
1996	6 134 600	74 400	35 600	38 800	74	13 900	26	52 700	100
1997	6 186 100	72 300	36 700	35 600	72	13 900	28	49 600	100
1998	6 234 500	70 200	37 700	32 500	70	13 900	30	46 500	100
1999	6 279 800	68 300	38 800	29 600	68	14 000	32	43 500	100
2000	6 322 200	66 500	39 800	26 700	66	14 000	34	40 700	100
2001	6 361 900	64 900	40 800	24 100	63	14 000	37	38 100	100
2002	6 399 100	63 700	42 000	21 700	61	14 000	39	35 700	100
2003	6 433 900	62 600	43 100	19 500	58	14 000	42	33 500	100
2004	6 466 700	61 700	44 200	17 500	56	14 000	44	31 500	100
2005	6 497 500	60 900	45 200	15 700	53	14 000	47	29 700	100
2006	6 526 600	60 300	46 300	14 000	50	14 000	50	28 000	100

Vital rates (per 1 000 population)[#]

Year	Population growth rate* (%)	Crude birth rate	Crude death rate	Rate of natural increase	Rate of net immigration
1987	1.1	13.4	5.1	8.3	2.5
1988	1.1	13.6	5.2	8.5	2.4
1989	1.1	13.8	5.2	8.5	2.4
1990	1.1	13.8	5.3	8.5	2.4
1991	1.1	13.8	5.4	8.4	2.4
1992	1.1	13.6	5.5	8.1	2.3
1993	1.0	13.2	5.5	7.7	2.3
1994	1.0	12.9	5.6	7.3	2.3
1995	0.9	12.5	5.7	6.8	2.3
1996	0.9	12.1	5.8	6.3	2.3
1997	0.8	11.7	5.9	5.8	2.3
1998	0.8	11.3	6.0	5.2	2.2
1999	0.7	10.9	6.2	4.7	2.2
2000	0.7	10.5	6.3	4.2	2.2
2001	0.6	10.2	6.4	3.8	2.2
2002	0.6	10.0	6.6	3.4	2.2
2003	0.5	9.7	6.7	3.0	2.2
2004	0.5	9.5	6.8	2.7	2.2
2005	0.5	9.4	7.0	2.4	2.2
2006	0.4	9.2	7.1	2.1	2.1

* Mid-year to mid-year growth.
[#] All vital rates for a year are calculated by relating the vital events to the corresponding mid-year population which approximates the person-years lived in that year.

Table 5.2   Distribution of population by age group and median age: 1986, 1991, 1996, 2001 and 2006

Age group	1986 (base) Number ('000)	%	1991 Number ('000)	%	1996 Number ('000)	%	2001 Number ('000)	%	2006 Number ('000)	%
0-14	1 272	23	1 229	21	1 208	20	1 143	18	1 069	16
15-64	3 828	69	4 077	70	4 279	70	4 471	70	4 649	71
65 and over	424	8	534	9	648	10	748	12	809	13
Median age	29		32		35		37		40	

Table 5.3   Dependency ratios and index numbers: 1986, 1991, 1996, 2001 and 2006

		1986 (base)	1991	1996	2001	2006
(a)	Dependency ratio					
	Youthful[#]	332	301	282	256	230
	Elderly*	111	131	151	167	174
	Overall[+]	443	432	434	423	404
(b)	Index number					
	Youthful[#]	100	91	85	77	69
	Elderly*	100	118	137	151	157
	Overall[+]	100	98	98	95	91

\# Number of youths aged under 15 per 1 000 persons aged 15 to 64.
* Number of persons aged 65 and over per 1 000 persons aged 15 to 64.
\+ Number of persons aged under 15 and 65 and over per 1 000 persons aged 15 to 64.

Appendix A

Method of computation

Introduction

To make a population projection, it is first necessary to establish accurate data on the age and sex structure of the population at a point in time to form the base for the projection. The base population in each sex-age group is then projected for future years based on the projected number of future births and deaths and net migration.

Base population

The base population for the present projection was derived from the 1986 By-Census. The By-Census consisted of two separate operations: the marine census and the land census. The former was conducted in February and the latter in March. In the first place, it was necessary to bring these two enumerated populations to the same reference date. The enumerated marine population was therefore adjusted from the reference date of 5 February 1986 to the land census reference date of 11 March 1986 by 'aging' the population for 34 days and by adding births and subtracting deaths by age which occurred between the reference dates. Migration among the marine population was taken to be nil. The enumerated land population and the adjusted marine population were then added together to form the total population as at 11 March 1986.

For the young ages 0-4, known birth figures for the period between the 1981 Census and the 1986 By-Census from Births and Deaths Registries were used as a control to guard against underenumeration of children under 5 which was found to be relatively more severe than that for older ages.

The adjusted total population was then further adjusted for error due to misstatement of age. As shown in Chart A.1, this kind of error was found in various age digits in the age and sex distribution of the population. In this adjustment the population figures were first arranged in quinquennial age groups 0-4, 5-9, 10-14 etc. This set of groupings was found to give the least age-reporting error. From the grouped data, graduated population figures at single years of age were obtained by osculatory interpolation using Greville's multipliers. The graduated population is given in Chart A.2.

The total population after these adjustments was brought forward to mid-year 1986. This was achieved by forward 'aging' the population by 112 days from 11 March to 30 June 1986 and by adding births and subtracting deaths by age which occurred during the 112-day period. Population increase brought about by net migration during the same period was also added. The result of these adjustments was the estimated population at mid-year 1986, the base population for the projection.

Births

On the basis of an analysis of the past and current fertility data, a set of assumptions was made concerning future fertility. The future number of births for a projection year was obtained by applying the projected age-specific fertility rates to the average number of women in each childbearing age in the year and summing up the results over the age span from 15 to 49. The projected number of births for each projection year, after allowing for infant deaths, would form the population under 1 at the end of that year.

Since separate projections were to be made for males and females, it was necessary to project the number of births by sex. The projected age-specific fertility rates referred to births of both sexes combined; the number of male and female births was estimated by reference to the average sex-ratio at birth using known birth data for the years 1971 to 1985 as shown in Table A.1.

Table A.1   Known births by sex: 1971-1985

Year	Male	Female
1971	41 095	38 692
1972	41 472	38 865
1973	42 282	39 708
1974	42 966	40 613
1975	41 519	38 240
1976	40 775	37 727
1977	41 330	38 687
1978	41 772	39 183
1979	42 349	39 621
1980	44 099	41 187
1981	44 608	42 139
1982	44 346	41 764
1983	42 835	40 456
1984	39 940	37 352
1985	39 292	36 826
1971-1985	630 680	591 060

Average sex-ratio at birth for 1971-1985 = 630 680/591 060 x 1 000
= 1 067 male births
per 1 000 female births

Survivorship

Based on the assumptions concerning future mortality, a set of future sex-age-specific death rates was derived. The projected sex-age-specific death rates were converted into q_x (the probability of dying between exact age x and exact age x+1). The life table functions l_x (survivors of the life table cohort at exact age x) and L_x (number of person-years lived by the life table cohort from exact age x to exact age x+1) were then computed and from these the survival ratios (L_{x+1}/L_x) were derived.

The population of each sex at age x at the beginning of a projection year (year t), after allowing for deaths during that year by applying the survival ratio to the population, would become the population at age x+1 at the beginning of the following projection year (year t+1). In notation form, this could be represented as follows:

$$P_x(t) \cdot S_{(x,x+1)(t,t+1)} = P_{(x+1)(t+1)}$$

where $P_x(t)$ = number of persons at age x at the beginning of a projection year (year t)

$S_{(x,x+1)(t,t+1)}$ = survival ratio of the population from age x in year t to age x+1 in year t+1

$P_{(x+1)(t+1)}$ = number of persons at age x+1 at the beginning of year t+1

The survival ratio at birth (L_0/l_0) was calculated and applied to the projected number of births for a projection year to give the number surviving at age under 1 at the end of that year.

The projected life tables and survival ratios are given in a separate report entitled 'Hong Kong Life Tables' which will be published later.

Migration

To simplify the computation process for the projection, it was assumed that the balance of migration over a projection year would be concentrated on the last day of that year. In this way, it was not necessary to take account of the births and deaths among migrants during the same period (which would be negligible in any case). The balance of migration was added to the projected population at the end of the projection year t, which formed the population at the beginning of the projection year t+1. The immigrants were then assumed to be subject throughout the subsequent projection years to the same birth rates and survival ratios as those assumed for the whole Hong Kong population.

Chart A.1   1986 By-Census population before graduation
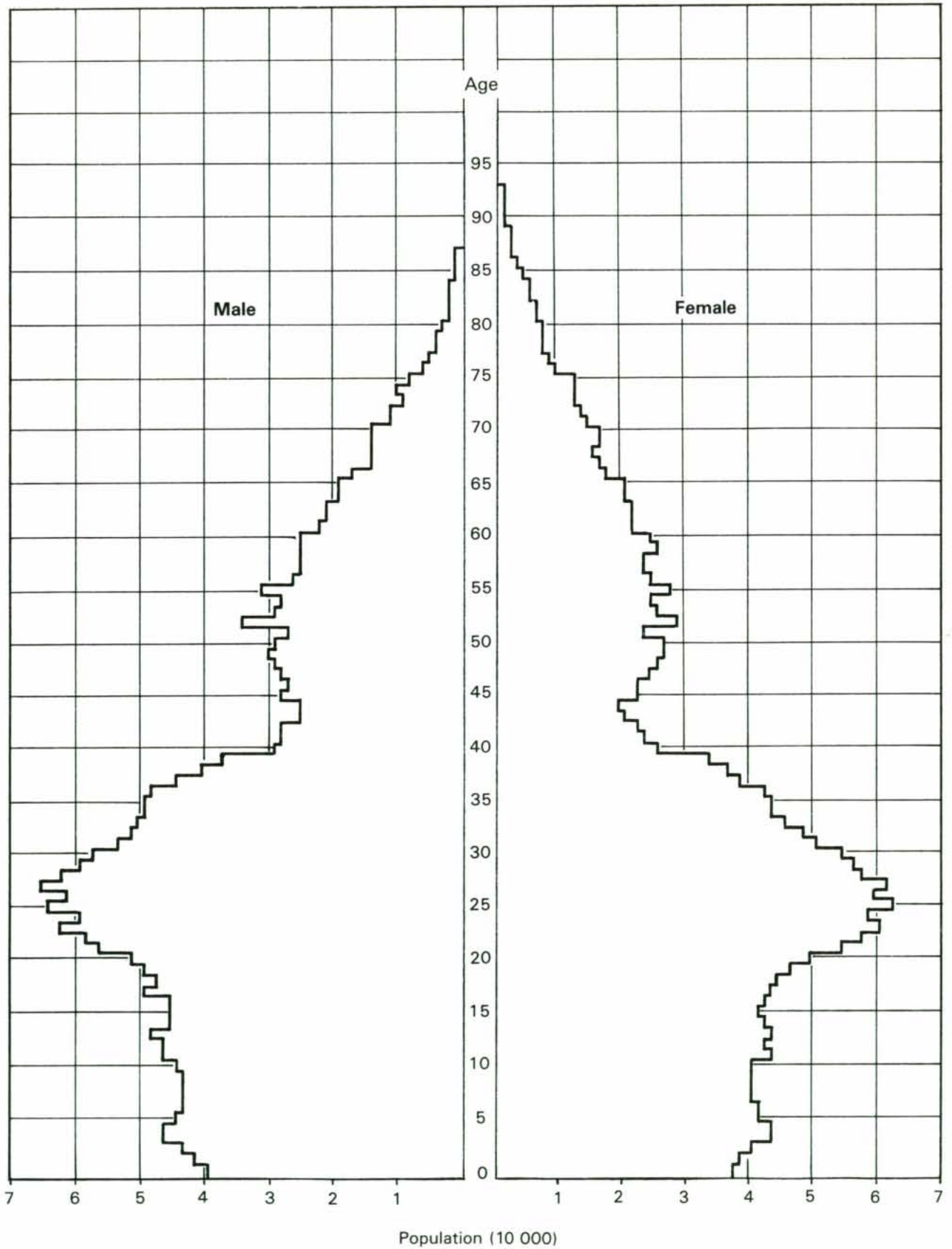
Population (10 000)

Chart A.2 1986 By-Census population after graduation*
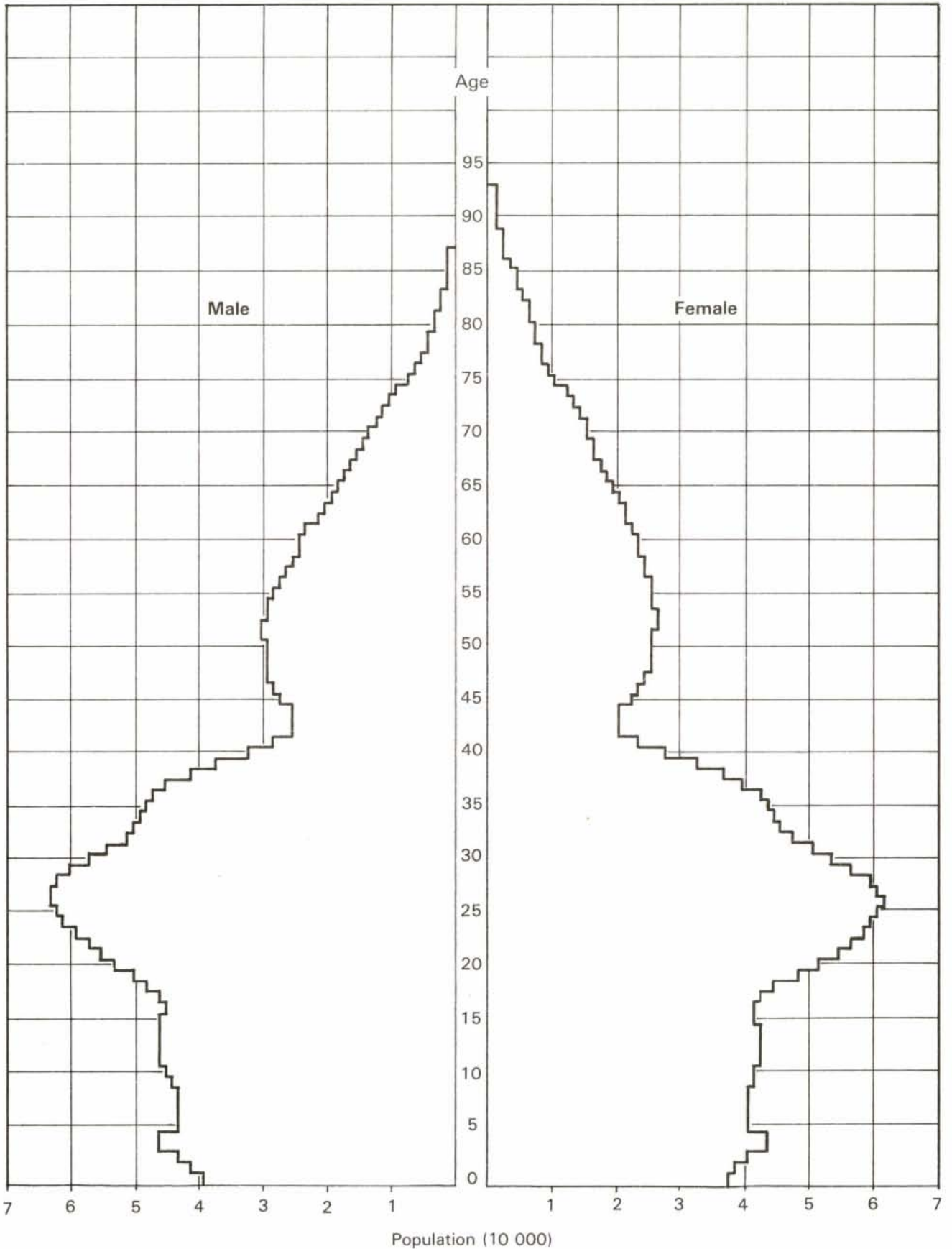
Population (10 000)

* Graduation performed by osculatory interpolation using Greville's multipliers.

Appendix B

Table B.1   Population estimate (1986) and projected population (1987-2006) by age by sex

Male

Age group	Mid-1986	Mid-1987	Mid-1988	Mid-1989	Mid-1990	Mid-1991	Mid-1992	Mid-1993	Mid-1994	Mid-1995	Mid-1996
						('000)					
0- 4	215.6	207.7	202.1	199.0	198.6	200.8	204.4	206.4	206.9	205.7	203.3
5- 9	217.0	219.9	222.4	223.5	222.6	218.6	210.8	205.2	202.0	201.6	203.8
10-14	229.2	226.9	224.1	221.1	218.8	218.5	221.4	223.8	224.9	224.1	220.0
15-19	237.1	229.5	225.4	223.7	222.8	221.5	219.3	216.5	213.5	211.2	210.9
20-24	289.5	279.0	265.9	251.9	238.6	227.7	220.3	216.2	214.5	213.7	212.4
25-29	315.1	316.9	315.3	311.2	304.7	296.7	286.1	273.1	259.1	245.8	234.9
30-34	267.0	279.1	291.8	304.0	313.6	318.9	320.5	318.9	314.9	308.3	300.2
35-39	224.4	236.2	245.1	252.6	260.7	270.9	282.7	295.3	307.5	317.1	322.0
40-44	140.6	154.0	172.0	192.0	210.7	226.2	237.9	246.7	254.0	262.1	272.0
45-49	141.5	137.7	133.9	132.1	134.4	142.2	155.4	173.1	192.8	211.2	226.5
50-54	147.8	147.6	146.8	145.2	143.4	140.4	136.7	133.1	131.3	133.5	141.2
55-59	132.5	135.6	138.6	140.9	142.3	143.1	143.0	142.2	140.7	138.9	136.2
60-64	108.3	111.8	115.0	118.2	121.4	124.4	127.4	130.3	132.6	134.0	134.8
65-69	79.7	83.0	86.6	90.3	93.9	97.4	100.7	103.8	106.8	109.8	112.7
70-74	55.7	58.3	60.5	62.7	65.0	67.7	70.7	73.8	77.2	80.4	83.6
75-79	26.8	30.1	33.7	37.3	40.5	43.1	45.3	47.2	49.0	51.0	53.3
80-84	11.7	12.6	13.5	14.6	16.1	18.1	20.4	23.0	25.5	27.8	29.8
85 and over	4.9	5.3	6.0	6.7	7.4	8.1	8.8	9.7	10.6	11.8	13.3
All ages	2 844.4	2 871.2	2 898.7	2 927.0	2 955.5	2 984.3	3 011.8	3 038.3	3 063.8	3 088.0	3 110.9

Age group	Mid-1997	Mid-1998	Mid-1999	Mid-2000	Mid-2001	Mid-2002	Mid-2003	Mid-2004	Mid-2005	Mid-2006
					('000)					
0- 4	199.7	195.5	190.9	186.0	181.2	176.5	172.3	168.6	165.4	162.7
5- 9	207.4	209.4	209.8	208.8	206.3	202.7	198.6	193.9	189.1	184.2
10-14	212.1	206.6	203.4	203.1	205.2	208.8	210.9	211.3	210.2	207.7
15-19	213.8	216.2	217.3	216.4	212.5	204.6	199.1	196.0	195.6	197.8
20-24	210.3	207.4	204.5	202.3	202.0	204.9	207.3	208.5	207.7	203.7
25-29	227.4	223.3	221.7	220.9	219.6	217.4	214.6	211.7	209.5	209.2
30-34	289.7	276.8	262.8	249.6	238.6	231.3	227.1	225.6	224.8	223.6
35-39	323.7	322.3	318.2	311.7	303.7	293.3	280.3	266.5	253.4	242.5
40-44	284.0	296.6	308.6	318.0	323.2	325.0	323.5	319.3	313.0	305.3
45-49	238.0	246.8	254.1	262.1	271.9	283.9	296.4	308.3	317.7	323.0
50-54	154.1	171.5	190.9	208.9	223.9	235.2	243.9	251.2	259.1	268.9
55-59	132.6	129.3	127.6	129.9	137.3	150.0	166.9	185.6	203.1	217.7
60-64	134.8	134.2	132.9	131.3	128.8	125.5	122.5	121.0	123.2	130.4
65-69	115.7	118.4	120.6	122.1	122.9	123.0	122.5	121.5	120.0	117.7
70-74	86.6	89.4	92.1	94.8	97.5	100.1	102.6	104.6	105.9	106.7
75-79	55.9	58.5	61.3	64.0	66.7	69.2	71.5	73.8	76.1	78.3
80-84	31.4	32.8	34.3	35.8	37.5	39.4	41.4	43.5	45.5	47.4
85 and over	15.0	16.9	18.9	20.7	22.6	24.4	26.1	27.9	29.8	31.6
All ages	3 132.2	3 151.9	3 169.9	3 186.4	3 201.4	3 215.2	3 227.5	3 238.8	3 249.1	3 258.4

Table B.1 Population estimate (1986) and projected population (1987-2006) by age by sex (Cont'd)

Female

Age group	Mid-1986	Mid-1987	Mid-1988	Mid-1989	Mid-1990	Mid-1991	Mid-1992	Mid-1993	Mid-1994	Mid-1995	Mid-1996
						('000)					
0- 4	200.2	193.1	187.6	185.3	185.4	187.7	191.1	193.0	193.4	192.4	190.0
5- 9	201.4	204.1	206.7	207.3	205.9	201.8	194.7	189.2	186.9	187.0	189.3
10-14	209.0	207.2	204.9	202.7	201.1	201.3	204.0	206.6	207.2	205.8	201.7
15-19	217.6	209.9	205.6	203.8	203.1	202.0	200.2	197.9	195.7	194.1	194.3
20-24	278.4	269.4	256.8	242.6	228.7	217.3	209.5	205.3	203.5	202.7	201.6
25-29	297.7	303.8	307.1	307.4	305.4	300.2	291.2	278.6	264.3	250.5	239.0
30-34	245.2	260.3	276.3	291.8	304.6	313.8	319.9	323.2	323.4	321.3	316.2
35-39	196.7	210.0	221.0	231.1	242.1	255.3	270.4	286.4	301.7	314.4	323.9
40-44	114.2	127.8	145.8	166.1	185.6	202.0	215.3	226.2	236.2	247.1	260.3
45-49	117.6	113.4	109.4	107.2	109.2	116.9	130.4	148.3	168.4	187.8	204.0
50-54	127.0	126.1	124.6	122.8	120.2	117.0	112.8	108.8	106.6	108.6	116.2
55-59	121.7	122.6	123.5	124.1	124.1	123.6	122.6	121.2	119.4	116.9	113.6
60-64	107.7	110.3	112.4	114.1	115.5	116.9	117.8	118.7	119.3	119.3	118.8
65-69	86.1	89.0	92.3	95.6	98.9	101.7	104.1	106.2	107.8	109.3	110.6
70-74	68.8	71.0	72.7	74.3	76.1	78.5	81.3	84.6	87.7	90.8	93.4
75-79	43.6	46.5	50.1	53.6	56.8	59.5	61.5	63.0	64.7	66.4	68.7
80-84	28.4	29.2	29.9	30.8	32.1	34.0	36.5	39.4	42.4	45.1	47.2
85 and over	18.6	20.1	21.7	23.4	25.0	26.6	28.1	29.4	31.0	32.7	34.9
All ages	2 679.9	2 713.8	2 748.4	2 784.0	2 819.8	2 856.1	2 891.4	2 926.0	2 959.6	2 992.2	3 023.7

Age group	Mid-1997	Mid-1998	Mid-1999	Mid-2000	Mid-2001	Mid-2002	Mid-2003	Mid-2004	Mid-2005	Mid-2006
					('000)					
0- 4	186.7	182.8	178.4	173.9	169.3	164.9	161.0	157.5	154.6	152.1
5- 9	192.7	194.6	195.1	194.0	191.7	188.4	184.4	180.1	175.6	171.0
10-14	194.7	189.1	186.8	186.9	189.2	192.6	194.5	195.0	193.9	191.6
15-19	197.0	199.6	200.2	198.9	194.7	187.7	182.2	179.9	180.0	182.3
20-24	199.8	197.6	195.4	193.8	194.0	196.7	199.4	199.9	198.6	194.5
25-29	231.3	227.1	225.3	224.5	223.4	221.7	219.4	217.3	215.6	215.8
30-34	307.2	294.5	280.4	266.5	255.2	247.4	243.3	241.4	240.7	239.5
35-39	329.9	333.1	333.3	331.2	326.1	317.1	304.6	290.4	276.5	265.2
40-44	275.3	291.3	306.6	319.4	328.7	334.7	338.0	338.3	336.3	331.0
45-49	217.2	228.1	238.1	248.9	262.2	277.0	293.0	308.3	321.0	330.3
50-54	129.6	147.3	167.2	186.4	202.5	215.6	226.4	236.3	247.1	260.2
55-59	109.6	105.7	103.6	105.6	113.1	126.3	143.8	163.5	182.4	198.3
60-64	118.0	116.7	115.0	112.6	109.5	105.6	101.8	99.8	101.9	109.3
65-69	111.6	112.6	113.3	113.3	112.9	112.2	111.0	109.4	107.2	104.3
70-74	95.9	97.8	99.5	101.0	102.2	103.3	104.2	104.9	105.0	104.7
75-79	71.2	74.3	77.2	79.9	82.3	84.5	86.4	87.9	89.2	90.5
80-84	48.9	50.4	51.7	53.3	55.2	57.4	59.8	62.2	64.6	66.6
85 and over	37.3	40.0	42.8	45.7	48.3	50.8	53.2	55.8	58.2	61.0
All ages	3 053.9	3 082.6	3 109.9	3 135.8	3 160.5	3 183.9	3 206.4	3 227.9	3 248.4	3 268.2

Table B.1   Population estimate (1986) and projected population (1987-2006) by age by sex (Cont'd)

Both sexes

Age group	Mid-1986	Mid-1987	Mid-1988	Mid-1989	Mid-1990	Mid-1991	Mid-1992	Mid-1993	Mid-1994	Mid-1995	Mid-1996
						('000)					
0- 4	415.8	400.8	389.7	384.3	384.0	388.5	395.5	399.4	400.3	398.1	393.3
5- 9	418.4	424.0	429.1	430.8	428.5	420.4	405.5	394.4	388.9	388.6	393.1
10-14	438.2	434.1	429.0	423.8	419.9	419.8	425.4	430.4	432.1	429.9	421.7
15-19	454.7	439.4	431.0	427.5	425.9	423.5	419.5	414.4	409.2	405.3	405.2
20-24	567.9	548.4	522.7	494.5	467.3	445.0	429.8	421.5	418.0	416.4	414.0
25-29	612.8	620.7	622.4	618.6	610.1	596.9	577.3	551.7	523.4	496.3	473.9
30-34	512.2	539.4	568.1	595.8	618.2	632.7	640.4	642.1	638.3	629.6	616.4
35-39	421.1	446.2	466.1	483.7	502.8	526.2	553.1	581.7	609.2	631.5	645.9
40-44	254.8	281.8	317.8	358.1	396.3	428.2	453.2	472.9	490.2	509.2	532.3
45-49	259.1	251.1	243.3	239.3	243.6	259.1	285.8	321.4	361.2	399.0	430.5
50-54	274.8	273.7	271.4	268.0	263.6	257.4	249.5	241.9	237.9	242.1	257.4
55-59	254.2	258.2	262.1	265.0	266.4	266.7	265.6	263.4	260.1	255.8	249.8
60-64	216.0	222.1	227.4	232.3	236.9	241.3	245.2	249.0	251.9	253.3	253.6
65-69	165.8	172.0	178.9	185.9	192.8	199.1	204.8	210.0	214.6	219.1	223.3
70-74	124.5	129.3	133.2	137.0	141.1	146.2	152.0	158.4	164.9	171.2	177.0
75-79	70.4	76.6	83.8	90.9	97.3	102.6	106.8	110.2	113.7	117.4	122.0
80-84	40.1	41.8	43.4	45.4	48.2	52.1	56.9	62.4	67.9	72.9	77.0
85 and over	23.5	25.4	27.7	30.1	32.4	34.7	36.9	39.1	41.6	44.5	48.2
All ages	5 524.3	5 585.0	5 647.1	5 711.0	5 775.3	5 840.4	5 903.2	5 964.3	6 023.4	6 080.2	6 134.6

Age group	Mid-1997	Mid-1998	Mid-1999	Mid-2000	Mid-2001	Mid-2002	Mid-2003	Mid-2004	Mid-2005	Mid-2006
					('000)					
0- 4	386.4	378.3	369.3	359.9	350.5	341.4	333.3	326.1	320.0	314.8
5- 9	400.1	404.0	404.9	402.8	398.0	391.1	383.0	374.0	364.7	355.2
10-14	406.8	395.7	390.2	390.0	394.4	401.4	405.4	406.3	404.1	399.3
15-19	410.8	415.8	417.5	415.3	407.2	392.3	381.3	375.9	375.6	380.1
20-24	410.1	405.0	399.9	396.1	396.0	401.6	406.7	408.4	406.3	398.2
25-29	458.7	450.4	447.0	445.4	443.0	439.1	434.0	429.0	425.1	425.0
30-34	596.9	571.3	543.2	516.1	493.8	478.7	470.4	467.0	465.5	463.1
35-39	653.6	655.4	651.5	642.9	629.8	610.4	584.9	556.9	529.9	507.7
40-44	559.3	587.9	615.2	637.4	651.9	659.7	661.5	657.6	649.3	636.3
45-49	455.2	474.9	492.2	511.0	534.1	560.9	589.4	616.6	638.7	653.3
50-54	283.7	318.8	358.1	395.3	426.4	450.8	470.3	487.5	506.2	529.1
55-59	242.2	235.0	231.2	235.5	250.4	276.3	310.7	349.1	385.5	416.0
60-64	252.8	250.9	247.9	243.9	238.3	231.1	224.3	220.8	225.1	239.7
65-69	227.3	231.0	233.9	235.4	235.8	235.2	233.5	230.9	227.2	222.0
70-74	182.5	187.2	191.6	195.8	199.7	203.4	206.8	209.5	210.9	211.4
75-79	127.1	132.8	138.5	143.9	149.0	153.7	157.9	161.7	165.3	168.8
80-84	80.3	83.2	86.0	89.1	92.7	96.8	101.2	105.7	110.1	114.0
85 and over	52.3	56.9	61.7	66.4	70.9	75.2	79.3	83.7	88.0	92.6
All ages	6 186.1	6 234.5	6 279.8	6 322.2	6 361.9	6 399.1	6 433.9	6 466.7	6 497.5	6 526.6

Appendix C

Chart C.1   Hong Kong population pyramid, mid-1986

Population (10 000)
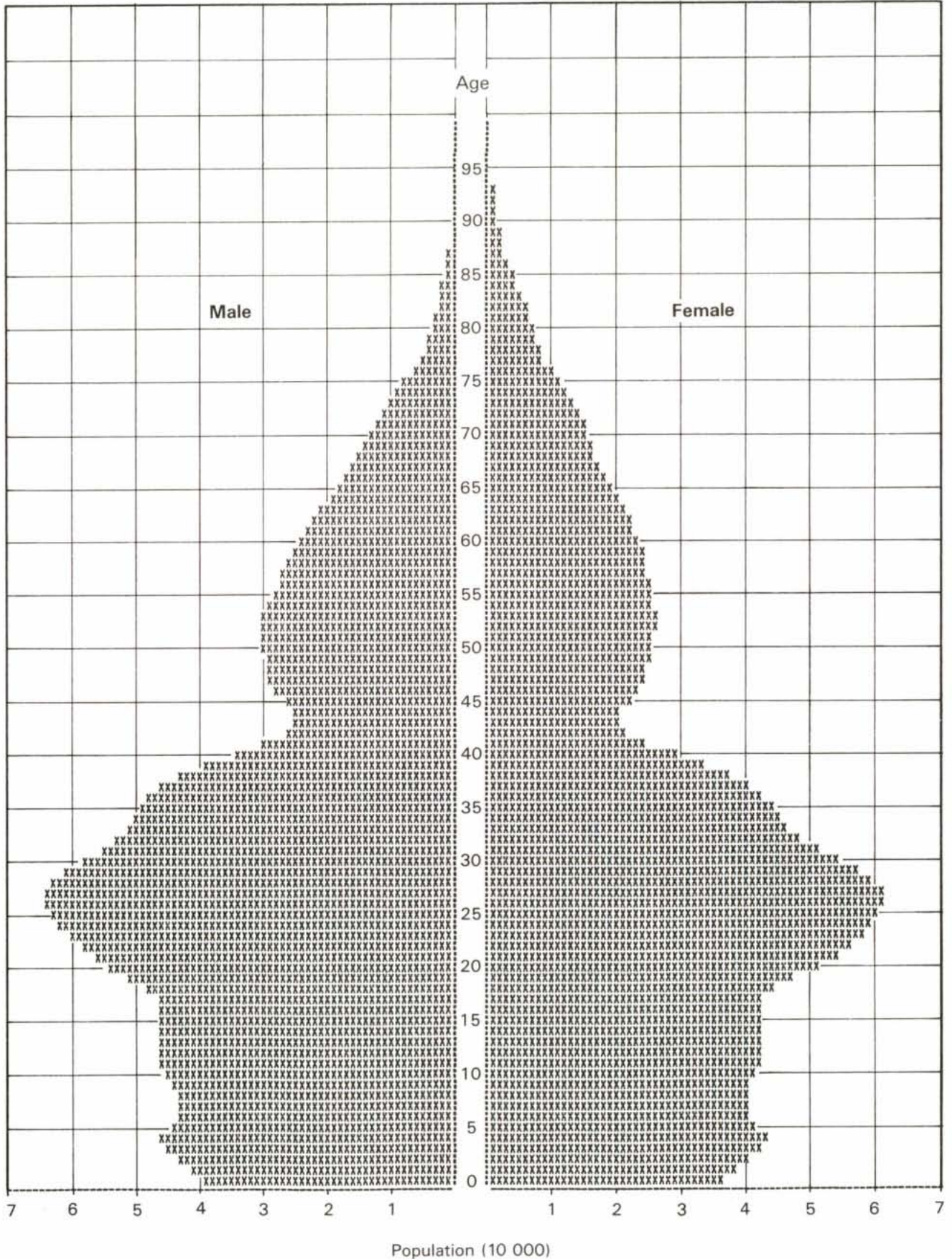
Chart C.2   Hong Kong population pyramid, mid-1991

Population (10 000)
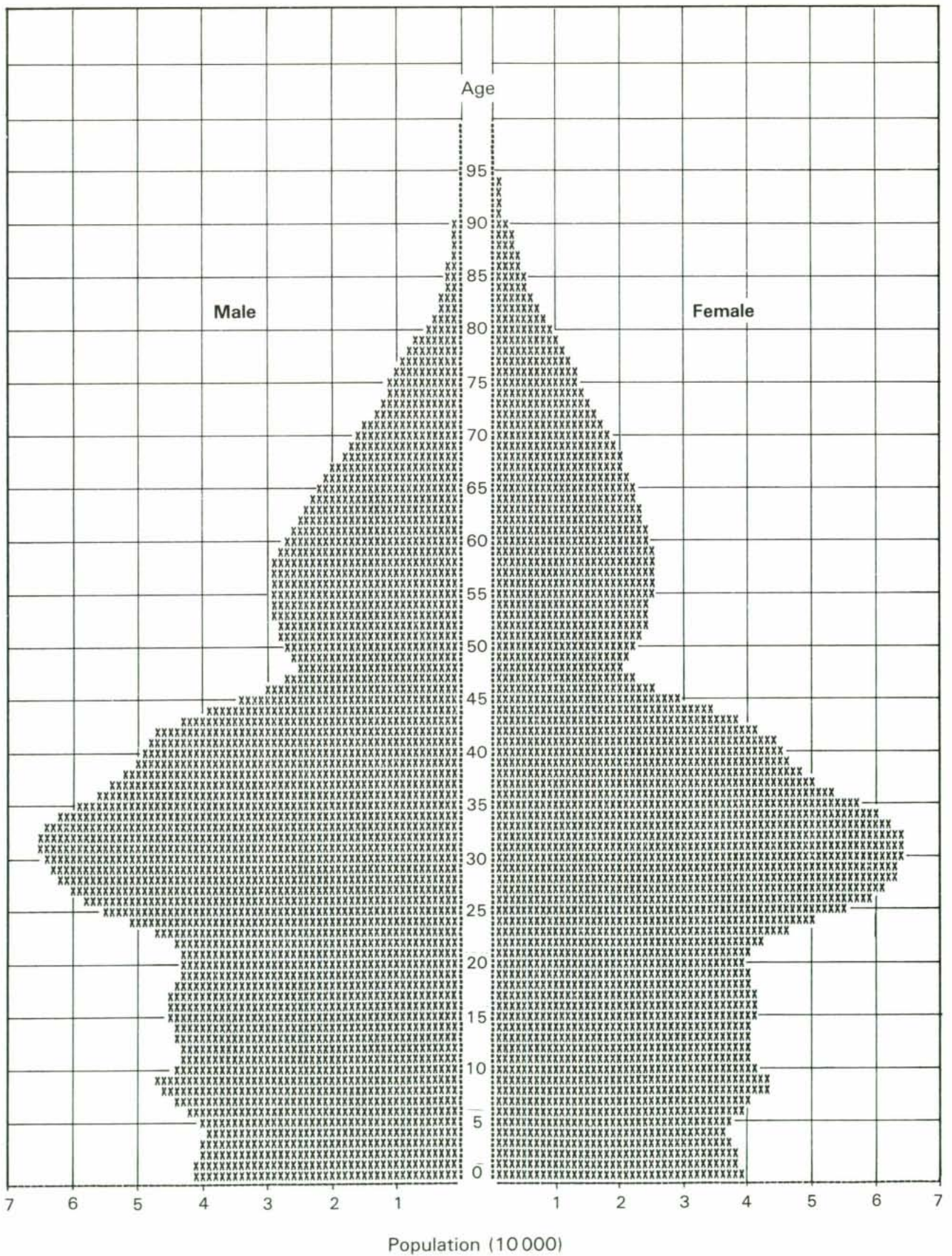
Chart C.3   Hong Kong population pyramid, mid-1996

Chart C.3   Hong Kong population pyramid, mid-1996

Age

Male

Female

Population (10 000)

20
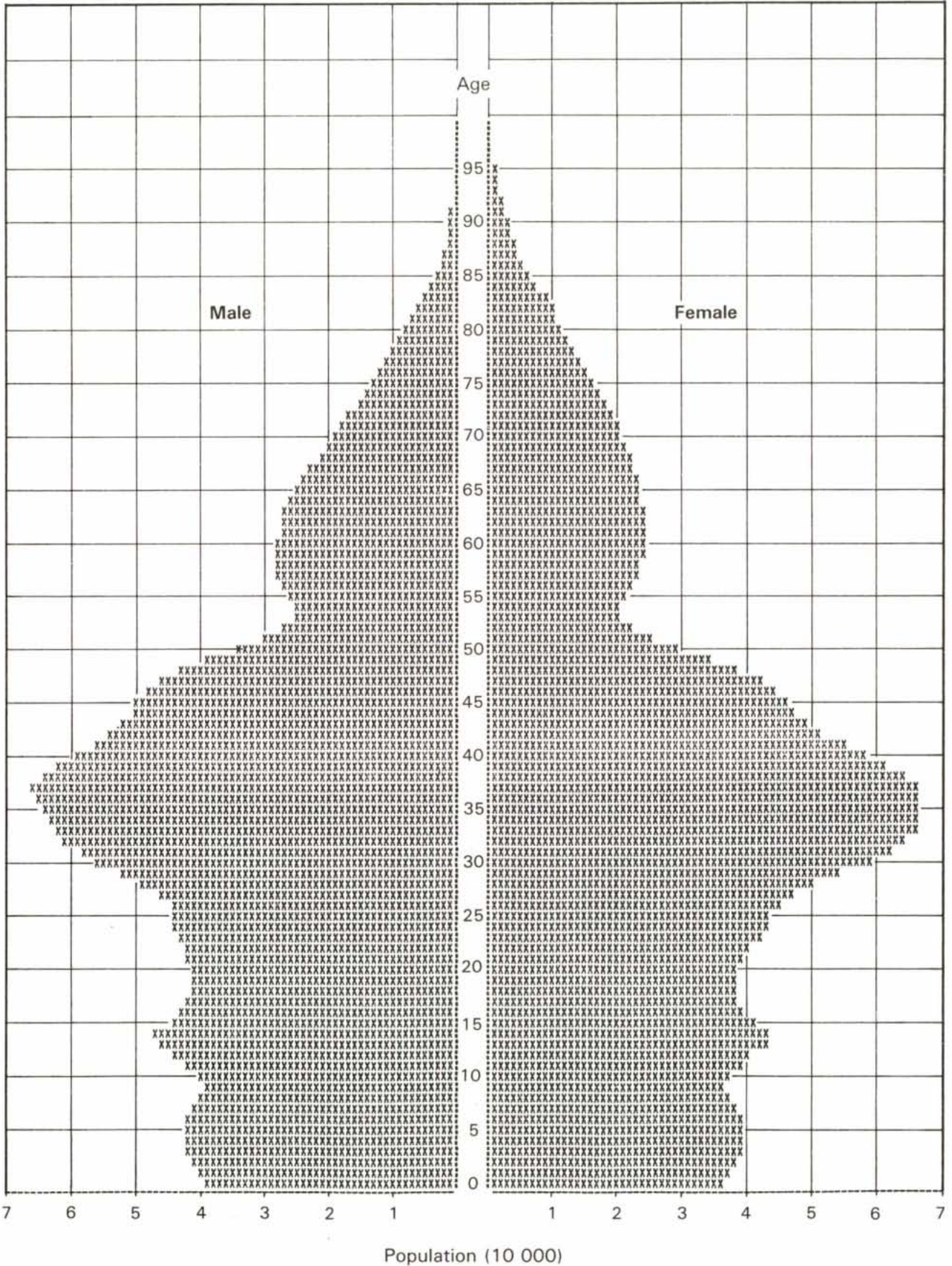
Chart C.4   Hong Kong population pyramid, mid-2001

Population (10 000)
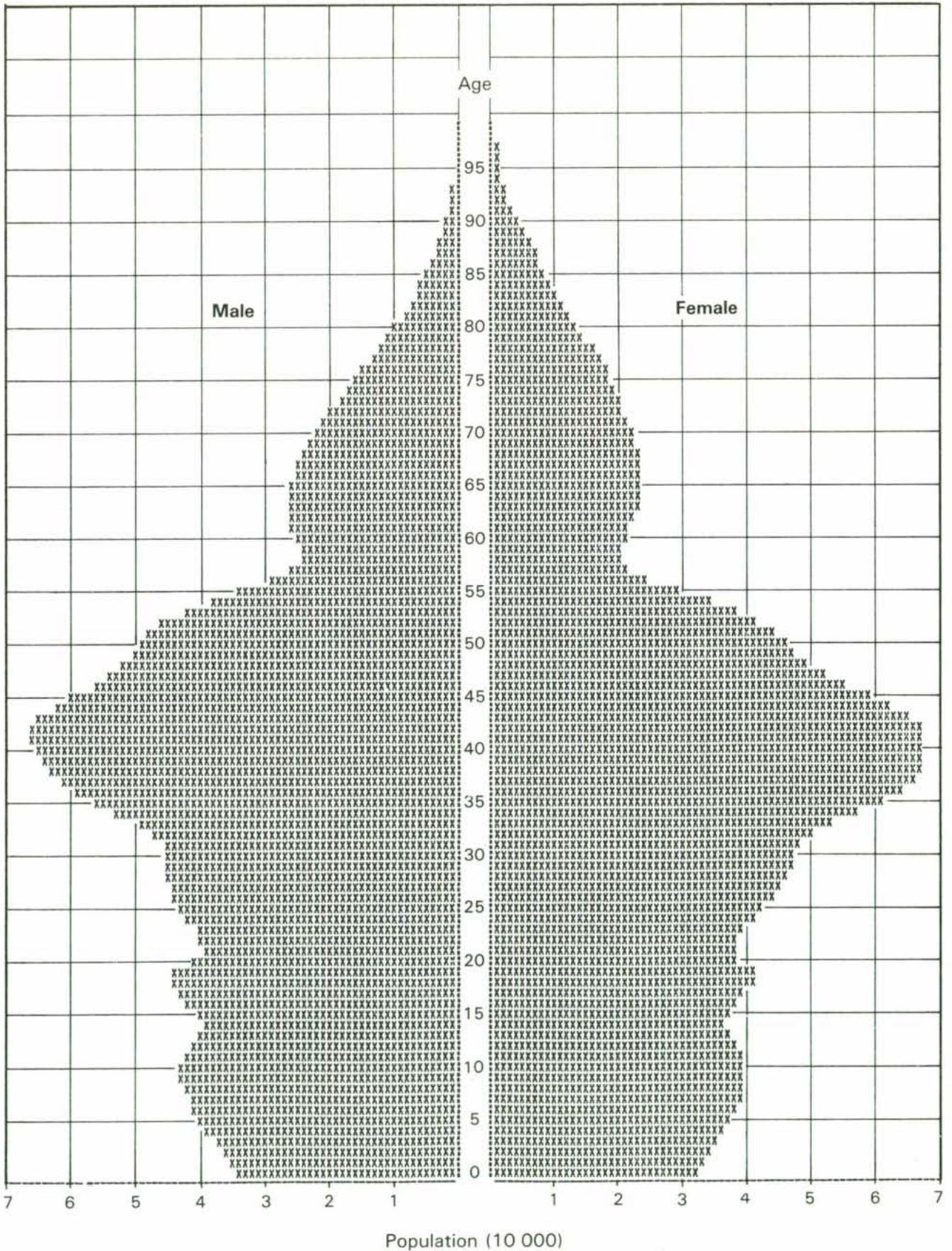
Chart C.5 Hong Kong population pyramid, mid-2006

Age

Male

Female

Population (10 000)
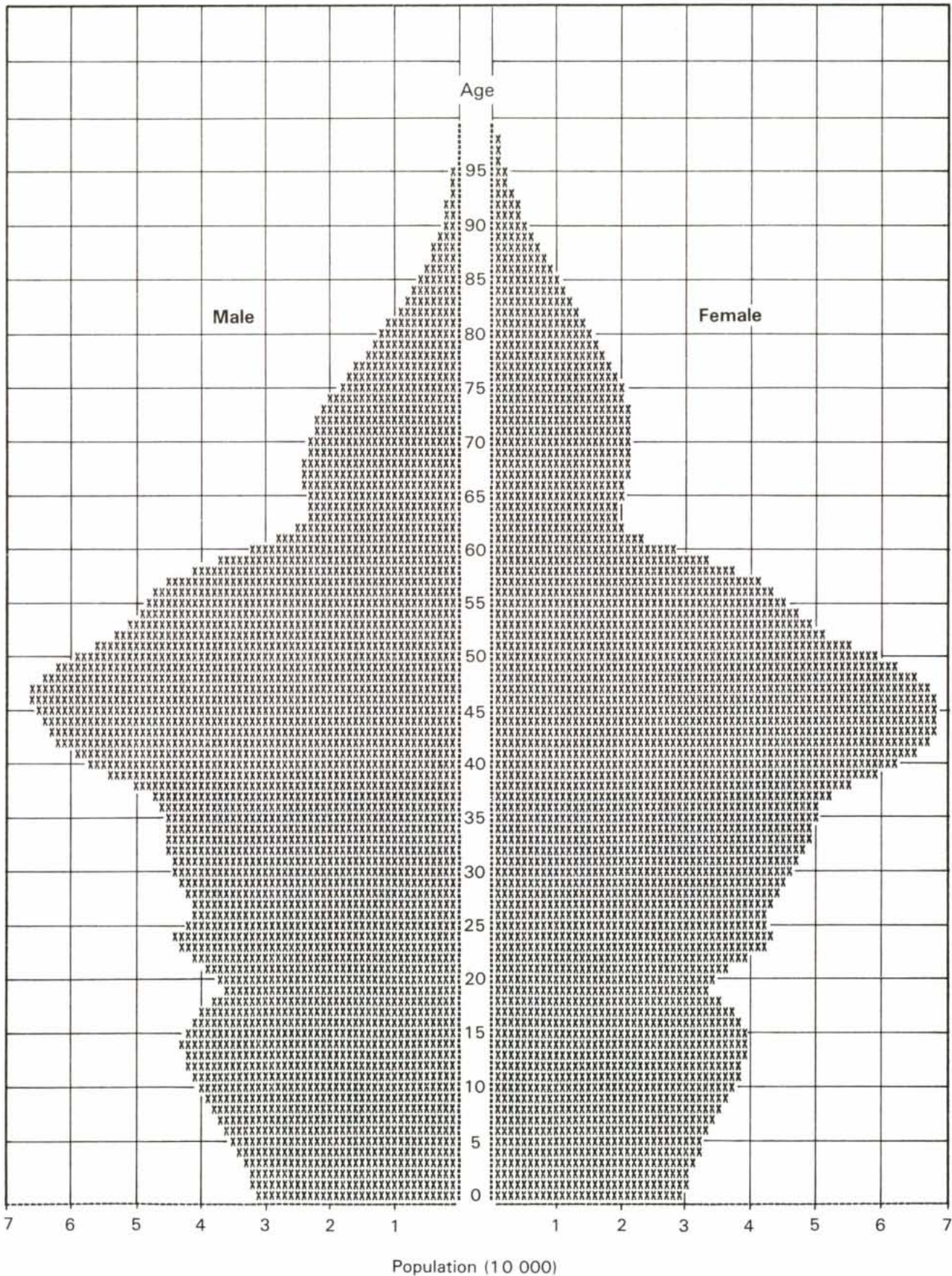
Part II

Analysis of Fertility and Mortality

1. Fertility

Introduction

Hong Kong's fertility has experienced a dramatic decline over the last few years. The total fertility rate (TFR)* decreased from 2 050 per 1 000 women in 1980 to 1 460 in 1985. A fertility decline of this order was beyond expectation when the fertility assumptions for the 1981 based population projection were modelled in 1982 on the past trends. The rate of decrease, within such a short period of time, was particularly significant even by the experience of developed countries. It was matched only by the fertility decline in West Germany in the early 1970's. The fertility level in Hong Kong has now fallen below the recent transition in such low fertility countries as the Netherlands, Sweden and the U.K..

The fertility decline in the 1970's was brought about by a significant change in the demographic, socio-economic conditions in Hong Kong and by a change in people's attitude towards the small family. These forces must have been gathering momentum since the turn of the decade and have further reduced fertility to its present low level.

The following provides background information on the transition of fertility in Hong Kong since 1971, paying particular attention to its recent trend and the reasons underlying the formulation of the fertility assumptions for the 1986 based population projection.

Fertility trends in retrospect

(a)   Live births and crude birth rates

After 1963, the annual number of live births in Hong Kong started to fall. The steep downward trend in births came to a halt in the early 1970's. The annual number of live births fluctuated around 80 000 during most of the time in the 1970's, rose to 87 000 in 1981 and then decreased abruptly to 76 000 in 1985 (Table 1.1). During this period, the crude birth rate (CBR)# fell steadily from 33 per 1 000 population in 1963 to 17 in 1981 and to 14 in 1985. However, the CBR is not a good indicator of the fertility level as it takes no account of the changing age and sex structure of the population. Age-specific fertility rates have to be adopted in the study and projection of fertility trends.

(b)   Age-specific fertility rates

The dramatic fertility decline over the period 1971 to 1985 was well demonstrated by a rapid reduction in the age-specific fertility rates (AFRs)@ at all childbearing ages (Table 1.2). Relatively speaking, the rate of decrease was more remarkable at older ages: 68 percent for the age group 35-39, 84 percent for the age group 40-44 and 90 percent for the age group 45-49. In absolute terms, the reduction in AFRs in the age group 20-34 was, however, most substantial, accounting for the majority of the fertility decline.

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*   TFR is the sum of the age-specific fertility rates for women aged 15 to 49 in a given year, representing the number of children that a woman would bear (ignoring mortality) if she were subject throughout her reproductive age to the age-specific fertility rates prevailing in that year.

\#   CBR is a ratio of the number of live births given during a calendar year to the estimated mid-year total population.

@   AFRs relate the numbers of live births occurring to women in given age groups during a calendar year to the estimated total female population in those age groups at the middle of that year.

The reduction in AFRs was due to two factors: nuptiality change in the form of a decreased proportion of women married* and a reduction in marital fertility (Table 1.3 and Table 1.4).

During the period 1971 to 1976, the reduction in marital fertility contributed to more than 90 percent of the total fertility decline# (Table 1.6). Since the marital fertility decline in that period related mostly to the curtailment of high-order births, its contribution to the total fertility decline was permanent.

The decrease in the proportion of women married became more noticeable after 1976 and nuptiality change, therefore, contributed more to the fertility decline during the later periods (Table 1.3 and Table 1.6). However, since the act of delaying marriage does not necessarily imply a choice of ultimate spinsterhood, the impact of a postponement of marriage on period fertility should not be permanent. Many of these marriages postponed at younger ages will be contracted at older ages.

In the most recent period 1981 to 1985 when the level of fertility was very low, the marital fertility decline at ages below 30 was basically attributable to a postponement of low-order births, in particular of first births. This factor and a substantial postponement of marriage during that period suggested that the drastic fertility decline since 1981 would, to a certain extent, be a temporary phenomenon. It pointed ahead to a possibility of some catching-up of the postponed events which would increase the fertility level in subsequent years.

(c) Total fertility rates - level and structure

The changes in AFRs over the years 1971 to 1985 can be summarized in the trend of TFR and in its structural development. The TFR, which is the sum of AFRs, has decreased significantly during this period by some 58 percent from 3 460 per 1 000 women in 1971 to 1 930 in 1981 and to only 1 460 in 1985 (Table 1.2). In fact, the total fertility rate has fallen below the replacement level@ since 1980. The drastic reduction in TFR in the last few years suggests that the ability of the population to reproduce itself has been very much depleted since the beginning of the 1980's.

The TFR has also experienced some structural changes since 1981. During these few years, fertility of women aged 25-34 contributed significantly more to total fertility: 67 percent as against 60 percent in earlier years (Table 1.7). The increased concentration of childbearing at these ages (which is equivalent to a reduced range of childbearing ages) was a result of a curtailment of high-order births at the older ages and a postponement of low-order births at the younger ages. When most couples limited their family size to one or two children, the share of high-order births in total fertility decreased. Consequently, the share of first and second births increased, accounting for 78 percent of total fertility in 1985; the corresponding proportion in 1971 was only 46 percent (Table 1.8).

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* A decreased proportion of women married refers to a postponement of marriage among young spinsters, which is revealed by an increasing median age at first marriage (Table 1.5).
# Total fertility decline in a period is quantified as the difference between the TFRs at the beginning and ending years of that period.
@ Population replacement considers the extent to which a population can reproduce itself. A TFR below 2 100 will result in a generation of women not giving a sufficient number of births to replace themselves after taking into consideration childhood mortality and the differential in the sex ratio at birth (which tends to favour male births).

Factors affecting decline in fertility

The marked reduction in marital fertility during the period 1971 to 1985 can be explained by a host of factors, including industrial development and urbanization, increased level of income, improved and extended education and improvement in the role expectation of women in society and in the employment opportunities for women. Changes in these factors alter people's aspirations as regards pecuniary reward and standard of living which, together with the increased cost of raising children, make a large family too expensive. This naturally leads to a substantial decrease in high-order births and to a postponement of first births among many couples.

Another important factor affecting the decline in marital fertility is the success of well organised and persistent efforts of the Government and the Hong Kong Family Planning Association in promoting family planning during these years. The desire among couples to practise contraception has been supported by a convenient supply of contraceptive devices and by the increased availability of sterilization services from family planning agencies in both the public and private sectors. As a result, not only have unplanned births been reduced but also the spacing of births has been regulated and both phenomena affect the fertility rates in the period.

It is not a common desire of many mothers to deliver their births in overseas countries. According to the statistics maintained, though the estimated number of births delivered in overseas countries doubled between 1979/80 and 1985/86 from 600 to 1 300 per year, this was still insignificant relative to the annual number of births in Hong Kong. The effect of these births on the past fertility rates was, therefore, only marginal. For the population projection, these overseas births would be accounted for under the balance of migration.

Future fertility levels

Under the present social and economic system and in the absence of any pro-natalistic policy of the Government, it is expected that the small family norm will remain popular. People will continue to delay marriage and married women will continue to fulfil roles in society other than just being a mother, ultimately achieving a small completed family size which will be far from adequate to substain the replacement of the population. These are the fundamental rationales underlying the fertility assumptions for the 1986 based population projection.

Since the drastic fertility decline in the last few years has related more to delayed marriage and postponement of low-order births, in particular first births, some catching-up of the postponed events is envisaged in the immediate future, thereby pushing up the level of total fertility. However, the long-term perspective is that fertility will continue its downward trend again and remain below the replacement level. To summarize, the future TFR will increase, marginally, over the next few years and then decrease gradually to the 1986 level over the rest of the projection period.

Fertility projection

(a) Method of projecting fertility

The past trends of AFRs by birth order form the basis for formulating the fertility assumptions. In extrapolating the past trends of AFRs, the time series of the rates were fitted against a number of statistical curves. In general, the log-linear, reciprocal linear or log-parabola models gave the best fit in terms of the coefficient of determination. The curves of best fit were carried forward for n years into the future, n being determined on the basis of subjective judgement. Particular reference was given to the actual values of the rates in the last few years and to the implications on future fertility of the postponement of marriage and low-order births and of some catching-up of the postponed events (particularly for the age group 25-39).

Having thus obtained the projected fertility rates, several cross checks were made to ensure their appropriateness and consistency. First, an assessment was made of the implications of the projected period rates for selected birth cohorts. Second, the derived AFRs and TFRs were examined in relation to past trends. Finally, the derived TFRs were then compared with the recent trends in other low fertility countries. On the basis of these three checks, the initially projected fertility rates were modified to make them consistent with what was considered to be the most likely future path of fertility in Hong Kong.

(b)   Projected age-specific fertility rates

The AFRs for different age groups were projected to change differently over the projection period (Table 1.10). For the age group 15-24, given the likelihood of a continual tendency towards delayed marriage and delayed first births, the projected AFRs would continue to decrease, albeit at a lower rate. For the age group 40-49, the projected AFRs would decrease rapidly as a result of curtailment of high-order births. On the contrary, the projected AFRs for the age group 25-39 would exhibit different trends. Assuming that the rapid decline in fertility in the age group 20-34 (as a result of postponement of marriage and childbearing) in the last few years was a temporary phenomenon and there would be some catching-up of the postponed events in the coming few years, the projected AFRs for the age groups 25-29 and 35-39 would increase up to 1991 and for the age group 30-34 up to 1996; thereafter, the rates would decrease again. With the established tendency towards higher ages of childbearing and assuming ages 30-34 being the upper age constraint for these vital events, particularly for first births, the projected AFRs for this age group would remain at a high level throughout the projection period, i.e. up to 2006.

The overall effect of these changes in the projected AFRs was that the projected TFR would increase marginally from a level of 1 360 in 1986 to 1 430 in 1991 and then decrease gradually to 1 350 in 2006. Fertility of women aged 25-34 would contribute an increased share in total fertility: from 67 percent in 1985 to 72 percent in 1996 and to 73 percent in 2006, as projected (Table 1.11). Following the past trend, the share of high-order births in total fertility will continue to decrease. Accordingly, the combined share of the first- and second-order births would further increase, from 78 percent in 1985 to 88 percent in 1996 and to 90 percent in 2006, as projected (Table 1.12).

The implications of the projected AFRs for selected birth cohorts in terms of the median age at first birth, the proportion of women remaining childless and the completed family size were examined. The assumption made for the first-order fertility rates brought out two important features. First on the shift in the age of mothers at first birth, 57 percent of women born in 1941 had had their first child by age 25 as compared with the projected figure of some 19 percent for those born in 1971 and thereafter (Table 1.13). In effect, the median age at first birth would increase from an actual value of 24 for women born in 1941 to the projected value of 29 for those born in 1971 (Table 1.14). Second, there would be an increased proportion of women remaining childless*; but a proportion of 15 percent, based on the experience of some developed countries, would be regarded as the ultimate limit adequately covering the effects of spinsterhood, no-child norm and infercundity.

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* This can be derived from deducting from 100 the proportion of women having at least one child given in the last column of Table 1.13.

For women born in 1941 who had almost completed childbearing in 1986, the number of their children ever born averaged 3.4; the figure was projected to decrease to 1.5 for those born in 1961 whose childbearing would be largely completed at the end of the projection period (Table 1.15). Such an average completed family size is not inconceivable to women born at the beginning of the 1960's who have enjoyed better education and higher labour participation and who also have affirmed the practice of late marriage and the small family norm.

(c)   Projected number of births

According to the current population projection, the projected number of births under the new fertility assumptions were 81 000 in 1991, 74 000 in 1996, 65 000 in 2001 and 60 000 in 2006.

International trends

As mentioned above, one of the assessments made before finalizing the fertility assumptions was to examine the recent fertility trends in other low fertility countries (Table 1.16). All the other countries considered had experienced considerable decline in fertility during the period 1971 to 1985, albeit from different levels and at varying rates of decrease. By and large, Hong Kong had witnessed the fastest rate of decrease, which had taken its TFR to fall from 3 460 to 1 460 within 14 years. Such a pace of decline was only matched by the fertility decline in West Germany in the early 1970's. Most attention was, therefore, placed on the experience of West Germany which saw the TFR fluctuating at a very low level, rebounding at each sharp decrease in the rate. This evidence supports the assumption that the projected TFR for 1991 would increase over 1986, and for 1996 and 2006 would decrease below 1991. Concerning the assumption that the TFR would remain below the replacement level for the whole of the projection period, experience of these low fertility countries has not yet proved it to be impossible. As a matter of fact, total fertility in Finland, West Germany, Sweden and Denmark has remained below the replacement level since 1968 without any sign of upsurge.

Comparison of the 1981 and 1986 fertility assumptions

A continuous decline in fertility was assumed in the 1981 based population projection; but the rate of decrease assumed was rather modest, so much so that the projected TFR for 2001 was overtaken quickly by the actual rate in 1983 (Table 1.17). Compared with the previous projection, the new projection has the advantage of witnessing the drastic fertility decline in the last few years and of drawing on more up-to-date experience of other low fertility countries. All evidence in hand suggests that the fertility has probably reached a level where further decrease would be unlikely in the near future, although in the long term its trend would still be falling. The new assumptions, therefore, portrayed that fertility would rebound in the next five years before it would start to decrease again. This contrasted with the 1981 fertility assumptions. Although a single variant was still considered pertinent to formulating the fertility assumptions in the current round of projection, this should not be read as implying a determinable future fertility trend.

Table 1.1   Live births and crude birth rates (per 1 000 women): 1971-1985

Year	Number of live births	Crude birth rate
1971	79 800	19.7
1972	80 300	19.5
1973	82 300	19.4
1974	83 600	19.1
1975	79 800	17.9
1976	78 500	17.4
1977	80 000	17.5
1978	81 000	17.3
1979	82 000	16.8
1980	85 300	17.0
1981	86 800	16.8
1982	86 100	16.4
1983	83 300	15.6
1984	77 300	14.4
1985	76 100	14.0

Table 1.2   Age-specific fertility rates and total fertility rates (per 1 000 women): 1971-1985

Year	15–19	20–24	25–29	Age group 30–34 Rate	35–39	40–44	45–49	Total fertility rate
			(live births per 1 000 women)					
1971	17	145	243	162	83	28	4	3 460
1972	17	139	248	146	77	26	3	3 320
1973	18	132	242	141	72	23	3	3 180
1974	19	132	215	136	64	21	3	2 970
1975	18	120	196	125	54	18	3	2 670
1976	17	108	189	118	48	14	1	2 480
1977	17	104	183	114	45	13	1	2 380
1978	15	98	176	112	43	11	1	2 270
1979	13	89	164	108	42	9	1	2 120
1980	12	88	160	104	39	8	1	2 050
1981	12	86	153	97	34	7	1	1 930
1982	10	80	147	93	34	6	1	1 830
1983	10	75	137	85	30	5	1	1 690
1984	8	63	124	80	28	5	0	1 520
1985	8	58	119	79	27	5	0	1 460

Index of rates
with those for 1971 taken as base (100)

1971	100	100	100	100	100	100	100	100
1972	103	96	102	90	93	91	90	96
1973	105	91	99	87	86	82	87	92
1974	110	91	89	84	77	74	68	86
1975	104	83	81	77	64	64	66	77
1976	101	74	78	73	58	51	38	72
1977	101	72	75	70	54	45	29	69
1978	89	68	72	69	51	39	28	66
1979	74	62	68	67	50	32	23	61
1980	73	61	66	64	47	29	22	59
1981	69	59	63	60	41	24	18	56
1982	59	55	60	57	41	22	17	53
1983	57	52	56	52	36	17	15	49
1984	50	43	51	49	34	17	7	44
1985	49	40	49	48	32	16	10	42

Table 1.3   Proportion of women currently married by age: 1971-1986

				Age group			
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1971	3	32	79	93	95	93	89
1976	4	31	74	92	95	94	91
1981	3	28	69	88	93	93	90
1986	2	21	62	84	89	91	90

Table 1.4   Age-specific marital fertility rates: 1971-1986

				Age group			
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
				Rate (live births per 1 000 currently married women)			
1971	586.4	448.5	305.9	173.6	87.6	30.6	4.3
1976	442.3	343.0	255.6	127.7	50.6	15.3	1.6
1981	349.2	302.5	222.0	111.2	37.0	7.3	0.8
1986[+]	348.6	236.8	179.6	90.6	28.2	4.0	0.3
				Index of rates with those for 1971 taken as base (100)			
1971	100	100	100	100	100	100	100
1976	75	76	84	74	58	50	37
1981	60	67	73	64	42	24	18
1986[+]	59	53	59	52	32	13	7

+ Fertility rates are estimated from the 1986 By-Census marital distribution
  of the population and the estimated age-specific fertility rates for 1986.

Table 1.5   Median age at marriage for spinsters and median interval between marriage and first/second live birth: 1971-1985

Year	Median age at marriage for spinsters	Median interval (in months) from marriage to first live birth	second live birth
1971	22.9	-	-
1976	23.4	16.5	40.5
1981	23.9	14.7	44.5
1982	24.2	16.5	44.4
1983	24.4	16.5	46.1
1984	24.7	17.4	47.9
1985	24.9	17.6	50.8

Table 1.6   Changes in total fertility rate explained by nuptiality and marital fertility: 1971-1976, 1976-1981 and 1981-1985

Component	1971-1976	1976-1981	1981-1985
	Component and total changes		
Nuptiality change	81	166	195
Marital fertility with age of mother			
< 30	391	206	181
$\geqslant$ 30	474	182	123
Interaction	-12	-23	-26
TFR change*	934	531	473

* TFR change is the aggregate of the component changes. It is slightly different from the difference between the TFRs given in Table 1.2 which are calculated from AFRs at single year of age.

Table 1.7 Percentage disaggregation of total fertility rate by age of mother: 1971-1985

	Age of mother						
Year	15–19	20–24	25–29	30–34	35–39	40–44	45–49
1971	2	21	36	24	12	4	1
1976	3	22	38	24	10	3	0
1981	3	22	39	25	9	2	0
1982	3	21	40	25	9	2	0
1983	3	22	40	25	9	1	0
1984	3	20	40	26	9	2	0
1985	3	19	40	27	9	2	0

Table 1.8 Percentage disaggregation of total fertility rate by birth order: 1971-1985

	Birth order				
Year	1	2	3	4	5+
1971	23	23	18	13	23
1976	33	29	17	9	12
1981	39	34	16	7	4
1982	39	35	16	6	4
1983	41	35	15	6	3
1984	41	36	15	5	3
1985	43	35	15	5	2

Table 1.9   Estimated number of live births delivered overseas by Hong Kong residents and
adjusted crude birth rates (per 1 000 women): 1977-1986

Period (mid – mid)	Number		Crude birth rate	
	Local births	Overseas births*	Local births	Local and overseas births
1977–1978	79 200	600	17.1	17.2
1978–1979	82 200	600	17.3	17.4
1979–1980	83 300	600	16.8	16.9
1980–1981	85 500	700	16.7	16.8
1981–1982	87 100	900	16.7	16.8
1982–1983	84 900	1 000	16.0	16.2
1983–1984	80 500	1 300	15.0	15.2
1984–1985	77 100	1 400	14.2	14.5
1985–1986	74 500	1 300	13.6	13.8

* Estimated from new arrivals of population aged 0 from countries other than the
People's Republic of China in the possession of parents who had permanent or
temporary residential status in Hong Kong.

Table 1.10   Actual and projected age-specific fertility rates and total fertility rates (per 1 000 women): 1985-2006

Year	15–19	20–24	25–29	Age group 30–34 Rate (live births per 1 000 women)	35–39	40–44	45–49	Total fertility rate
1985	8	58	119	79	27	5	O	1 460
1986	7	50	111	76	25	4	O	1 360
1991	7	46	116	85	30	3	O	1 430
1996	6	43	112	90	28	3	O	1 410
2001	6	42	110	88	26	2	O	1 370
2006	6	40	109	88	25	2	O	1 350

Index of rates
with those for 1985 taken as base (100)

1985	100	100	100	100	100	100	100	100
1986	86	86	93	96	93	78	69	94
1991	81	79	98	108	110	67	42	98
1996	77	75	95	115	102	56	27	97
2001	77	72	93	113	96	48	19	94
2006	76	70	92	112	93	41	14	93

* The figures below the broken line are projected rates.

Table 1.11   Percentage disaggregation of actual and projected total fertility rates by age of mother: 1985-2006

	Age of mother						
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1985	3	19	40	27	9	2	O
1986	3	18	41	28	9	1	O
1991	2	16	41	30	10	1	O
1996	2	15	40	32	10	1	O
2001	2	15	40	32	10	1	O
2006	2	15	40	33	9	1	O

*   The figures below the broken line are projected.

Table 1.12   Percentage disaggregation of actual and projected total fertility rates by birth order: 1985-2006

	Birth order				
Year	1	2	3	4	5+
1985	43	35	15	5	2
1986	43	37	14	4	2
1991	56	30	10	3	1
1996	60	28	9	2	1
2001	61	28	9	2	O
2006	62	28	8	2	O

*   The figures below the broken line are projected.

Table 1.13   Percentage of women born in selected years with at least one child by given age

	Exact age						
Mother's year of birth	20	25	30	35	40	45	50
1931[a]	16.6	57.8	81.6	90.8	93.0	93.5	93.5
1936[a]	12.7	56.8	81.3	89.7	91.6	91.8	91.9
1941[b]	14.0	57.2	84.0	91.6	93.6	93.9	93.9
1946[b]	12.4	55.9	87.8	95.3	97.1	97.3	97.3
1951[b]	7.1	43.8	77.4	87.5	90.9	91.1	91.1
1956[c]	7.5	37.4	67.8	80.5	86.2	86.4	86.5
1961[c]	5.7	28.9	59.1	80.0	85.8	86.1	
1966[c]	3.5	20.4	54.9	78.6	84.5		
1971[d]	3.1	19.5	54.7	78.5			
1976[d]	3.0	19.0	54.1				
1981[d]	3.0	18.5					
1986[d]	3.0						

[a]   Based partly on the 1976 By-Census results and partly on birth statistics.
[b]   Based partly on the 1976 By-Census results, partly on birth statistics and partly on projections.
[c]   Based partly on birth statistics and partly on projections.
[d]   Based entirely on projections.

Table 1.14   Median age of mothers born in selected years at first birth

Mother's year of birth	Median age at first birth
1931	24.0[a]
1936	24.1[a]
1941	24.1[a]
1946	24.5[a]
1951	25.7[b]
1956	26.7[c]
1961	28.5[d]
1966	29.3[d]
1971	29.3[e]

[a] Based on the 1976 By-Census results.
[b] Based partly on the 1976 By-Census results and partly on birth statistics.
[c] Based entirely on birth statistics.
[d] Based partly on birth statistics and partly on projections.
[e] Based entirely on projections.

Table 1.15   Number of children ever born by women born in selected years by given age

	Exact age						
Mother's year of birth	20	25	30	35	40	45	50
1931[a]	0.24	1.34	2.95	4.29	4.82	4.95	4.95
1936[a]	0.18	1.16	2.50	3.31	3.67	3.73	3.73
1941[b]	0.21	1.28	2.53	3.19	3.41	3.44	3.44
1946[b]	0.20	1.20	2.36	2.86	3.00	3.02	3.02
1951[b]	0.09	0.75	1.64	2.08	2.21	2.23	2.23
1956[c]	0.09	0.58	1.26	1.67	1.81	1.83	1.83
1961[c]	0.07	0.42	0.95	1.39	1.53	1.54	
1966[c]	0.04	0.30	0.84	1.28	1.42		
1971[d]	0.04	0.28	0.81	1.24			
1976[d]	0.04	0.27	0.78				
1981[d]	0.03	0.26					
1986[d]	0.03						

[a]   Based partly on the 1976 By-Census results and partly on birth statistics.
[b]   Based partly on the 1976 By-Census results, partly on birth statistics and partly on projections.
[c]   Based partly on birth statistics and partly on projections.
[d]   Based entirely on projections.

Table 1.16   International trends in total fertility rate (per 1 000 women): 1971-1985

Country	1971	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Hong Kong	3 460	2 480	2 380	2 270	2 120	2 050	1 930	1 830	1 690	1 520	1 460
Singapore	3 040	2 110	1 820	1 790	1 790	1 740	1 720	1 710	1 590	1 610	1 620
Japan	2 160	1 850	1 800	1 790	1 770	1 750	1 740	1 770	1 800	1 810	1 760
West Germany	1 920	1 450	1 400	1 380	1 380	1 440	1 440	1 410	1 330	1 290	1 280
Denmark	2 040	1 750	1 660	1 670	1 600	1 550	1 440	1 430	1 380	1 400	1 450
Nether-lands	2 380	1 640	1 590	1 590	1 570	1 600	1 560	1 500	1 470	1 490	1 510
Finland	1 700	1 720	1 690	1 650	1 640	1 630	1 650	1 720	1 740	1 700	1 640
Sweden	1 980	1 690	1 650	1 600	1 660	1 680	1 630	1 620	1 610	1 650	1 730
England & Wales	2 380	1 720	1 680	1 750	1 860	1 870	1 790	1 760	1 760	1 760	1 790
Australia	2 950	2 080	2 040	1 980	1 940	1 900	1 940	1 940	1 930	1 880	1 890

Table 1.17 Actual and projected total fertility rates (per 1 000 women) from the past and present projections: 1981-2006

Year	Actual	1981 based projections	1986 based projections
1981	1 930	NA	NA
1982	1 830	2 010	NA
1983	1 690	1 970	NA
1984	1 520	1 940	NA
1985	1 460	1 900	NA
1986	1 330	1 880	1 360
1991	-	1 790	1 430
1996	-	1 750	1 410
2001	-	1 730	1 370
2006	-	-	1 350

2. Mortality

Introduction

By international standards, Hong Kong's current level of mortality, as summarised by the expectation of life at birth, is very low. In 1985, the expectation of life at birth was 73.8 years for males and 79.2 years for females. This was very close to the highest life expectancy ever recorded in Japan, Iceland and Switzerland - countries with the lowest mortality (Table 2.1).

The speed of mortality improvement during the past five years, though not particularly spectacular, has already surpassed the projected tempo of mortality decline assumed in the 1981 based population projection. This experience suggests that a more optimistic view can be taken in projecting the level of mortality for the next 20 years.

The following provides background information on the mortality improvement of Hong Kong since 1971 and the reasons underlying the formulation of mortality assumptions for the 1986 based population projection.

Past trends of mortality

(a) Deaths and crude death rates

In the 1960's, the number of deaths in a year fluctuated around 19 000, yielding the crude death rate (CDR)* of 5 to 6 per 1 000 population. The number of deaths increased steadily throughout the 1970's and reached a peak of about 27 000 in 1983, then decreased slightly after that (Table 2.2). The CDR fluctuated around 5.0 during this period; it started falling again in the early 1980's and was about 4.6 in 1985.

In order to reflect more accurately the general trend of mortality during the period 1971 to 1985, the standardized death rate (SDR)# was calculated to discount the effects of the changing sex-age structure of the population on the CDR (Table 2.2). Clearly, there was a gradual and continuous decline in mortality over the fifteen-year period.

The major trends of mortality improvement over the period involved first, a reduction in the sex-age-specific death rates and a corresponding increase in life expectancy; second, changes in the distribution of causes of death; and third, changes in the differences between male and female mortality. These three factors are the main themes of analysis for the projection.

(b) Sex-age-specific death rates

Greater insight into the decline in mortality can be gained by examining the trends in the sex-age-specific death rates (SADRs)@ for the period 1971 to 1985 (Table 2.3). The trends have indicated three interesting features. First, the mortality decline had been greatest at young ages and least at advanced ages. Second, male mortality improved somewhat more rapidly than female mortality. Third, the tempo of mortality decline was not uniform over the period, being relatively faster in the early 1970's.

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* CDR relates the number of deaths occurring during a calendar year to the mid-year total population.
\# SDR was computed using the direct standardization method in which the 1971 population and its sex-age structure was used as the standard population.
@ SADRs relate the numbers of deaths in given ages for each sex in a calendar year to the mid-year population of those particular age and sex groups.

(c)   Excess male mortality

In most countries females enjoy higher survivorship over males. Hong Kong follows the same pattern. The experience in the past fifteen years showed that the index of excess male mortality* started at a value of about 1.2 at infancy and increased gradually with age. It reached a peak of over 2 in the age range 55-74. Above these ages, the lower female death rates tended to converge with the higher male death rates (Table 2.4). In the course of mortality decline, the pattern of excess male mortality only changed slightly. More noticeable was the reduction in the index at the younger ages below 34 as a result of a somewhat faster rate of male mortality improvement.

(d)   Causes of death

The pattern of causes of death in Hong Kong changed considerably during the period 1971 to 1985, although diseases of the circulatory system, neoplasms and diseases of the respiratory system always accounted for a majority of deaths (Table 2.5). Diseases of the circulatory system and neoplasms took a heavier toll of life over the years 1971-1985. The toll for the former diseases increased from 25 percent at the beginning of the period to 29 percent by the late 1970's while the toll for neoplasms increased steadily from 21 percent to 29 percent. Diseases of the respiratory system accounted for some 16 percent of deaths over the whole period. Complementary to these changes, most other causes of death accounted for a lower share of total deaths.

The difference in the rates of mortality decline in various age groups was directly attributable to differing rates of improvement in specific causes of death. The trends of mortality by age, sex and major cause of death from 1971 to 1985 have shown some interesting features (Table 2.6). First, there was a considerable fall in infant mortality - very much relating to a significant improvement in mortality from diseases of the respiratory system and from death caused by medical conditions which originated in the perinatal period. Second, mortality from diseases of the circulatory system improved fairly rapidly for both sexes, particularly at ages below 70 and the percentage improvement was generally greater for males than for females. Third, there had been some reduction in mortality from neoplasms at ages below 60 for both sexes; but above age 60, it increased rapidly with age and over time. Finally, mortality from diseases of the respiratory system recorded a significant reduction in almost all ages, particularly at the younger ages.

(e)   Expectation of life

Expectation of life at birth# is a single index of mortality for describing the mortality condition of the population over time and for comparison. According to the mortality condition in Hong Kong in 1971, the expectation of life at birth was 67.8 years for males and 75.3 for females. By 1985, the figures increased to 73.8 and 79.2 years respectively, suggesting a substantial improvement in mortality over the period.

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*   The index of excess male mortality is derived by dividing the age-specific death rate for males by that for females.
#   Expectation of life at birth is the average lifetime that a hypothetical cohort of births, all assumed to be born in a given year, would live if they were subject throughout their life to the mortality condition prevailing in that year (which is defined by the life table). Similarly, expectation of life at an older age indicates the average number of years lived by the cohort after the age.

Over time, the greatest gain in life expectancy had been found at the oldest ages and the smallest gain at the youngest ages. During the period 1971 to 1985, males added 6 years to their expectation of life at birth but half of that gain was due to the increase in life expectancy at age 60. At all ages, females gained less than males from the improvement in mortality; the gain in the expectation of life was 3.9 years at birth and 1.7 years at age 60 (Table 2.7).

The faster rate of male mortality improvement also resulted in a decreasing difference in the expectations of life at birth between males and females: from 7.5 years in 1971 to 5.4 years in 1985. This experience was different from that of other low mortality countries (Table 2.1).

Mortality projection

(a) Rationale of mortality decline

The significant decline in mortality over the past fifteen years was directly attributable to a substantial improvement in socio-economic conditions in Hong Kong, advances in medical technology and the expansion in the provision of medical facilities and services in that period. The present trends of mortality should possibly continue in the light of the existing conditions which should further improve in the future. There are also some relevant new developments. First, there is a growing awareness and concern among the public that problems such as stress, cigarette smoking, high alcohol consumption, lack of exercise and imbalanced diet (particularly with excess fat and sugar but insufficient fibre) adversely affect the general body health. Second, the Government has been making efforts through wider publicity and stricter controls to reduce traffic accidents, industrial accidents and hazards relating to smoking. These developments may in the future trigger off extensive behavioural changes which will ultimately help reduce mortality further.

(b) Method of projecting mortality

Basically, the assumed future death rates at ages 1 to 44 were derived by extrapolating trends in the sex-age-specific death rates and those at age 0 and ages 45 and above by extrapolating trends in the sex-age-cause-specific death rates. In projecting the cause-specific death rates most attention was given to examining trends in the death rates from neoplasms, diseases of the circulatory system and the respiratory system, since mortality from these diseases contributed most to total mortality.

Specifically, the projection of mortality trends involved the fitting of the past series of the age-specific death rates by sex and cause with different models. In general, the linear, log-linear or reciprocal linear models gave the best fit in terms of the coefficient of determination. However, in most cases, the reciprocal curve which tended to tail less rapidly than the other curves was selected. The selected curves were then carried forward for n years into the future, n being determined on the basis of subjective judgement with reference to the actual death rates for the last few years. The presumptions of a more rapid rate of mortality improvement in the earlier period of the projection and a relatively stable pattern of excess male mortality had also been made.

Having thus obtained the assumed future death rates, several cross checks were made to ensure their appropriateness and consistency. First, the projected sex-age-specific death rates were examined in relation to their past trends. Second, the projected sex-age-specific death rates were further checked against the past pattern of excess male mortality. Third, an assessment was made of the magnitude of the expectation of life at birth implied by the projected sex-age-specific

death rates. The difference between the male and female expectations of life at birth was expected to stabilize at the level observed in the last few years. Finally, the expectations of life at birth for Hong Kong in future years were compared with those assumed in the latest population projections of such developed countries as the United States and Japan. On the basis of these four checks, the initial assumed future death rates were modified to make them consistent with what was considered to be the most likely future path of mortality in Hong Kong.

(c)   Projected age-specific death rates

The past trends in the sex-age-specific death rates for both sexes were assumed to continue gradually in the projection although the rate of decline over the projection period would be slower than in the past fifteen years. Within the projection period, the rate of decline in the earlier period would be faster than in the later period. In general, improvement in mortality would be slower at advanced ages than at the youngest adult ages (Table 2.8). It might be noted that the death rates at the younger ages were so low that even a greater rate of reduction assumed would make little difference to the size of the projected population.

It was also assumed that male and female mortality would improve at similar rates so that the pattern of excess male mortality would remain more or less the same as that observed in the last few years (Table 2.9).

The reduction in the projected sex-age-specific death rates would result in a further increase in life expectancy throughout the period 1987 to 2006. The expectation of life at birth would increase from 73.8 years in 1985 to 77.3 years in 2006 for males (a gain of 3.5 years) and from 79.2 to 82.9 for females (a gain of 3.7 years) (Table 2.10). The difference between the male and female expectations of life at birth would remain at about 5.6 to 5.8 years. Over the period of the projection, the greatest gain in life expectancy would be found at the oldest ages and the smallest gain at the youngest ages. This pattern of change is expected to follow broadly the observation in the past fifteen years.

(d)   Projected numbers of deaths

According to the current population projection, the projected numbers of deaths under the new mortality assumptions were 31 000 in 1991, 36 000 in 1996, 41 000 in 2001 and 46 000 in 2006. Despite a continuous mortality decline, the numbers of deaths increased as a result of the aging of the population.

International comparison

Compared with other countries in the region, Hong Kong enjoys very low mortality, with the expectation of life at birth being very close to that for Japan, Sweden and Switzerland (Table 2.1). The recent experience of these very low mortality countries should not, however, be taken to reflect any attainable limits of life. The likelihood of further advances in medical technology and developments in socio-economic environment points to the possibility of continuing decline in mortality in future that may not be envisaged in the past. The rationale of a continuous decline in mortality was clearly demonstrated in the latest population projections of the United States and Japan (Table 2.11). Some analogy existed between these projections, namely that mortality would further decline and excess male mortality would prevail. The same rationale was adopted in the mortality projection for Hong Kong and the results, in terms of the expectation of life at birth, were similar to those in these two projections.

Comparison of the 1981 and 1986 mortality assumptions

Mortality had continued to improve at a significant rate during the last few years, so much so that the expectation of life at birth in 1981-1985 (based on the actual death rates) was already higher than the life expectancy in 2001 assumed in the 1981 based population projection (Table 2.12). The present mortality projection has the advantages of drawing on more recent experience of other low mortality countries and of witnessing the further decline in mortality in Hong Kong over the last five years. All this evidence points to a continuation of the decline in mortality hence the resultant substantial increase in life expectancy. A single mortality variant was therefore considered pertinent to formulating the mortality assumptions for the new population projection. However, it should not be read as implying a determinable future trend of mortality.

Table 2.1 International trends of expectations of life at birth: 1971-1985

Country	1971	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
					Male						
Hong Kong	67.8	69.6	70.1	70.6	70.6	71.6	72.3	72.6	72.3	73.2	73.8
Japan	70.2	72.2	72.7	73.0	73.5	73.4	73.8	74.2	74.2	74.5	74.8
Switzerland	70.2	71.7	72.1	72.0	72.4	-	72.5	72.9	72.7	73.8	-
Sweden	72.0	72.2	72.8	72.5	72.6	72.8	73.1	73.5	73.6	73.8	-
Norway	71.2	72.1	72.3	72.4	72.2	72.5	72.7	72.7	72.8	-	-
Netherlands	71.0	71.5	72.0	71.9	72.4	72.5	72.7	72.7	72.9	73.0	73.1
Iceland	71.6	73.0	-	73.4	-	73.7	73.4	74.7	73.4	-	-
England & Wales	69.2	69.7	70.2	70.1	70.2	-	71.2	71.3	-	-	-
West Germany	67.5	68.6	69.2	69.2	69.6	69.9	70.2	70.5	70.7	71.3	-
U.S.A.(White)	68.3	69.9	70.2	70.4	70.8	70.7	71.1	71.5	71.7	71.8	71.8
					Female						
Hong Kong	75.3	76.2	76.7	76.7	76.9	77.9	78.5	78.4	78.4	79.0	79.2
Japan	75.6	77.4	78.0	78.3	78.9	78.8	79.1	79.7	79.8	80.2	80.5
Switzerland	76.4	78.3	79.0	78.9	79.1	-	79.4	79.7	79.8	80.8	-
Sweden	77.6	78.1	79.2	78.9	78.9	79.1	79.3	79.6	79.6	79.9	-
Norway	77.5	78.3	78.9	78.8	79.0	79.2	79.5	79.8	79.8	-	-
Netherlands	76.7	78.0	78.4	78.5	78.9	79.2	79.3	79.4	79.6	79.7	79.7
Iceland	77.5	79.2	-	79.3	-	79.7	79.9	79.7	80.6	-	-
England & Wales	75.5	75.8	76.3	76.3	76.2	-	77.2	77.3	-	-	-
West Germany	73.9	75.3	76.0	76.0	76.4	76.7	76.9	77.2	77.5	78.1	-
U.S.A.(White)	75.8	77.5	77.9	78.0	78.4	78.1	78.4	78.7	78.7	78.8	78.7
				Difference	(Female	-	Male)				
Hong Kong	7.5	6.6	6.6	6.1	6.3	6.3	6.2	5.8	6.1	5.8	5.4
Japan	5.4	5.2	5.3	5.3	5.4	5.4	5.3	5.5	5.6	5.7	5.7
Switzerland	6.2	6.6	6.9	6.9	6.7	-	6.9	6.8	7.1	7.0	-
Sweden	5.6	5.9	6.4	6.4	6.3	6.3	6.2	6.1	6.0	6.1	-
Norway	6.3	6.2	6.6	6.4	6.8	6.7	6.8	7.1	7.0	-	-
Netherlands	5.7	6.5	6.4	6.6	6.5	6.7	6.6	6.7	6.7	6.7	6.6
Iceland	5.9	6.2	-	5.9	-	6.0	6.5	5.0	7.2	-	-
England & Wales	6.3	6.1	6.1	6.2	6.0	-	6.0	6.0	-	-	-
West Germany	6.4	6.7	6.8	6.8	6.8	6.8	6.7	6.7	6.8	6.8	-
U.S.A.(White)	7.5	7.6	7.7	7.6	7.6	7.4	7.3	7.2	7.0	7.0	6.9

Table 2.2   Deaths and death rates: 1971-1985

Year	Number of deaths	Crude death rate (per 1 000 population)	Standardized death rate* (per 1 000 population)
1971	20 400	5.0	5.0
1972	21 400	5.2	5.0
1973	21 300	5.0	4.7
1974	21 900	5.0	4.6
1975	21 600	4.8	4.3
1976	22 600	5.0	4.4
1977	23 300	5.1	4.3
1978	23 800	5.1	4.2
1979	25 100	5.2	4.2
1980	25 000	5.0	3.9
1981	24 800	4.8	3.7
1982	25 400	4.8	3.7
1983	26 500	5.0	3.6
1984	25 500	4.7	3.4
1985	25 300	4.6	3.2

*   Standardized death rates are computed using the sex-age population
     distribution of 1971 as the standard population.

Table 2.3 Sex-age-specific death rates (per 1 000 population): 1971-1985

Age group	Death rate															Index of rates				
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1971/73	1974/76	1977/79	1980/82	1983/85
Male																				
0	21.2	19.3	18.4	19.2	16.1	16.2	14.7	13.4	13.9	12.6	10.7	9.9	10.2	9.0	8.0	100	85	74	57	46
1- 4	1.0	1.1	1.1	1.1	0.8	0.8	0.8	0.7	0.7	0.6	0.7	0.5	0.5	0.5	0.5	100	84	67	56	44
5- 9	0.5	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	100	98	77	63	47
10-14	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	100	86	81	72	57
15-19	0.7	0.9	0.8	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	100	70	66	62	49
20-24	1.2	1.4	1.3	1.1	0.9	0.9	1.0	1.0	0.8	0.8	0.7	0.7	0.7	0.6	0.5	100	77	74	56	48
25-29	1.7	1.5	1.7	1.4	1.1	1.1	1.2	1.2	1.1	1.0	0.9	0.9	0.7	0.7	0.7	100	72	70	56	42
30-34	2.0	1.9	2.0	2.1	1.5	1.8	1.5	1.6	1.3	1.2	1.2	1.1	1.0	0.9	0.9	100	91	75	57	47
35-39	2.8	2.7	2.5	2.1	2.0	2.2	2.3	2.0	2.1	1.7	1.7	1.6	1.5	1.3	1.3	100	78	81	63	51
40-44	4.3	4.2	4.1	3.9	3.8	3.4	3.4	3.0	3.3	2.7	2.8	2.9	2.9	2.7	2.4	100	88	78	67	64
45-49	6.2	6.3	6.0	5.9	5.5	5.7	5.4	5.3	5.6	5.1	4.6	4.6	4.2	4.1	4.0	100	92	89	77	66
50-54	10.4	9.7	10.4	9.5	9.0	8.7	8.6	9.1	8.6	7.9	7.6	8.2	7.8	7.2	7.2	100	89	87	77	73
55-59	17.6	17.3	14.6	14.3	14.4	13.8	13.8	13.8	13.7	13.7	12.2	12.2	12.3	11.5	10.7	100	86	83	77	69
60-64	28.8	29.1	27.0	25.4	22.8	23.2	23.3	21.2	21.6	19.7	19.5	19.5	20.5	19.1	17.5	100	83	78	68	67
65-69	43.0	43.8	39.7	38.2	37.0	38.8	37.0	35.7	35.1	33.8	30.8	29.2	30.4	28.2	26.6	100	90	85	73	67
70-74	61.0	64.9	58.1	55.6	53.4	59.1	54.7	53.1	52.5	47.0	47.4	45.9	51.4	45.5	42.4	100	90	88	75	75
75 and over	106.0	111.3	96.1	91.5	90.0	97.7	96.1	94.3	91.0	92.1	81.9	85.2	84.9	80.8	77.7	100	86	88	81	77
Female																				
0	16.1	16.1	14.9	15.1	13.0	12.0	12.5	10.8	10.5	10.4	9.2	9.5	8.9	7.7	6.7	100	84	73	62	50
1- 4	0.8	0.9	1.0	1.0	0.7	0.8	0.7	0.7	0.6	0.6	0.4	0.5	0.5	0.4	0.4	100	89	72	55	47
5- 9	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	100	90	67	49	55
10-14	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	100	84	86	77	69
15-19	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	100	85	72	58	54
20-24	0.7	0.6	0.6	0.7	0.6	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.5	0.3	0.3	100	92	74	60	59
25-29	0.8	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.5	0.5	100	82	73	56	52
30-34	1.1	1.0	1.1	1.1	1.0	1.1	0.8	0.9	0.7	0.7	0.7	0.8	0.6	0.6	0.5	100	102	75	66	53
35-39	1.5	1.5	1.4	1.3	1.3	1.3	1.2	1.1	1.0	1.1	1.0	1.0	0.7	0.7	0.6	100	85	77	70	47
40-44	2.2	2.3	2.1	2.0	2.0	1.9	1.9	1.6	1.8	1.7	1.6	1.5	1.3	1.1	1.2	100	89	80	72	55
45-49	3.3	3.2	3.1	3.0	2.8	3.0	2.8	2.8	2.7	2.6	2.7	2.6	2.3	2.2	2.1	100	91	87	82	68
50-54	5.5	5.2	5.1	4.8	4.5	4.7	4.1	4.3	4.1	4.2	3.9	3.6	3.7	3.4	3.2	100	88	79	73	65
55-59	7.8	8.2	7.7	7.2	7.5	7.3	7.2	7.0	7.4	7.0	6.6	5.8	6.0	5.4	5.8	100	93	91	82	72
60-64	11.7	12.5	12.8	12.2	11.8	11.8	12.1	11.1	11.1	10.4	9.8	10.7	10.5	9.5	9.1	100	96	93	83	79
65-69	20.2	18.1	17.2	18.3	17.5	18.7	19.2	19.1	18.9	17.7	16.6	15.9	15.9	15.4	15.6	100	98	102	90	84
70-74	31.0	31.0	28.5	28.8	27.1	28.0	27.9	29.2	27.9	27.6	25.0	26.8	25.8	26.3	24.5	100	92	95	87	85
75 and over	73.4	74.1	68.1	68.1	68.2	70.4	72.7	69.2	69.4	66.3	65.2	61.7	64.6	59.7	58.0	100	95	97	89	84

Table 2.4   Indexes of excess males mortality by age: 1971/73-1983/85

Age group	1971/73	1974/76	1977/79	1980/82	1983/85
0	1.2	1.3	1.3	1.2	1.2
1- 4	1.2	1.1	1.1	1.2	1.1
5- 9	1.3	1.4	1.4	1.6	1.1
10-14	1.3	1.4	1.3	1.2	1.1
15-19	1.8	1.5	1.6	1.9	1.6
20-24	2.0	1.7	2.0	1.9	1.6
25-29	1.9	1.6	1.8	1.9	1.5
30-34	1.9	1.7	1.9	1.6	1.6
35-39	1.8	1.6	1.9	1.6	1.9
40-44	1.9	1.9	1.8	1.7	2.2
45-49	1.9	1.9	2.0	1.8	1.9
50-54	1.9	1.9	2.1	2.0	2.2
55-59	2.1	1.9	1.9	2.0	2.0
60-64	2.3	2.0	1.9	1.9	2.0
65-69	2.3	2.1	1.9	1.9	1.8
70-74	2.0	2.0	1.9	1.8	1.8
75 and over	1.5	1.3	1.3	1.3	1.3

Table 2.5   Percentage distribution of deaths by cause of death: 1971/73-1983/85

Cause of death	\	\	Year	\	\	Increase(+)/ decrease(−)
	1971/73	1974/76	1977/79	1980/82	1983/85	1971/73−1983/85
Infectious and parasitic diseases	6.8	4.3	3.0	3.1	3.0	−3.8
Neoplasms	20.9	23.0	24.7	26.4	28.7	+7.8
Diseases of the circulatory system	24.9	27.4	29.7	29.3	29.2	+4.3
Diseases of the respiratory system	16.5	15.8	14.9	15.8	16.5	0.0
Diseases of the digestive system	5.1	4.9	4.4	4.5	4.3	−0.8
Diseases of the genitourinary system	2.9	3.1	3.5	4.0	4.2	+1.3
Congenital anomalies and certain conditions originating in the perinatal period	4.3	4.2	3.5	3.0	2.4	−1.9
Symptoms, signs and ill-defined conditions	9.0	8.2	7.5	5.0	3.5	−5.5
Injuries and poisonings	7.2	6.4	6.2	6.8	6.1	−1.1
Other diseases	2.4	2.7	2.6	2.1	2.1	−0.3
Total	100.0	100.0	100.0	100.0	100.0	

Table 2.6 Death rates (per 100 000 population) by age by sex by leading cause of death: 1971, 1976, 1981 and 1985 (ranking according to 1985)

Age group	Cause of death	1971	1976	1981	1985	1971	1976	1981	1985
		Male				Female			
All ages	All causes	558	541	512	500	448	459	448	426
	Neoplasms	120	137	150	164	90	99	104	112
	Diseases of the circulatory system	126	146	135	133	125	144	145	138
	Diseases of the respiratory system	91	78	83	83	74	67	69	68
	Others	221	180	144	120	159	149	130	108
0	All causes	2 119	1 616	1 065	798	1 608	1 195	921	667
	Certain conditions originating in the perinatal period	1 008	767	580	401	616	510	492	312
	Congenital anomalies	325	421	275	272	307	326	241	240
	Diseases of the respiratory system	417	222	99	57	403	146	90	56
	Others	369	206	111	68	282	213	98	59
1–44	All causes	135	107	89	71	78	66	50	41
	Injuries and poisonings	33	30	34	24	15	16	15	12
	Neoplasms	29	26	23	21	17	16	13	14
	Diseases of the circulatory system	13	10	8	7	12	9	6	4
	Others	60	41	24	19	34	25	16	11
45–49	All causes	623	570	465	396	328	303	268	211
	Neoplasms	223	225	207	187	129	135	113	117
	Diseases of the circulatory system	105	111	84	67	78	67	66	48
	Diseases of the respiratory system	56	57	50	37	30	13	12	7
	Others	239	177	124	105	91	88	77	39
50–54	All causes	1 042	873	764	717	552	472	389	316
	Neoplasms	341	328	320	335	224	184	174	156
	Diseases of the circulatory system	230	211	176	149	132	124	83	69
	Diseases of the respiratory system	124	99	89	75	57	42	33	17
	Others	347	235	179	158	139	122	99	74
55–59	All causes	1 765	1 379	1 215	1 070	783	732	664	577
	Neoplasms	530	487	497	502	298	270	274	263
	Diseases of the circulatory system	468	379	320	253	222	220	185	144
	Diseases of the respiratory system	248	173	146	121	85	65	56	34
	Others	519	340	252	194	178	177	149	136
60–64	All causes	2 882	2 321	1 953	1 754	1 168	1 177	983	907
	Neoplasms	658	690	703	691	330	402	351	344
	Diseases of the circulatory system	805	754	569	504	382	402	344	276
	Diseases of the respiratory system	501	322	293	245	173	137	119	103
	Others	918	555	388	314	283	236	169	184
65–69	All causes	4 297	3 883	3 077	2 660	2 018	1 865	1 663	1 558
	Neoplasms	931	1 000	948	925	494	498	507	520
	Diseases of the circulatory system	1 347	1 414	984	814	748	717	632	518
	Diseases of the respiratory system	814	647	584	487	305	263	215	196
	Others	1 205	822	561	434	471	387	309	324
70–74	All causes	6 102	5 912	4 744	4 237	3 098	2 801	2 502	2 452
	Neoplasms	1 085	1 352	1 290	1 260	655	604	580	668
	Diseases of the circulatory system	2 039	2 160	1 719	1 399	1 104	1 141	1 009	898
	Diseases of the respiratory system	1 215	966	921	826	477	373	394	391
	Others	1 763	1 434	814	752	862	683	519	495
75 and over	All causes	10 604	9 767	8 192	7 774	7 336	7 042	6 516	5 797
	Neoplasms	1 197	1 364	1 344	1 599	665	795	892	930
	Diseases of the circulatory system	3 425	3 530	2 769	2 598	2 408	2 534	2 386	2 230
	Diseases of the respiratory system	2 528	2 131	2 046	1 995	1 563	1 467	1 378	1 307
	Others	3 454	2 742	2 033	1 582	2 700	2 246	1 860	1 330

Table 2.7   Expectations of life at selected ages by sex: 1971-1985

Age	1971	1976	1981	1985	Increase (in years) 1971–1985
			Male		
0	67.8	69.6	72.3	73.8	+6.0
20	49.9	51.3	53.6	54.8	+4.9
40	31.4	32.5	34.5	35.5	+4.1
60	15.4	15.8	17.7	18.4	+3.0
80	5.4	5.2	6.4	6.5	+1.1
			Female		
0	75.3	76.2	78.5	79.2	+3.9
20	57.1	57.6	59.6	60.0	+2.9
40	38.0	38.5	40.3	40.5	+2.5
60	20.5	20.8	22.3	22.2	+1.7
80	7.1	7.1	8.5	8.1	+1.0

Table 2.8   Indexes of projected death rates: 1986-2006

Age group	1983/85	1986	1991	1996	2001	2006
			Male			
0	100	89	82	76	72	69
1- 4	100	87	70	62	54	48
5- 9	100	88	76	64	56	50
10-14	100	96	80	70	64	58
15-19	100	87	71	65	60	56
20-24	100	89	75	63	56	49
25-29	100	94	77	64	56	49
30-34	100	96	81	70	58	51
35-39	100	94	78	65	57	51
40-44	100	96	85	73	64	56
45-49	100	97	87	79	73	69
50-54	100	97	91	83	76	69
55-59	100	93	85	78	74	70
60-64	100	92	85	77	73	69
65-69	100	96	88	82	79	76
70-74	100	94	86	81	78	76
75 and over	100	96	94	93	93	92
			Female			
0	100	88	80	73	69	67
1- 4	100	86	68	59	51	45
5- 9	100	89	75	63	54	48
10-14	100	97	81	70	62	55
15-19	100	90	72	65	58	55
20-24	100	89	76	63	54	47
25-29	100	93	78	64	54	47
30-34	100	98	84	71	57	49
35-39	100	93	78	63	56	50
40-44	100	96	84	73	63	55
45-49	100	96	82	75	70	65
50-54	100	97	91	83	75	67
55-59	100	94	84	76	68	66
60-64	100	92	84	76	69	66
65-69	100	97	89	80	76	73
70-74	100	95	85	78	75	73
75 and over	100	94	94	92	91	90

Table 2.9   Indexes of projected excess male mortality by age: 1986-2006

Age group	1983/85	1986	1991	1996	2001	2006
0	1.2	1.2	1.2	1.2	1.2	1.2
1- 4	1.1	1.1	1.1	1.1	1.2	1.2
5- 9	1.1	1.1	1.1	1.1	1.2	1.1
10-14	1.1	1.1	1.1	1.1	1.1	1.1
15-19	1.6	1.6	1.6	1.6	1.7	1.7
20-24	1.6	1.7	1.6	1.6	1.7	1.7
25-29	1.5	1.5	1.5	1.5	1.5	1.6
30-34	1.6	1.6	1.6	1.6	1.7	1.7
35-39	1.9	2.0	1.9	2.0	2.0	2.0
40-44	2.2	2.2	2.2	2.2	2.2	2.2
45-49	1.9	1.9	2.0	2.0	1.9	2.0
50-54	2.2	2.2	2.2	2.1	2.2	2.2
55-59	2.0	2.0	2.0	2.1	2.1	2.1
60-64	2.0	2.0	2.0	2.0	2.1	2.0
65-69	1.8	1.8	1.8	1.9	1.9	1.9
70-74	1.8	1.8	1.8	1.9	1.9	1.9
75 and over	1.3	1.4	1.3	1.4	1.4	1.4

Table 2.10   Actual and projected expectations of life at selected ages by sex: 1985-2006

Age	1985	1986	1991	1996	2001	2006	Increase (in years) 1985–2006
				Male			
0	73.8	74.0	75.1	76.1	76.7	77.3	+3.5
20	54.8	55.0	55.9	56.8	57.5	58.0	+3.2
40	35.5	35.7	36.6	37.4	37.9	38.4	+2.9
60	18.4	18.6	19.4	20.0	20.4	20.7	+2.3
80	6.5	6.9	7.3	7.6	7.9	8.1	+1.6
				Female			
0	79.2	79.8	80.9	81.8	82.4	82.9	+3.7
20	60.0	60.7	61.6	62.5	63.0	63.4	+3.4
40	40.5	41.2	42.0	42.8	43.3	43.7	+3.2
60	22.2	22.9	23.6	24.3	24.7	25.0	+2.8
80	8.1	8.8	9.2	9.5	9.7	9.9	+1.8

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Table 2.11   International trends of projected expectations of life at birth: 1986-2006

Country	1986	1991	1996	2001	2006
			Male		
Hong Kong	74.0	75.1	76.1	76.7	77.3
Japan*	75.1	75.9	76.4	76.9	77.2
U.S.A.#	72.0	72.9	73.9	74.9	75.9
			Female		
Hong Kong	79.8	80.9	81.8	82.4	82.9
Japan*	80.8	81.7	82.3	82.8	83.1
U.S.A.#	79.3	80.3	81.4	82.5	83.5
		Difference (Female - Male)			
Hong Kong	5.8	5.8	5.7	5.7	5.6
Japan*	5.7	5.8	5.9	5.9	5.9
U.S.A.#	7.3	7.4	7.5	7.6	7.6

* Figures extracted from the population projection produced in 1986.
\# Figures extracted from the low mortality assumption of the 1984-produced population projection series for the whites for the years 1985, 1990, 1995, 2000 and 2005.

Table 2.12 Comparison of actual and assumed expectations of life at birth

	Male			Female		
Year	Actual	Projected (1981 based)	Projected (1986 based)	Actual	Projected (1981 based)	Projected (1986 based)
1977	70.1	NA	NA	76.7	NA	NA
1978	70.6	NA	NA	76.7	NA	NA
1979	70.6	NA	NA	76.9	NA	NA
1980	71.6	NA	NA	77.9	NA	NA
1981	72.3	71.9	NA	78.5	77.6	NA
1982	72.6	71.9	NA	78.4	77.6	NA
1983	72.3	72.0	NA	78.4	77.7	NA
1984	73.2	72.0	NA	79.0	77.7	NA
1985	73.8	72.1	NA	79.2	77.7	NA
1986	-	72.1	74.0	-	77.8	79.8
1991	-	72.2	75.1	-	78.0	80.9
1996	-	72.4	76.1	-	78.1	81.8
2001	-	72.4	76.7	-	78.2	82.4
2006	-	-	77.3	-	-	82.9