Hong Kong

Population

A 20-Year Projection

Census and Statistics Department, Hong Kong

February, 1978

這份刊物的 PDF 版本的文字是從印刷版掃描而成，再利用光學字符識別軟件轉換成電子格式。由於原印刷版本已印製並保存多年，光學字符識別技術未必能準確地識別某些文字或數字。因此，搜索或複製此 PDF 檔案內的文字時應加以注意。

The text of this PDF publication was scanned from its printed version and then converted to electronic text using Optical Character Recognition (OCR) software. Because of the age and condition of the original printed copy, the OCR may not recognise certain characters or figures accurately. Caution should therefore be taken when searching or copying text from this PDF publication.

Hong Kong Population

A 20-Year Projection

Census and Statistics Department, Hong Kong

February, 1978

Printed and Published by D. R. Rick, Government Printer
at the Government Press, Java Road, Hong Kong

Contents

	Page
Foreword	5
Part I: General Account of Population Projections	7
Appendix 1	
Summary of Fertility, Mortality and Migration Assumptions	12
Appendix 2	
Table 1: Hong Kong Population Estimate, mid-1976	14
Table 2: Hong Kong Population Projections, mid-1977	14
Table 3: Hong Kong Population Projections, mid-1978	16
Table 4: Hong Kong Population Projections, mid-1979	16
Table 5: Hong Kong Population Projections, mid-1980	18
Table 6: Hong Kong Population Projections, mid-1981	18
Table 7: Hong Kong Population Projections, mid-1982	20
Table 8: Hong Kong Population Projections, mid-1983	20
Table 9: Hong Kong Population Projections, mid-1984	22
Table 10: Hong Kong Population Projections, mid-1985	22
Table 11: Hong Kong Population Projections, mid-1986	24
Table 12: Hong Kong Population Projections, mid-1987	24
Table 13: Hong Kong Population Projections, mid-1988	26
Table 14: Hong Kong Population Projections, mid-1989	26
Table 15: Hong Kong Population Projections, mid-1990	28
Table 16: Hong Kong Population Projections, mid-1991	28
Table 17: Hong Kong Population Projections, mid-1992	30
Table 18: Hong Kong Population Projections, mid-1993	30
Table 19: Hong Kong Population Projections, mid-1994	32
Table 20: Hong Kong Population Projections, mid-1995	32
Table 21: Hong Kong Population Projections, mid-1996	34
Appendix 3	
Chart 1: Projected Total Population, 1976–1991	38
Chart 2: Hong Kong Population Pyramid, mid-1976	39
Chart 3: Hong Kong Population Pyramid, mid-1981	40
Chart 4: Hong Kong Population Pyramid, mid-1986	41
Chart 5: Hong Kong Population Pyramid, mid-1991	42
Chart 6: Hong Kong Population Pyramid, mid-1996	43
Part II: Analysis of Components and Methods of Computation	
Fertility Trends	47
Mortality Trends	52
Balance of Migration	61
Methods of Computation	64
Definitions	68

Foreword

The first set of population projections for Hong Kong was made on the basis of information from the 1961 Census and birth and death statistics and migration data then available. Since 1961, new projections have been made every 5 years after each population census.

This report, which is the fourth in the series, gives the projections by age and sex, based on the mid-1976 population estimates from the 1976 By-census (which was taken on 2 August 1976); it also gives a comprehensive description of the method of projection and the detailed assumptions employed. The 20-years spread follows the pattern of the previous set; it represents a balance between the requirements of users and the diminishing reliability of assumptions with time.

Compared with previous series, the new projections have the advantage of being based on more up-to-date birth and death statistics and more (if still incomplete) information on migration, including the age and sex structure of migrants. But, however firm the present base may be, the future uncertainty remains. This is particularly so in relation to migration; it is also so in the case of fertility which has become low to a point that gives rise to particular difficulties in foreseeing its future.

The report is divided into two parts. Part I gives a summary of the method and also the detailed results. Part II contains a more detailed exposition of past history and the assumptions and methods of computation used. At the end is a list of definitions of terms used in this report.

February 1978

D. S. Whitelegge
Commissioner for Census & Statistics

Part I

General Account of Population Projections

The purpose of the projection

The main purpose of population projection is to provide an estimate of the total future population of Hong Kong and its composition by age and sex as a common framework for use in forward planning generally, principally in development fields in the public sector such as housing, education, transport, medical and social services.

The population projections previously available were prepared in 1972. These were based on the age and sex distribution derived from the 1971 Census and a particular set of assumptions about the future number of births, deaths and migrants, which drew on past experience and incorporated the information then available. Some changes in these demographic factors have occurred since the last projections were made and new information on the age and sex distribution is available from the 1976 By-census. New population projections for the period from 1976 to 1996, therefore, have been made on revised assumptions concerning future fertility, mortality, immigration and emigration.

The method of projection

The standard method of population projection is by components. This method involves the specification of the population elements by sex and by age intervals and the separate projection of each component of population change (i.e. fertility, mortality and migration).

The first step in projecting is to select a base population year. These projections use the year 1976, since the 1976 By-census has provided the latest information on the size and age distribution of the population. The By-census population has first been adjusted for mis-statements of age, and then brought back to mid-year 1976 (the By-census reference date was 2 August 1976).

The projections of the population and its composition from the base year are then worked out year by year, based on projections of mortality and fertility and assumptions as regards migration.

First, projected survival ratios* by sex and age are applied to the population at the beginning of a projection year, to derive the surviving population at the end of that year. Then the fertility factor is introduced; projected age-specific fertility rates† are applied to the average number of women in each of the child-bearing ages 15–49 to obtain the number of births in the year, which are then subject to specific survival ratios. Finally, the migration element is brought in; the assumed net balance of migration is added to/subtracted from the surviving population by sex and age at the end of the year. This three-fold process is repeated for each year of the overall projection period, giving for each year the projected population by age and sex.

Assumptions

The projection method described above requires assumptions as to the future trends in the three components of fertility, mortality and migration. Implicit in these assumptions so far as the present exercise is concerned is the principle of continuity: that is to say that any changes in the future can be seen to be an extension of what has been happening in the past. Thus, a historical analysis is required to determine past trends, these provide the basis for the assumptions which are informed by present experience, subjective judgment and, where appropriate, experience from elsewhere.

Three different sets of assumptions are used, producing three projections – high, medium and low. These assumptions are set out in Appendix I. In pages 47 to 63 in Part II to this report may be found the background historical analysis and a fuller description of the assumptions.

Any projection is only as good as the assumptions on which it is based. The assumptions used here are made at a particular moment of time, on the basis of the statistical and other evidence available at the time. There is a large arbitary element in the migration assumptions, in particular. The fertility assumptions are the most important for overall population size in the longer term. However, although it is unlikely that fertility would change abruptly over a short span of time, there must remain many uncertainties about trends in the longer term, bearing in mind that what one is attempting to do is to foresee the aggregate effect of the behaviour of many individuals in changing circumstances. This is particularly so when fertility becomes as low as it has in Hong Kong. In all this, therefore, there is inevitably a considerable element of subjective judgement.

The results of the projection

There are three projections: high, medium and low. The high and low projections represent outer limits within which, saving some exceptional circumstances, the future population may confidently be expected to lie. The medium projection is based on the set of assumptions which at this time seem the most appropriate in the light of present trends and conditions, and is that which it would be reasonable to use as providing the most likely indication of the trend over the next 20 years.

The projections at one year intervals and by quinquennial age groups for the period 1977–96 are given in Appendix 2. The population pyramids for the years 1976, 1981, 1986, 1991 and 1996 (derived from the medium projection) are given in Appendix 3.

*Survival ratio – the proportion of survivors in a cohort (which is a group of persons all born during the same year being analysed as a unit through their lifetime) at any particular age, derived from the specific life table based on the assumed schedule of death rates.

†Age-specific fertility rate – the ratio of the number of live births occurring to mothers in each child-bearing age group during a calender year to the total female population in that age group at the middle of that year.

Appendix I

SUMMARY OF FERTILITY, MORTALITY AND MIGRATION ASSUMPTIONS

Fertility assumptions

The projection of fertility trends involves the projection of age-specific birth rates by birth order. The birth rate for each birth order was projected based on past trends; the rate of increase or decrease derived from comparing the projected birth rate with that for the base year 1976 was assumed to be the same for each age group of mothers. The age-specific birth rates by birth order for each future year were projected by applying this rate of increase or decrease to the base year age-specific birth rates for each birth order. The projected age-specific fertility rates were derived from summing the projected age-specific birth rates over all birth orders.

Projected changes in birth rate by birth order

High projection	*1st order*	*2nd order*	*3rd and higher order*
1976–1996	Increasing along a log-linear trend fitted on the basis of past data	Remaining unchanged at the 1976 level	Decreasing along a log-linear trend fitted on the basis of past data until reaching a prescribed low level
Medium projection			
1976–1983	Remaining unchanged at the 1976 level	Same as above	Same as above
1983–1996	Increasing along a log-linear trend fitted on the basis of past data	Same as above	Same as above
Low projection			
1976–1983	Remaining unchanged at the 1976 level	Decreasing along a log-linear trend fitted on the basis of past data	Decreasing at an average rate observed in 1975–76 until reaching a prescribed low level
1983–1996	Increasing along a log-linear trend fitted on the basis of past data	Remaining unchanged at the 1983 level	Same as above

Mortality assumptions

The projection of mortality trends involves the projection of age-specific death rates for males and females. The standardized death rate (i.e. discounting the sex-age structure of the population) for each cause group was projected based on past trends. An index of increase or decrease was derived from comparing the projected death rate with that for the base period 1972–76. The index was disaggregated by age with reference to assumed age differentials in the mortality increase or decrease. The age-cause-specific death rates for each future year were projected by applying this index to the corresponding age-cause-specific death rates for the base period. The projected age-specific death rates for each sex were derived from summing the projected age-cause-specific death rates over all cause groups.

High projection: 5% lower than the projected sex-age-specific death rates used in the medium projection.

Medium projection: The projected sex-age-specific death rates as described above.

Low projection: 5% higher than the projected sex-age-specific death rates used in the medium projection.

Migration assumptions

The assumptions about future migration were made separately for each component of migration. The sex and age structure of each of these migration components was assumed to be in line with the average distribution as observed in the past.

Projected net balance of migration by component

Component	*High projection*	*Medium projection*	*Low projection*
Emigrants	−20,000	−30,000	−35,000
Legal immigrants from China	26,000	22,000	18,000
Legal immigrants from other countries	7,000	7,000	7,000
Illegal immigrants (including overstayers)	15,000	13,000	10,000
Net balance of migration	28,000	12,000	nil

Appendix 2

TABLE 1 : HONG KONG POPULATION ESTIMATE

MID- 1976

AGE GROUP	ESTIMATED POPULATION MALE	FEMALE	TOTAL
0- 4	205100	193400	398500
5- 9	212100	201800	413900
10-14	273500	262900	536400
15-19	272200	259200	531400
20-24	228400	215300	443700
25-29	193200	167800	361000
30-34	123600	94000	217600
35-39	126800	101900	228700
40-44	135100	117600	252700
45-49	131300	121300	252600
50-54	117300	111000	228300
55-59	93900	92300	186200
60-64	74900	77800	152700
65-69	42500	56600	99100
70-74	24100	45100	69200
75 +	19600	52200	71800
TOTAL	2273600	2170200	4443800

TABLE 2 : HONG KONG POPULATION PROJECTION

MID- 1977

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	205100	193100	398200
5- 9	206500	196200	402700
10-14	262100	251300	513400
15-19	281100	266100	547200
20-24	241600	225800	467400
25-29	201700	178600	380300
30-34	136400	107800	244200
35-39	121200	95500	216700
40-44	134800	116500	251300
45-49	132100	121600	253700
50-54	119600	113700	233300
55-59	97400	95600	193000
60-64	76900	80100	157000
65-69	47500	60100	107600
70-74	25200	45900	71100
75 +	21100	56100	77200
TOTAL	2310300	2204000	4514300

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
205100	193000	398100	205000	193000	398000
206500	196200	402700	206500	196200	402700
262100	251300	513400	262100	251300	513400
281100	266100	547200	281100	266100	547200
241600	225800	467400	241600	225800	467400
201700	178500	380200	201700	178500	380200
136400	107800	244200	136400	107700	244100
121200	95500	216700	121200	95500	216700
134800	116500	251300	134800	116500	251300
132000	121600	253600	132000	121600	253600
119500	113700	233200	119500	113700	233200
97300	95600	192900	97200	95500	192700
76800	80100	156900	76700	80000	156700
47400	60000	107400	47300	60000	107300
25100	45800	70900	25000	45700	70700
21000	55800	76800	20900	55600	76500
2309600	2203300	4512900	2309000	2202700	4511700

TABLE 3 : HONG KONG POPULATION PROJECTION

MID- 1978

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	206000	193500	399500
5- 9	204800	194800	399600
10-14	249100	237800	486900
15-19	285700	270700	556400
20-24	258800	237100	495900
25-29	211600	188500	400100
30-34	154200	125400	279600
35-39	116800	90200	207000
40-44	134900	115300	250200
45-49	132800	121100	253900
50-54	121600	116200	237800
55-59	101100	99100	200200
60-64	78400	82000	160400
65-69	52800	64300	117100
70-74	26400	46500	72900
75 +	22800	60200	83000
TOTAL	2357800	2242700	4600500

TABLE 4 : HONG KONG POPULATION PROJECTION

MID- 1979

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	207700	194800	402500
5- 9	206100	196100	402200
10-14	235800	224200	460000
15-19	286000	271700	557700
20-24	275300	247700	523000
25-29	222200	198400	420600
30-34	172000	143400	315400
35-39	115600	88100	203700
40-44	134100	113200	247300
45-49	133300	120300	253600
50-54	123500	118100	241600
55-59	104600	102500	207100
60-64	80000	84100	164100
65-69	57500	68200	125700
70-74	28300	47700	76000
75 +	24600	64300	88900
TOTAL	2406600	2282800	4689400

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
204900	192600	397500	202300	190200	392500
204100	194100	398200	203600	193700	397300
248200	237200	485400	247600	236700	484300
284400	269900	554300	283300	269400	552700
257400	236100	493500	255900	235300	491200
210500	187600	398100	209600	187000	396600
153600	124900	278500	153100	124500	277600
116200	89700	205900	115800	89300	205100
134400	114800	249200	134100	114500	248600
132400	120800	253200	132200	120500	252700
121300	115800	237100	121100	115600	236700
100800	98700	199500	100600	98500	199100
78000	81700	159700	77700	81400	159100
52500	64000	116500	52200	63700	115900
26300	46300	72600	26100	46100	72200
22600	59600	82200	22300	59100	81400
2347600	2233800	4581400	2337500	2225500	4563000

MEDIUM PROJECTION.			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
205200	192500	397700	199800	187600	387400
204600	194800	399400	203600	193900	397500
234100	222900	457000	233000	222000	455000
283700	270100	553800	281700	269100	550800
272400	245600	518000	269300	244100	513400
220000	196500	416500	218000	195200	413200
170700	142200	312900	169700	141400	311100
114500	87200	201700	113700	86500	200200
133100	112300	245400	132400	111700	244100
132600	119500	252100	132200	119000	251200
122900	117400	240300	122500	117000	239500
104100	101800	205900	103700	101300	205000
79300	83500	162800	78800	83000	161800
57000	67600	124600	56500	67200	123700
28000	47300	75300	27700	46900	74600
24100	63300	87400	23700	62500	86200
2386300	2264500	4650800	2366300	2248400	4614700

TABLE 5 : HONG KONG POPULATION PROJECTION

MID- 1980

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	210800	198100	408900
5- 9	209100	198500	407600
10-14	224000	212200	436200
15-19	282400	268300	550700
20-24	288800	256700	545500
25-29	235000	209300	444300
30-34	187400	159000	346400
35-39	119500	91500	211000
40-44	132100	110000	242100
45-49	133500	119100	252600
50-54	125000	119400	244400
55-59	107800	105700	213500
60-64	82300	86700	169000
65-69	61200	71500	132700
70-74	31000	49700	80700
75 +	26400	68100	94500
TOTAL	2456300	2323800	4780100

TABLE 6 : HONG KONG POPULATION PROJECTION

MID- 1981

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	218200	204700	422900
5- 9	209400	197700	407100
10-14	215100	204600	419700
15-19	275200	261100	536300
20-24	299200	264100	563300
25-29	249900	220800	470700
30-34	200700	172800	373500
35-39	128400	100100	228500
40-44	129000	105600	234600
45-49	133600	117800	251400
50-54	126300	120100	246400
55-59	110500	108700	219200
60-64	85000	89500	174500
65-69	64000	74300	138300
70-74	34400	52400	86800
75 +	28200	71800	100000
TOTAL	2507100	2366100	4873200

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
206500	194200	400700	198000	186400	384400
206900	196600	403500	205300	195300	400600
221600	210200	431800	219900	208900	428800
279200	266200	545400	276600	264700	541300
284400	253600	538000	279400	251400	530800
231600	206300	437900	228400	204400	432800
185400	157100	342500	183800	155800	339600
118000	90200	208200	116700	89100	205800
130600	108600	239200	129600	107700	237300
132500	118000	250500	131800	117300	249100
124100	118400	242500	123600	117700	241300
107000	104700	211700	106400	103900	210300
81300	85700	167000	80600	85000	165600
60400	70700	131100	59800	70000	129800
30500	49000	79500	30100	48500	78600
25700	66800	92500	25200	65600	90800
2425700	2296300	4722000	2395200	2271700	4666900

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
211700	198800	410500	199900	187800	387700
206500	195200	401700	204500	193400	397900
211900	202000	413900	209700	200200	409900
271100	258300	529400	268000	256400	524400
293200	260100	553300	286700	257100	543800
245300	216800	462100	240700	214200	454900
197900	170100	368000	195600	168300	363900
126300	98200	224500	124700	96800	221500
127000	103800	230800	125600	102500	228100
132200	116300	248500	131300	115400	246700
125100	118800	243900	124400	117900	242300
109500	107300	216800	108700	106400	215100
83800	88200	172000	82900	87300	170200
63000	73100	136100	62100	72300	134400
33800	51500	85300	33300	50900	84200
27400	70100	97500	26600	68600	95200
2465700	2328600	4794300	2424700	2295500	4720200

TABLE 7 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1982	AGE GROUP	MALE	FEMALE	TOTAL
	0- 4	225500	211500	437000
	5- 9	209900	197800	407700
	10-14	210300	199800	410100
	15-19	264500	250200	514700
	20-24	307000	270400	577400
	25-29	266400	232400	498800
	30-34	211700	184200	395900
	35-39	142700	114200	256900
	40-44	124400	99800	224200
	45-49	133900	116900	250800
	50-54	127300	120200	247500
	55-59	112900	111400	224300
	60-64	88300	92700	181000
	65-69	65900	76500	142400
	70-74	38600	55800	94400
	75 +	30000	75400	105400
	TOTAL	2559300	2409200	4968500

TABLE 8 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1983	AGE GROUP	MALE	FEMALE	TOTAL
	0- 4	233100	218600	451700
	5- 9	210700	198300	409000
	10-14	208700	198400	407100
	15-19	251500	236800	488300
	20-24	311500	275100	586600
	25-29	283500	243700	527200
	30-34	221600	194100	415700
	35-39	160300	131800	292100
	40-44	120100	94500	214600
	45-49	134000	115700	249700
	50-54	128100	119800	247900
	55-59	114900	113800	228700
	60-64	91800	96000	187800
	65-69	67300	78300	145600
	70-74	43000	59700	102700
	75 +	32100	78900	111000
	TOTAL	2612200	2453500	5065700

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
216400	203200	419600	201100	188900	390000
206300	194800	401100	203800	192600	396400
206400	196600	403000	203700	194400	398100
259600	246700	506300	255900	244400	500300
299600	265500	565100	291700	261900	553600
260400	227400	487800	254500	224000	478500
207900	180700	388600	204800	178400	383200
140000	111900	251900	137900	110100	248000
122000	97500	219500	120200	95900	216100
132100	115000	247100	130900	113700	244600
125900	118600	244500	124900	117500	242400
111600	109700	221300	110700	108500	219200
86800	91000	177800	85700	89800	175500
64500	75100	139600	63500	74000	137500
37800	54700	92500	37100	53900	91000
29000	73200	102200	28100	71400	99500
2506300	2361600	4867900	2454500	2319400	4773900

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
221400	207900	429300	204800	192400	397200
206100	194300	400400	201100	189900	391000
204000	194500	398500	200700	191900	392600
245700	232600	478300	241500	229800	471300
302900	269300	572200	294000	265100	559100
276200	237700	513900	268700	233600	502300
216700	189700	406400	212700	186700	399400
157100	128900	286000	154500	126700	281200
117100	91700	208800	114900	89700	204600
131800	113300	245100	130200	111800	242000
126300	117800	244100	125200	116500	241700
113400	111800	225200	112300	110400	222700
90000	94000	184000	88800	92700	181500
65700	76600	142300	64500	75300	139800
41900	58300	100200	41000	57300	98300
30800	76300	107100	29700	74200	103900
2547100	2394700	4941800	2484600	2344000	4828600

TABLE 9 : HONG KONG POPULATION PROJECTION

MID- 1984

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	240400	225500	465900
5- 9	212400	199500	411900
10-14	210000	199700	409700
15-19	238200	223200	461400
20-24	311900	276000	587900
25-29	299900	254300	554200
30-34	232100	204000	436100
35-39	177900	149700	327600
40-44	119000	92500	211500
45-49	133200	113600	246800
50-54	128700	118900	247600
55-59	116700	115700	232400
60-64	95100	99300	194400
65-69	68800	80300	149100
70-74	46900	63200	110100
75 +	34500	82700	117200
TOTAL	2665700	2498100	5163800

TABLE 10 : HONG KONG POPULATION PROJECTION

MID- 1985

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	247500	232100	479600
5- 9	215500	202800	418300
10-14	212900	202100	415000
15-19	226500	211200	437700
20-24	308200	272700	580900
25-29	313400	263300	576700
30-34	244800	214800	459600
35-39	193200	165200	358400
40-44	122900	95900	218800
45-49	131300	110400	241700
50-54	128900	117800	246700
55-59	118300	117000	235300
60-64	98100	102400	200500
65-69	70900	82800	153700
70-74	50000	66300	116300
75 +	37700	87000	124700
TOTAL	2720100	2543800	5263900

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
226100	212300	438400	208700	196100	404800
206300	194300	400600	198500	187200	385700
204500	195200	399700	200700	192100	392800
231700	218400	450100	226800	215100	441900
302200	269500	571700	292400	264900	557300
291100	247200	538300	282000	242300	524300
226100	198600	424700	221000	195000	416000
174000	146100	320100	171000	143500	314500
115500	89300	204800	112900	86900	199800
130500	110900	241400	128700	109000	237700
126600	116600	243200	125200	115000	240200
114900	113300	228200	113700	111800	225500
93100	97000	190100	91800	95400	187200
66900	78300	145200	65600	76800	142400
45600	61700	107300	44600	60400	105000
33000	79700	112700	31800	77200	109000
2588100	2428400	5016500	2515400	2368700	4884100

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
230900	216700	447600	213000	200100	413100
207700	196000	403700	196800	186000	382800
206700	197000	403700	202500	193500	396000
219200	205700	424900	213800	202000	415800
297700	265600	563300	287300	260500	547800
303000	255200	558200	292100	249600	541700
237600	208400	446000	231300	204100	435400
188600	161000	349600	184900	157900	342800
118900	92200	211100	115900	89500	205400
128100	107200	235300	125900	105000	230900
126500	115100	241600	124900	113300	238200
116200	114300	230500	114800	112500	227300
95800	99700	195500	94300	97900	192200
68800	80500	149300	67200	78800	146000
48500	64400	112900	47200	63000	110200
35900	83600	119500	34400	80700	115100
2630100	2462600	5092700	2546300	2394400	4940700

TABLE 11 : HONG KONG POPULATION PROJECTION

MID- 1986

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	254100	238300	492400
5- 9	222900	209400	432300
10-14	213300	201300	414600
15-19	217600	203600	421200
20-24	301100	265500	566600
25-29	323700	270600	594300
30-34	259700	226300	486000
35-39	206500	178900	385400
40-44	131700	104300	236000
45-49	128300	106100	234400
50-54	129100	116600	245700
55-59	119500	117700	237200
60-64	100600	105300	205900
65-69	73400	85400	158800
70-74	52400	68800	121200
75 +	41400	91800	133200
TOTAL	2775300	2589900	5365200

TABLE 12 : HONG KONG POPULATION PROJECTION

MID- 1987

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	259800	243700	503500
5- 9	230200	216200	446400
10-14	213700	201400	415100
15-19	212900	198800	411700
20-24	290400	254600	545000
25-29	331400	276900	608300
30-34	276100	237900	514000
35-39	217400	190300	407700
40-44	145800	118400	264200
45-49	123900	100400	224300
50-54	129400	115600	245000
55-59	120600	117800	238400
60-64	102900	107900	210800
65-69	76400	88400	164800
70-74	54000	70900	124900
75 +	45600	97000	142600
TOTAL	2830500	2636200	5466700

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
235300	220900	456200	217200	204000	421200
212800	200500	413300	198600	187400	386000
206400	195600	402000	201600	191600	393200
209500	197500	407000	203600	193300	396900
289700	257700	547400	278700	252200	530900
311800	261600	573400	299400	255300	554700
251200	218800	470000	243600	213800	457400
201000	173900	374900	196600	170400	367000
127200	100200	227400	123800	97200	221000
124600	102500	227100	122000	99900	221900
126300	113500	239800	124500	111400	235900
117200	114700	231900	115600	112700	228300
98200	102300	200500	96500	100200	196700
71000	82800	153800	69300	80900	150200
50600	66700	117300	49200	65000	114200
39300	87900	127200	37600	84600	122200
2672100	2497100	5169200	2577800	2419900	4997700

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
239300	224600	463900	221300	207800	429100
217600	204900	422500	199800	188600	388400
206100	195200	401300	200900	190800	391700
204000	192100	396100	197600	187500	385100
278200	246200	524400	266700	240200	506900
318200	267000	585200	304400	260000	564400
266300	229400	495700	257300	223700	481000
210900	184500	395400	205700	180300	386000
140800	113800	254600	136900	110400	247300
119700	96200	215900	116700	93400	210100
126200	112200	238400	124100	109800	233900
118000	114500	232500	116200	112300	228500
100200	104600	204800	98400	102300	200700
73700	85500	159200	71900	83400	155300
52000	68500	120500	50400	66700	117100
43200	92600	135800	41200	88900	130100
2714400	2531800	5246200	2609500	2446100	5055600

TABLE 13 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1988 AGE GROUP	MALE	FEMALE	TOTAL
0- 4	264700	248200	512900
5- 9	237700	223300	461000
10-14	214600	201900	416500
15-19	211200	197400	408600
20-24	277500	241200	518700
25-29	336000	281600	617600
30-34	293100	249200	542300
35-39	227200	200200	427400
40-44	163300	135800	299100
45-49	119600	95100	214700
50-54	129600	114400	244000
55-59	121400	117400	238800
60-64	104900	110200	215100
65-69	79500	91600	171100
70-74	55300	72600	127900
75 +	50100	102500	152600
TOTAL	2885700	2682600	5568300

TABLE 14 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1989 AGE GROUP	MALE	FEMALE	TOTAL
0- 4	268200	251500	519700
5- 9	245100	230200	475300
10-14	216300	203100	419400
15-19	212500	198700	411200
20-24	264300	227700	492000
25-29	336300	282500	618800
30-34	309400	259700	569100
35-39	237600	210000	447600
40-44	180700	153600	334300
45-49	118600	93100	211700
50-54	128800	112500	241300
55-59	122000	116600	238600
60-64	106600	112100	218700
65-69	82500	94800	177300
70-74	56700	74500	131200
75 +	54600	108100	162700
TOTAL	2940200	2728700	5668900

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
242700	227800	470500	224800	211100	435900
222500	209600	432100	203500	192000	395500
205900	194700	400600	198200	188000	386200
201600	190000	391600	194700	185000	379700
264400	232100	496500	252300	225700	478000
321500	270800	592300	306600	263300	569900
282000	239600	521600	271400	233200	504600
219700	193400	413100	213600	188700	402300
157600	130700	288300	153200	126900	280100
115000	90500	205500	111600	87300	198900
126000	110600	236600	123600	108000	231600
118400	113800	232200	116500	111300	227800
101900	106600	208500	99900	104200	204100
76700	88400	165100	74700	86000	160700
53000	70000	123000	51300	67900	119200
47400	97600	145000	45000	93500	138500
2756300	2566200	5322500	2640900	2472100	5113000

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
245200	230100	475300	227500	213700	441200
227300	214000	441300	207500	195700	403200
206200	194700	400900	195700	185400	381100
202100	190700	392800	194700	185300	380000
250400	217900	468300	237800	211100	448900
320800	271000	591800	305100	263000	568100
296900	249100	546000	284700	241900	526600
229000	202200	431200	221900	196900	418800
174400	147800	322200	169500	143600	313100
113400	88100	201500	109700	84600	194300
124800	108200	233000	122100	105200	227300
118700	112600	231300	116600	110000	226600
103400	108100	211500	101300	105500	206800
79400	91200	170600	77300	88600	165900
54200	71600	125800	52400	69300	121700
51500	102600	154100	48800	98000	146800
2797700	2599900	5397600	2672600	2497800	5170400

TABLE 15 : HONG KONG POPULATION PROJECTION

MID- 1990

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	270300	253500	523800
5- 9	252100	236800	488900
10-14	219400	206400	425800
15-19	215500	201100	416600
20-24	252600	215700	468300
25-29	332800	279200	612000
30-34	322800	268600	591400
35-39	250300	220800	471100
40-44	195800	169000	364800
45-49	122500	96500	219000
50-54	127000	109300	236300
55-59	122300	115500	237800
60-64	108000	113300	221300
65-69	85200	97700	182900
70-74	58500	76800	135300
75 +	58900	113500	172400
TOTAL	2994000	2773700	5767700

TABLE 16 : HONG KONG POPULATION PROJECTION

MID- 1991

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	271000	254100	525100
5- 9	258700	242900	501600
10-14	226700	213000	439700
15-19	215800	200300	416100
20-24	243800	208100	451900
25-29	325700	272000	597700
30-34	333100	276000	609100
35-39	265100	232200	497300
40-44	208900	182600	391500
45-49	131100	104900	236000
50-54	124100	105100	229200
55-59	122500	114300	236800
60-64	109300	114000	223300
65-69	87600	100500	188100
70-74	60800	79300	140100
75 +	63000	119000	182000
TOTAL	3047200	2818300	5865500

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
246300	231200	477500	229100	215100	444200
232000	218400	450400	211700	199700	411400
207500	196400	403900	193900	184200	378100
204400	192500	396900	196500	186600	383100
238000	205300	443300	224800	198000	422800
316400	267100	583500	300100	258700	558800
308700	257000	565700	294800	249100	543900
240500	212000	452500	232100	205900	438000
188700	162500	351200	183300	157800	341100
116800	91000	207800	112700	87200	199900
122500	104600	227100	119400	101300	220700
118700	111200	229900	116400	108300	224700
104600	109100	213700	102300	106200	208500
81900	93800	175700	79600	91000	170600
55800	73600	129400	53800	71100	124900
55300	107500	162800	52400	102400	154800
2838100	2633200	5471300	2702900	2522600	5225500

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
246200	231000	477200	229400	215400	444800
236400	222600	459000	215900	203600	419500
212700	200900	413600	195800	185500	381300
204000	191100	395100	195600	184800	380400
228400	197100	425500	214700	189300	404000
308400	259200	567600	291500	250400	541900
317500	263400	580900	302000	254800	556800
254000	222400	476400	244300	215600	459900
201000	175400	376400	194800	170200	365000
125000	99000	224000	120400	94700	215100
119100	99900	219000	115700	96300	212000
118500	109600	228100	116000	106500	222500
105600	109500	215100	103200	106400	209600
84100	96200	180300	81600	93200	174800
57900	75800	133700	55700	73100	128800
59100	112300	171400	55800	106800	162600
2877900	2665400	5543300	2732400	2546600	5279000

TABLE 17 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1992

AGE GROUP	MALE	FEMALE	TOTAL
0- 4	270400	253600	524000
5- 9	264400	248300	512700
10-14	234000	219800	453800
15-19	216200	200400	416600
20-24	239100	203300	442400
25-29	315100	261200	576300
30-34	340800	282300	623100
35-39	281300	243700	525000
40-44	219600	193900	413500
45-49	145000	118800	263800
50-54	119800	99400	219200
55-59	122800	113400	236200
60-64	110300	114200	224500
65-69	89700	102900	192600
70-74	63400	82100	145500
75 +	66900	124300	191200
TOTAL	3098800	2861600	5960400

TABLE 18 : HONG KONG POPULATION PROJECTION

HIGH PROJECTION

MID- 1993

AGE GROUP	MALE	FEMALE	TOTAL
0- 4	268800	252000	520800
5- 9	269300	252800	522100
10-14	241500	226800	468300
15-19	217100	200900	418000
20-24	237400	201900	439300
25-29	302200	247800	550000
30-34	345300	286900	632200
35-39	298300	254900	553200
40-44	229400	203700	433100
45-49	162200	136100	298300
50-54	115800	94200	210000
55-59	123000	112300	235300
60-64	111100	113800	224900
65-69	91500	105200	196700
70-74	66100	85000	151100
75 +	70800	129700	200500
TOTAL	3149800	2904000	6053800

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
244800	229800	474600	228600	214600	443200
240400	226300	466700	219900	207400	427300
217400	205300	422700	197000	186700	383700
203800	190700	394500	194900	184000	378900
222900	191700	414600	208700	183500	392200
297000	247800	544800	279600	238500	518100
323800	268800	592600	307000	259500	566500
269000	232900	501900	257900	225400	483300
210800	185800	396600	203800	180100	383900
138300	112400	250700	133300	107800	241100
114400	93800	208200	110700	89900	200600
118500	108300	226800	115700	105000	220700
106300	109300	215600	103700	106100	209800
85900	98400	184300	83300	95200	178500
60200	78200	138400	57900	75400	133300
62600	117100	179700	59000	111100	170100
2916100	2696600	5612700	2761000	2570200	5331200

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
242500	227500	470000	226500	212700	439200
243800	229400	473200	223500	210700	434200
222400	210000	432400	200700	190100	390800
203600	190200	393800	192200	181200	373400
220500	189600	410100	205800	181100	386900
283300	233700	517000	265300	224000	489300
327100	272700	599800	309200	262800	572000
284600	243100	527700	271900	234900	506800
219500	194700	414200	211600	188300	399900
154800	129100	283900	149300	124100	273400
109900	88200	198100	105800	84000	189800
118300	106800	225100	115300	103200	218500
106800	108600	215400	104100	105200	209300
87500	100300	187800	84800	96900	181700
62800	80900	143700	60300	77900	138200
66000	121800	187800	62000	115300	177300
2953400	2726600	5680000	2788300	2592400	5380700

TABLE 19 : HONG KONG POPULATION PROJECTION

MID- 1994

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	266400	249800	516200
5- 9	272800	256100	528900
10-14	248800	233700	482500
15-19	218800	202100	420900
20-24	238700	203200	441900
25-29	289100	234300	523400
30-34	345700	287800	633500
35-39	314500	265400	579900
40-44	239700	213500	453200
45-49	179300	153600	332900
50-54	114800	92300	207100
55-59	122300	110400	232700
60-64	111600	113000	224600
65-69	93100	106900	200000
70-74	68800	88000	156800
75 +	74800	135200	210000
TOTAL	3199200	2945300	6144500

TABLE 20 : HONG KONG POPULATION PROJECTION

MID- 1995

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	263500	247100	510600
5- 9	274900	258100	533000
10-14	255900	240300	496200
15-19	221900	205400	427300
20-24	241700	205600	447300
25-29	277500	222400	499900
30-34	342200	284500	626700
35-39	327800	274400	602200
40-44	252300	224200	476500
45-49	194100	168900	363000
50-54	118600	95700	214300
55-59	120600	107300	227900
60-64	112000	112000	224000
65-69	94500	108100	202600
70-74	71200	90700	161900
75 +	78900	140900	219800
TOTAL	3247600	2985600	6233200

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
239400	224600	464000	223500	209900	433400
246300	231800	478100	226200	213200	439400
227100	214400	441500	204600	193900	398500
203900	190200	394100	189700	178500	368200
221100	190300	411400	205800	181300	387100
269400	219600	489000	250800	209400	460200
326500	272900	599400	307700	262600	570300
299300	252500	551800	285100	243600	528700
228700	203500	432200	219800	196500	416300
171300	146000	317300	165200	140600	305800
108400	85800	194200	103900	81300	185200
117200	104500	221700	113900	100500	214400
107100	107500	214600	104200	103900	208100
88900	101800	190700	86100	98200	184300
65200	83500	148700	62600	80300	142900
69400	126600	196000	65100	119600	184700
2989200	2755500	5744700	2814200	2613300	5427500

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
235800	221300	457100	219800	206400	426200
247400	232900	480300	227700	214700	442400
231800	218800	450600	208800	197800	406600
205200	191900	397100	187900	177300	365200
223300	192100	415400	207600	182600	390200
257000	207000	464000	238000	196400	434400
322100	268900	591000	302700	258200	560900
311000	260500	571500	295100	250800	545900
240100	213200	453300	230000	205500	435500
185400	160600	346000	178800	154700	333500
111800	88700	200500	106900	83900	190800
115100	101000	216100	111400	96700	208100
107200	106200	213400	104000	102300	206300
90100	102700	192800	87100	98900	186000
67400	86000	153400	64700	82500	147200
73100	131700	204800	68500	124200	192700
3023800	2783500	5807300	2839000	2632900	5471900

TABLE 21 : HONG KONG POPULATION PROJECTION

MID- 1996

AGE GROUP	HIGH PROJECTION MALE	FEMALE	TOTAL
0- 4	260500	244200	504700
5- 9	275600	258700	534300
10-14	262400	246400	508800
15-19	229200	212000	441200
20-24	242000	204800	446800
25-29	268700	214800	483500
30-34	335100	277400	612500
35-39	338000	281600	619600
40-44	266900	235600	502500
45-49	207000	182400	389400
50-54	127100	104000	231100
55-59	117900	103200	221100
60-64	112200	110900	223100
65-69	95700	108900	204600
70-74	73300	93300	166600
75 +	83200	146900	230100
TOTAL	3294800	3025100	6319900

MEDIUM PROJECTION			LOW PROJECTION		
MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
232100	217800	449900	215800	202600	418400
247300	232700	480000	228100	215000	443100
236200	222900	459100	213100	201800	414900
210300	196400	406700	189800	178700	368500
223000	190700	413700	206700	180800	387500
247500	198800	446300	227900	187800	415700
314100	261100	575200	294300	250000	544300
319800	266800	586600	302300	256400	558700
253500	223500	477000	242000	215100	457100
197400	173300	370700	190100	166900	357000
119700	96600	216300	114500	91300	205800
111900	96400	208300	107900	91900	199800
107100	104700	211800	103700	100600	204300
91100	103100	194200	87900	99200	187100
69300	88200	157500	66500	84600	151100
76900	136900	213800	71900	128900	200800
3057200	2809900	5867100	2862500	2651600	5514100

Appendix 3

Chart 1

Projected Total Population 1976–1996

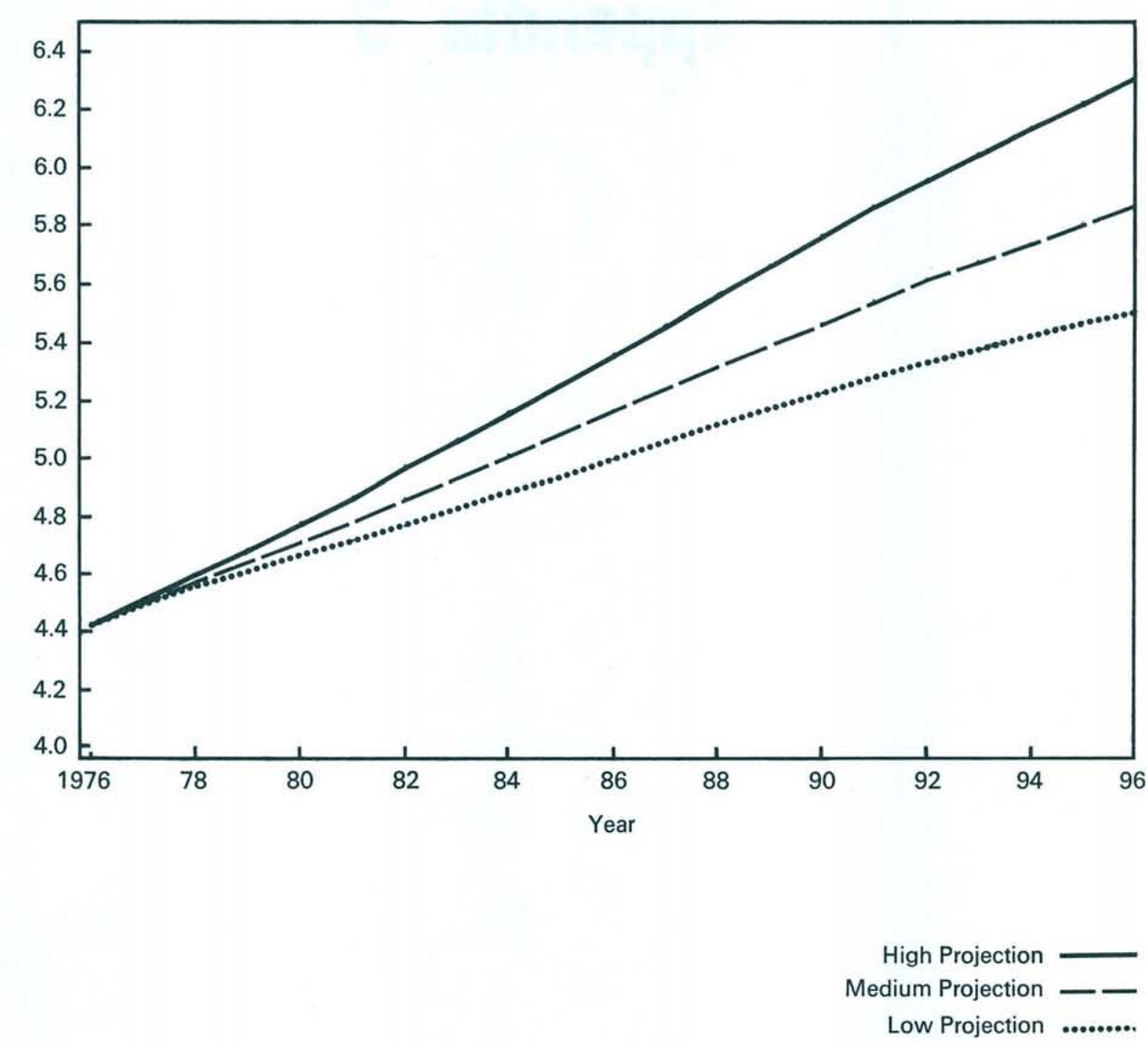


Chart 2

Population Pyramid
Mid-1976

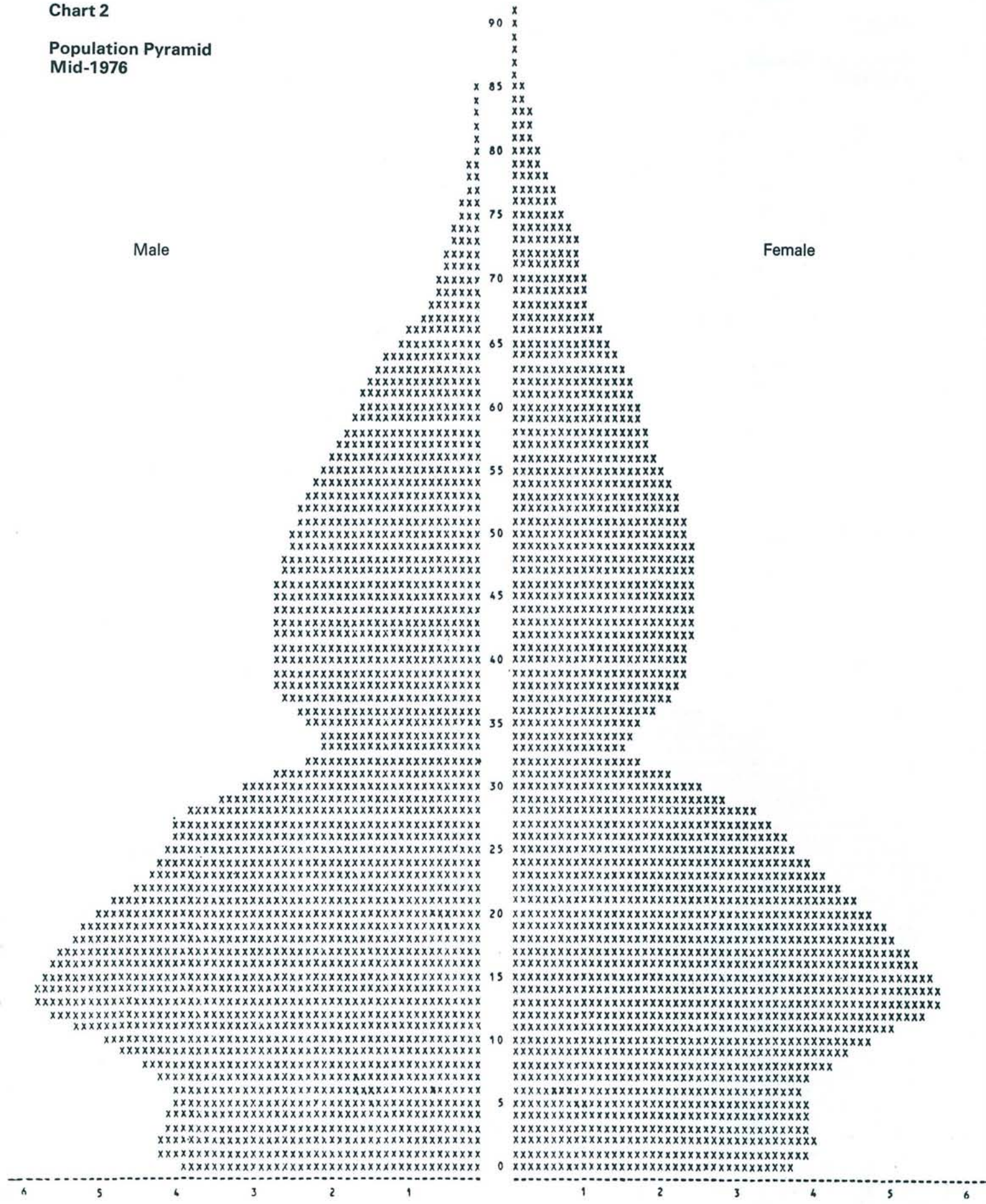


Chart 3

Population Pyramid
Mid-1981

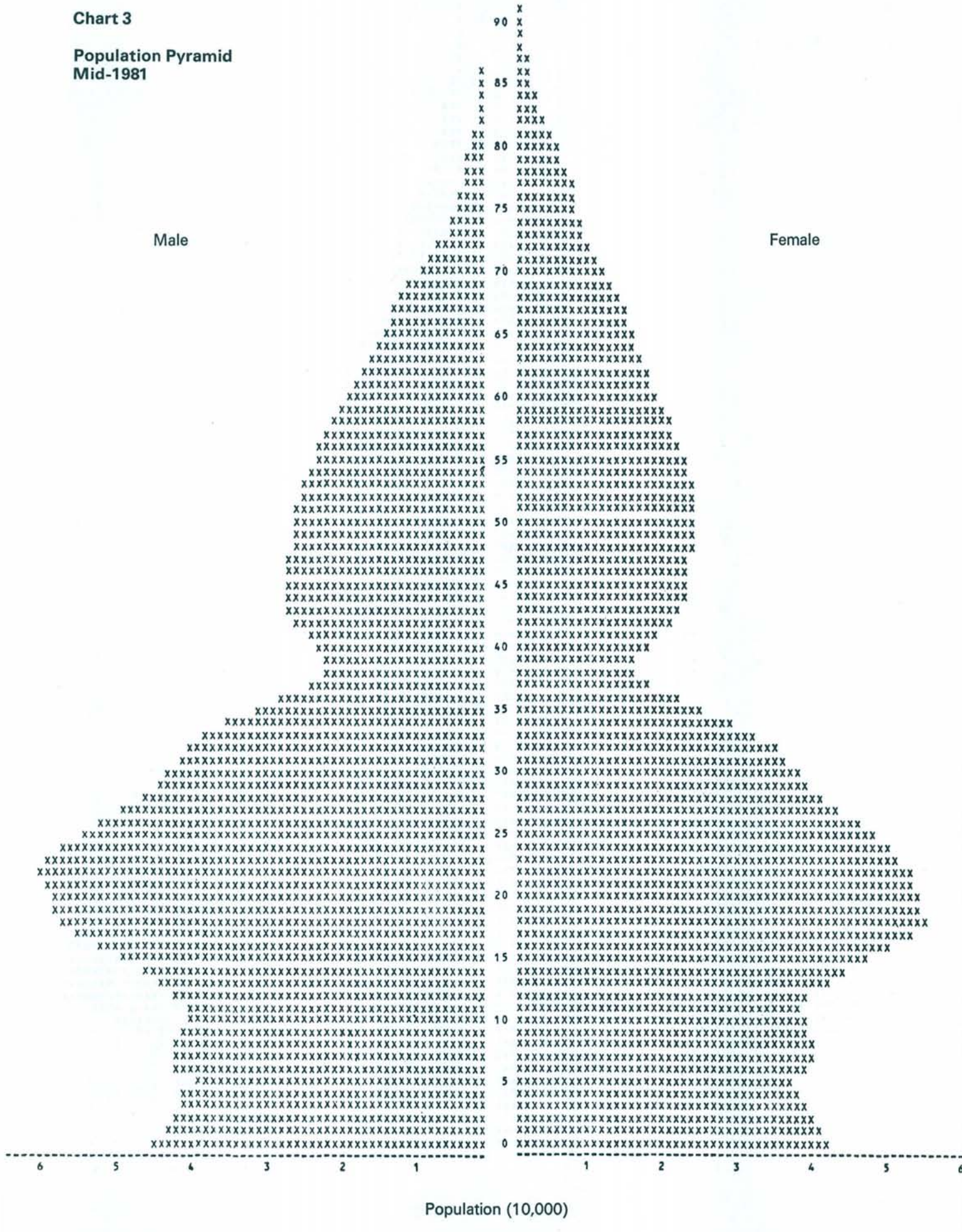


Chart 4

Population Pyramid
Mid-1986

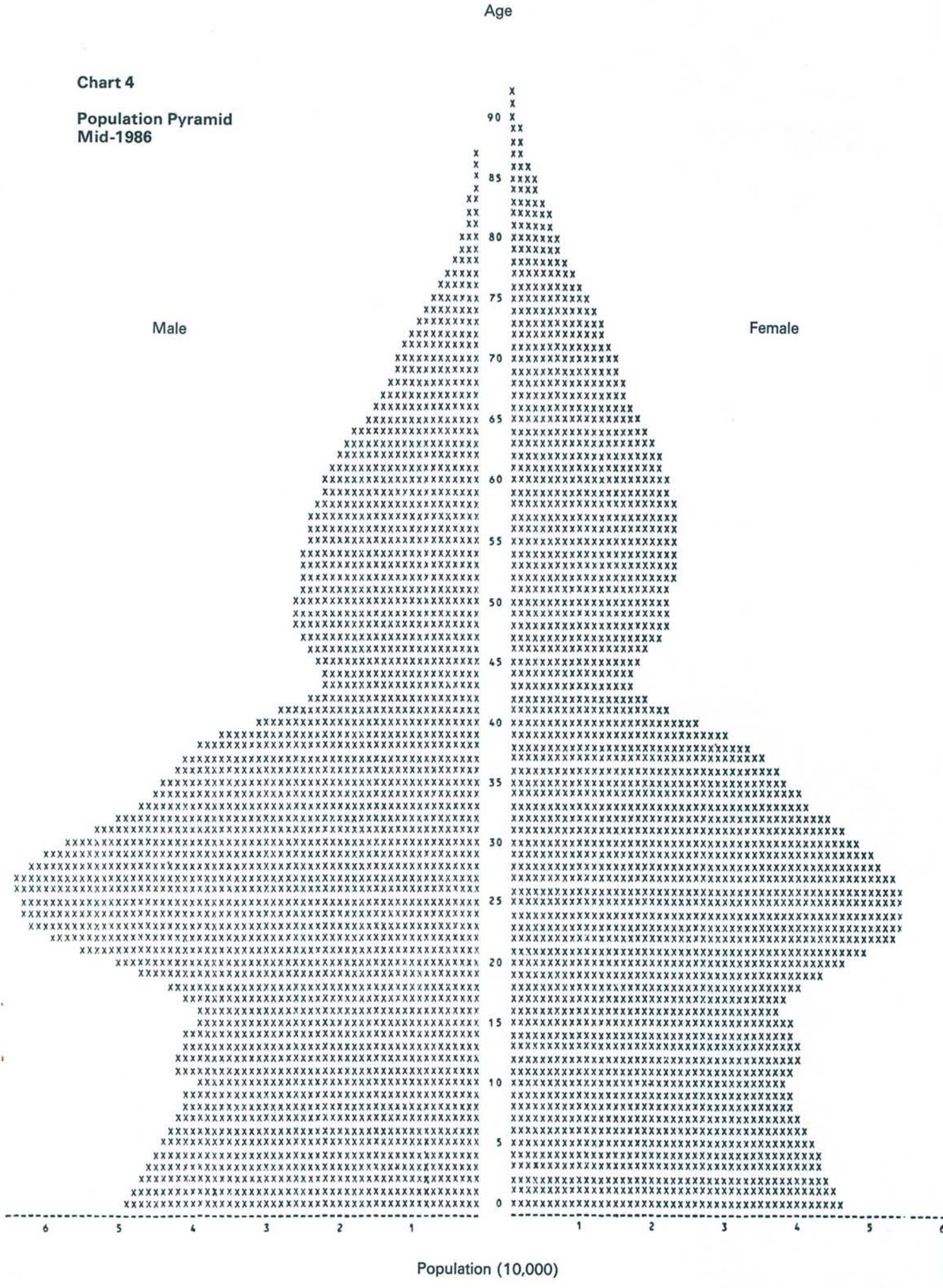


Chart 5

Population Pyramid
Mid-1991

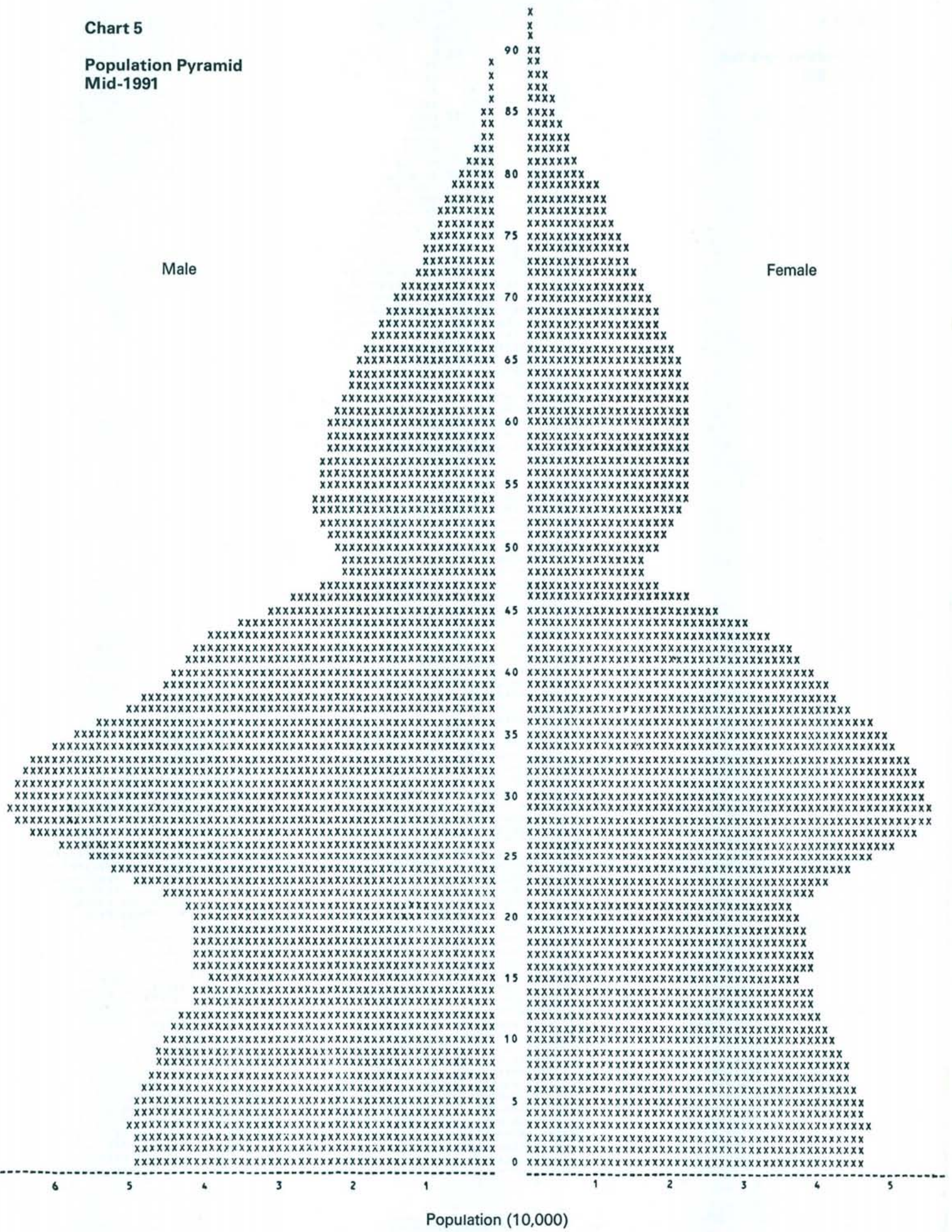
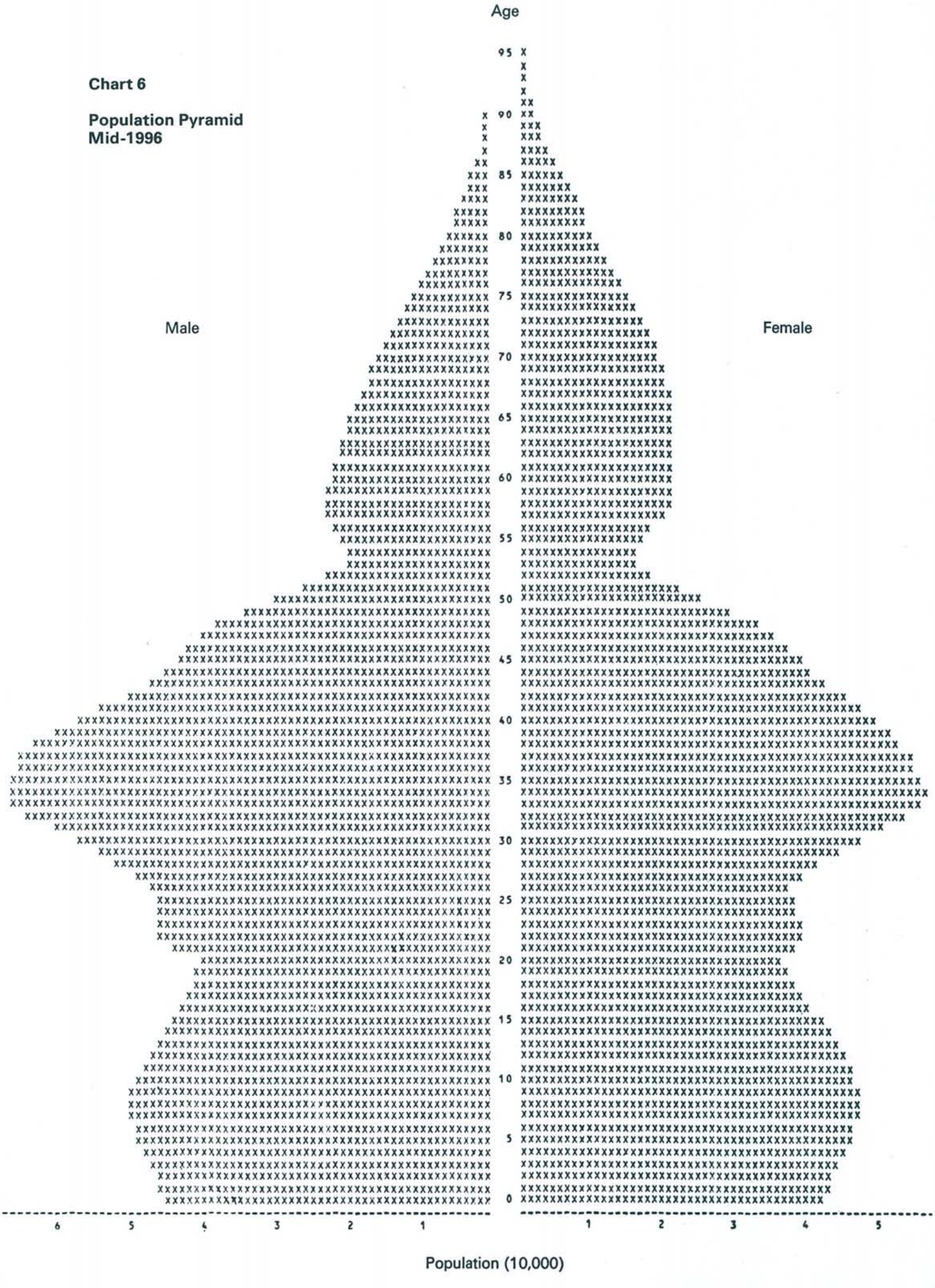


Chart 6

Population Pyramid
Mid-1996



Part II

Analysis of Components and Method of Computation

FERTILITY TRENDS

1 Trends in birth rates

Hong Kong had a high birth rate in the pre-war and early post-war periods. Even in the late 1950's, the crude birth rate remained between 35 and 40 per thousand population. The decline in the birth rate only became apparent in the early 1960's. The crude birth rate dropped steadily from 35 per thousand in 1961 to 20 per thousand in 1970. The rate remained stable at the level of about 19.5 per thousand between 1971 and 1974 but in 1975, resumed its declining trend. The figure for 1976 was 17.7.

Table 1.1 Crude birth rates, 1961–1976

Year	*Number of live births*	*Estimated mid-year population*	*Crude birth rate‡*
1961	110,884*	3,168,100	35.0
1962	112,503*	3,305,200	34.0
1963	114,550*	3,420,900	33.5
1964	107,625*	3,504,600	30.7
1965	101,110*	3,597,900	28.1
1966	91,832*	3,629,900	25.3
1967	88,215*	3,722,800	23.7
1968	82,685*	3,802,700	21.7
1969	82,482†	3,863,900	21.3
1970	79,132†	3,959,000	20.0
1971	79,789†	4,045,300	19.7
1972	80,344†	4,115,700§	19.5
1973	82,252†	4,212,600§	19.5
1974	83,581†	4,319,600§	19.3
1975	79,790†	4,395,800§	18.2
1976	78,486†	4,443,800§	17.7

*Figures based on registration of births with an adjustment for under-registration.
†Figures based on actual number of births delivered in hospitals, maternity homes and other institutions and registration of self-delivered births with slight adjustment for late-registration of self-delivered births.
‡Number of births per 1,000 population.
§Revised population estimates based on results of 1976 By-census.

2 Trends in fertility by age

The crude birth rate is calculated by relating the number of live births in a year to the average size of the population during the year. It can provide a simple and broad guide to the longer term trends. However, it cannot accurately reflect changes in fertility over time since it is based on the population at large, male and female, and even amongst the female population at risk (taken to be those in the fertile age agoup 15–49) is affected by changes in the age structure and such factors as age of marriage.

Age-specific fertility rates are a better measure of fertility because they are not affected by the age structure of the female population. Table 2.1 below shows the age-specific fertility rates for Hong Kong for the years 1969–1976 (the starting year of this and subsequent tables is dictated by limitations in the availability of information).

Table 2.1 Age-specific fertility rates*, 1969–1976

	Births per 1,000 female population							
Age group	*1969*	*1970*	*1971*	*1972†*	*1973†*	*1974†*	*1975†*	*1976†*
15–19	17.4	18.1	17.0	17.4	17.9	18.8	17.8	17.4
20–24	172.1	155.3	145.0	139.3	132.5	133.3	121.5	109.7
25–29	242.8	233.4	243.0	248.0	243.3	219.2	198.6	192.1
30–34	178.2	168.8	162.2	145.8	141.8	137.4	126.0	119.6
35–39	92.8	87.1	83.3	77.4	72.4	65.7	54.5	48.9
40–44	37.4	31.0	28.4	25.8	23.5	21.1	18.3	14.6
45–49	5.9	4.4	3.6	3.2	3.2	2.5	2.4	1.5
Net reproduction rate (NRR)‡	1.779	1.655	1.625	1.552	1.497	1.415	1.255	1.185

*Age-specific fertility rate is the ratio of the number of live births occurring to mothers in a child-bearing age group during a calendar year to the total female population in that age group at the middle of that year.
†Revised rates based on revised population estimates after 1976 By-census.
‡See page 48 for discussion of the concept of NRR.

It can be seen from Table 2.1 that the birth rates for almost all the fertile age groups declined steadily over the past 8 years. For the age groups 30 and over, the higher the age group the faster the rate of decrease. In the age group 25–29, there was a slight increase in the rate over the period 1970–72, but from 1973 onwards its birth rate also declined. Although the rate of decrease for this age group was comparatively less significant than that for the older age groups, because it is the most fertile age group the decline actually contributed appreciably to the overall fertility decline. To summarise, this rather uneven pattern of fertility decline was to a large extent associated with a marked decline in the number of high order births over this period.

Table 2.2 Percentage distribution of live births by birth order, 1969–1976

Year	*1st order*	*2nd order*	*3rd order*	*4th order*	*5th order and above*
1969	25.2	21.2	15.6	12.1	25.9
1970	26.5	22.3	16.1	11.9	23.2
1971	26.5	23.5	16.8	11.8	21.4
1972	31.7	22.7	16.5	10.6	18.5
1973	32.9	24.9	16.2	10.2	15.8
1974	37.6	25.8	15.2	8.8	12.6
1975	39.8	26.8	15.0	8.0	10.4
1976	38.9	30.6	15.1	7.3	8.1

Table 2.2 shows that, in each year during the period 1969–71, a substantial proportion (more than 20%) of the total live births were of a fifth child and above. This proportion dropped considerably in recent years and was only 8% in 1976. Broadly, the pattern reflected a general preference among women of younger ages for a small family; such a tendency would have a significant impact on the future age-specific fertility rates.

In the absence of the relevant data on births of, say, $(x+1)^{th}$ order relating to the total number of women who have born x number of children, it is not possible to compute the age-parity-specific* fertility rates. However, a simple breakdown of the age-specific fertility rates by birth order can provide an indication of the effect of the general decline in high order births on the differential declines in fertility among different age groups.

*Parity means the number of births to a mother.

Table 2.3 Age-specific birth rates by birth order, 1970 and 1976*

Births per 1,000 female population

	1st order		*2nd order*		*3rd order*		*4th order*		*5th order and above*	
Age group	*1970*	*1976*	*1970*	*1976*	*1970*	*1976*	*1970*	*1976*	*1970*	*1976*
15–19	13.6	13.9	4.0	3.2	0.5	0.3	—	—	—	—
20–24	76.7	63.5	50.0	35.2	21.3	9.0	6.0	1.7	1.3	0.3
25–29	54.8	66.8	64.5	69.5	54.6	35.4	35.7	14.5	23.8	5.9
30–34	14.4	16.6	27.2	31.8	31.7	29.9	33.8	20.2	61.7	21.1
35–39	3.3	3.9	6.6	8.0	9.7	8.5	12.8	8.1	54.7	20.4
40–44	0.6	0.6	1.2	1.2	2.2	1.5	2.7	1.7	24.3	9.6
45–49	0.1	0.1	0.2	0.1	0.3	0.1	0.5	0.1	3.3	1.1

*Revised rates based on revised population estimates after 1976 By-census.

The third and higher order birth rates for all child-bearing age groups recorded a substantial decline during the period 1970–76, the higher the birth order the larger the decline. For each birth order rate, the rate of decrease was higher for the age groups under 30. The pattern of change, however, was somewhat different for the first and second order birth rates. There was a general increase in the rates for the age groups 25–39, but a moderate decrease for the young age groups 15–24.

3 The concept of population replacement

Before proceeding to the projection of fertility trends, it is necessary to explain briefly the concept of the net reproduction rate (NRR).

The NRR may be defined as the total number of female children that would be born per woman to a cohort of women as they pass through the reproductive ages 15–49, allowing for mortality of some of the women up to and during this period, according to constant fertility and mortality conditions. Thus, an NRR of 1 means that each woman during her child-bearing period would produce an average of one girl, who may be said to 'replace' her in the population. The population would then have a propensity to remain stationary. If the NRR remains at this level for a sufficiently long period of time (40 to 50 years), and provided that the net balance of migration is nil, the population would eventually become stationary. On the other hand, when the NRR is below unity, the population would have a propensity to diminish. It should be noted, however, that the NRR measures a hypothetical situation when the population is continuously subject to particular fertility conditions. If the schedule of age-specific fertility rates changes, the NRR also changes. In practice, it has been found that, after the NRR has reached a level of 1, it tends to fluctuate.

4 Method of fertility projection

The method of projecting fertility used in the present exercise consists of the projection of the birth rates by birth order for each child-bearing age. These detailed projections are informed by subjective judgments as to the likely future trend of NRR based on *inter alia* experience in developed countries which experienced rapid fertility decline in the past and whose NRRs are now at or below unity. Based on the projected age-specific fertility rates, the NRR for each year throughout the projection period is then computed. If the NRR so computed deviates significantly from this trend, the assumptions concerning future age-specific birth rates by birth order would be re-formulated and the process repeated until the resultant NRR approximately matches the pattern.

5 Future fertility trends

The NRR has been falling steadily over the past 8 years. If the present trend in the age-specific fertility rates continues in the future, it appears that the NRR would reach a level of 1 in the early 1980's. Since individual behaviour patterns only change slowly, it is unlikely that the NRR would remain immediately at the level of 1 and not fall below 1. On the other hand, it is unlikely that the NRR would stay forever below unity. Based on past trends of fertility decline in other low-fertility countries and on an appreciation of the position in Hong Kong, the judgment is that it would gradually rise back to 1 after a certain period of time, and then fluctuate about this level.

Experience over the past 8 years indicates that the high order birth rates were on a steadily declining trend. For the purposes of the projection, it is assumed that the present trend in the third and higher order birth rates would continue over the entire projection period and that the first and second order birth rates would increase, decrease or remain unchanged (as the case may be), from one period to another, so that the NRR derived from the projected age-specific fertility rates would approximately follow the general pattern thought likely to emerge.

High projection – The first order birth rate is assumed to increase along past trends (1970–76); the second order birth rate is assumed to remain unchanged at the 1976 level throughout the projection period. The third and higher order birth rates are assumed to decline along past trends (1970–76) until each reaches a prospective low limit which is subjectively fixed, based on the experience of other low-fertility countries. This will cause the NRR to drop to a level of 1 in 1983, which will continue to decline until it reaches 0.98 around 1986/1987 when the increase in the first order birth rate just balances the decline in the third and higher order birth rates. From then onwards, the NRR will increase slowly and finally reach 1 again in 1992.

Medium projection – The first order birth rate is assumed to remain unchanged at the 1976 level until 1983, and then to start increasing gradually. The second order birth rate is assumed to remain unchanged at the 1976 level throughout the projection period. The third and higher order birth rates are assumed to decline along past trends (1970–76) until each reaches a prospective low limit. Under these assumptions, the NRR will fall steadily to a level of 1 in 1981, and will continue to decline until it reaches 0.94 around 1987. From 1988 onwards, the NRR will increase slowly and will be back to 1 again in 1998.

Low projection – The first order birth rate is assumed to remain unchanged at the 1976 level until 1983, and then to start increasing gradually. The second order birth rate is assumed to decline along past trends (1970–76) until 1983, and then to remain unchanged over the rest of the projection period. The third and higher order rates are assumed to decline, following the more rapid rate of decrease in the past two years until each reaches a prospective low limit. Under these assumptions, the NRR will fall to a level of 1 in 1979 and will continue to decline until it reaches 0.89 around 1985. From then onwards, the NRR will increase steadily and eventually reach 1 again in the early 2000's.

6 Projected age-specific fertility rates

The projected change in the birth rate for each birth order is assumed to apply equally to all child-bearing age groups. Using the 1976 data as the base line, the projected age-specific birth rates by birth order for each successive future year can be calculated by adjusting the initial age-specific birth rates for each birth order by the projected rate of increase or decrease in that particular birth order rate for the respective future year compared with 1976. After repeating this process for all birth orders, the projected age-specific fertility rates can be arrived at by summing the projected age-specific birth rates over all birth orders. Table 6.1 shows the projected age-specific fertility rates for the years 1976, 1981, 1986, 1991 and 1996 for each of the three projections. A graphical illustration of the change in the pattern of fertility over the projection period is given in Chart B1.

Table 6.1 Projected age-specific fertility rates, 1976, 1981, 1986, 1991 and 1996

		Births per 1,000 female population			
Age Group	*1976**	*1981*	*1986*	*1991*	*1996*
High projection					
15–19	17.4	18.4	19.5	20.8	22.2
20–24	109.7	110.2	113.6	118.9	125.3
25–29	192.1	173.9	169.9	172.9	179.4
30–34	119.6	90.9	79.8	77.4	78.8
35–39	48.9	33.6	27.4	25.7	26.0
40–44	14.6	9.2	7.1	6.4	6.4
45–49	1.5	1.0	0.6	0.6	0.6
Medium projection					
15–19	17.4	17.3	17.9	19.0	20.3
20–24	109.7	105.1	106.1	110.8	116.5
25–29	192.1	168.6	161.9	164.3	170.1
30–34	119.6	89.6	77.8	75.3	76.5
35–39	48.9	33.3	27.0	25.2	25.5
40–44	14.6	9.2	7.0	6.3	6.3
45–49	1.5	1.0	0.6	0.6	0.6

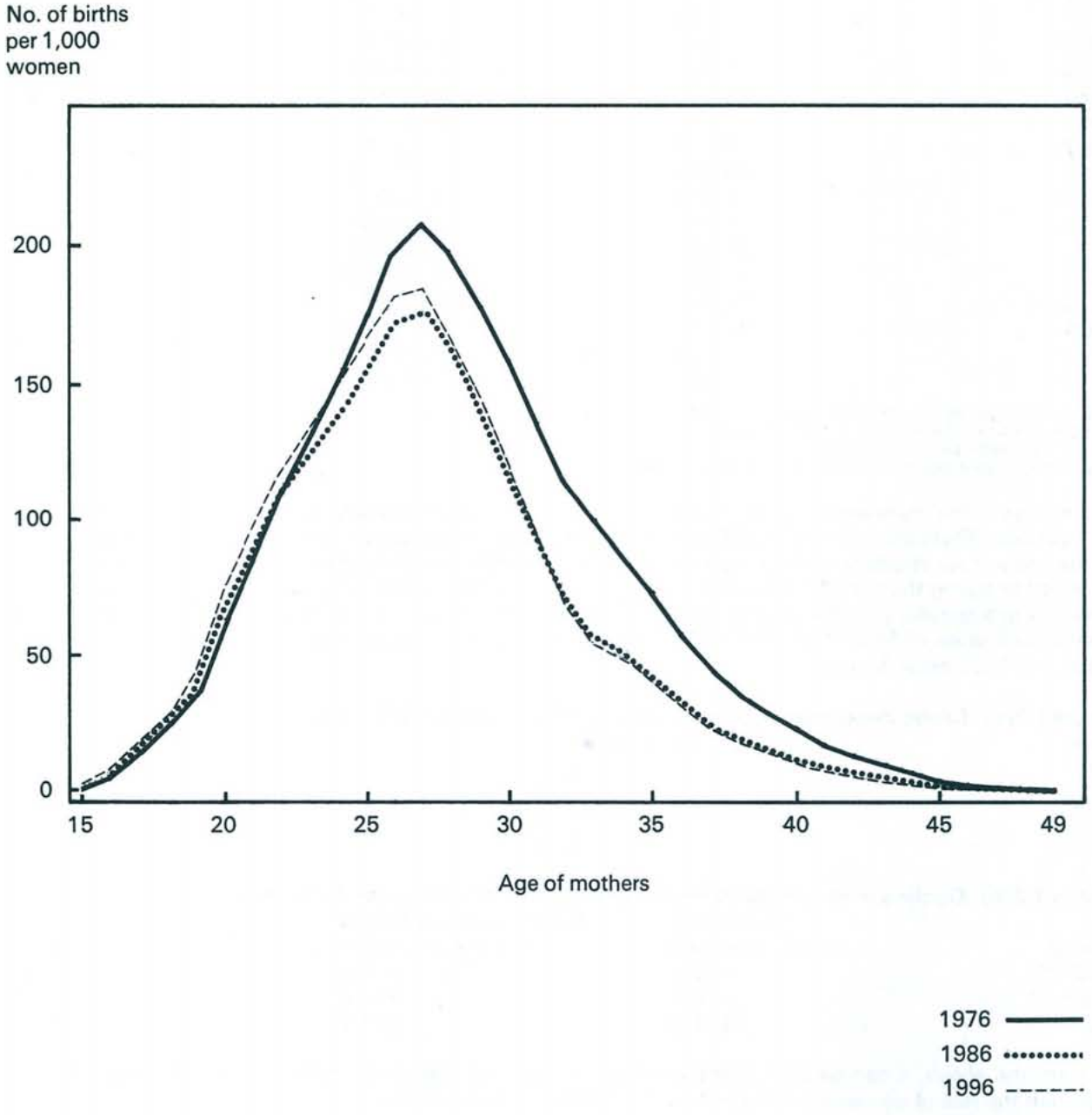
*actual figure.

Age Group	1976*	1981	1986	1991	1996
	Births per 1,000 female population				
Low projection					
15–19	17.4	17.1	17.7	18.8	20.1
20–24	109.7	102.0	103.2	108.5	114.2
25–29	192.1	158.0	154.1	159.6	165.6
30–34	119.6	78.6	71.8	73.0	74.5
35–39	48.9	28.0	24.4	24.6	25.0
40–44	14.6	7.5	6.2	6.2	6.2
45–49	1.5	0.7	0.6	0.6	0.6

*actual figure.

Chart B1

Projected Age-Specific Fertility Rates
Medium Projection



MORTALITY TRENDS

1 Trends in death rates

The level of mortality in Hong Kong was very high up to the outbreak of the Second World War; the crude death rate varied between 26 and 37 per thousand population. A major decline in mortality became apparent after the War. The rate was 10.2 in 1951 and 6.1 in 1961, a drop of 40% in a single decade. Thereafter decline was more gradual. Since 1964, the rate has recorded little significant change and has fluctuated about the level of 5 per thousand.

Table 1.1 Crude death rates, 1961–1976

Year	*Number of deaths*	*Estimated mid-year population*	*Crude death rate‡*
1961	19,325*	3,168,100	6.1
1962	20,933*	3,305,200	6.3
1963	20,340*	3,420,900	5.9
1964	18,657*	3,504,600	5.3
1965	18,150*	3,597,900	5.0
1966	19,261*	3,629,900	5.3
1967	20,234*	3,722,800	5.4
1968	19,444*	3,802,700	5.1
1969	19,256*	3,863,900	5.0
1970	19,996*	3,959,000	5.1
1971	20,374†	4,045,300	5.0
1972	21,397†	4,115,700§	5.2
1973	21,251†	4,212,600§	5.0
1974	21,879†	4,319,600§	5.1
1975	21,597†	4,395,800§	4.9
1976	22,692†	4,443,800§	5.1

*Figures based on registration of deaths with an adjustment for under-registration.
†Figures based on actual number of deaths occurred.
‡Number of deaths per 1,000 population.
§Revised population estimates based on results of 1976 By-census.

Changes in the crude death rate as shown in Table 1.1, however, do not accurately reflect changes in mortality over time. There are considerable differences in the risk of death at various ages and between sexes; changes in the age and sex structure of the population, therefore, affect the crude death rate. In order to show the trends in mortality during the period 1961–76, it is necessary to standardize the death rate based on the age and sex structure in a specific year. For easy comparison between different periods, the standardized death rates for the bench-mark years of 1966, 1971 and 1976 have been computed based on the sex-age distributions of 1961, 1966 and 1971 respectively.

Table 1.2(a) Crude death rates and standardized death rates, 1961, 1966, 1971 and 1976

Year	*Crude death rate*	*Standardized death rate*
1961	6.07	—
1966	5.32	4.91
1971	5.06	4.42
1976	5.11	4.52

Table 1.2(b) Decline in crude death rates by component, 1961, 1966, 1971 and 1976

Period	*% decline in crude death rate*	*% attributable to changes in sex-age structure*	*% attributable to decline in mortality*
1961–66	−12.4	+ 6.7	−19.1
1966–71	− 4.9	+12.0	−16.9
1971–76	+ 1.0	+11.7	−10.7

From the above, it can be seen that there was a continuous decline in mortality over the past 16 years, although the rate of decrease in the period 1971–76 was somewhat slower.

2 Differential mortality by age and sex

Mortality differs significantly between ages; the death rate starts at a high level in the first year of life, falls to a minimum near age 11, then moves up slowly until midlife and finally rises rapidly at the older ages. Table 2.1 shows differential mortality among age groups for males and for females over the past 16 years. To minimize the yearly fluctuations in the rates, the average sex-age-specific death rates for 1961–65 and 1972–76 have been used for the comparison.

Table 2.1(a) Age-specific death rates (male), 1961–1965 and 1972–1976*

Deaths per 1,000 male population

Age group	*1961–65*	*1972–76*	*% change 1972–76/1961–65*
0	35.3	17.8	−50
1–4	3.1	1.0	−67
5–9	0.8	0.5	−42
10–14	0.7	0.4	−42
15–19	0.8	0.7	−17
20–24	1.6	1.2	−25
25–29	1.7	1.4	−17
30–34	2.2	1.9	−11
35–39	3.1	2.3	−25
40–44	4.9	4.0	−19
45–49	7.5	6.0	−20
50–54	13.3	9.6	−28
55–59	19.7	15.0	−24
60–64	35.3	25.7	−27
65–69	45.5	39.8	−12
70–74	76.7	58.7	−23
75 and over	131.4	97.8	−26

Table 2.1(b) Age-specific death rates (female), 1961–1965 and 1972–1976*

Deaths per 1,000 female population

Age group	*1961–65*	*1972–76*	*% change 1972–76/1961–65*
0	29.1	14.2	−51
1–4	3.1	0.9	−71
5–9	0.7	0.3	−50
10–14	0.5	0.3	−38
15–19	0.6	0.4	−33
20–24	0.9	0.6	−36
25–29	1.2	0.8	−34
30–34	1.5	1.1	−25
35–39	2.0	1.4	−33
40–44	2.8	2.1	−27
45–49	4.0	3.1	−24
50–54	6.5	4.9	−24
55–59	8.9	7.7	−14
60–64	15.0	12.3	−18
65–69	20.3	18.1	−11
70–74	36.6	28.9	−21
75 and over	81.3	70.2	−14

*Revised rates based on revised population estimates after 1976 By-census.

This shows that the average age-specific death rates for the two 5-year periods are always higher for males than for females and that, while death rates have fallen for all ages, the greatest reduction has been in the younger age groups. It should also be noted that for almost all age groups between 0 and 45, the declines in female mortality have been more remarkable than those in male mortality; and vice versa for all ages above 45.

3 Changes in mortality by cause

Different causes of death affect both males and females in different age groups by different degree. The uneven rate of mortality decrease among the population in different sex-age groups over the past decades was probably largely associated with the change in the pattern of the major causes of deaths.

The pattern of the causes of death in Hong Kong changed considerably during the period 1961–76. Again, to minimize the yearly fluctuations, the deaths from all causes over a 5-year period have been used for the analysis. Table 3.1 gives the percentage distribution of all deaths by causes for 1961–65 and 1972–76.

Table 3.1 Percentage distribution of deaths by cause of death, 1961–1965 and 1972–1976

Cause of death	*1961 -65*	*1972–76*	*Increase/decrease (1972–76)−(1961–65)*
Infectious and parasitic diseases	13.6%	5.3%	− 8.3%
Neoplasms	14.5	22.2	+7.7
Diseases of the circulatory system	21.3	26.4	+5.1
Diseases of the respiratory system	14.4	16.1	+1.7
Diseases of the digestive system	6.5	5.0	−1.5

Cause of death	*1961–65*	*1972–76*	*Increase/decrease (1972–76)—(1961–65)*
Congenital anomalies and causes of perinatal mortality	8.2%	4.2%	−4.0%
Ill-defined causes	17.1	16.2	−0.9
Accidents, poisonings and violence			
All other causes	4.4	4.6	+0.2
All causes	100.0	100.0	0.0

Deaths due to infectious and parasitic diseases that used to account for over 13% of the total deaths in the period 1961–65 dropped to about 5% in 1972–76. The decline in deaths from congenital anomalies and causes of perinatal mortality was also fairly significant. On the other hand, neoplasms that contributed less than 15% of the total deaths in 1961–65 increased markedly to over 22% in 1972–76. The increase in deaths from diseases of the circulatory system was also significant.

4 Changes in standardized cause-specific death rates and their effects on trends in mortality by age

The change in the percentage distribution of all deaths by cause shows changes in the relative importance among the various cause groups over time. They cannot, however, show changes in the magnitude or the direction of the cause-specific mortality trend. For the latter purpose, it is necessary to compare the cause-specific death rates for the two periods. To eliminate the effect of the changing age structure of the population, the cause-specific death rates have been standardized based on the sex-age distribution of 1976. Table 4.1 gives the standardized cause-specific death rates for both sexes for the periods 1961–65 and 1972–76.

Table 4.1 Standardized cause-specific death rates, 1961–1965 and 1972–1976

Deaths per 100,000 population

	Male			*Female*		
Cause of death	*1961–65*	*1972–76*	*% change 1972–76/ 1961–65*	*1961–65*	*1972–76*	*% change 1972–76/ 1961–65*
Infectious and parasitic diseases	110.0	42.3	−62	52.2	13.7	−74
Neoplasms	122.9	136.4	+11	97.9	96.4	− 2
Diseases of the circulatory system	210.7	139.8	−34	180.1	141.2	−22
Diseases of the respiratory system	89.4	90.6	+ 1	86.8	80.0	− 8
Diseases of the digestive system	47.6	33.1	−31	29.0	19.0	−35
Congenital anomalies and Causes of perinatal mortality	28.4	22.2	−22	21.5	17.1	−20
Ill-defined causes	95.3	37.9	−60	108.7	51.6	−53
Accidents, poisoning and violence	54.1	53.8	− 1	30.9	29.1	− 6
All other causes	33.3	23.4	−30	28.5	25.1	−12
All causes	791.7	579.5	−27	635.6	473.2	−26

Over the past 16 years, the death rate from infectious and parasitic diseases dropped markedly by 62% for males and 74% for females. The decline in mortality from this group of diseases, which mainly affects the very young and the old, contributed significantly to the remarkable decline in infant mortality, especially post-neonatal mortality, during this period; and had a substantial effect on the decline in mortality at the older ages.

Mortality from diseases of the digestive system showed a significant decline over the period 1961–76, 31% for males and 35% for females. The improvement, however, was much more marked among infants and children under 15. The effect of the decline in mortality from this group of causes on the decline in infant mortality, especially post-neonatal mortality, was as significant as that of the decline in infectious and parasitic diseases.

Immaturity, birth injuries, and other causes of an endogenous nature associated with perinatal mortality continued to decrease over the period 1961–76. This resulted in a notable decline in neonatal mortality and thus contributed, but in a less degree, to the decline in infant mortality generally.

There was a notable increase in deaths from congenital anomalies, but the rate was still comparatively low.

Diseases of the circulatory system mainly affect the very old. The increase in the number of deaths from these diseases, and in their proportion of total deaths, was mainly the result of the rapid growth in the number of old people. Mortality from this group of diseases, as indicated by the standardized death rates, actually dropped by as much as 34% for males and 22% for females over the period 1961–76. This contributed significantly to the mortality decline among the population in the age groups 50 and over.

Mortality from diseases of the respiratory system showed a slight increase for males and a decrease for females during the period 1961–76. The rates fluctuated widely from year to year, but the fact that the change over time was minor could indicate that these fluctuations were random.

Neoplasms was the only cause group where a significant increase in the death rate was recorded over the period 1961–76; the increase in neoplasm deaths, however, was different for both sexes. Mortality from this group of diseases increased by as much as 11% for males, but for females a drop of less than 2% was recorded. The increase may be partly due to better diagnostic techniques developed recently for this group of diseases, although this is difficult to quantify.

With the improvement in diagnostic techniques, deaths classified under 'ill-defined' causes continued to decline markedly. During the period 1961–76, the rate dropped by as much as 60% for males and 53% for females.

Accidents, poisoning and violence accounted for many deaths among the population in the age group 5–34. Road accidents and drowning were the main killers. The death rate was higher for males than for females. Mortality from this group of causes, however, showed no significant change over the period 1961–76.

Following the general trend of mortality decline, the death rate from diseases of the nervous system, genito-urinary system, skin, musculo-skeletal system and those related to pregnancy, child-bearing and puerperium etc. continued to fall during the period 1961–76. The rate of decrease was relatively more significant for males than for females.

5 Future mortality trends by cause

Mortality has been falling steadily since 1961. In view of the existing socio-economic conditions in Hong Kong and advances in medical technology, there is every reason to believe that the present trends in mortality in all sex-age groups will continue in the future, although the rate of decrease is likely to be slower and not of the same extent among different cause groups. A direct extrapolation of past trends in the age-specific death rates would, it is felt, result in an over-estimation of the decline in mortality, in particular, as the declines in mortality from different causes of death constitute different declines in mortality in different age groups. The projection of the age-specific death rates, therefore, involves the separate projection of the trends in mortality from different cause groups for males and for females. To eliminate the effect of changing age structure of the population, the standardized sex-cause-specific death rates have been used in the projection. It is believed that, discounting the age effect, mortality from each cause group would decrease (or increase) on the present trend at a more or less constant rate. A log-linear trend was therefore fitted to the time series of the standardized death rates for each group of causes of deaths in the past 16 years and projected to the next 20 years. The projected trends were modified at a later stage in the light of the experience of more advanced countries.

The second step in the projection involves the assessment of the impact of the change in mortality from different cause groups on the death rates for males and females in different ages. This is achieved by comparing the average sex-age-cause-specific death rates for the two 5-year periods 1961–65 and 1972–76. The assumptions about the future pattern of mortality from the various cause groups by age and sex have been based on information on the existing trends and the comparison of the conditions in Hong Kong with those in more advanced countries.

Mortality from infectious and parasitic diseases declined rapidly in the past 16 years. In the light of observation of the pattern of this group of diseases in other countries, it appears likely that the fairly rapid rate of decrease for males may persist over the next 20 years. For females, however, since the death rate is already very low, any future decline must be at a slower rate.

During the past years, the decline in mortality from this group of diseases was mainly concentrated in the younger ages, especially among infants and children under 15. In view of the fact that the death rate of this cause group for ages under 15 is already very low, any further decline in future years should be less significant. This should also apply to the decline in the death rate for the older ages.

Mortality from neoplasms increased steadily during the period 1961–76. The present death rate in this cause group is, however, still low compared with that in developed countries, and it appears likely that the upward trend in mortality from neoplasms would continue in the next 20 years. In spite of the projected increase in the death rate, advances in medical technology and improvements in diagnostic techniques would assist treatment in the young and middle ages. It is therefore assumed that over the period of the projection the increase in the death rate of neoplasms would be mainly in ages under 15 and over 55.

In spite of a notable increase in deaths from diseases of the circulatory system, the standardized death rate of this cause group actually dropped considerably over the past 16 years. The declining trends are in line with those observed in developed countries. Although the death rate of this cause of diseases has dropped to a level lower than that prevailing in these countries, it is believed that the present trends will continue in the future but at a slower rate of decrease. It is assumed in the projection that the rate of decrease in mortality from this cause group would be reduced to half of the level observed over the past 16 years.

Mortality from this cause group increases rapidly with age. It has little effect for ages under 15. It is therefore assumed that over the period of the projection the decline in the death rate of diseases of the circulatory system would be in ages 15 and above, and that the decline would be least significant among the very young and the old.

The death rate of diseases of the respiratory system fluctuated widely from year to year during the past 16 years. The trend values however remained more or less stable over the period. Mortality from this group of diseases is still fairly high compared with that in developed countries. On the other hand, the relatively high mortality from this cause group is in line with that observed in other sub-tropical countries whose experience seems more relevant than that of countries with colder climates. It is therefore assumed in the projection that

the death rate of these diseases would remain unchanged at the present level and that the mortality pattern by age would also not be affected.

Mortality from diseases of the digestive system has declined rapidly in the past decade. The decline was most significant in the younger ages 0–4. The present death rate of this cause group for males is still fairly high compared with that in developed countries and there seems to be room for further improvement. On the other hand, the rate has already reached at very low level for females. It is therefore assumed in the projection that the current trend in mortality from this cause group for males would continue in the future and that the trend for females would be declining at $\frac{1}{3}$ of its original speed. The decline would continue to be more significant in the younger ages 0–4 and less significant in the older ages.

Mortality from congenital anomalies and causes of perinatal mortality decreased steadily in the past. With continuous improvements in the provision of maternal and child health facilities and advances in medical technology, it appears that the declining trend would continue in the future, although the rate of decrease would be reduced. The decline in the death rate would, of course, be mainly in the young age groups, especially under 1.

With rapid improvements in diagnostic techniques, the number of deaths classified as from ill-defined causes dropped markedly over the period 1961–76. The death rate for the older ages classified under this cause group, however, is still fairly high compared with that in developed countries and the declining trend observed in the past would most probably continue in the future. The decline should be concentrated mainly in ages 15 and above.

The death rate of accidents, poisoning and violence fluctuated widely from year to year. The trend values however remained more or less stable over the period 1961–76. It is therefore assumed in the projection that the death rate of this cause group would remain unchanged at the present level and that the mortality pattern by age would also not be affected.

Mortality from all other causes, which was proportionately low, continued to decline during the period 1961–76. It is assumed in the projection that the declining trend would continue in the future and that the decline would be relatively less significant towards the older ages.

6 Projected sex-age-specific death rates

In order to secure a more stable base for the projection of mortality, the average sex-age-cause-specific death rates for the 5-year period 1972–76 have been used. The projection is made separately for males and for females. The first step in the projection is to compute an index of increase (or decrease) for the death rate of each cause group for each successive future year (which is derived from comparing the projected standardized death rate of the particular cause group for the respective future year with that for the base period). The index of increase (or decrease) for any cause group is disaggregated by age, based on assumed differentials in the mortality increase (or decrease) in the different broad age groups, and applied to the corresponding age-cause-specific death rates for the base period. After repeating this process for all cause groups for the respective future year, the next step is to sum the projected age-cause-specific death rates to arrive at the projected age-specific death rates for that particular year.

The set of the projected sex-age-specific death rates is used in the medium projection. For the high projection, a 5% downward adjustment, and for the low projection a 5% upward adjustment is made based on the average deviation of the actual death rates from the trend values. Table 6.1 shows the projected sex-age-specific death rates for the years 1976, 1981, 1986, 1991 and 1996 for each of the three projections. A graphical illustration of the change in the death rates over time is given in Charts D1 and D2.

Table 6.1(a) Projected age-specific death rates (male), 1976, 1981, 1986, 1991 and 1996

Deaths per 1,000 male population

Age Group	*1976*	*1981*	*1986*	*1991*	*1996*
High projection					
0	15.03	14.52	13.92	13.28	12.61
1–4	0.80	0.78	0.77	0.75	0.74
5–9	0.44	0.43	0.43	0.42	0.42
10–14	0.37	0.36	0.36	0.36	0.35
15–19	0.65	0.63	0.61	0.59	0.57
20–24	1.08	1.01	0.96	0.92	0.89
25–29	1.27	1.16	1.09	1.03	0.99
30–34	1.76	1.62	1.51	1.43	1.37
35–39	2.16	2.03	1.92	1.84	1.77
40–44	3.66	3.43	3.25	3.10	2.99
45–49	5.54	5.18	4.90	4.67	4.48
50–54	8.84	8.21	7.70	7.29	6.96
55–59	13.92	13.15	12.59	12.19	11.93
60–64	23.68	22.22	21.14	20.36	19.80
65–69	36.54	33.98	32.05	30.61	29.52
70–74	53.59	49.34	46.11	43.65	41.76
75 and over	89.91	83.83	79.69	76.94	75.18

Age Group	1976	1981	1986	1991	1996
	Deaths per 1,000 male population				
Medium projection					
0	15.82	15.28	14.65	13.97	13.27
1–4	0.84	0.83	0.81	0.79	0.78
5–9	0.46	0.45	0.45	0.45	0.44
10–14	0.39	0.38	0.38	0.37	0.37
15–19	0.69	0.66	0.64	0.62	0.60
20–24	1.13	1.06	1.01	0.97	0.94
25–29	1.33	1.22	1.14	1.08	1.04
30–34	1.86	1.71	1.59	1.51	1.45
35–39	2.28	2.13	2.02	1.93	1.86
40–44	3.86	3.61	3.42	3.27	3.14
45–49	5.83	5.46	5.16	4.92	4.72
50–54	9.31	8.64	8.11	7.68	7.32
55–59	14.65	13.84	13.25	12.84	12.56
60–64	24.93	23.39	22.26	21.43	20.84
65–69	38.46	35.77	33.74	32.22	31.07
70–74	56.41	51.93	48.54	45.95	43.96
75 and over	94.64	88.24	83.89	80.99	79.13
Low projection					
0	16.61	16.05	15.39	14.67	13.94
1–4	0.88	0.87	0.85	0.83	0.82
5–9	0.48	0.48	0.47	0.47	0.47
10–14	0.41	0.40	0.40	0.39	0.39
15–19	0.72	0.69	0.67	0.65	0.63
20–24	1.19	1.12	1.06	1.02	0.99
25–29	1.40	1.28	1.20	1.14	1.09
30–34	1.95	1.79	1.67	1.58	1.52
35–39	2.39	2.24	2.12	2.03	1.95
40–44	4.05	3.79	3.59	3.43	3.30
45–49	6.12	5.73	5.42	5.16	4.96
50–54	9.77	9.07	8.51	8.06	7.69
55–59	15.39	14.53	13.91	13.48	13.18
60–64	26.17	24.56	23.37	22.50	21.88
65–69	40.39	37.56	35.43	33.83	32.63
70–74	59.23	54.53	50.97	48.25	46.15
75 and over	99.38	92.65	88.08	85.04	83.09

Table 6.1(b) Projected age-specific death rates (female), 1976, 1981, 1986, 1991 and 1996

Age Group	1976	1981	1986	1991	1996
	Deaths per 1,000 female population				
High projection					
0	11.61	11.33	10.93	10.47	10.00
1–4	0.80	0.79	0.78	0.77	0.76
5–9	0.33	0.32	0.32	0.32	0.31
10–14	0.27	0.27	0.27	0.26	0.26
15–19	0.39	0.38	0.37	0.36	0.35
20–24	0.56	0.54	0.52	0.51	0.50
25–29	0.73	0.70	0.68	0.66	0.64
30–34	1.01	0.97	0.93	0.90	0.88
35–39	1.26	1.21	1.17	1.13	1.10
40–44	1.92	1.85	1.79	1.74	1.69
45–49	2.85	2.76	2.69	2.62	2.56
50–54	4.55	4.40	4.27	4.15	4.04
55–59	7.14	6.91	6.71	6.54	6.38
60–64	11.48	11.09	10.73	10.42	10.13
65–69	16.81	16.11	15.49	14.94	14.45
70–74	26.70	25.33	24.16	23.14	22.24
75 and over	65.12	61.07	57.86	55.31	53.26

Age Group	1976	1981	1986	1991	1996
	Deaths per 1,000 female population				
Medium projection					
0	12.22	11.92	11.51	11.02	10.51
1–4	0.84	0.83	0.83	0.81	0.80
5–9	0.34	0.34	0.34	0.33	0.33
10–14	0.29	0.28	0.28	0.28	0.27
15–19	0.41	0.40	0.39	0.38	0.37
20–24	0.59	0.57	0.55	0.54	0.52
25–29	0.77	0.74	0.72	0.69	0.67
30–34	1.06	1.02	0.98	0.95	0.92
35–39	1.33	1.28	1.23	1.19	1.16
40–44	2.02	1.95	1.89	1.83	1.78
45–49	3.00	2.91	2.83	2.76	2.69
50–54	4.79	4.63	4.49	4.36	4.25
55–59	7.51	7.28	7.07	6.88	6.71
60–64	12.09	11.67	11.30	10.97	10.67
65–69	17.70	16.95	16.30	15.73	15.21
70–74	28.11	26.67	25.43	24.36	23.42
75 and over	68.55	64.28	60.91	58.22	56.06
Low projection					
0	12.83	12.52	12.08	11.58	11.03
1–4	0.88	0.88	0.87	0.85	0.84
5–9	0.36	0.36	0.35	0.35	0.35
10–14	0.30	0.30	0.29	0.29	0.29
15–19	0.44	0.42	0.41	0.40	0.39
20–24	0.62	0.60	0.58	0.56	0.55
25–29	0.81	0.78	0.75	0.73	0.71
30–34	1.11	1.07	1.03	1.00	0.97
35–39	1.39	1.34	1.29	1.25	1.21
40–44	2.12	2.05	1.98	1.92	1.87
45–49	3.15	3.06	2.97	2.90	2.83
50–54	5.03	4.86	4.72	4.58	4.46
55–59	7.89	7.64	7.42	7.22	7.05
60–64	12.69	12.25	11.86	11.51	11.20
65–69	18.58	17.80	17.12	16.51	15.97
70–74	29.51	28.00	26.70	25.58	24.59
75 and over	71.98	67.50	63.95	61.13	58.86

Chart D1

Projected Age-Specific Death Rates (Male)
Medium Projection

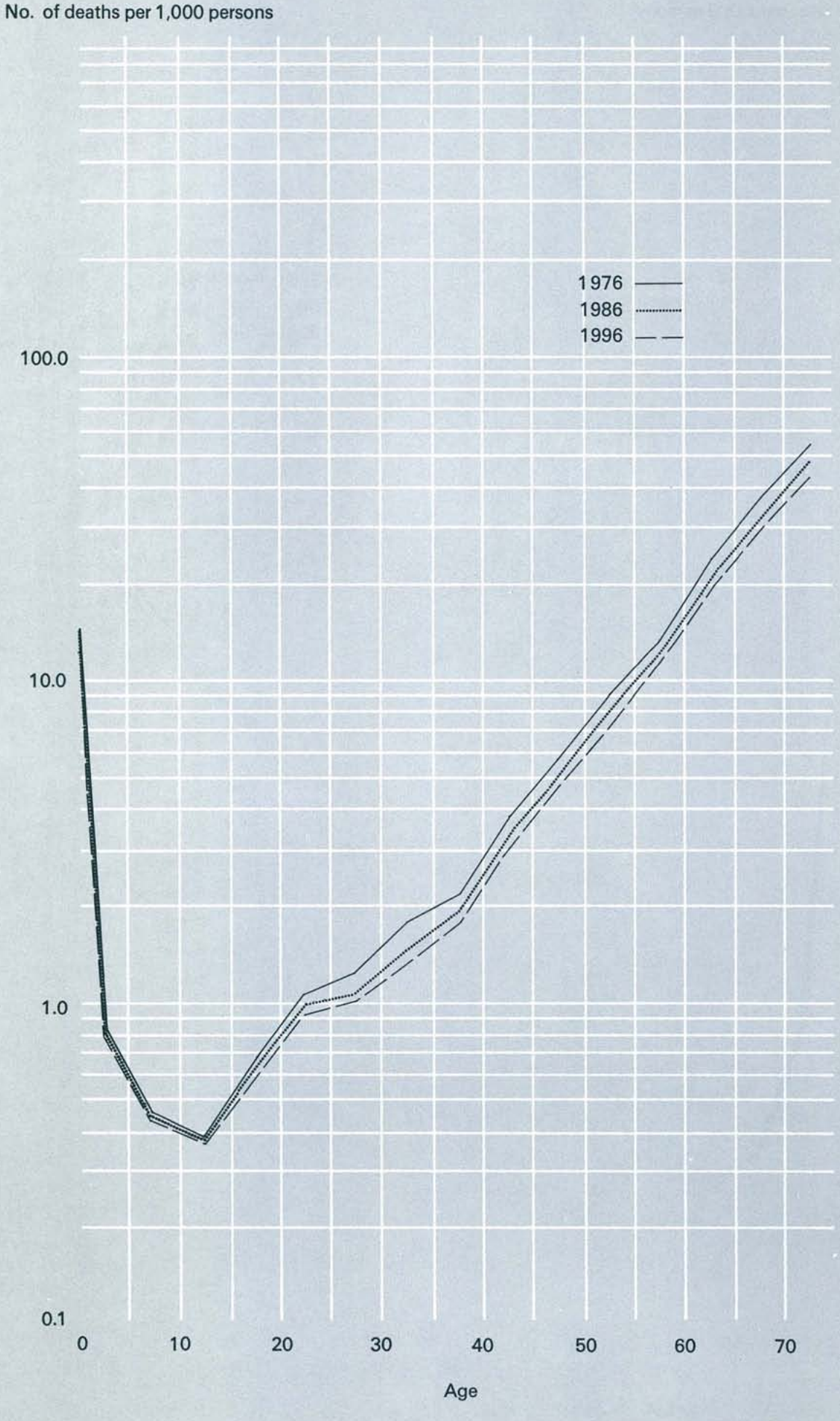
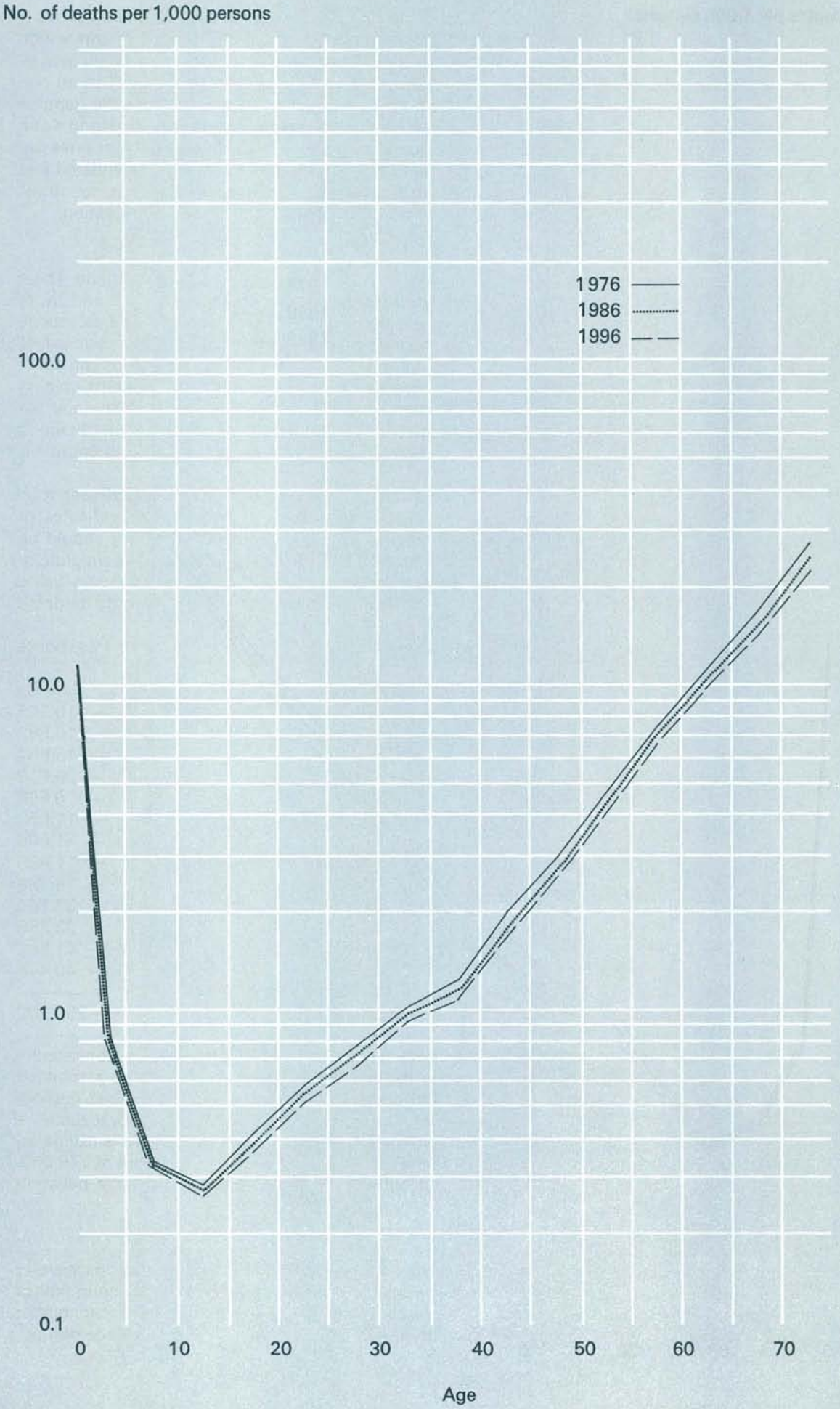


Chart D2

Projected Age-Specific Death Rates (Female)
Medium Projection



BALANCE OF MIGRATION

1 Introduction

In Hong Kong, migration is an uncertain element in the growth of population. It is dependent on factors which are largely unpredictable and information is in any case incomplete. All that can be hoped for is a broad indication of past trends, with an assumption of continuity in the future. The overall movement of persons into and out of Hong Kong in a year (5 million either way) is, of itself, little use in this context, because the genuine migration component (as identified by those persons with a declared intention to reside in or leave Hong Kong for at least 1 year) is marginal in number and because an adequate breakdown of the overall number does not exist. For the purposes of the analysis, therefore, four components in the migrant streams are differentiated and dealt with separately, namely, emigrants; legal immigrants from China; legal immigrants from other countries; and illegal immigrants. Taken together these components constitute the total net balance of migration.

2 Emigrants

It is difficult to obtain specific information regarding the number of Hong Kong residents who emigrate. There is at present no real way of distinguishing between Hong Kong residents going abroad for visits and those emigrating by reference either to declared interest or subsequent decision. It is true that under the provisions of the Registration of Persons Ordinance any person who emigrates must surrender his identity card before departure, but many people do not do so. Fortunately, some information is now available from certain Consulates and Commissions on the number of immigrant and student visas issued to Hong Kong residents holding Hong Kong British Passports or Certificates of Identity. This data serves as a valuable check on the age-sex pattern of emigrants. However, because of incomplete coverage and the fact that some persons after obtaining a visa may change their minds about going or may return to Hong Kong after a short stay in these countries, it cannot represent the actual volume of emigration.

Crude estimates of the volume of emigration have, therefore, to be derived from the difference between total arrivals and departures of Hong Kong residents holding Hong Kong British Passports and Certificates of Identity. In the long run, any temporary movements (including persons going abroad for tourism) should be eliminated by this process, and the difference over time should provide an indication of the trend in emigration. Table 2.1 below shows the arrival and departure figures at the airport and harbour (travelling by ocean-going vessels) in relation to Hong Kong residents (Hong Kong British Passports and Certificates of Identity holders).

Table 2.1 Arrivals and departures of Hong Kong residents holding Hong Kong British Passports and Certificates of Identity, 1964–1976

Year	*Arrival*	*Departure*	*Balance*
1964	28,846	39,151	– 10,305
1965	29,765	40,327	– 10,562
1966	38,487	54,149	– 15,662
1967	55,814	76,627	– 20,813
1968	90,087	96,942	– 6,855
1969	114,439	125,492	– 11,053
1970	138,336	140,142	– 1,806
1971	128,985	140,481	– 11,496
1972	155,506	174,304	– 18,798
1973	247,816	280,980	– 33,164
1974	320,259	353,645	– 33,386
1975	357,046	398,908	– 41,862
1976	394,569	435,014	– 40,445
1964–1976	2,099,955	2,356,162	–256,207

It can be seen that the balance of arrivals and departures of Hong Kong residents was consistently negative throughout the period 1964–76. The larger outflow recorded in 1967 might have been associated with the local disturbances in the summer of 1967, with some degree of return resulting in the net outflow dropping considerably during the period 1968–70. Since 1971, the outflow has been on the rise, reaching a level of some 40,000 in the years 1975 and 1976. The total outflow for the whole period 1964–76 is estimated to have been of the order of 256,000, and for the latter half of the period (i.e. 1971–76) of the order of 179,000. In all the circumstances, the assumption is made that the net outflow in future years will fluctuate between 20,000–35,000.

3 Legal immigrants from China

During the period 1964–76, the number of legal immigrants from China totalled 183,881. Admissions were at a high level in 1964 and 1965, but gradually came down to a very low level by 1971. From the second half of 1972, the number increased significantly. It reached a peak of about 55,000 in the year 1973, but thereafter declined, a total of 18,000 being recorded in 1976. For the period mid-1971 to mid-1977, the average number

of entries in this category was around 26,000 each year; for the period mid-1974 to mid-1977, (i.e. after the 1973 peak) the figure was about 22,000. Recent figures indicate that it would be reasonable to centre the assumptions as to the number of entries at around this level.

Table 3.1 shows the number of immigrants entering Hong Kong via Lo Wu from China during the period 1964–76.

Table 3.1 Legal immigrants entering Hong Kong via Lo Wu from China, 1964–1976

Year	*Number*
1964	13,055
1965	8,554
1966	5,209
1967	1,761
1968	2,159
1969	597
1970	446
1971	2,486
1972	20,588
1973	55,243
1974	32,018
1975	23,755
1976	18,010
1964–1976	183,881

4 Legal immigrants from other countries

With the existing data collection system, there is no specific information regarding the number of immigrants from other countries. The records maintained by the Immigration Department merely show the number of entry permits and visa applications approved but the number of immigrants is probably in fact less than this, since some immigrants may fail to come after obtaining an entry permit or visa and some may leave Hong Kong after staying for a short period or at the termination of their employment contracts.

There is another source of data in relation to immigration from other countries. A register of British and Commonwealth citizens residing in Hong Kong and a register of non-Commonwealth alien residents, i.e. citizens of non-Commonwealth countries who were granted temporary or permanent residential status to enable them to stay in Hong Kong for a period of 6 months or more are maintained by the Immigration Department. From these registers, it is possible to obtain the number of alien residents and British and Commonwealth citizens residing in Hong Kong at the end of each year. An estimate of the number of immigrants from these countries can be derived by taking the difference between each annual period, although it will be affected by temporary movements and by any time lag between arrival and registration due to administrative procedures. The number of resident aliens and British and Commonwealth citizens at each end-year from 1973 to 1976 are shown in Table 4.1 below.

Table 4.1 Number of resident aliens and British and Commonwealth citizens, 1973–1976

Year	*Resident aliens*	*British/Commonwealth citizens*	*Total*	*Net gain from preceding year*
End-1973	26,825	31,574	58,399	—
End-1974	25,894	37,938	63,832	5,433
End-1975	26,316	42,960	69,276	5,444
End-1976	29,886	47,450	77,336	8,060
1974–1976	—	—	—	18,937

It can be seen that during the period 1974–76, an increase in the number of alien residents and British and Commonwealth citizens residing in Hong Kong was of the order of 19,000, or an average of some 6,500 annually. For the purposes of the projection, it is assumed that an annual net increase would be of the order of 7,000.

5 Illegal immigrants

Statistics on the number of illegal immigrants entering Hong Kong are incomplete and difficult to obtain. Such data is only available when illegal immigrants turn up for registration for identity cards. Some illegal immigrants would register soon after arrival and some register after a longer period.

An estimate of the actual number of illegal immigrants entering Hong Kong each month who would subsequently turn up for registration within 12 months is made based on the relationship between the number of police arrests in that particular month and registrations within 12 months of arrival.

An estimate of the number of illegal immigrants who would register after 12 months of arrival (within 48 months) has been based on the average late registration pattern observed in the past. This estimate is imperfect

because it does not take into account those illegal immigrants who would register after 48 months. From a comparison between the overall results of the 1976 By-census and the current estimate of the population, it is possible to deduce that about 60% of illegal immigrants register within 12 months of arrival, with the remaining 40% of them registering after 12 months. This indication is used in revising the estimate of illegal immigrants over the years.

During the period 1964–70, the estimate of the number of illegal immigrants was around 10,000 a year; then it started increasing fairly rapidly, and was close to 30,000 in the year 1974. In 1975–76, the numbers (as estimated) decreased substantially. For the period mid-1976 to mid-1977, the estimate was of the order of 10,000.

6 Future migration trends – summary

Table 6.1 shows the assumptions concerning gross migration movements for each migration component for the three projections.

Table 6.1 Migration assumptions by component and projected net balance of migration

Component	*High projection*	*Medium projection*	*Low projection*
Emigrants	−20,000	−30,000	−35,000
Legal immigrants from China	26,000	22,000	18,000
Legal immigrants from other countries	7,000	7,000	7,000
Illegal immigrants (including overstayers)	15,000	13,000	10,000
Net balance of migration	28,000	12,000	nil

METHODS OF COMPUTATION

1 Introduction

To make a population projection, it is necessary to establish first 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 future number of births and deaths and the balance of migration.

2 Base population

The base population for the present set of projections was obtained from the 1976 By-census. The By-census consisted of two separate operations: the marine census and the land census. The former was conducted in May and the latter in August. 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 marine census moment of 30 May 1976 to the land census moment of 2 August 1976 by 'aging' the population for 64 days and by adding births and subtracting deaths by age which occurred during the 64-day period. Migration amongst 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 2 August 1976.

This total population was then adjusted for error due to mis-statements of age. In this calculation the population figures were first arranged in quinquennial age groups 6–10, 11–15, 16–20 etc. This set of groupings was found to give the least age-reporting error. From the grouped data, graduated values of population at single years of age were obtained by osculatory interpolation using Sprague's multipliers.

The graduated values were then adjusted for under-enumeration on the basis of the land post-enumeration check. For the young ages 0–5, known birth figures for the period August 1972–July 1976 from the Registrar General's Department were used as control to guard against under-enumeration of infants and children under 5 which was found to be relatively more severe as compared with that in the older ages.

The total population after these adjustments was brought forward to mid-year 1976. This was achieved by backward 'aging' the population by 33 days from 2 August to 30 June 1976, and by subtracting births and adding deaths by age which occurred during the 33-day period. Population increase brought about by the net balance of migration over the period was also deducted. The resultant of these adjustments was the estimated population at mid-year 1976, the base population for the projection.

3 Births

On the basis of the analysis of the past and current fertility data, a set of assumptions was made about future fertility trends upon which the age-specific fertility rates were projected for each of the three projections, i.e. high, medium and low. The projected number of births for an annual period was obtained by applying the projected age-specific fertility rates to the average number of women in each of the child-bearing ages in the year and summing the results over the reproductive ages of 15–49. The projected number of births for each annual period after allowing for infant deaths would form the population under 1 at the end of the projected annual period.

Since separate projections were to be prepared for males and for females, it was necessary to project the number of male and female births. In the projection of fertility, the age-specific fertility rates referred to births of both sexes combined; the number of male and female births were estimated by reference to an average sex-ratio at birth using known birth data for the years 1970 to 1976 as shown in Table 3.1 below.

Table 3.1 Known births by sex, 1970–1976

Year	*Male*	*Female*
1970	39,608	36,983
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
1970–1976	289,717	270,828

$$\text{Average sex-ratio at birth for 1970–1976} = \frac{289,717}{270,828} \times 1,000$$

$$= 1,070$$

4 Survivorship

Based on the assumptions concerning future mortality trends, three sets of sex-age-specific death rates were projected for the high, medium and low projections. 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 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 formed.

The population of each sex at a particular age x at the beginning of the projected annual period (year t), after allowing for deaths during the period by applying the survivorship rate to the population, will become the population at age x+1 at the end of the projected annual period (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 any age x at the beginning of the projected annual period (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 aged x+1 at the end of the projected annual period (year t+1)

The survival ratio at birth (L_o/l_o) was calculated and applied to the projected number of births for the projected annual period to give the numbers surviving at age under 1 at the end of the period.

Details concerning the construction of the life table are given in a separate publication in this series entitled 'Hong Kong Life Tables'.

4 Migration

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

These assumptions are fairly crude, but without accurate knowledge of the fertility behaviour and survivorship pattern of the immigrants they are the best that could be made.

Each of the four components of migration – emigrants, legal immigrants from China, legal immigrants from other countries, and illegal immigrants including overstayers – has its own age and sex structure and different levels assumed for the high, medium and low projections. The age and sex distribution of the projected net balance of migration for each of the three projections was estimated by summing the average sex-age distribution of each of the components, which in turn was derived from the administrative records available in recent years. Before summation, the average sex-age distribution of each migration component was weighted by the numbers assumed for the high, medium and low projections.

Definitions

DEFINITIONS

Age-cause-specific death rate
The ratio of the number of deaths (for each sex) in each age group from each group of diseases occurring during a calendar year to the total population (for each sex) in that age group at the middle of that year.

Age-specific birth rate by birth order
The ratio of the number of live births of each birth order occurring to mothers in each child-bearing age group during a calendar year to the total female population in that age group at the middle of that year.

Age-specific death rate
The ratio of the number of deaths (for each sex) in each age group occurring during a calendar year to the total population (for each sex) in that age group at the middle of that year.

Age-specific fertility rate
The ratio of the total number of live births occurring to mothers in each child-bearing age group during a calendar year to the total female population in that age group at the middle of that year.

Birth order (birth parity)
The number of births to a mother.

Cause-specific death rate
The ratio of the number of deaths (for each sex) from each group of diseases occurring during a calendar year to the total population (for each sex) at the middle of that year.

Cohort
A group of persons all born during the same year being analysed as a unit through their lifetime.

Birth rate
The ratio of the total number of live births occurring during a calendar year to the total population at the middle of that year. The birth rate calculated on this basis is described as the 'crude birth rate' since it is averaged over the population at large and disguises what can be quite significant differences between the various ages.

Death rate
The ratio of the total number of deaths occurring during a calendar year to the total population at the middle of that year. The death rate calculated on this basis is described as the 'crude death rate' since it is averaged over the population at large and disguises what can be quite significant differences between the various ages and the sexes.

Log-linear trend
A trend (fitted by the method of least squares) of time series plotted against a logarithmic Y-scale.

Net reproduction rate
The total number of female children that would be born per woman to a cohort of women as they pass through the child-bearing ages 15–49, allowing for mortality of some of the women up to and during this period, according to constant fertility and mortality conditions.

Standardized death rate
The ratio of the number of 'expected' deaths during a calendar year to a standard population. The number of deaths was derived by applying the age-specific death rates for that year to the age and sex distribution of the standard population. The standardized death rate is not influenced by age and sex structure since it is based on a fixed population.

Survival ratio
The proportion of survivors in a cohort at any particular age, derived from the specific life table based on the assumed schedule of death rates.

GPHK 79483—42L—5/78

$6.00—J334276/5