MSC IN DATA SCIENCE AND BUSINESS STATISTICS 2019-2020

STAT 6108 :
Official Statistics and Structural Equation Modelling
Second Term, 2019-2020

PART 1- OFFICIAL STATISTICS
PowerPoint - 2

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January/February 2020

The Hong Kong Population

- The Hong Kong Population : Who are included in the population?

- Population figures (as from 1996) are compiled using the “resident population” approach. The population estimate compiled is referred to as the “Hong Kong Resident Population”

- The “Hong Kong Resident Population” comprises “Usual Residents” 常住居民 and “Mobile Residents” 流動居民

"Usual Residents" include two categories of people:

- (a) Hong Kong Permanent Residents who have stayed in Hong Kong for at least 3 months during the 6 months before or for at least 3 months during the 6 months after the reference time-point, regardless of whether they are in Hong Kong or not at the reference time-point; and

  (b) Hong Kong Non-permanent Residents who are in Hong Kong at the reference time-point.

- For those Hong Kong Permanent Residents who are not "Usual Residents", they are classified as "Mobile Residents" if they have stayed in Hong Kong for at least 1 month but less than 3 months during the 6 months before or at least 1 month but less than 3 months during the 6 months after the reference time-point, regardless of whether they are in Hong Kong or not at the reference time-point.

- Under the “resident population” approach, visitors are not included in the Hong Kong Population.

- Population figures (before 1996) were compiled using the “de facto population” approach (「時點人口」方法編製).

  They are considered broadly comparable to figures compiled using the “resident population” approach (「居住人口」方法編製). The latter method is better and is possible in more recent times because of much increased computer power.

Size of the population

- Population situation at the Census Moment – data from Population Census (or Population By-census) as benchmark
- Updating of the population situation at the Census Moment (time t = 0) to that at a current date:

- $P(t) = P(0) + B - D + I - M$

  where

  B = births

  D = deaths,

  I = in-migration

  M = out-migration

  >>> between time 0 and time t.

Similar calculation to update the population size from any time point t=1 to t=2

→B, D, I, M data are provided by Immigration Department. These are compiled based on the Birth Registration, Death Registration and Passenger Records systems.

人口統計
Population statistics

年中 Mid-Year	人口 Population	人口增長率 Population growth rate
實數 Actual		
1961	3 168 100	3.4%
1966	3 629 900	0.9%
1971	4 045 300	2.2%
1976	4 518 000	1.3%
1981	5 183 400	2.4%
1986	5 524 600	1.3%
1991	5 752 000	0.8%
1996	6 435 500	2.5%
2001	6 714 300	0.7%
2006	6 857 100	0.6%
2011	7 071 600	0.7%
2012	7 150 100	1.1%
2013	7 178 900	0.4%
2014	7 229 500	0.7%
2015	7 291 300	0.9%
2016	7 336 600	0.6%
2017	7 391 700	0.8%
2018	7 451 000	0.8%
2019#	7 524 100	1.0%

註釋：#臨時數字。
Note: #Provisional figure

Note : Population growth rates are “ANNUAL growth rates”

年中 Mid-Year	人口 Population	人口增長率 Population growth rate
推算 Projected		
2021	7 608 400	0.7%*
2026	7 825 200	0.6%*
2031	7 996 200	0.4%*
2036	8 141 700	0.4%*
2041	8 213 800	0.2%*
2046	8 207 200	§ *
2051	8 131 400	-0.2%*
2056	8 004 000	-0.3%*
2061	7 862 200	-0.4%*
2066	7 723 200	-0.4%*

註釋：* 五年期間的平均每年增長率。
§ 在±0.05%之內

Notes: * Average annual growth rate over a 5-year period.
§ Within ±0.05%

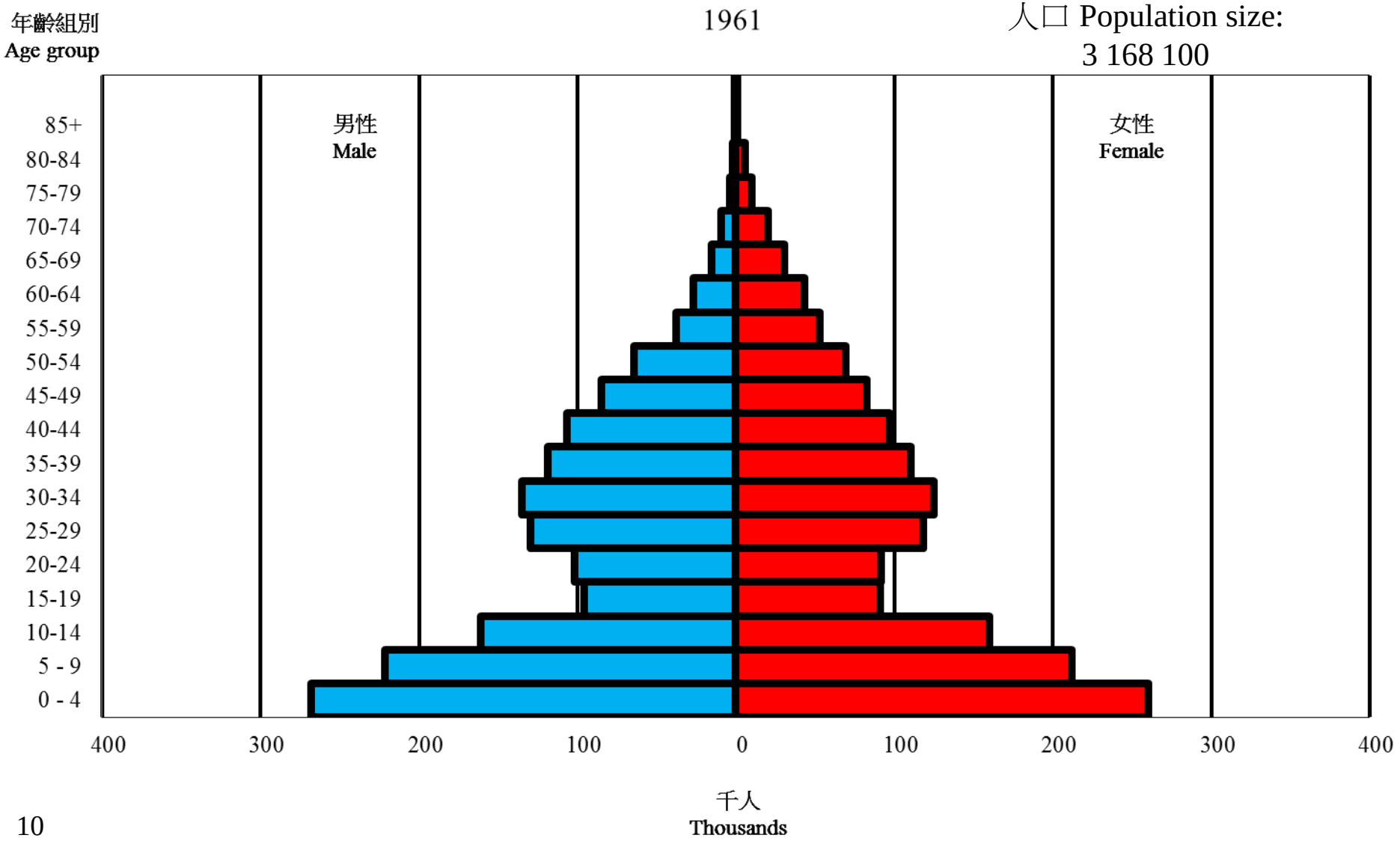
人口老化
Population ageing

年中 Mid-Year	十五歲以下的人口比例 Population aged under 15		六十五歲及以上的人口比例 Population aged 65 and over		人口年齡中位數 Median age of population		
	數目 Number	百分比 %	數目 Number	百分比 %	男性 Male	女性 Female	合計 Both sexes
實數 Actual							
1961	1 283 900	40.5	100 100	3.2	22.5	23.8	23.1
1966	1 484 700	40.9	138 300	3.8	19.5	20.8	20.1
1971	1 452 100	35.9	182 300	4.5	21.4	21.9	21.7
1976	1 366 200	30.2	244 500	5.4	23.8	23.8	23.8
1981	1 277 300	24.6	344 300	6.6	26.3	26.2	26.3
1986	1 273 700	23.1	424 000	7.7	28.7	28.9	28.8
1991	1 198 700	20.8	502 400	8.7	31.7	31.6	31.6
1996	1 204 100	18.7	653 700	10.2	34.3	34.1	34.2
2001	1 098 500	16.4	753 300	11.2	37.1	36.6	36.8
2006	939 200	13.7	852 100	12.4	39.9	39.3	39.6
2011	823 500	11.6	941 400	13.3	42.0	41.4	41.7
2012	812 900	11.4	979 900	13.7	42.4	41.7	42.0
2013	796 500	11.1	1 019 900	14.2	42.8	42.2	42.5
2014	803 500	11.1	1 063 800	14.7	43.2	42.6	42.8
2015	826 400	11.3	1 114 600	15.3	43.4	42.9	43.1
2016	830 500	11.3	1 163 200	15.9	43.7	43.2	43.4
2017	844 800	11.4	1 214 600	16.4	44.1	43.7	43.9
2018	860 800	11.6	1 266 200	17.0	44.4	44.1	44.2
2019#	873 600	11.6	1 332 400	17.7	45.0	44.5	44.7

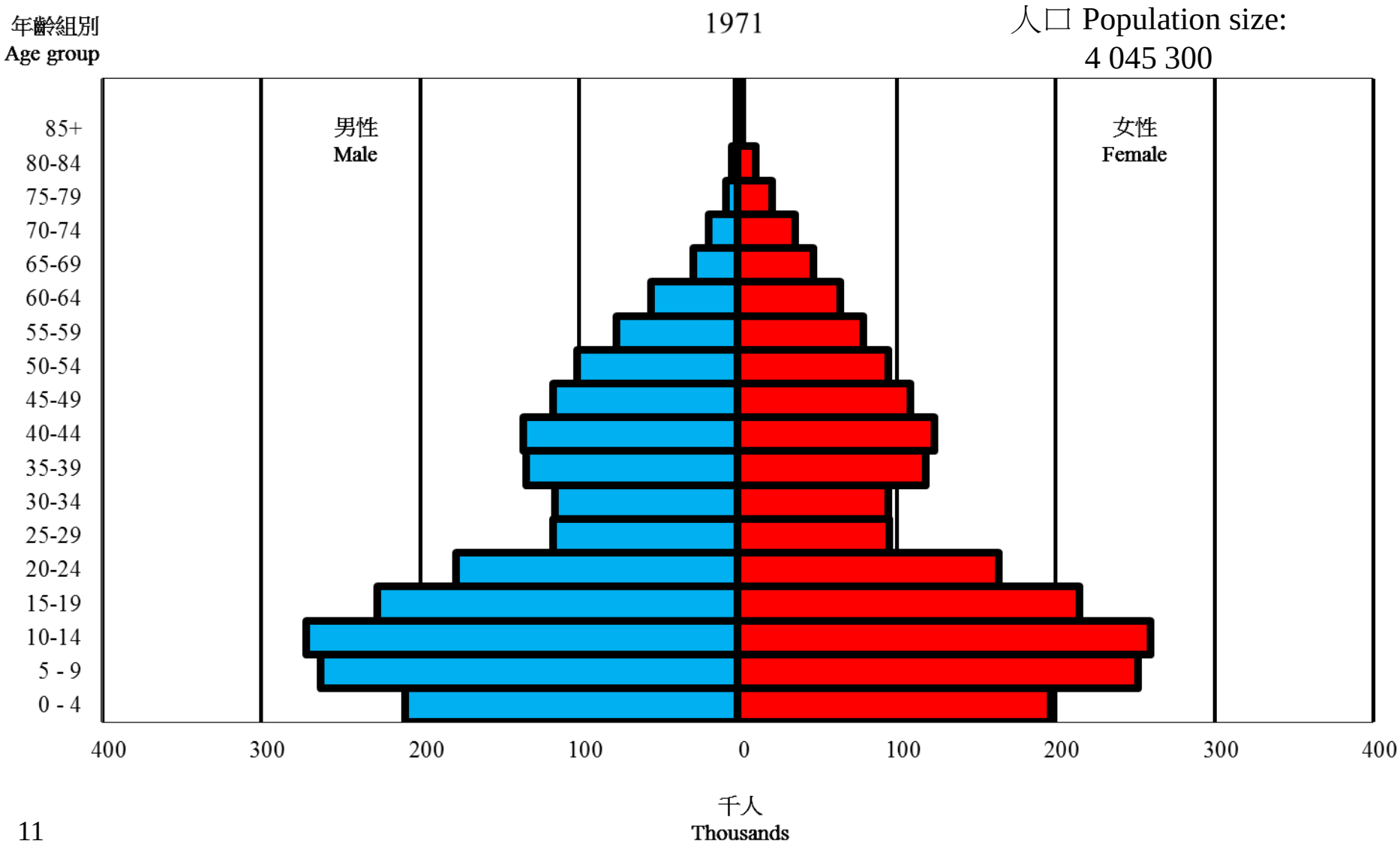
註釋：#臨時數字。Note: #Provisional figures.

年中	十五歲以下的人口比例		六十五歲及以上的人口比例		人口年齡中位數		
Mid-Year	Population aged under 15		Population aged 65 and over		Median age of population		
	數目 Number	百分比 %	數目 Number	百分比 %	男性 Male	女性 Female	合計 Both sexes
推算 Projected							
2021	911 700	12.0	1 453 600	19.1	45.2	44.8	45.0
2026	883 900	11.3	1 824 300	23.3	46.5	46.1	46.3
2031	826 900	10.3	2 159 400	27.0	47.9	47.6	47.7
2036	762 600	9.4	2 373 300	29.1	48.9	48.9	48.9
2041	717 600	8.7	2 523 800	30.7	49.9	50.1	50.0
2046	709 600	8.6	2 595 100	31.6	50.6	51.1	50.9
2051	717 600	8.8	2 641 500	32.5	50.3	51.3	50.9
2056	711 400	8.9	2 657 300	33.2	49.3	50.8	50.2
2061	683 900	8.7	2 669 300	34.0	50.4	51.1	50.8
2066	653 200	8.5	2 591 300	33.6	51.6	51.8	51.7

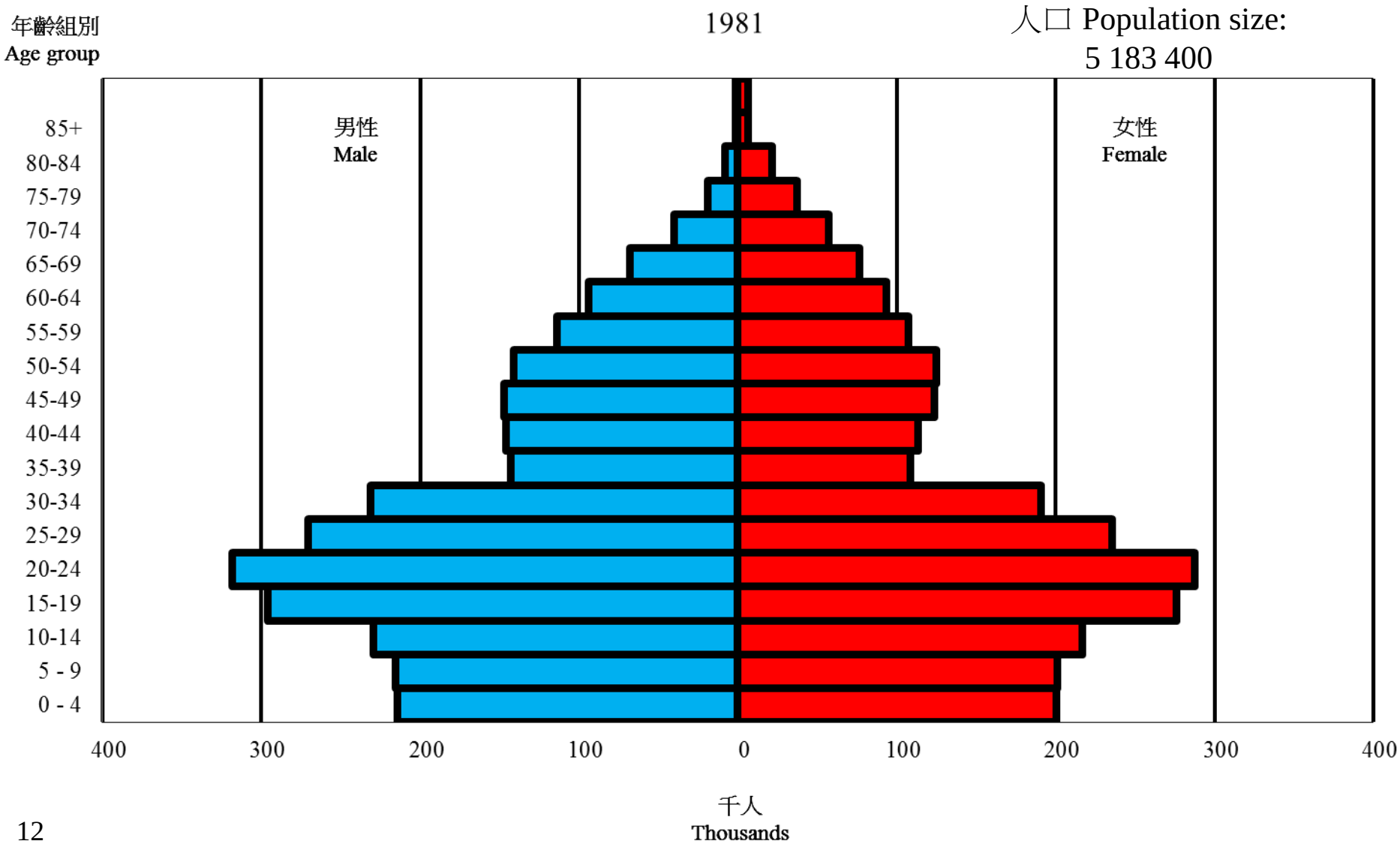
人口金字塔
Population Pyramid



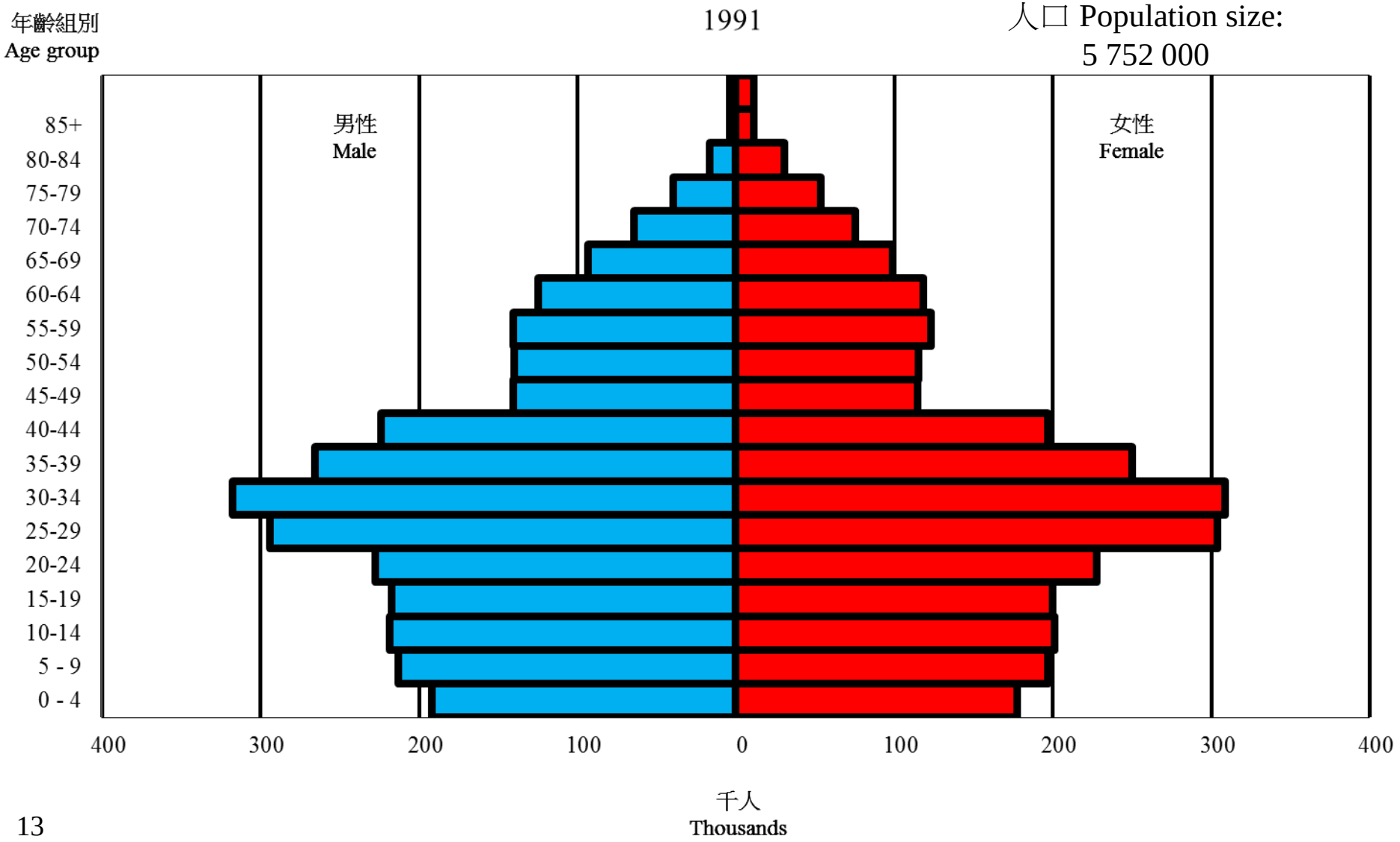
人口金字塔
Population Pyramid



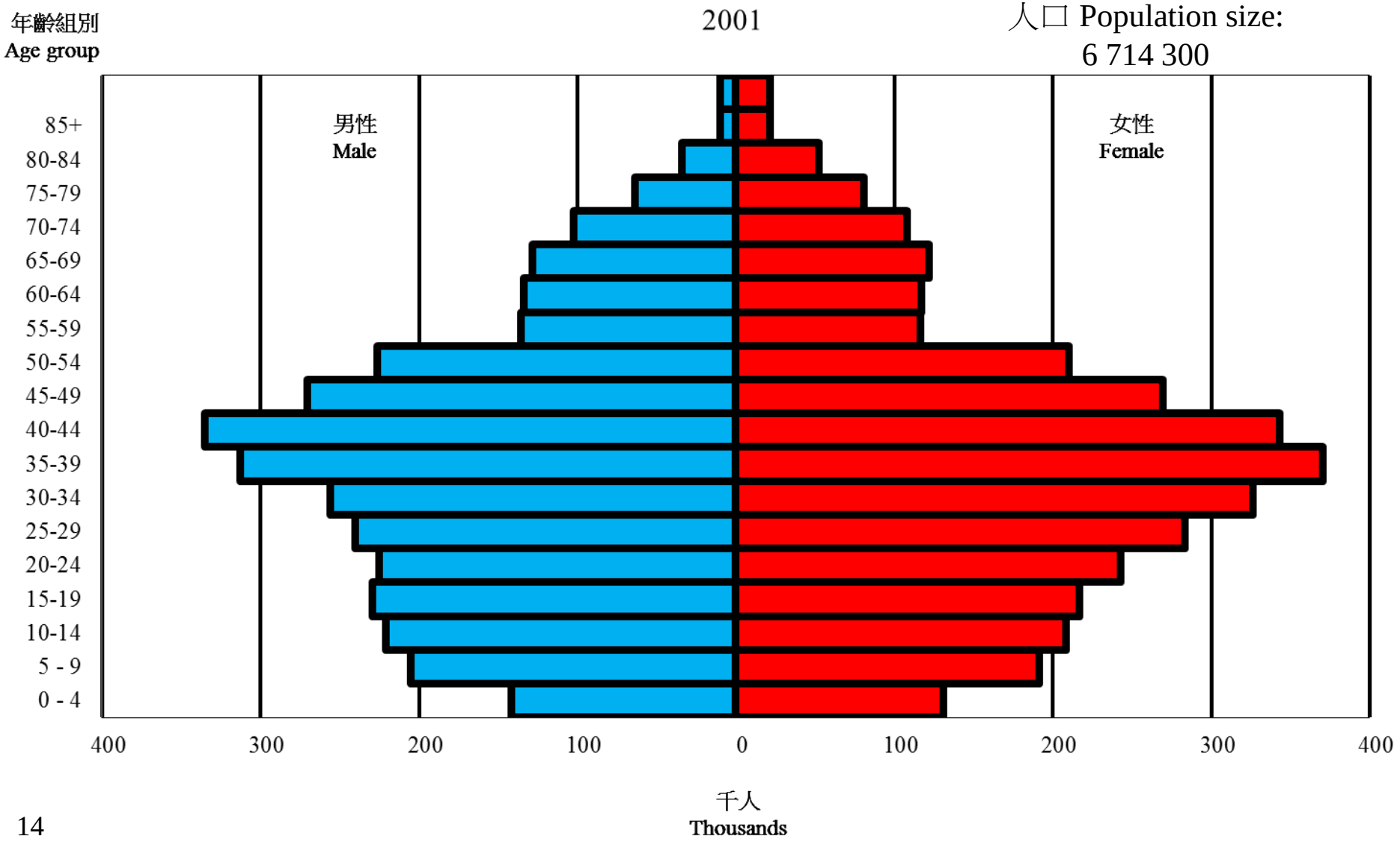
人口金字塔
Population Pyramid

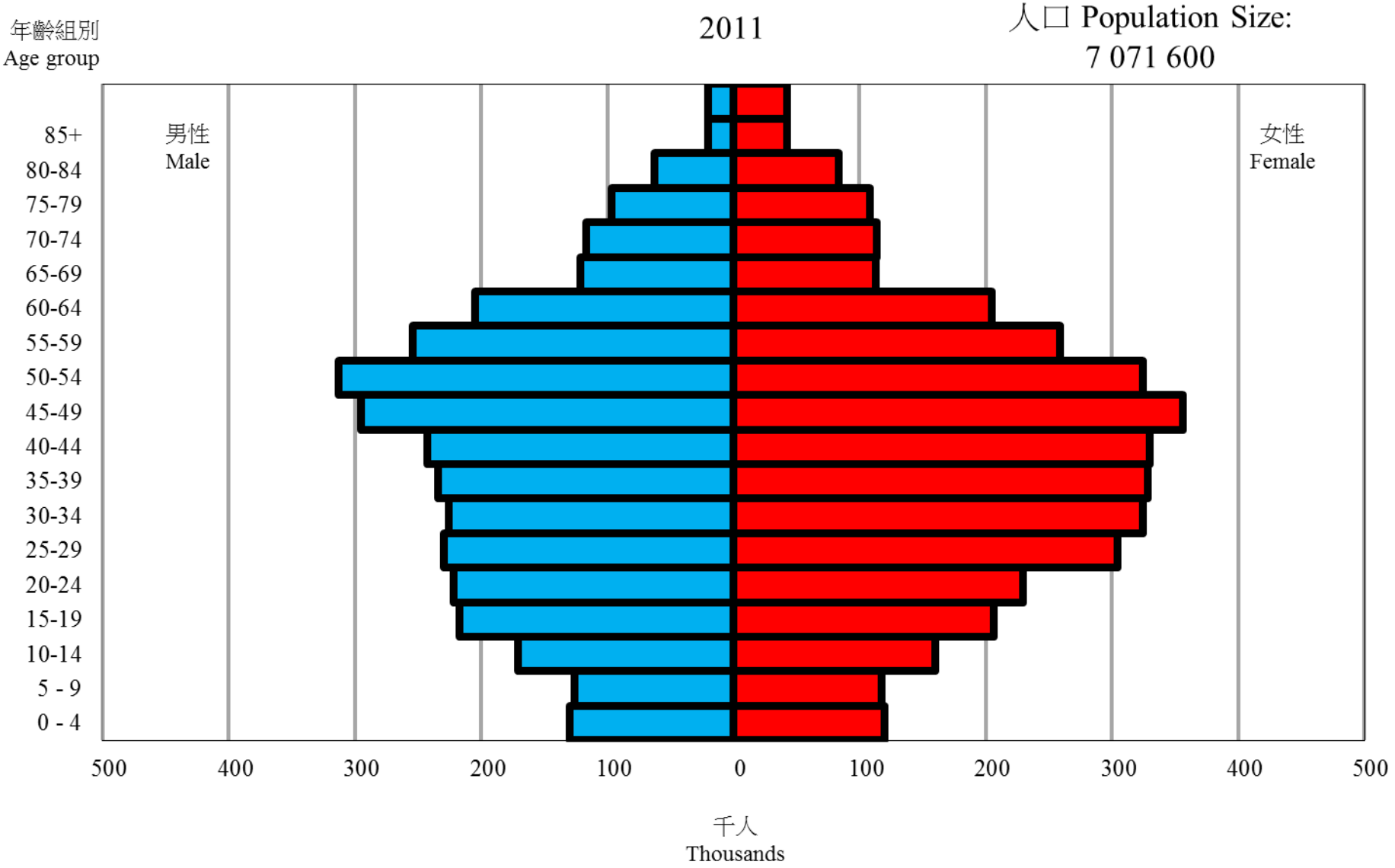


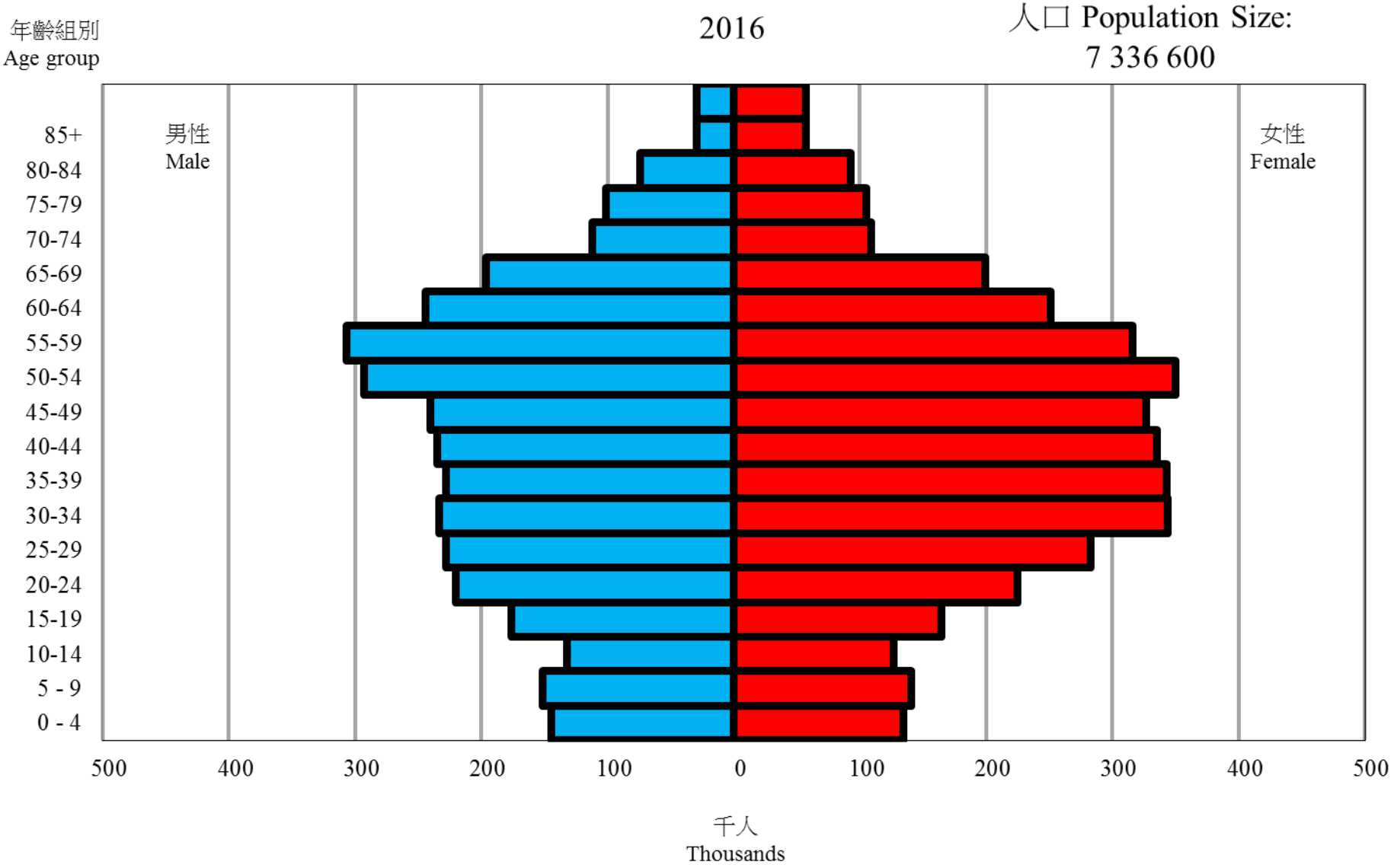
人口金字塔
Population Pyramid

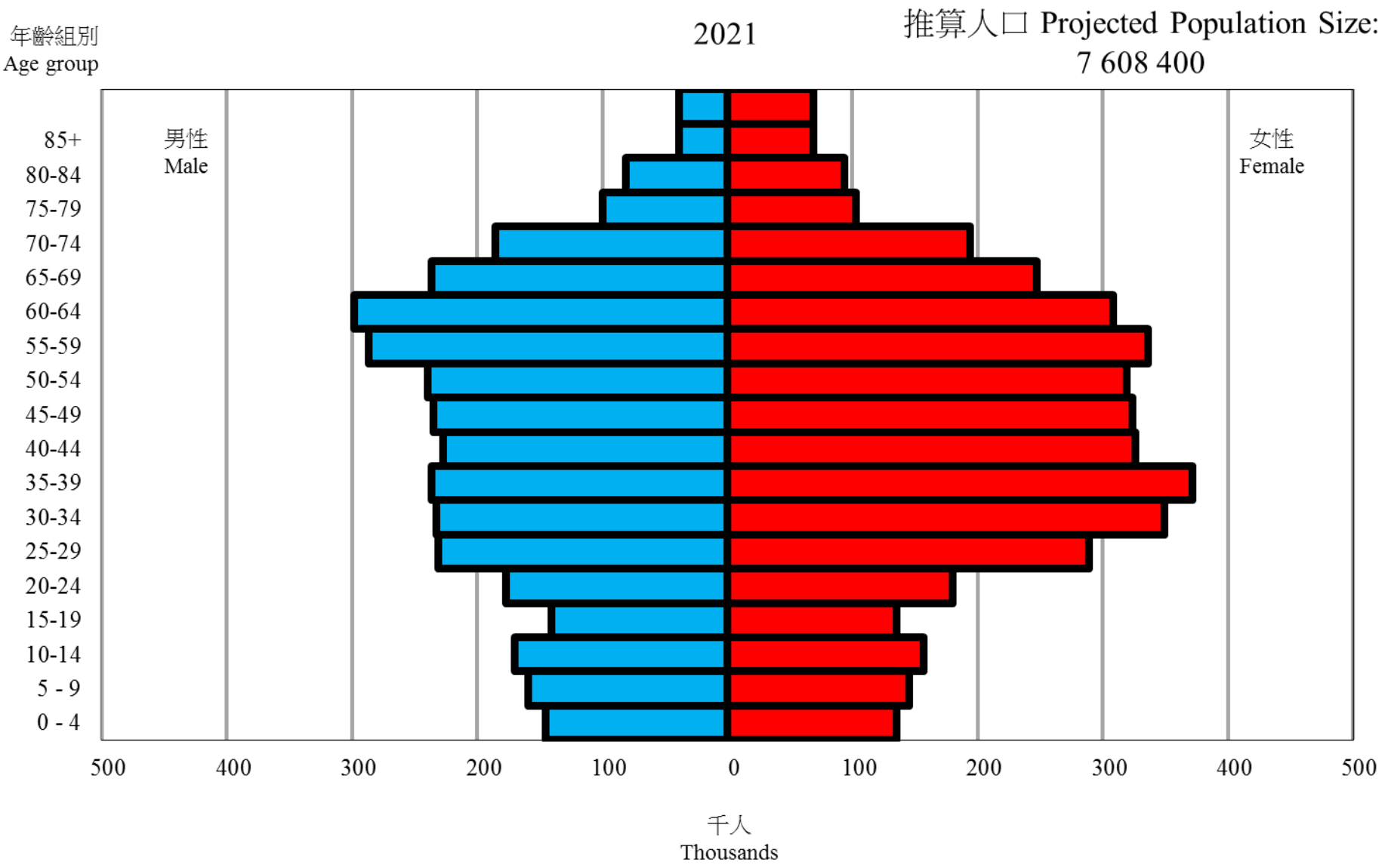


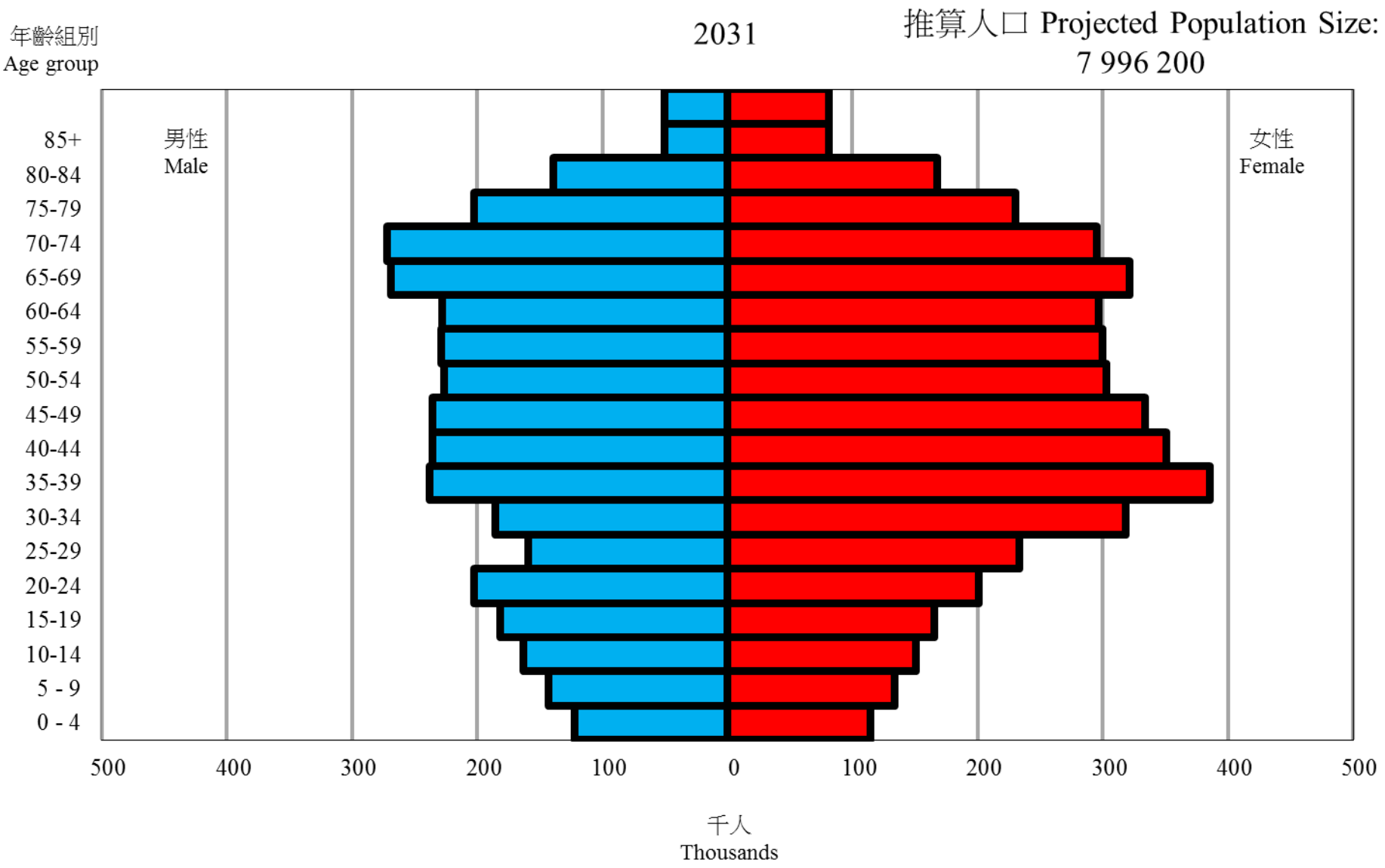
人口金字塔
Population Pyramid

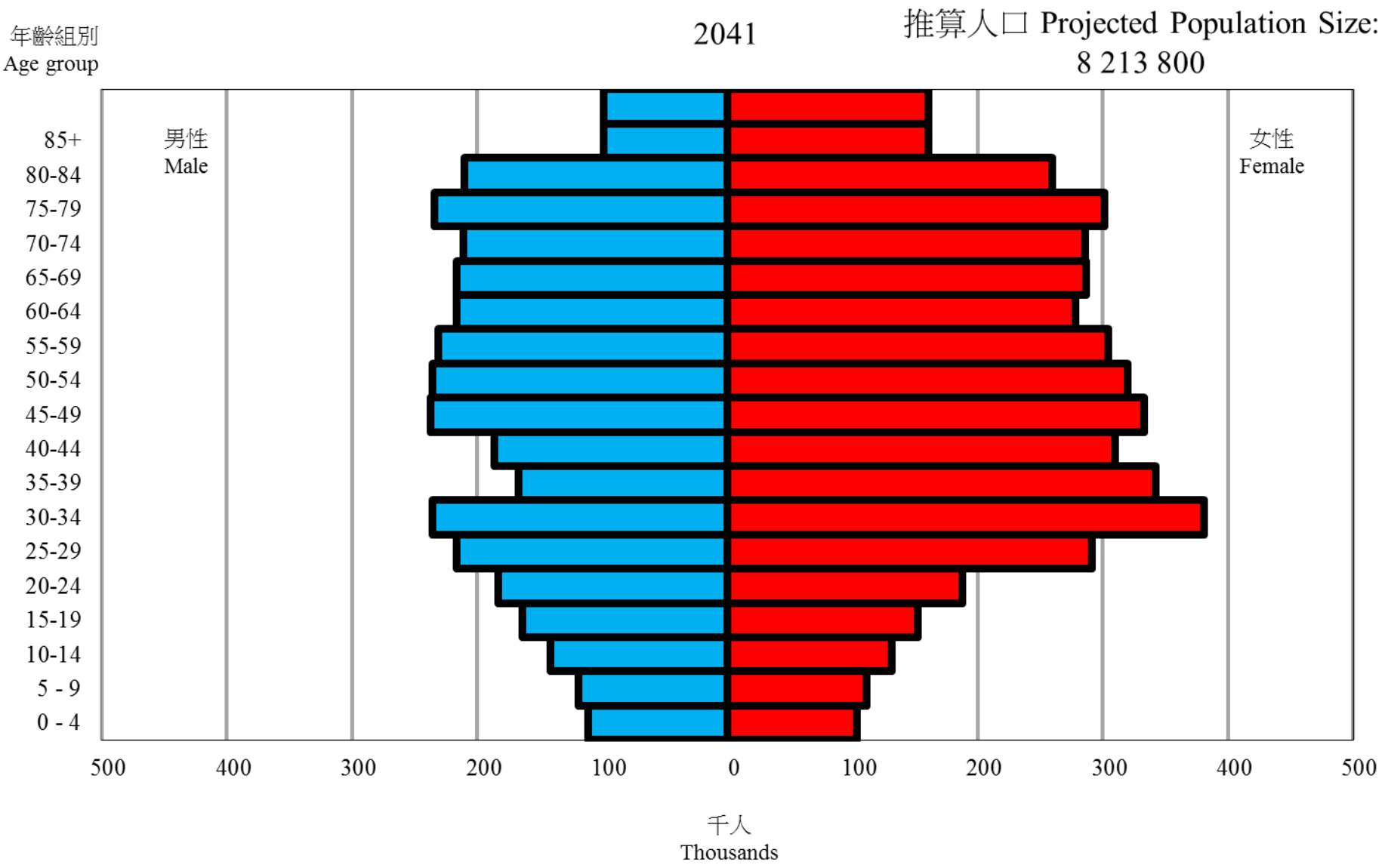


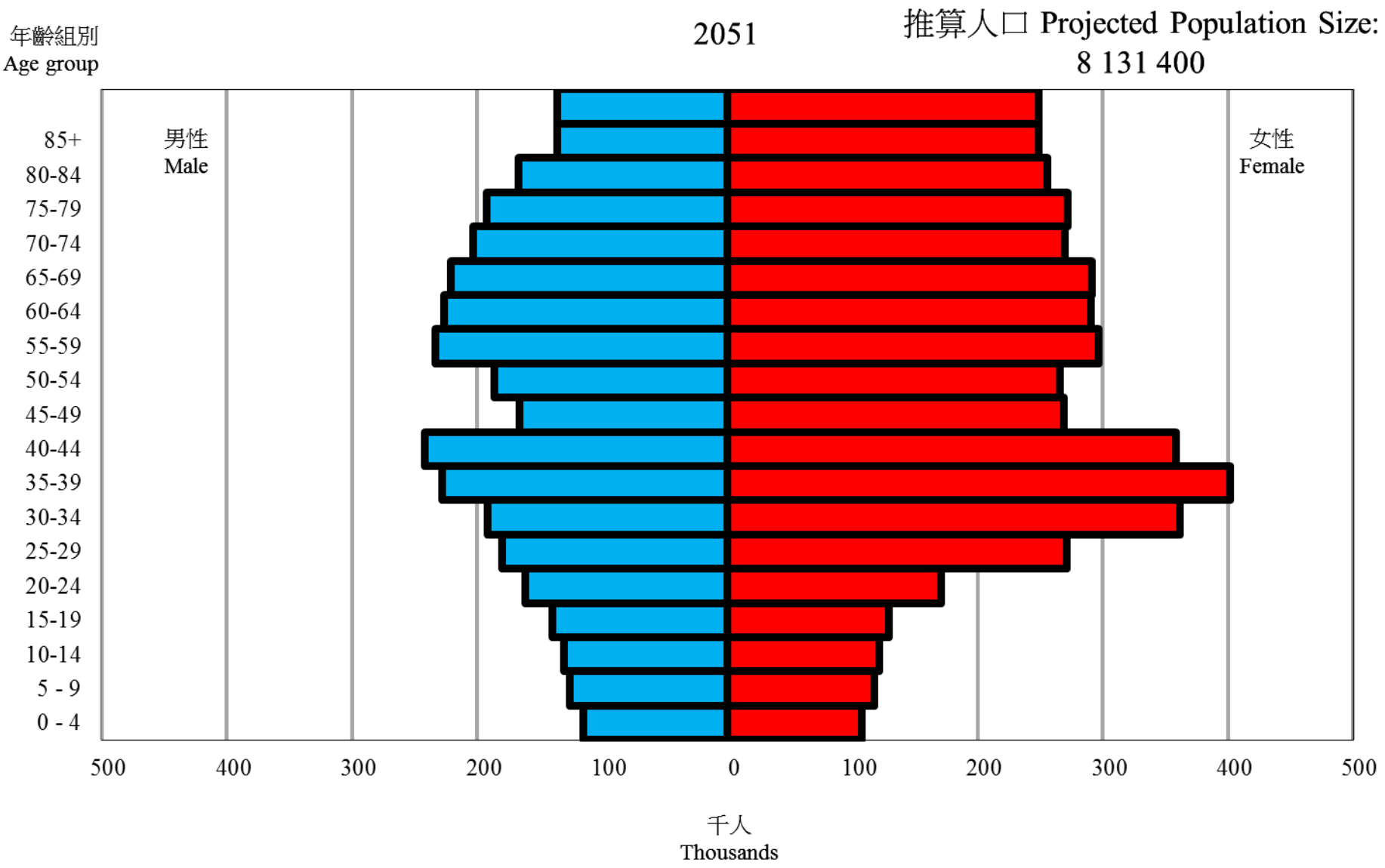

年齡組別
Age group
2011
人口 Population Size:
7 071 600
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands

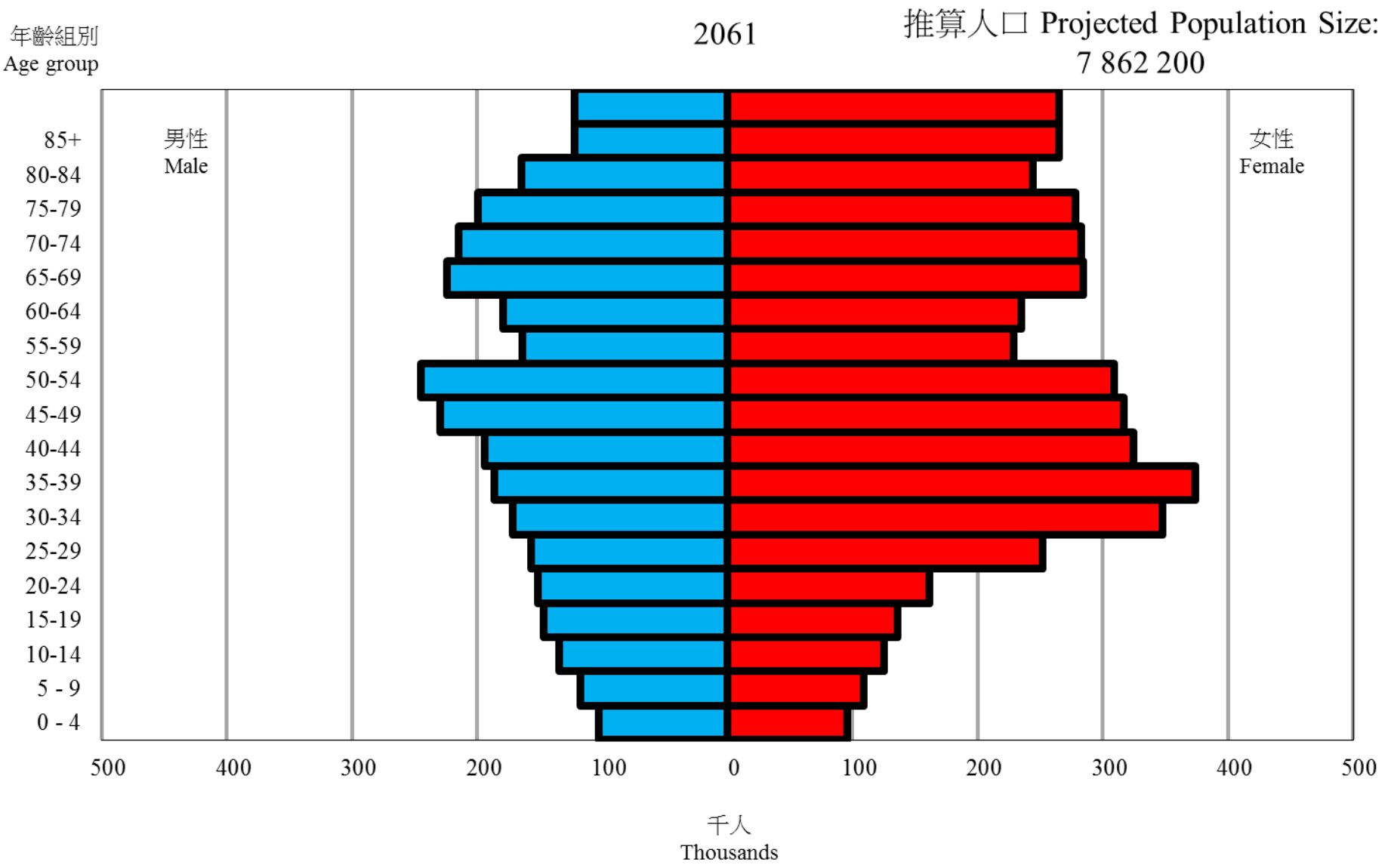

年齡組別
Age group
2016
人口 Population Size:
7 336 600
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands

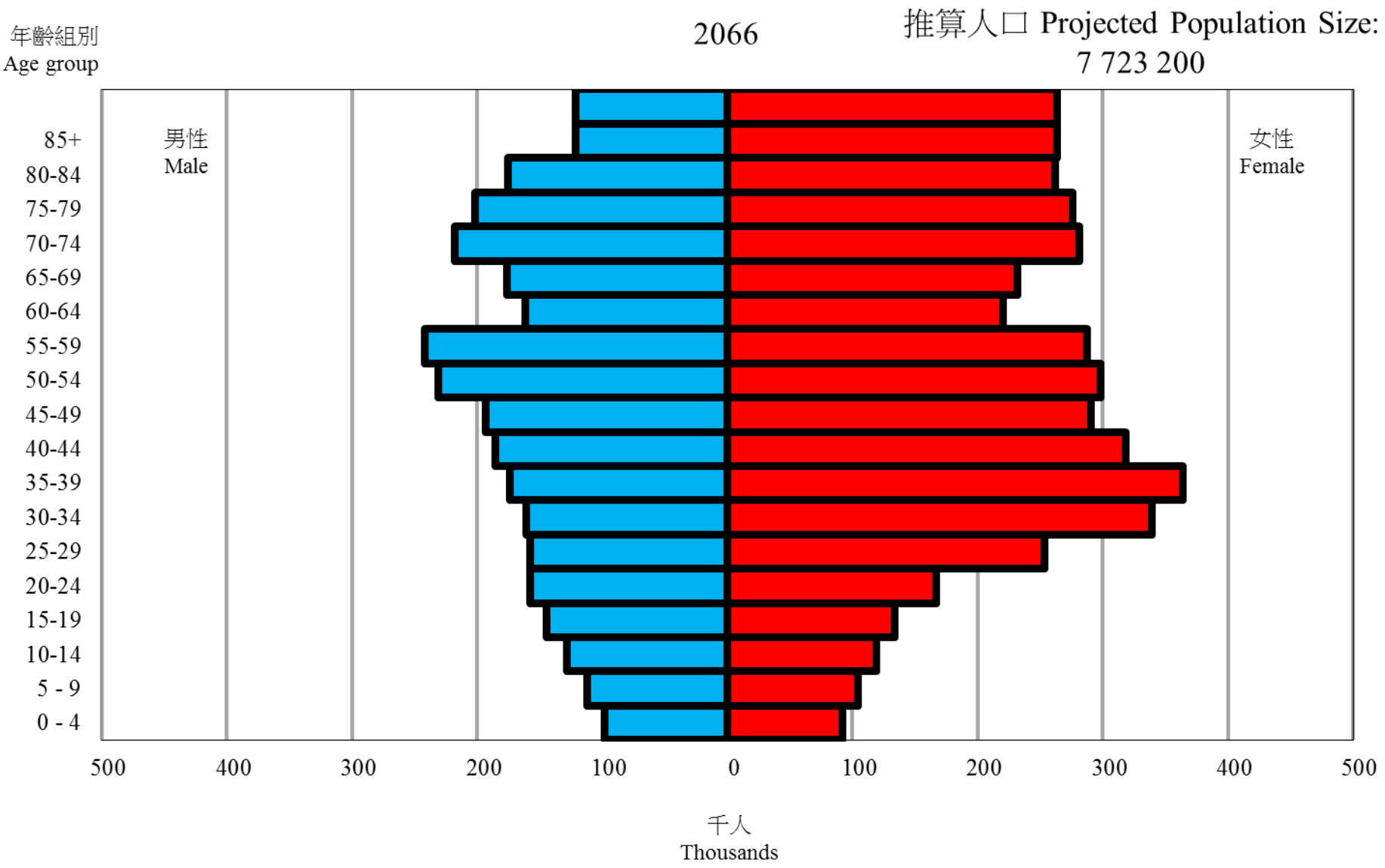

年齡組別
Age group
2021
推算人口 Projected Population Size:
7 608 400
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands


年齡組別
Age group
2031
推算人口 Projected Population Size:
7 996 200
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands


2041
推算人口 Projected Population Size:
8 213 800
年齡組別
Age group
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands


2051
推算人口 Projected Population Size:
8 131 400
年齡組別
Age group
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands


年齡組別
Age group
2061
推算人口 Projected Population Size:
7 862 200
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands


2066
推算人口 Projected Population Size:
7 723 200
年齡組別
Age group
男性
Male
女性
Female
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5 - 9
0 - 4
500
400
300
200
100
0
100
200
300
400
500
千人
Thousands

Population Projections

*** For the future, we make population projections – analyzing the trends of B, D, I and M and making assumptions about them for the future and repeat the application of the formula repeatedly year after year.

Population Projections

Projections are not the same as **Forecasts**.

Projections are compiled with assumptions based on the continuation of

(a) current (and foreseeable) trends AND

(b) current (and announced) public policies.

If upon the publication of the projections, it becomes known that serious problems may arise in the future, **people may adjust their behaviour and public policies may be altered by the Government**, *resulting* in changes in trends, the OUTCOMES may then be different from the Projections.

The projections were NOT wrong. THIS in fact reflects the usefulness of the work on projections.

The Dependency ratio

- Definition:

  Child dependency ratio is the number of persons aged under 15 per 1 000 persons aged 15–64.

  Elderly dependency ratio is the number of persons aged 65 and over per 1 000 persons aged 15–64.

  Overall dependency ratio is the number of persons aged under 15 and those aged 65 and over per 1 000 persons aged 15–64.

25

撫養比率
Dependency ratio

年 Year	少年兒童 Child	老年 Elderly	總撫養比率 Overall
實數 Actual			
1993	284	132	416
1996	263	143	406
2001	226	155	381
2002	219	159	378
2003	212	162	375
2004	203	165	368
2005	193	167	360
2006	185	168	354
2007	179	170	349
2008	173	170	343
2009	166	172	338
2010	160	175	335
2011	155	177	333
2012	152	183	335
2013	149	190	339
2014	150	198	348
2015	154	208	363
2016	155	218	373
2017	158	228	386
2018	162	238	400
2019#	164	251	415

註釋：#臨時數字。Note:#Provisional figures.

年 Year	少年兒童 Child	老年 Elderly	總撫養比率 Overall
推算 Projected			
2021	174	277	451
2026	173	357	529
2031	165	431	596
2036	152	474	626
2041	144	508	652
2046	145	529	674
2051	150	554	704
2056	153	573	727
2061	152	592	744
2066	146	579	724

The Dependency ratio

>> These are **actually "demographic" indicators**, although they seem to be "social" or "economic" indicators.

>> The labour force is contributed chiefly by persons in the "mid-age" group (or, "people in the normal working age range [15-64]").

The "Labour Force Participation Rate" [LFPR] (Percentage of people in this age group being "economically active" in recent years **was stable at 61% or so)**.

→ *There will be more discussion on this under "Labour statistics"*

Though not in the labour force, many persons who are in the mid-age group but not "economically active" are still actually rendering much support to the young and the elderly in various ways (e.g. being engaged in housework; acting as carers)

[[Prior to recent times, there were periodic variations in LPFR owing to expansion in education opportunities (both for male and female but particularly the latter); increased employment of married women; and various other socio-economic factors.]]

*[[LPFR may decrease due to "ageing "of the labour force — note that people begin to drop off the labour force at 50-55 "early retirement"; **but** LPFR may also increase **if** labour shortage sets in]]*

Ageing of the Population
(and increase in the dependency ratio)

- From 1961 onwards, the **proportion** of elderly persons (65 or over) in the population **rose ONE percentage point every five years.**
- Hong Kong reached the stage of an "aged society"
  (i.e. , the proportion reached 14%) in 2013. It took some **30** years for that proportion to rise from 7% to 14%)
  (Demographers like to look at this ***duration*** across territories.)
- From 2013 or so onwards, **that proportion rises 3-4 percentage points every five years**. A very drastic ***acceleration***. This continues for the ensuing 15-20 years.

→ A very aged society by the 2040's.

→ But **the acceleration mentioned above** is a particularly difficult situation to deal with. We should have made better use of the Demographic Window during the period 2000-2015 to get well prepared for the ageing of the population

Sex ratio

- Definition : **Sex ratio** refers to the ratio of the number of males per 1 000 females.

To Note:

- 1) There are some 340,000 foreign domestic helpers (FDHs) in HK. Most are females.

[[The figure provided by Immigration Department is "390 000 valid visa holders" on the reference date. But note there are FDH's who are on leave, who have left HK for good before expiry of contract but employers have not reported the cases, etc.

2) Many HK men marry in the mainland and their wives come subsequently to HK for permanent settlement

3) Life expectation of women is longer than that of men.

性別比率　Sex Ratio

(a) 包括外籍家庭傭工

(a) Foreign Domestic Helpers included

年 Year	年齡組別 Age Group					
	0–14歲 0–14	15–24歲 15–24	25–44歲 25–44	45–64歲 45–64	65歲及以上 65 and over	合計 Overall
實數 Actual						
1994	1 067	1 037	975	1 158	802	1 015
1995	1 068	1 033	951	1 151	810	1 004
1996	1 075	1 023	944	1 143	824	1 001
2001	1 072	989	865	1 075	858	956
2006	1 063	972	790	1 003	856	912
2011	1 073	1 006	724	932	871	876
2012	1 071	1 013	714	924	870	870
2013	1 068	1 016	709	914	872	865
2014	1 067	1 018	708	900	874	861
2015	1 070	1 018	708	886	875	857
2016	1 065	1 019	707	871	876	852
2017	1 067	1 014	707	861	874	848
2018	1 066	1 015	706	849	874	844
2019#	1 062	1 004	705	838	875	839

註釋：#臨時數字。　Note:#Provisional figures.

年 Year	年齡組別 Age Group 0–14歲 0–14	15–24歲 15–24	25–44歲 25–44	45–64歲 45–64	65歲及以上 65 and over	合計 Overall
推算 Projected						
2021	1 086	1 008	694	822	879	833
2026	1 083	1 020	668	771	875	812
2031	1 074	1 049	635	744	835	791
2036	1 073	1 041	622	742	782	769
2041	1 073	1 020	608	745	734	747
2046	1 073	1 012	603	736	696	728
2051	1 073	1 005	604	724	665	712
2056	1 073	1 002	575	741	649	702
2061	1 073	1 003	545	750	646	696
2066	1 073	1 003	531	754	642	691

性別比率　Sex Ratio
(b) 不包括外籍家庭傭工
(b) Foreign Domestic Helpers excluded

年 Year	年齡組別 Age Group 0–14歲 0–14	15–24歲 15–24	25–44歲 25–44	45–64歲 45–64	65歲及以上 65 and over	合計 Overall
實數 Actual						
1994	1 067	1 088	1 068	1 178	802	1 060
1995	1 068	1 092	1 054	1 173	810	1 056
1996	1 075	1 079	1 038	1 157	824	1 048
2001	1 072	1 074	986	1 105	858	1 021
2006	1 063	1 039	907	1 030	857	971
2011	1 073	1 043	884	961	872	948
2012	1 071	1 037	878	957	871	943
2013	1 068	1 041	873	950	873	939
2014	1 067	1 043	878	934	874	935
2015	1 070	1 053	879	920	875	932
2016	1 065	1 044	878	908	876	925
2017	1 067	1 043	875	899	875	921
2018	1 066	1 047	873	887	875	916
2019#	1 062	1 036	873	879	876	911

註釋：#臨時數字。　　Note: #Provisional figures.

年 Year	年齡組別 Age Group 0–14歲 0–14	15–24歲 15–24	25–44歲 25–44	45–64歲 45–64	65歲及以上 65 and over	合計 Overall
推算 Projected						
2021	1 086	1 040	877	859	879	909
2026	1 083	1 056	878	812	876	894
2031	1 074	1 086	879	790	836	878
2036	1 073	1 083	897	793	783	862
2041	1 073	1 069	911	802	735	845
2046	1 073	1 067	919	798	696	829
2051	1 073	1 066	928	792	665	815
2056	1 073	1 066	908	812	649	807
2061	1 073	1 066	886	825	647	802
2066	1 073	1 067	878	830	642	800

Births and Crude birth rate

Births –

All babies born in the Territory

regardless of the identities of their mothers

Crude birth rate =

No. of births during the year / no. of persons in the population at mid-year

(Usually expressed as rate *per thousand population*: that is, the above quotient *multiplied* by 1000)

出生統計Birth statistics

年 Year	出生人數 Number of births	粗出生率 (每千名人口計算) Crude birth rate (per 1 000 population)
實數Actual		
1961	110 884	35.0
1966	91 832	25.3
1971	79 789	19.7
1976	78 511	17.4
1981	86 751	16.8
1986	71 620	13.0
1991	68 281	12.0
1996	63 291	9.9
2001	48 219	7.2
2006	65 626	9.6
2011	95 451	13.5
2012	91 558	12.8
2013	57 084	8.0
2014	62 305	8.6
2015	59 878	8.2
2016	60 856	8.3
2017	56 548	7.7
2018	53 716	7.2

統計時點 （年中） Reference time-point (Mid-year)	由上一統計時點至本統計時點 的出生人數 Number of births from the previous reference time-point to this reference time-point
推算 Projected	
2021	59 800
2026	55 800
2031	49 500
2036	46 300
2041	48 800
2046	50 300
2051	47 900
2056	45 300
2061	43 300
2066	41 700

出生統計（包括內地女性在港所生嬰兒數目的細分）
Birth statistics (with breakdown for births in HK to Mainland women)

統計期間 Reference period	活產嬰兒數目 Number of live births	其中由內地女性在香港所生的活產嬰兒數目： Of which number of live births born in Hong Kong to Mainland women:			
		其配偶為香港永久性居民 whose spouses are Hong Kong Permanent Residents	其配偶為非香港永久性居民 whose spouses are not Hong Kong Permanent Residents	其他 Others	小計 Sub-total
1999	51 281	6 621	559	-	7 180
2000	54 134	7 464	709	-	8 173
2001	48 219	7 190	620	-	7 810
2002	48 209	7 256	1 250	-	8 506
2003	46 965	7 962	2 070	96	10 128
2004	49 796	8 896	4 102	211	13 209
2005	57 098	9 879	9 273	386	19 538
2006	65 626	9 438	16 044	650	26 132
2007	70 875	7 989	18 816	769	27 574
2008	78 822	7 228	25 269	1 068	33 565
2009	82 095	6 213	29 766	1 274	37 253
2010	88 584	6 169	32 653	1 826	40 648
2011	95 451	6 110	35 736	2 136	43 982
2012	91 558	4 698	26 715	1 786	33 199
2013	57 084	4 670	790	37	5 497
2014	62 305	5 179	823	22	6 024
2015	59 878	4 775	775	16	5 566
2016	60 856	4 370	606	3	4 979
2017	56 548	3 826	502	6	4 334
2018	53 716	3 549	434	0	3 983

Fertility Rate

- **Age specific fertility rate (ASFR) of a given year:**

  Number of live births occurring among 1000 women in a given age group

- **The Total Fertility Rate (TFR) of a given year** refers to the average number of children that would be born alive to 1000 women *during their lifetime* based on the *age specific fertility rates in that given year*.

- For a population to replace itself, each woman would have to produce on average (on a long term basis) a sufficient number of children to replace their parents. A TFR of 2100 children per 1000 women is *considered to correspond* to the **replacement level**.

- We need to distinguish between **birth trends** and **fertility trends**

生育統計Fertility statistics

年 Year	年齡別生育率 Age specific fertility rates 年齡組別 Age group							總和生育率 (每千名女性) Total fertility rate (per 1 000 women)
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
實數 Actual								
1971	17.0	145.0	243.0	162.2	83.3	28.4	3.8	3 459
1976	17.2	107.9	189.1	117.7	48.1	14.4	1.5	2 480
1981	11.7	85.9	153.0	97.3	34.4	6.8	0.7	1 933
1986	7.0	48.6	111.9	78.5	26.9	4.0	0.3	1 367
1991	6.5	39.1	97.4	81.2	30.4	4.5	0.3	1 281
1996	5.9	37.1	80.7	78.6	31.8	5.0	0.2	1 191
2001	4.3	29.1	57.2	61.7	29.3	4.7	0.2	931
2006	3.2	25.0	56.5	71.6	35.1	5.2	0.3	984
2011	3.2	26.6	63.6	86.6	51.8	8.7	0.4	1 204
2012	2.8	21.1	64.5	99.7	57.5	10.8	0.4	1 285
2014	3.1	19.6	60.9	94.9	56.9	11.3	0.6	1 235
2015	2.9	19.3	59.2	91.8	55.2	10.9	0.6	1 196
2016	2.7	17.8	59.1	93.0	57.3	11.4	0.7	1 205
2017	2.7	16.8	54.4	85.3	54.7	11.2	0.7	1 125
2018	2.1	15.1	50.4	84.0	52.0	10.9	0.8	1 072
推算 Projected								
2021	1.4	19.1	52.9	89.5	59.8	13.5	0.7	1 176
2026	1.2	17.7	59.0	86.3	57.7	13.8	0.7	1 175
2031	1.4	15.7	56.3	89.8	55.3	12.8	0.7	1 161
2036	1.3	16.9	51.0	87.2	55.9	12.6	0.7	1 134
2041	1.4	16.7	56.0	83.6	55.8	12.2	0.6	1 125
2046	1.4	17.1	55.0	88.4	54.6	12.7	0.6	1 138
2051	1.4	17.7	55.9	87.0	55.6	12.7	0.6	1 151
2056	1.4	18.1	57.0	87.5	55.5	12.3	0.6	1 160
2061	1.4	17.9	57.6	88.2	55.6	12.5	0.6	1 166
2066	1.4	17.6	57.0	88.3	55.9	12.5	0.6	1 166

Total Fertility Rate

ASFR: (per 1000 women) for 2018

15-19	20-24	25-29	…	45-49
2.1	15.1	50.4	...	0.9

Thus, for a woman,

during age 15, expected no. of babies born = 0.0021; similarly for 16, 17, 18, 19

And, during age 20, expected no. of babies born = 0.0151, similarly for 21, 22, 23, 24

….. (for older ages ….)

So, over the lifetime, the expected no. of babies born
=(0.0021x5)+(0.0151x5)+…+ (0.0008x5)
= 1.072

>> TFR for 2018 is thus 1072 per 1000 women

Why are TFR's of HK women so low? Watch for explanations under the subject of ***cross boundary marriage*** *to be discussed below.*

Death Rate

Crude death rate =

No. of deaths **during the year** / no. of persons in the population ***at mid-year***

(Usually expressed as rate *per thousand population* : that is, the above quotient *multiplied* by 1000)

Sex-age-specific death rate =

No. of deaths during the year in a certain sex-age group/ no. of persons in that sex-age group in the population at mid-year

(also, usually expressed as rate *per thousand)*

>>> "Death rate" is also called " mortality rate ")

死亡統計 Death statistics

年 Year	死亡人數 Number of deaths	粗死亡率(每千名人口計算) Crude death rate (per 1 000 population)
實數 Actual		
1961	19 325	6.1
1966	19 261	5.3
1971	20 374	5.0
1976	22 633	5.0
1981	24 832	4.8
1986	25 912	4.7
1991	28 429	5.0
1996	32 176	5.0
2006	37 457	5.5
2011	42 346	6.0
2012	43 917	6.1
2013	43 397	6.0
2014	45 087	6.2
2015	46 108	6.3
2016	46 905	6.4
2017	46 829	6.3
2018	47 400	6.4

死亡統計
Death statistics

統計時點（年中） Reference time-point(Mid-year)	由上一統計時點至本統計時點的死亡人數 Number of deaths from the previous reference time-point to this reference time-point
推算 Projected	
2021	52 100
2026	56 400
2031	62 300
2036	69 800
2041	80 500
2046	91 700
2051	99 800
2056	102 600
2061	101 100
2066	98 000

Standardization of Death rate

Standardised death rate: *(expressed as per thousand pop.)*

$$\text{for population A} = \frac{\sum_i n_i r_i}{P}$$

$$\text{for population B} = \frac{\sum_i n_i r_i^*}{P}$$

where :

n_i = number of persons in age group i in the "Standard Population"

P = total size of the "Standard Population"

r_i = sex-age-specific death rate for persons in sex-age group i in population A

r_i^* = sex-age-specific death rate for persons in sex-age group i in population B

Standardization of Death rate (cont'd)

- Suppose Population B is taken as the Standard Population.
- It can be seen that the numerator in the above formula is just the number of deaths in the year and the denominator is the size of the Population B.

In other words, the standardized death rate for population B is equal to the crude death rate of population B.

Hong Kong

Year	Crude death rate[#]	Standardized death rate*
1981	4.8	10.4
1984	4.7	9.8
1987	4.8	9.3
1990	5.2	9.4
1993	5.2	8.9
1996	5.0	8.0
1999	5.0	7.7
2002	5.1	6.9
2005	5.7	7.0
2008	6.0	6.7
2011	6.0	6.0

[#] Deaths per 1 000 population

* Using the Hong Kong population at 2011 Population Census Moment as the Standard Population.

Life expectation at birth :

- Expectation of life at birth refers to the number of **years** that a person born *in a given year* is expected to live if he/she was subject to the prevalent mortality conditions as reflected by the set of sex-age-specific death rates (number of deaths occurring among 1 000 persons for a given sex in a given age group) *for that year*.

- ***>> Hong Kong (2018)***

  male- 82.3 years; female – 87.7 years

Life expectation : conceptual illustration of the method of calculation (for more advanced work, more detailed actuarial method is used for estimating the survival from one age to the next)

SASDR for, say, males are as follows (expressed as per person, not per 1000 persons):

Age	0	1	2	3	...	99
SASDR	R(0)	R(1)	R(2)	R(3)	…	R(99)

Survival from age x to age (x+1) : 1-R(x)

- Let us start with a " cohort " of 1000 males,
- 1000xR(0) will not live beyond Age 1, with each living for an average of ½ year
- 1000 x[1-R(0)]xR(1) will not beyond Age 2, each living for 1-1/2 years
- 1000 x[1-R(0)]x[1-R(1)]xR(2) will not beyond Age 3, each living for 2-1/2 years
- And so on.
- Sum up to get the "total no. of years expected to be lived by these 1000 persons" and divide by 1000.
- We get the average no. of years expected to be lived per person.
- This is the "Expectation of life ***at birth***".

- We can have "expectation of life ***at Age M***", calculated in a similar manner.

Life expectation at various ages: (how many years to live after a certain age -implications for savings requirements)

YEARS

	2011	2021	2031
AT BIRTH			
MALE	80.5	82.2	83.5
FEMALE	86.7	88.5	89.8
AT 40			
MALE	41.4	43.0	44.2
FEMALE	47.3	49.0	50.3
AT 60			
MALE	23.1	24.6	25.6
FEMALE	28.4	29.9	31.1

Cross–boundary marriages of HK people (2000) — including both marriages registered in HK and in the Mainland

HK men who married during 2000 = (a) + (b) = 41 524

[[b/(a+b)= 42.7% of them married Mainland women]]

HK women who married during 2000 = (a) + (c) = 25 492

[[c/(a+c) =7% of them married Mainland men]]

HK = from HK

ML = from Mainland China

Bridegroom	**HK**	**HK**	**ML**
Bride	**HK**	**ML**	**HK**
	23 804 (a)	**17 720(b)**	**1 688 (c)**

Cross–boundary marriages of HK people (2010) — including both marriages registered in HK and in the Mainland

HK men who married during 2010 = (a) + (b) = 46 725

[[b/(a+b)= 41% of them married Mainland women]]

HK women who married during 2010 = (a) + (c) = 32 370

[[c/(a+c) =14.9% of them married Mainland men]]

HK = from HK

ML = from Mainland China

Bridegroom	**HK**	**HK**	**ML**
Bride	**HK**	**ML**	**HK**
	27 534 (a)	**19 191(b)**	**4 836 (c)**

Cross–boundary marriages of HK people (2018) — including both marriages registered in HK and in the Mainland

HK men who married during 2018 = (a) + (b) = 41 354

[[b/(a+b)= 33.3% of them married Mainland women (32.7% in 2017)]]

HK women who married during 2018 = (a) + (c) = 34 878

[[c/(a+c) = 21% of them married Mainland men (20% in 2017)]]

HK = from HK

ML = from Mainland China

Bridegroom	HK	HK	ML
Bride	HK	ML	HK
	27561 (a)	13 784(b)	7317 (c)

53

Cross-boundary marriages and their effects on the HK population

- There are a huge no. of such marriages.

  Already so since 1980's : Late 1970's - opening up of the Mainland– more and easier transport flow and other exchanges

  Initially, some were "economic" marriages (especially the "HK man – Mainland woman" couples). But not so anymore soon afterwards. Education level of the Mainlander wives these days are not low at all.

  More student (tertiary) flows of either sex both ways HK←→ Mainland

  More marriage agencies business at work in recent years

- Significantly more HK-men/Mainland–women couples than HK-women/Mainland-men couples (even now) — Reasons:

  (1) many more HK men than HK women work in the Mainland or go there for duty visits (and stay some while longer after work);

  (2) cultural reasons

In-migration and out-migration

>>> Out-migration:

- People "emigrating to other countries" and settling down for good. [But note– many of them return to HK after some years (say, after having gained settlement rights) and get counted as in-migrants then]

- People moving to the Mainland for settlement (note- again some may 'return' afterwards and counted as "in-migrants" then

>>>In-migration

(1) Arrivals" – From the Mainland (a quota of 150 persons a day) – practically all are the spouses and children born in the Mainland to cross-boundary marriages

(2) Persons from the Mainland under certain selection schemes

(3) Persons with Working Permits (and family members where applicable) from various countries: a predominant group- the Foreign Domestic Helpers (the FDH's – they cannot gain HKPR status for however long they stay in HK)

- Some people in HK say that the "New Arrivals" compete with HK residents for resources- housing, medical,….and we do not welcome them
- However, we should note:

(a) They are HK people's closest relatives. They come for "family reunion". In particular, the children are HK people's offsprings, who contribute to the continuation of the HK population

(b) If the "New Arrivals" do not come to settle in HK, the HK population will in fact start to shrink in size from the 2020's onwards (but in the meantime getting even more "aged")

Some international data

(figure in brackets refers to the year of reference IF NOT 2015)

	CBR (per '000)	CDR (per '000)	TFR (per '000)	Life Exp at B (M) Years	Life Exp at B(F) Years
Hong Kong, China	8.2	6.3	1195	81.4	87.3
Macao, China	11.0	3.1	1142	79.9	86.3
China	12.1	7.1	--	---	---
Japan	7.9	10.2	1422 (14)	80.5 (14)	86.8 (14)
Korea	8.6	5.3 (14)	1205 (14)	79.0 (14)	85.5 (14)
Malaysia	16.7 (14)	4.8	2018 (14)	---	---
Singapore	10.8	5.1	1240	80.4	84.9
France	11.8	9.1 (14)	1885 (11)	79.3 (14)	85.4 (14)
Germany	9.1	11.4 (14)	1364 (11)	78.7 (14)	83.6 (14)
UK	12.0	9.1	1920 (12)	79.0 (12)	82.7 (12)
Canada	10.9 (14)	7.5 (14)	--	---	---
USA	12.5 (14)	8.2 (14)	1863 (14)	76.4 (14)	81.2 (14)

>> Other statistics on the Population :

To see the document :

"Statistics on the HK population (updated: November 2018)"

To note situations in regard to

ageing of the population; the change in the gender balance; marriage pattern; migration pattern; and so on.

>> Also, very useful to read the C&SD publications:

"Population Projections 2017-2066"

"Demographic Trends in Hong Kong 1986-2016"

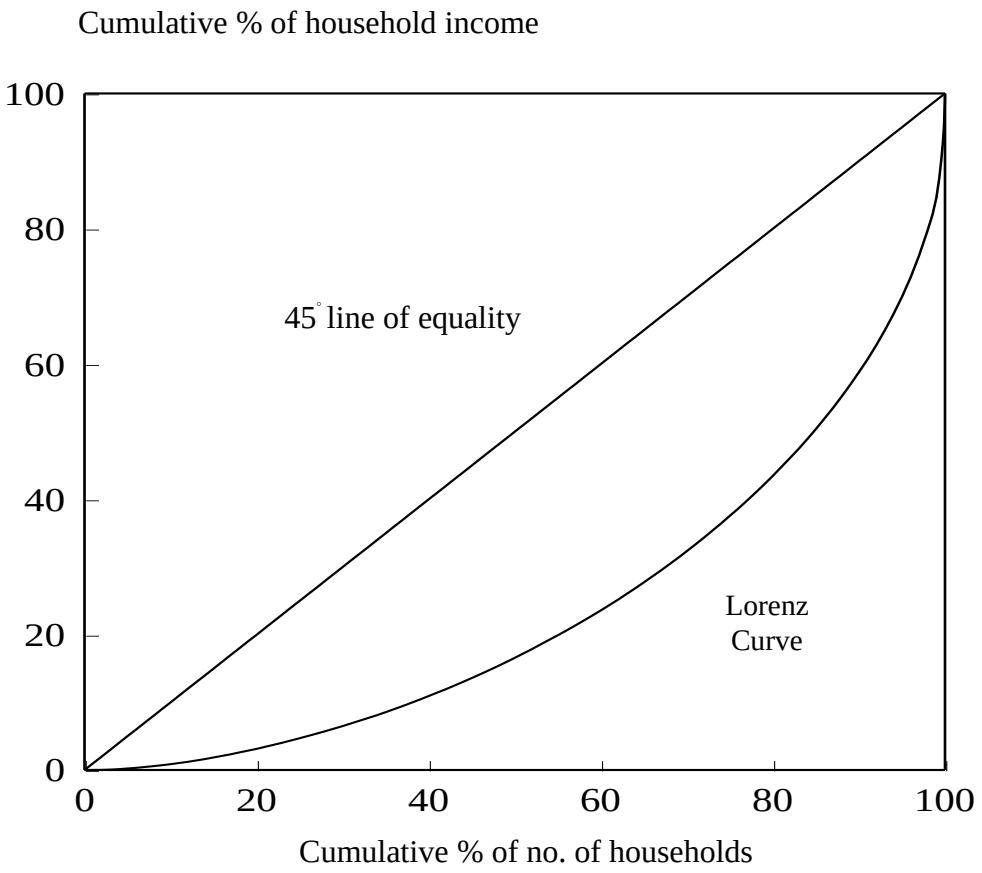
>> Access the following webpage to view more international statistics on population

https://unstats.un.org/unsd/demographic-social/products/dyb/dyb_2017/
http://wdi.worldbank.org/table/2.1

Lorenz Curve
(for household income distribution)

- Plotting cumulative percentages of household income against cumulative percentages of number of households, starting from households with the lowest income
- Degree of income disparity reflected by the extent to which the Lorenz Curve is concave against the 45 degree line
- The closer the Lorenz Curve to the 45 ^{o} line, the smaller is the degree of income disparity

Lorenz Curve



Lorenz Curve and the Gini Coefficient

- Gini Coefficient—

  Ratio

  (area enclosed by the diagonal line and the Lorenz Curve)

  to

  (the area of the triangle bounded by the x-axis, y-axis and the diagonal line)

- NOTE: The Lorenz Curve can actually be drawn for personal income *and* other variables (similarly, Gini Coefficients can also be calculated for the respective Lorenz Curves)

HOUSEHOLD INCOME	Previously		More Recently	
	Year	Gini Coefficient	Year	Gini Coefficient
Hong Kong	1991	0.476	2001//06//11//16	0.525//0.533//0.537//0.539
Singapore	1990	0.44	2001//06//11	0.456//0.476//0.482
Japan	1989	0.29	1999	0.30
Australia	1990	0.42	2001//06//10	0.426//0.425//0.428
Canada	1990	0.36	2001//06//09	0.513//0.506//0.515
UK	1991	0.51	2001//06//10	0.513//0.518//0.520
US	1991	0.43	2001//06//10//New-York(‘15)	0.466//0.470//0.469//0.551

Statistics on the Labour Force and Unemployment

(1) Employed Population + Unemployed Population **(A)** = Economically Active Population **(B)** *[also known as the "Labour Force"]*

(2) Employed Population : People aged 15 who are at work for pay or for profit

(3) Unemployed Persons :People aged 15 or above who fulfill all the 3 conditions below .(Brief description only. A more detailed definition exists)

- no job
- available for work
- seeking work
- **But,** a person fulfilling the first two conditions but not seeking work is **still an "unemployed person"** ***IF*** the reason for not seeking work is that "he believes work is not available" –> "discouraged worker"

Statistics on the Labour Force and Unemployment

>> **Based on a series of surveys (in HK, the General Household Survey), we will find out :**
the **employed persons** and the **unemployed persons**.
Thus, the size of the **Economically Active Population** can be established.

>> Whole Population – Economically Active Population
= **Economically Inactive Population**

>> **Unemployment Rate** = $\frac{A}{B} \times 100\%$
(recall: B=Econ. Act. Pop.)

>> ***Economically Inactive Population*** : includes infants, children, full-time students aged 15 +; ‘home-makers”; “retired persons,...

Labour Force Participation Rate (LFPR)

>> Labour Force Participation Rate of the Population=

(Economically Active Population / Population aged 15 or over) x 100%

>> Labour Force Participation Rate for a **specific sex-age** group is the ratio

between

the number of persons in the Labour Force of a particular sex-age group

and

the number of persons in that sex-age group

Where the age group is NOT mentioned, we are talking about the LFPR for the whole male(15+) / whole female (15+) populations *or* the LFPR of the entire population

Labour Force and "participation in the labour force"

>> The labour force is contributed chiefly by persons in the "mid-age" group (those in the " normal working age range" [15-64]).

The "**Labour Force Participation Rate**" [LFPR] (Percentage of people aged 15 or over being "economically active") in recent years is stable at 61% or so).

LFPR for a specific sex-age group is also defined – in regard to people in that sex-age group

[[In Hong Kong there has been significant expansion in education opportunities (both for male and female but particularly the latter); increased employment of married women; advancements in technology ; and changes in various other socio-economic/cultural factors. All these lead to LFPR changes over time.]]

[[LPFR is normally lower with increase in age after the 50's — with some people starting to "retire" at 50-55 ("early retirement").

LFPR may also increase/decrease *with* bigger/less *demand for working people arising from change in the economic structure and/or changes in technology]]*

67

Labour Force and "participation in the labour force"

LFPR --

2000 – Male – 73.5%; Female – 49.9%;

Overall – 61.4%

2019 (Q3) – Male – 67.1%; Female – 55.1%;

Overall – 60.5%

……

Labour Force -- size (thousand persons)

2000	M- 1 964	F- 1 410	T- 3 374
2019 (Q3)	M- 2 019	F- 1 999	T- 3 975

……

The 2019 (Q3) figures are from "Quarterly Report on General Household Survey, Third Quarter 2019"). There you can also see LF (size) and LFPR for various sex-age groups

68

Labour Force and
"participation in the labour force"

- Female participation in the labour force
  > education opportunities
  > family duties (traditional values
  undergoing some change)
  > technological advances
  > economic cycles -- need to earn income
  -- job opportunity

69

Labour Force

Labour Force projections (in '000)

	Year 2012	Year 2027
25-49	2154	2073
50-64	958	1014
15 or over(Total LF)	3487	3422

70

Statistics on Employment and unemployment

- **Employment status-**

  Employer; Employee;

  Self-employed; Unpaid family worker

- Unemployment Rate– has been stable at 3-4% for the last several years

- **Underemployment**– "Underemployed persons" are still "employed".

  They are those employed persons who work less than 35 hours per week "INVOLUNTARILY" (i.e. they are still seeking more work)

Statistics on Employment and unemployment

- → "Quarterly Report on General Household Survey (GHS) " contains a lot of useful data on this area of statistics. This report is issued in respect of each calendar quarter.
- → The GHS is conducted every month.
- → The **unemployment rate** is issued every month, in respect of "moving 3-month periods" (i.e. Jan-Mar, Feb-Apr, Mar-May, Apr-Jun,…) with "seasonal adjustments" made.

- The household survey provides data on both employment and unemployment. Employment statistics are also available from surveys of establishments. **Reconciliation** of employment statistics from both sources do pose some difficulties.

Other Social statistics

- Statistics on education: education attainment; student enrolment; teachers, schools, classes
- Statistics on housing
- Statistics on health; causes of death; morbidity; prevalence, incidence; doctors, nurses. Hospital beds
- Statistics on transport: area of residence *vs* area of work/study; major mode of transport used to go to work/study
- Statistics on Social welfare: social security; disability; cases of family violence reported
- Statistics on law and order

(End of PowerPoint – 2)