

# A very low fertility rate in Hong Kong: Challenges and Opportunities

**Paul Yip**

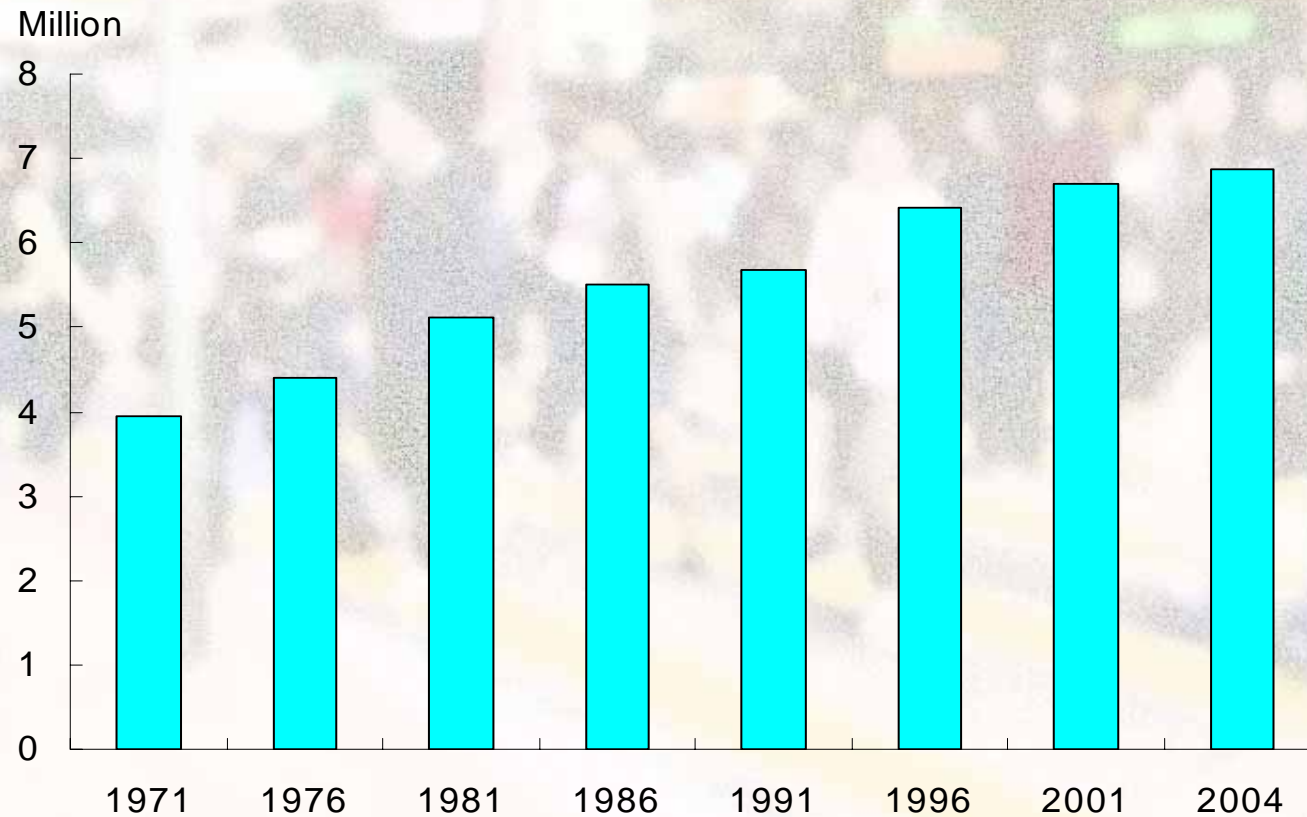
**Department of Statistics and Actuarial Science  
The University of Hong Kong**



# Outline

- An overview of the fertility pattern
- A critical review of dependence ratio
- Implication on health care delivery
- Opportunities and challenges

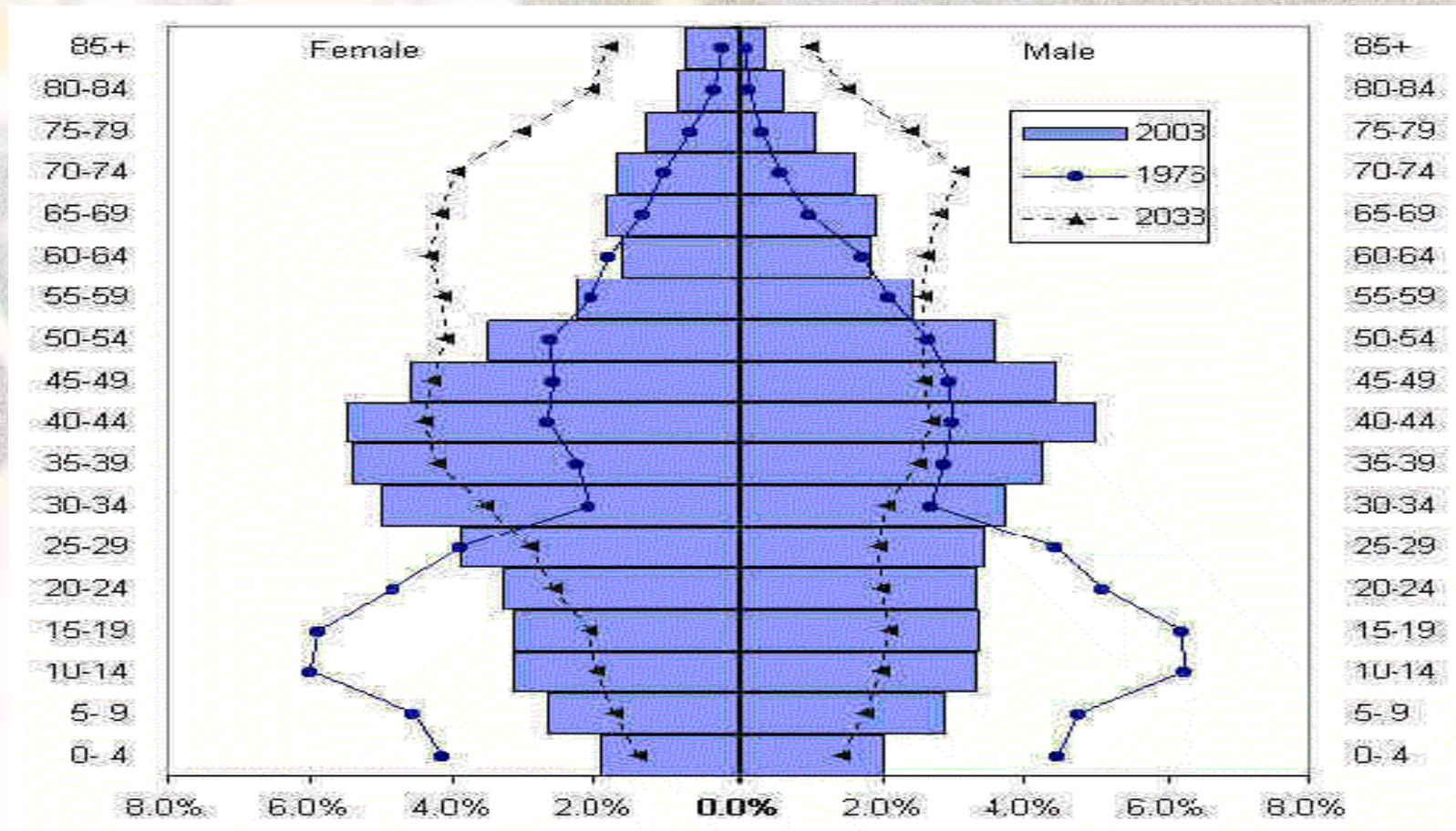
# Population size refers to the mid-point of the respective years



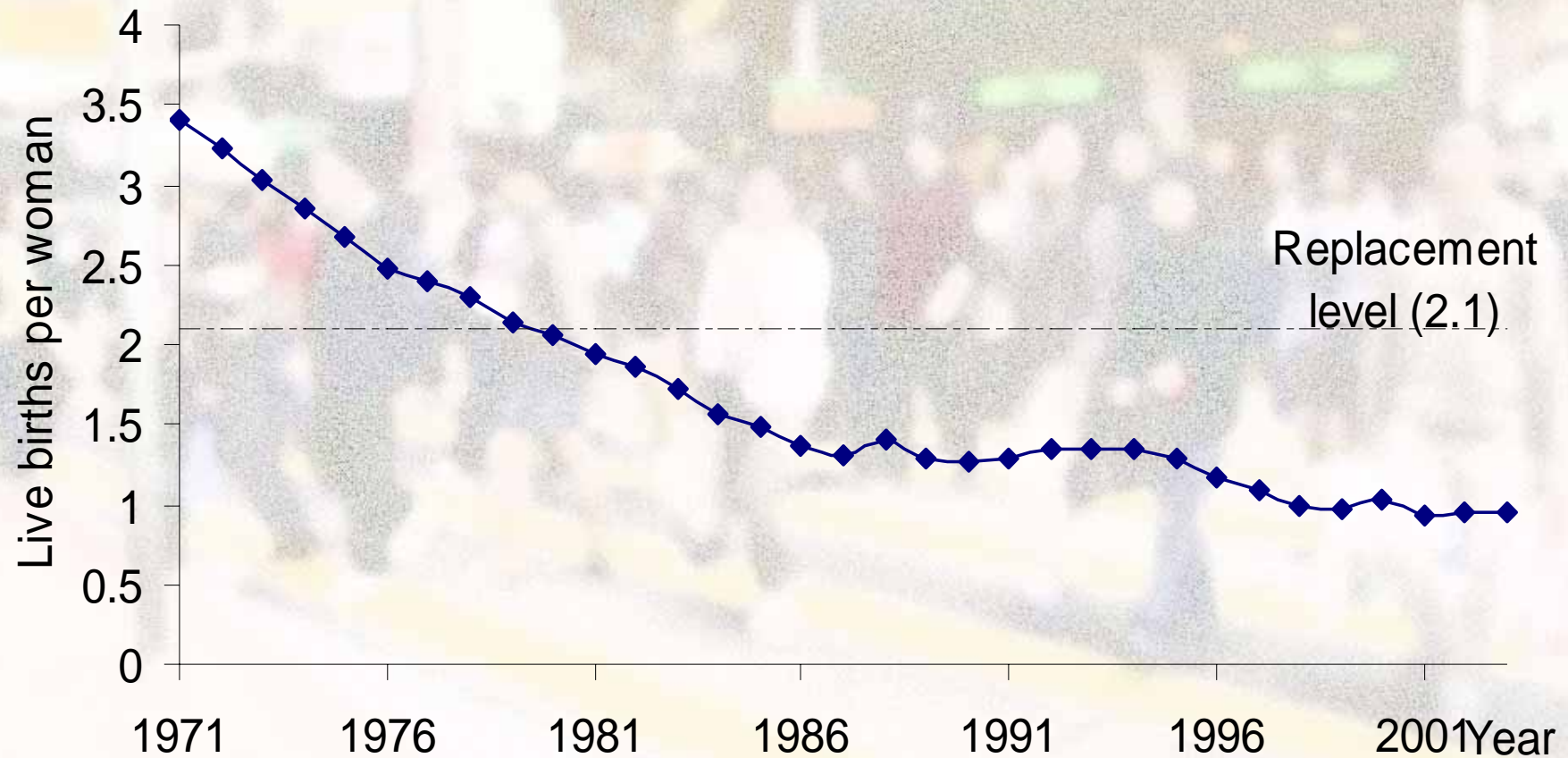
## Average annual growth rate

1971 - 76	2.34
1976 - 81	3.23
1981 - 86	1.53
1986 - 91	0.62
1991 - 96	1.80
1996 - 01	0.94
2001 - 04	0.84

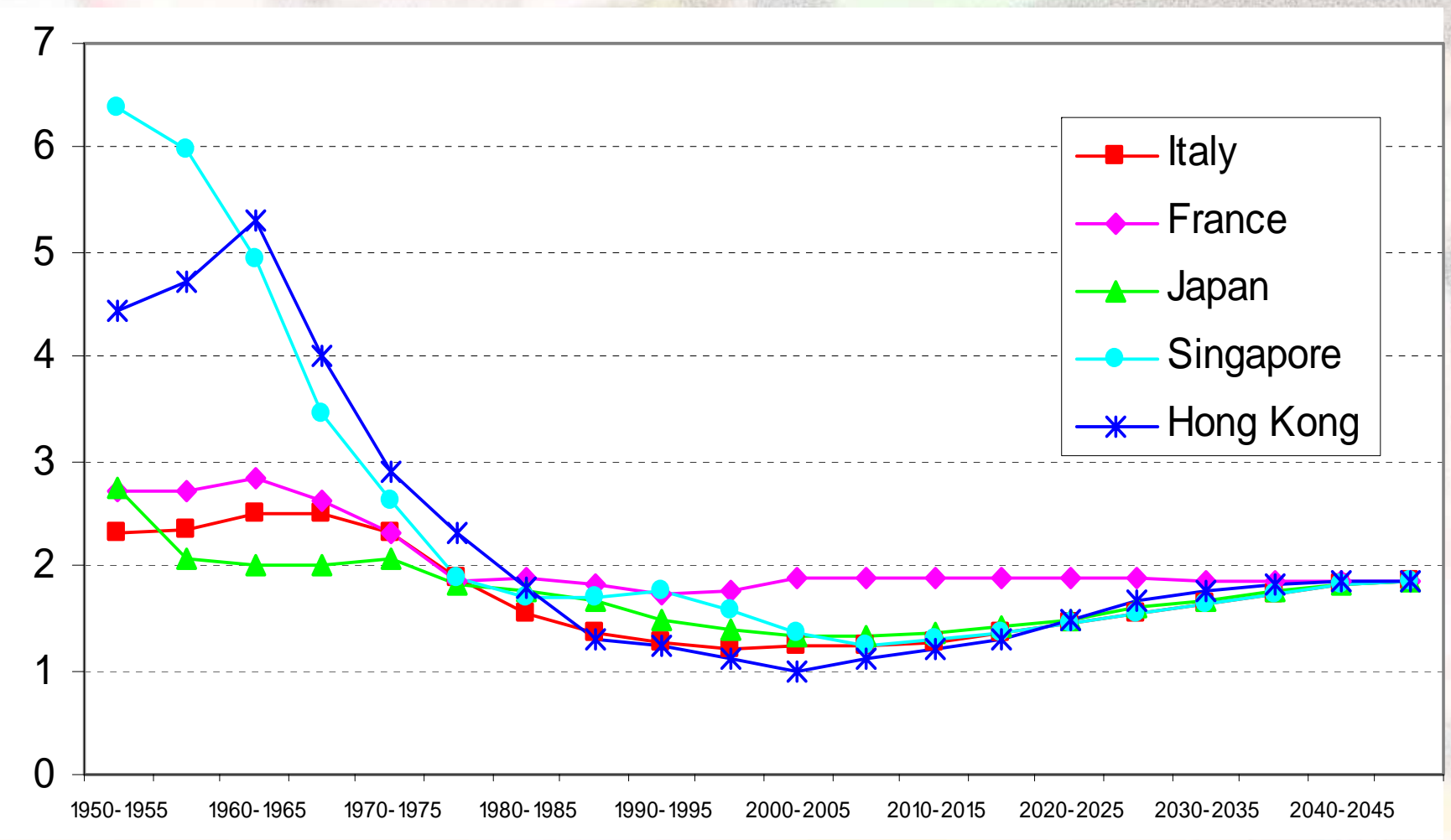
# Population pyramid of Hong Kong 1976, 2003 and 2033



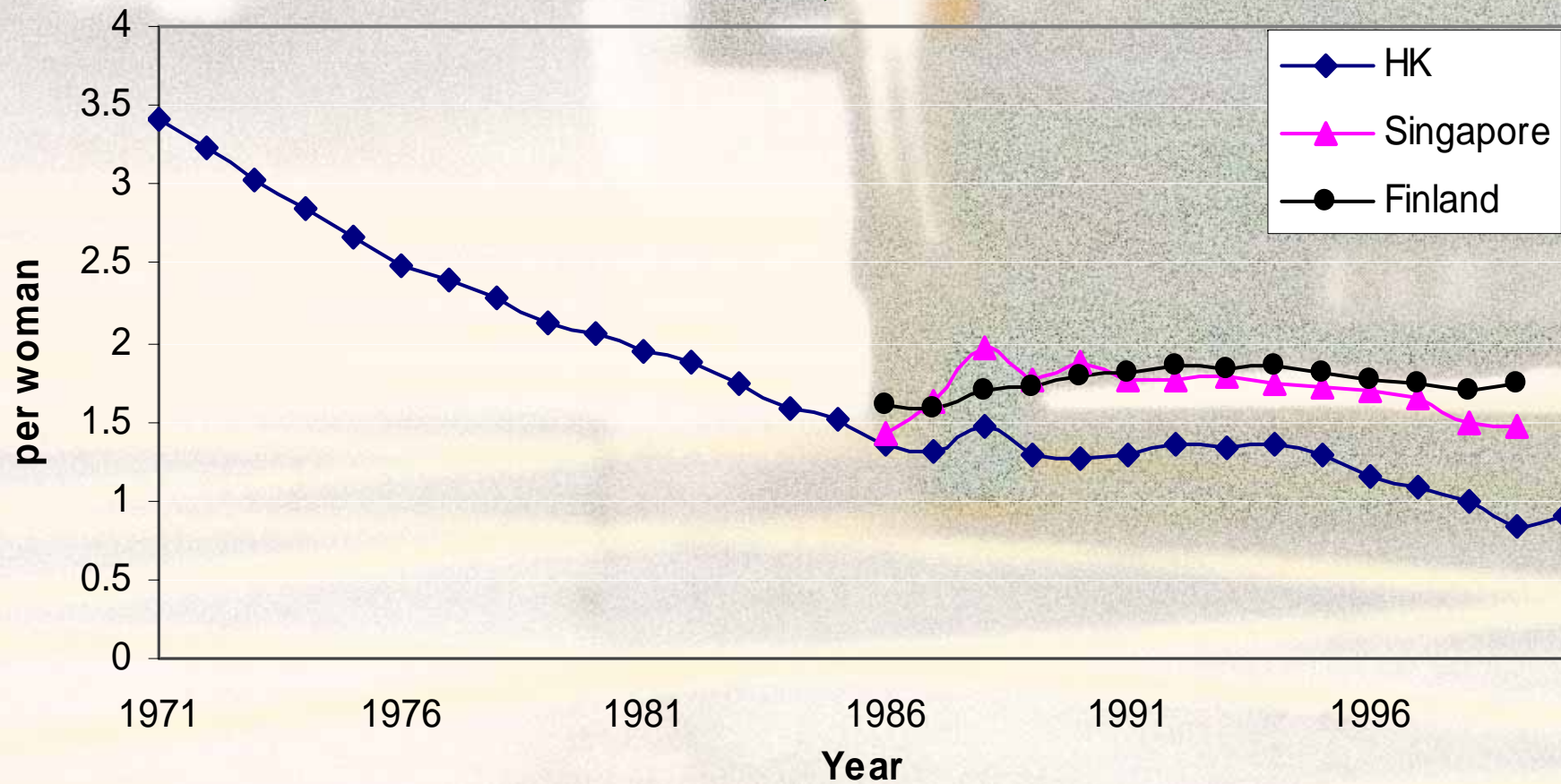
## Total fertility rates of Hong Kong SAR, 1971 - 2005



# Change in TFR, Italy, France, Japan, Singapore, Hong Kong from 1950 to 2000, prospects to 2050



## Total fertility rate, HKSAR and other low fertility economies, 1971-2000



# Total fertility rates of Hong Kong and selected low fertility economies, 1995 – 2002

Year	Asian economies			Non-Asian economies							
	Hong Kong	Singapore	Japan	Sweden	Norway	Netherlands	Australia	Denmark	UK	Germany	US
1995	1.3	1.67	1.42	1.74	1.87	1.53	1.83	1.81	1.71	1.25	1.98
1996	1.17	1.66	1.43	1.61	1.89	1.53	1.8	1.75	1.73	1.32	1.98
1997	1.1	1.61	1.39	1.52	1.86	1.56	1.78	1.75	1.72	1.37	1.97
1998	0.99	1.47	1.38	1.5	1.81	1.63	1.76	1.72	1.72	1.36	2
1999	0.97	1.47	1.34	1.5	1.85	1.65	1.76	1.74	1.69	1.36	2.01
2000	1.02	1.6	1.36	1.55	1.85	1.72	1.76	1.77	1.64	1.38	2.06
2001	0.93	1.41	1.33	1.57	1.78	1.71	1.73	1.75	1.63	1.35	2.03
2002	0.96	1.37	1.32	1.65	1.75	1.73	1.75	1.73	1.64	1.34	2.01



# Reasons for decline of TFR

- Reduction on marital fertility rate (44%)
- Change in marital structure: (56%)
  - Increasing spinsters and late marriages
  - Increasing Cross-boundary marriages  
(China and Hong Kong)
  - Increasing age difference in marriage

# Decomposition method for TFR

## ■ Definition

$P_i$  : Proportion of marriage in age group  $i$

$AMFR_i$  : Age-specific marital fertility rate in age group

# Results for decomposition of the change in TFR

Proportion (%) of decline in the TFR attributable to change in

Age group	$p_i$	AMFR	Total
15-19	5	-1	4
20-24	18	7	25
25-29	20	22	42
30-34	9	9	18
35-39	4	4	8
40-44	<0.5	3	3
45-49	<0.5	<0.5	<0.5
Total	56	44	100

# A new measure - WTMFR

- A Weighted Total Marital Fertility Rate (WTMFR)

$$WTMFR = \sum_{i=1}^7 w_i \times TMFR_i.$$

$W_i$ : Percentage of women get married in age group  $i$  to all married women

$TMFR_i$ : Total marital fertility rate for women get married in age group  $i$

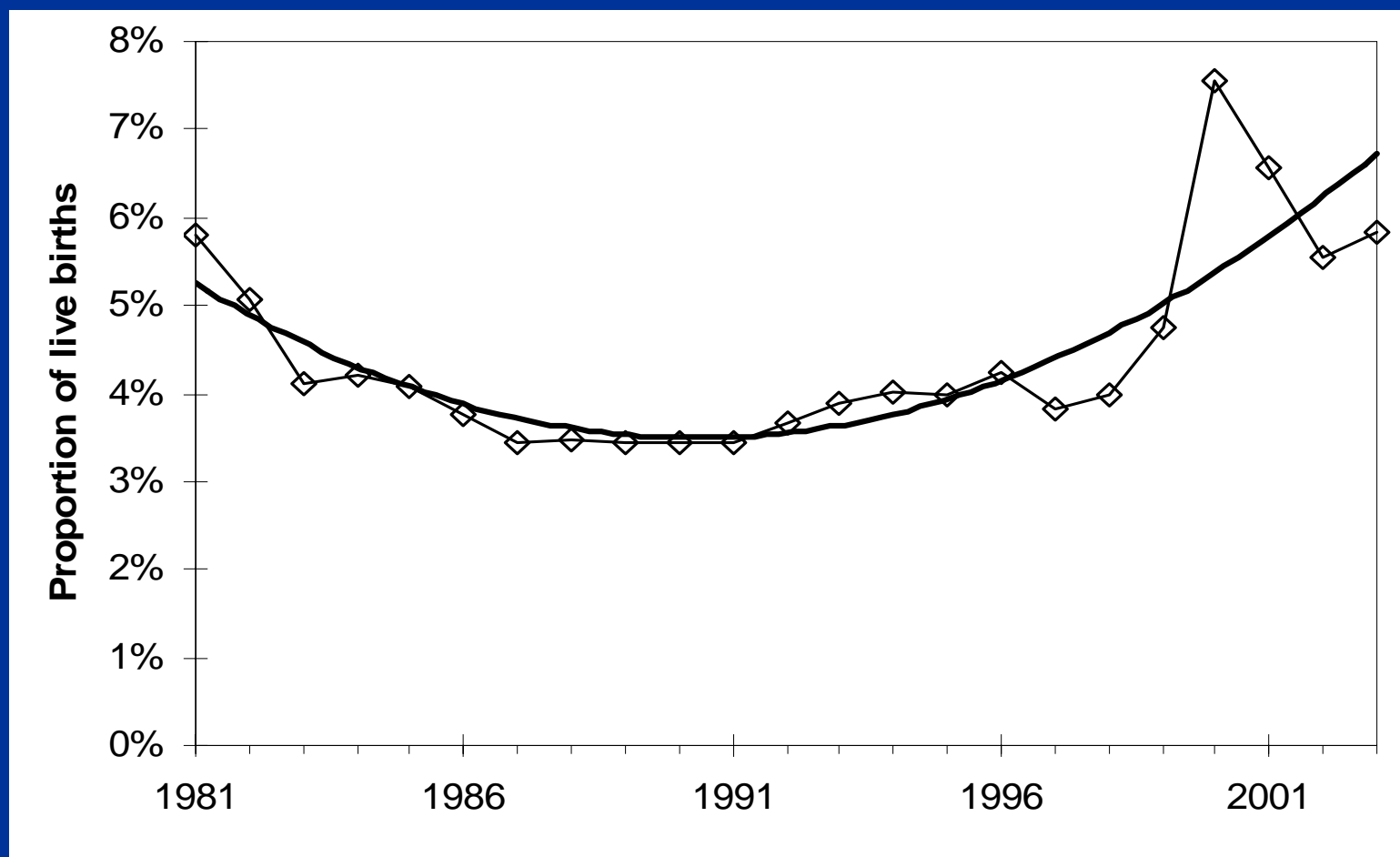
## A new measure - WTMFR

- Comparison of TMFR and WTMFR

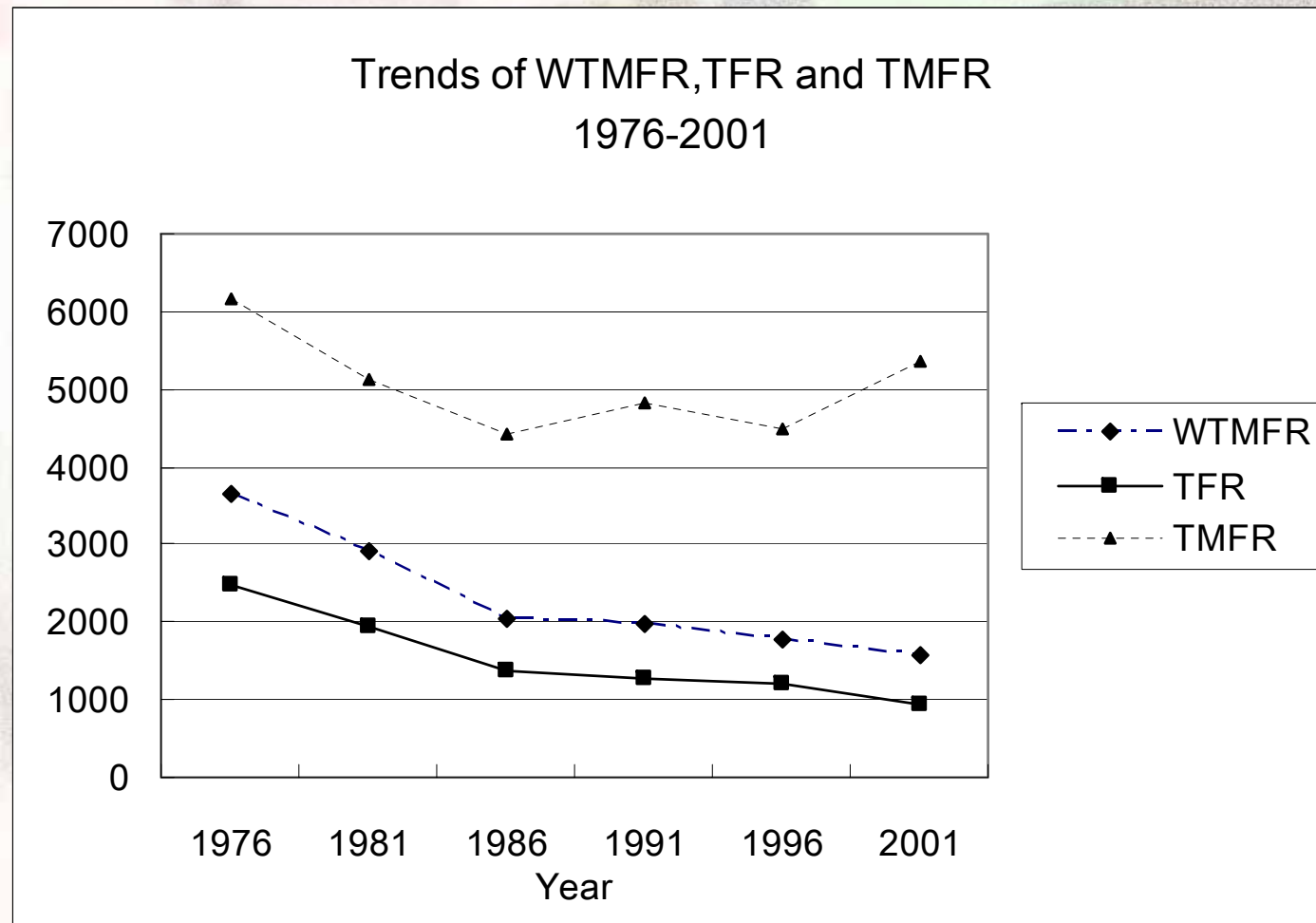
TMFR: assumes that all women get married at age twenty.

WTMFR: take the marriage percentage as weights, hence avoids the over-general assumption and has the same trend as TFR (birth outside wedlock is constant (7%) in HK )

## Proportion of live births in Hong Kong by cohabitating parents, 1981-2003



# Comparison of TFR, TMFR and WTMFR



# Decomposition Results for WTMFR

Proportion (%) of decline in the WTMFR attributable to change in

Age group	W <sub>i</sub>	TMFi	Total
15-19	28	3	31
20-24	46	27	73
25-29	-14	16	2
30-34	-7	2	-5
35-39	-1	<0.5	-1
40-44	<0.5	<0.5	<0.5
45-49	<0.5	<0.5	<0.5
Total	52	48	100

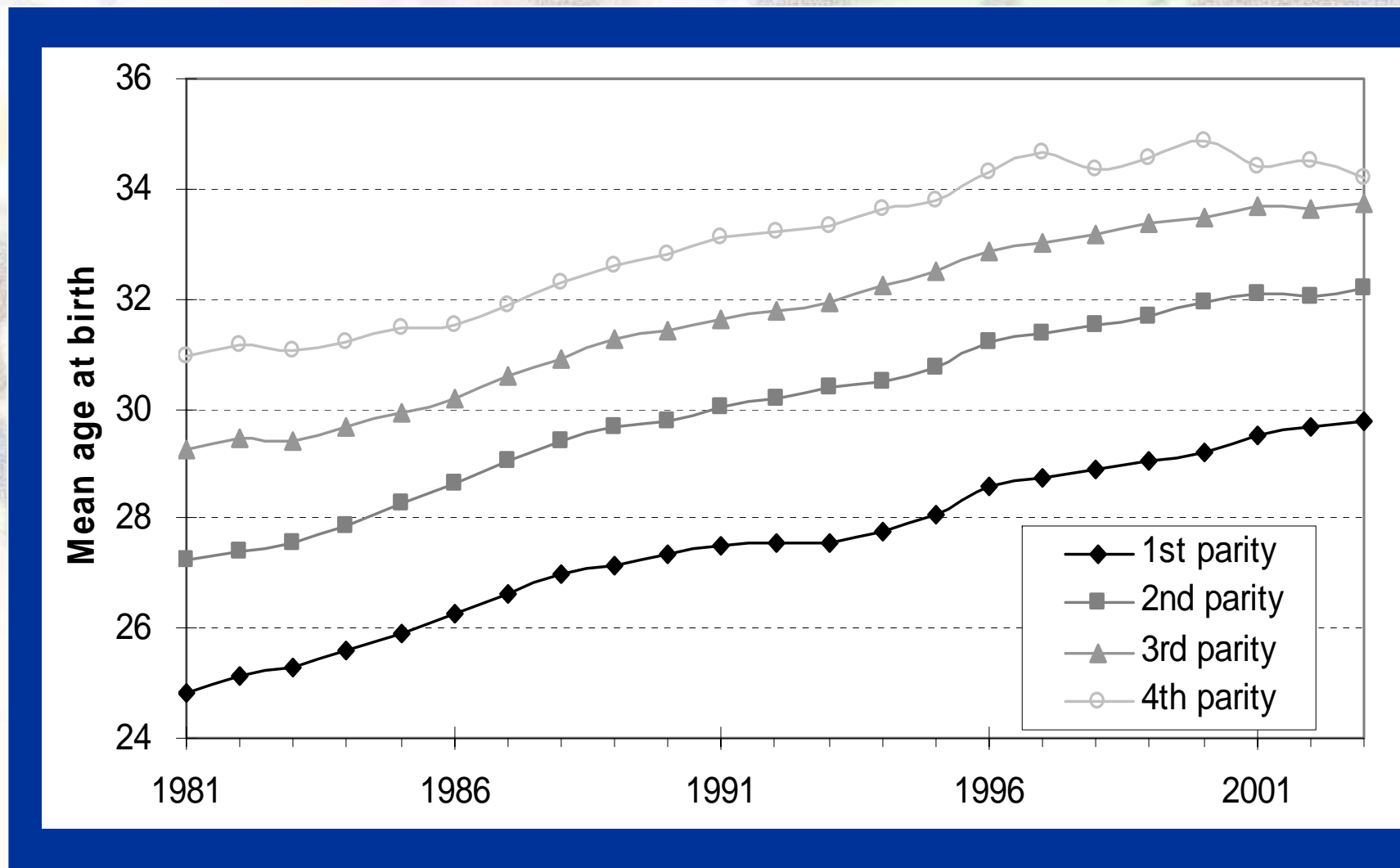


# Reasons for decline of TFR

- Reduction on marital fertility rate (44%)
- Change in marital structure: (56%)
  - Increasing spinsters and Late marriages
  - Increasing Cross-boundary marriages
  - Increasing age difference in marriage



## Mean age of mothers by live birth order, 1981-2003

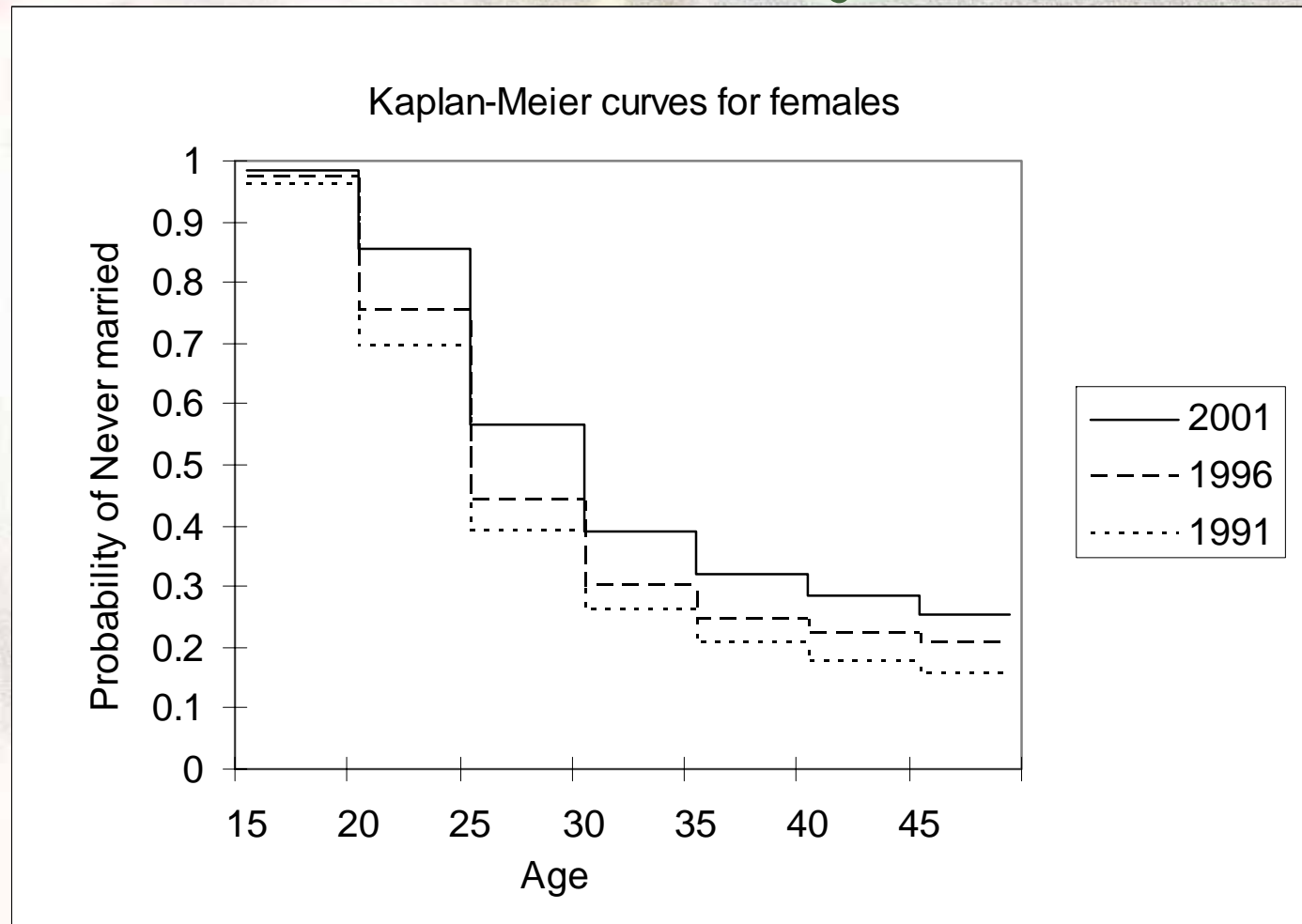


# Increase in Spinster

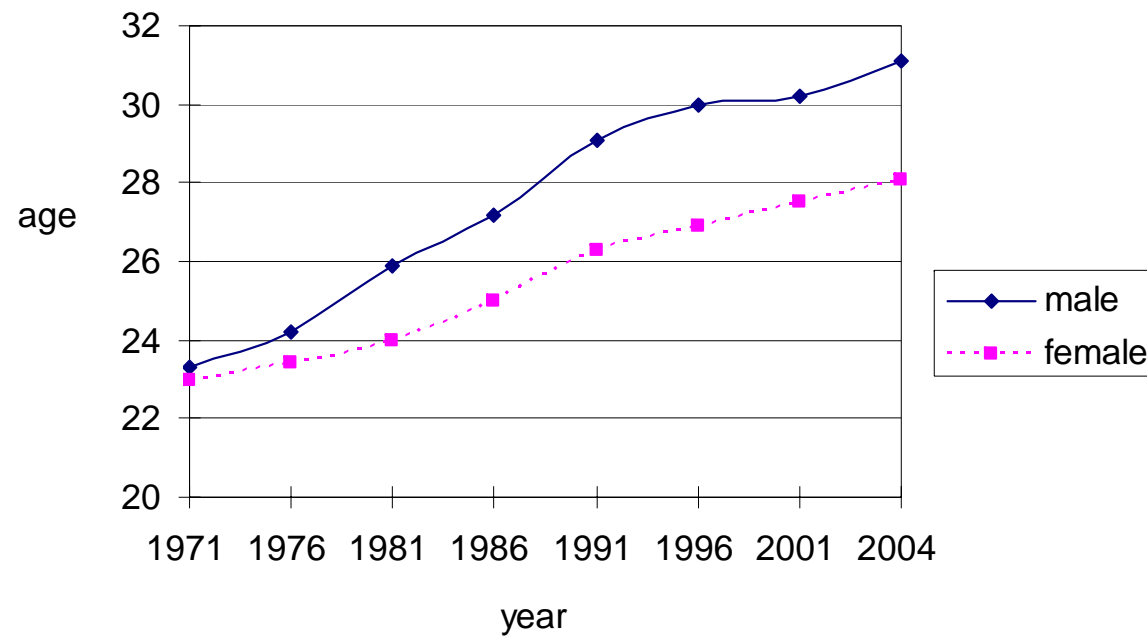
- For the same age group 15-49  
Never married men > Never married  
women (76850 vs **892100** )

However, due to the preference of  
gloom age pattern we estimate there  
will be about 135,000 women at  
marriage age can't find the partner in  
Hong Kong.

# A of never married Kaplan-Meier curve: Probability



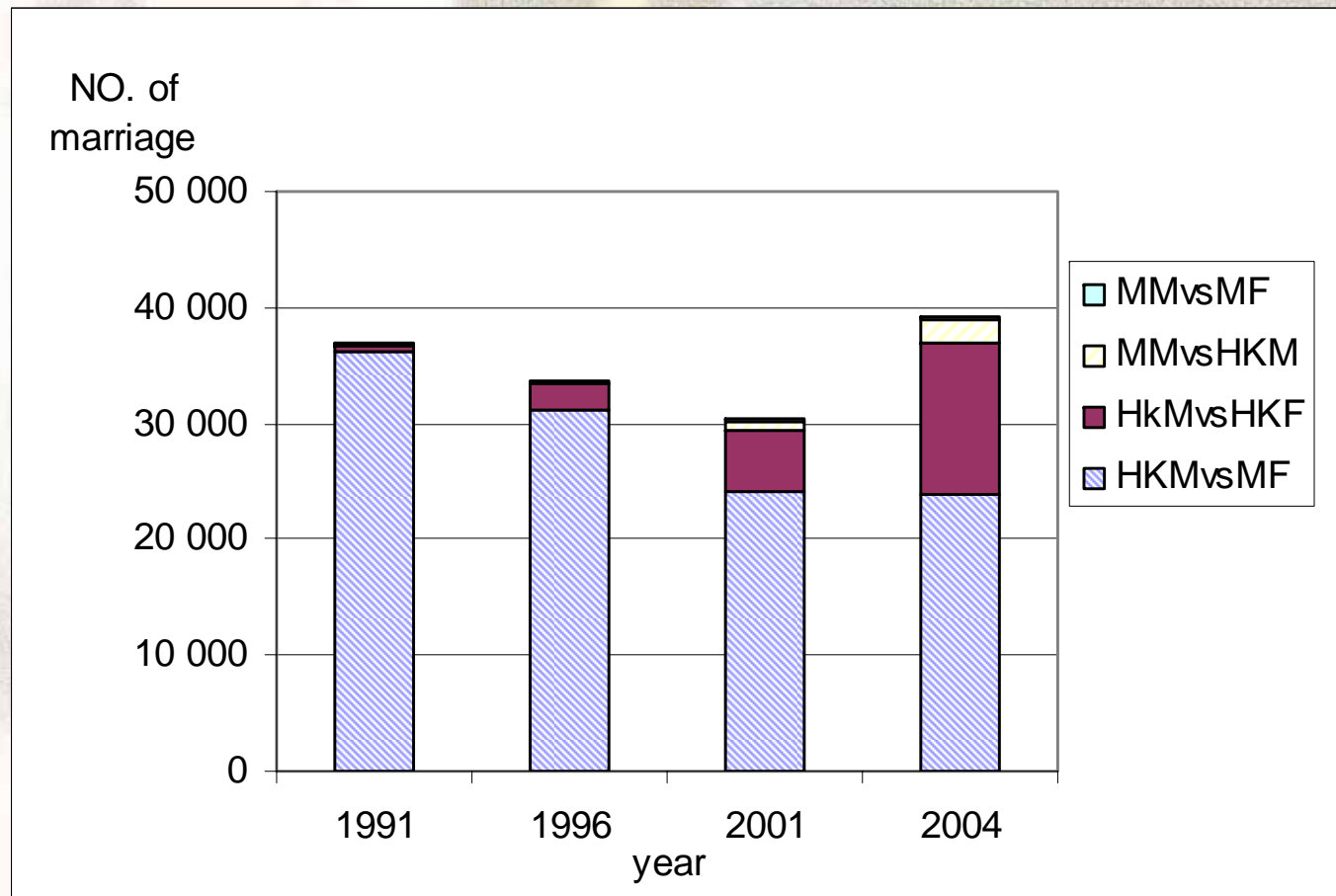
# Median Age at First Marriage 1971-2004



# Increase Cross-boundary Marriage

- Cross-boundary marriage in 2004,  
(HK Male and HK Female: **61.37%**)  
(HK Male and Mainland Female: **33.77%**)  
590 cases to 13126 cases in 2004  
(HK Female and Mainland Male: **4.86**  
90 cases in 1991 to 1888 in 2004

# Marriages composition 1991-2004



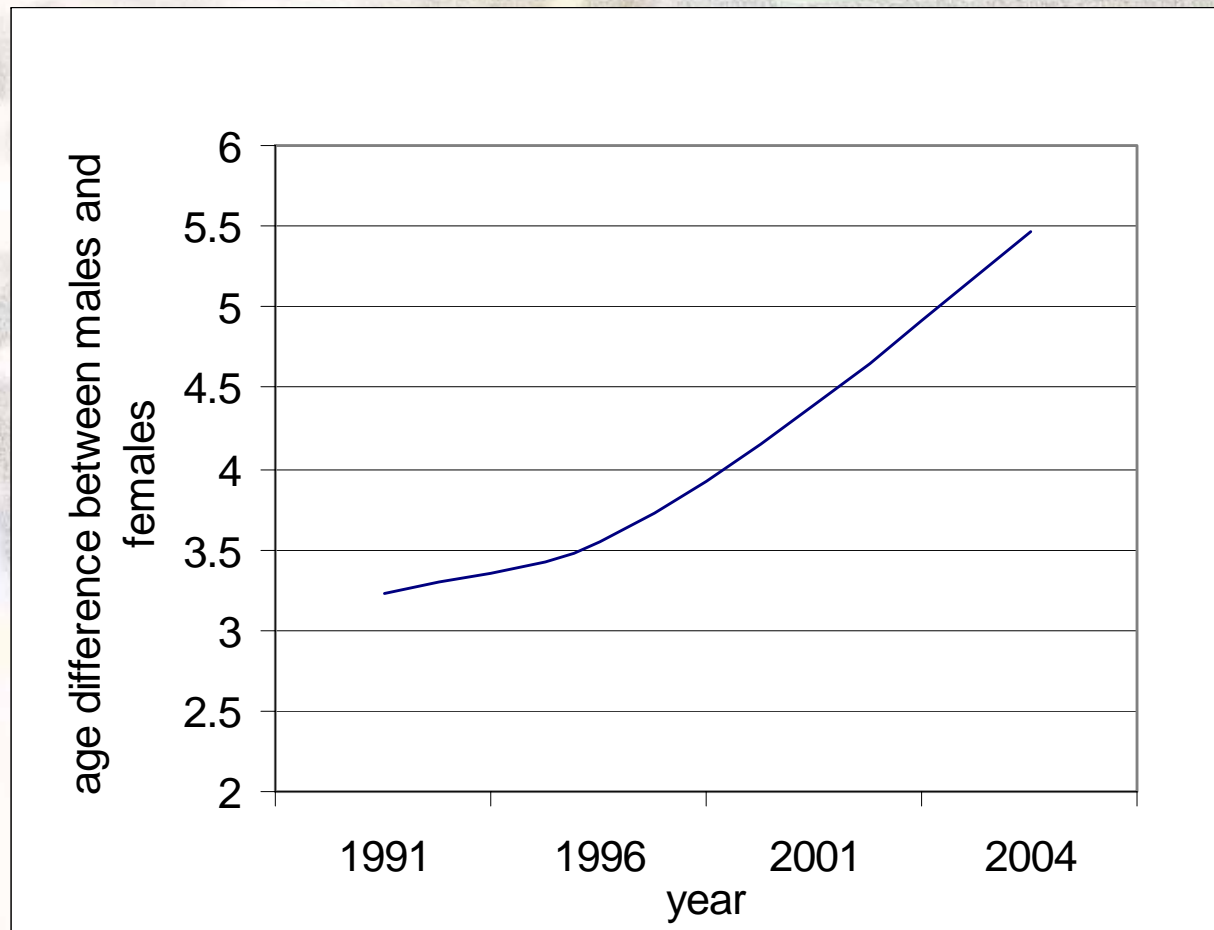


Year	HK Women and Mainland Men
1991	90
1996	269
2001	723
2004	1888

Increased  
by  
nearly 21  
times  
for  
1991-2004

Year	HK Men and Mainland women
1991	590
1996	2215
2001	5169
2004	13126

# Increasing age difference in marriage



# Number of Marriages

P(Age of Groom < Age of Bride)

		Age of Bride								Number of Groom
		16-19	20-24	25-29	30-34	35-39	40-44	45-49	50+	
Age of Groom	16-19	62	31	3	0	0	0	0	0	96
	20-24	159	1046	286	34	4	2	0	0	1531
	25-29	50	1357	5304	860	79	17	1	0	7668
	30-34	15	512	3563	3508	393	47	7	1	8046
	35-39	6	146	894	1698	809	120	32	3	3708
	40-44	1	36	205	487	489	233	56	7	1514
	45-49	0	13	43	119	140	140	73	18	546
	50+	0	7	18	50	96	118	127	328	744
	Total Number of Cases									23853

# Myths

## **Ageing is no big deal:**

Speed and magnitude and 80% growth is from migrants.

## **A smaller population size to Hong Kong is good:**

Yes it is only true if we can choose who is going to stay.

## **Increasing fertility measures in overseas countries is useless:**

The reduction of the TFR in other countries has levelled off around 1.3 but not in Hong Kong

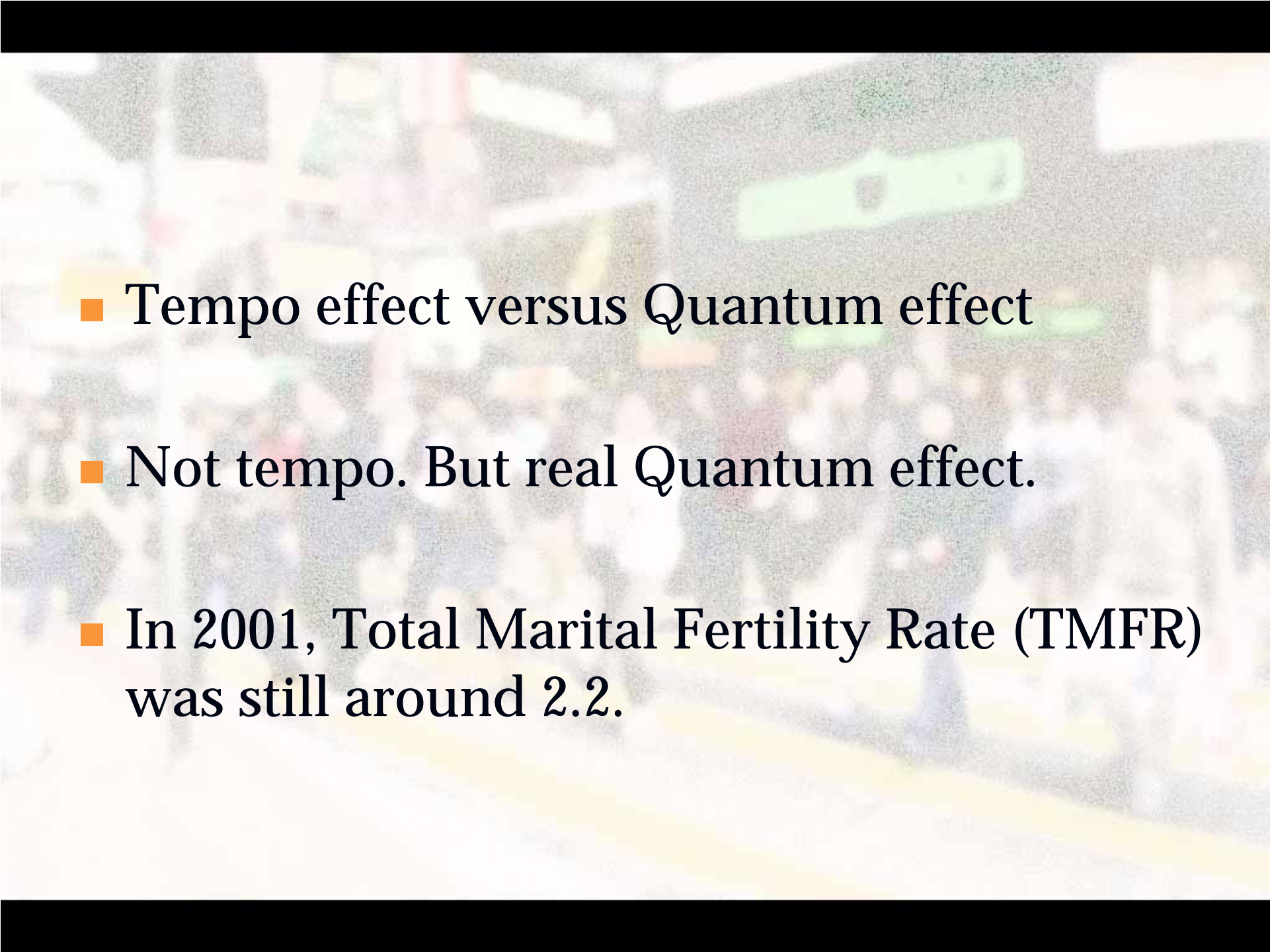
## **Hong Kong can have unlimited supply of people from China, it is a city**

The supply is unstable and unreliable. Hong Kong has become less attractive in attracting migrants

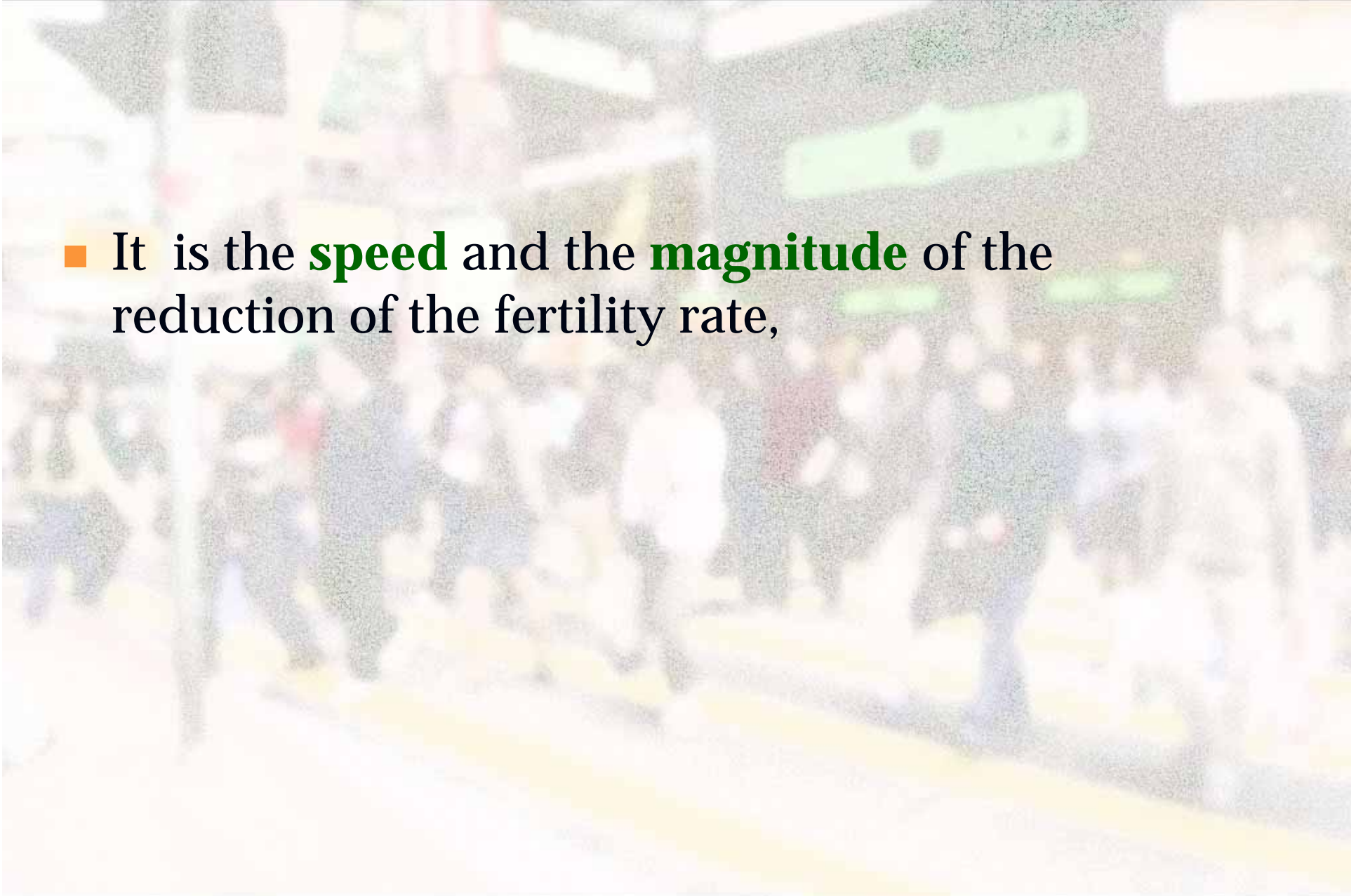
## **Silver Hair Market**

It might be true twenty years later but not now

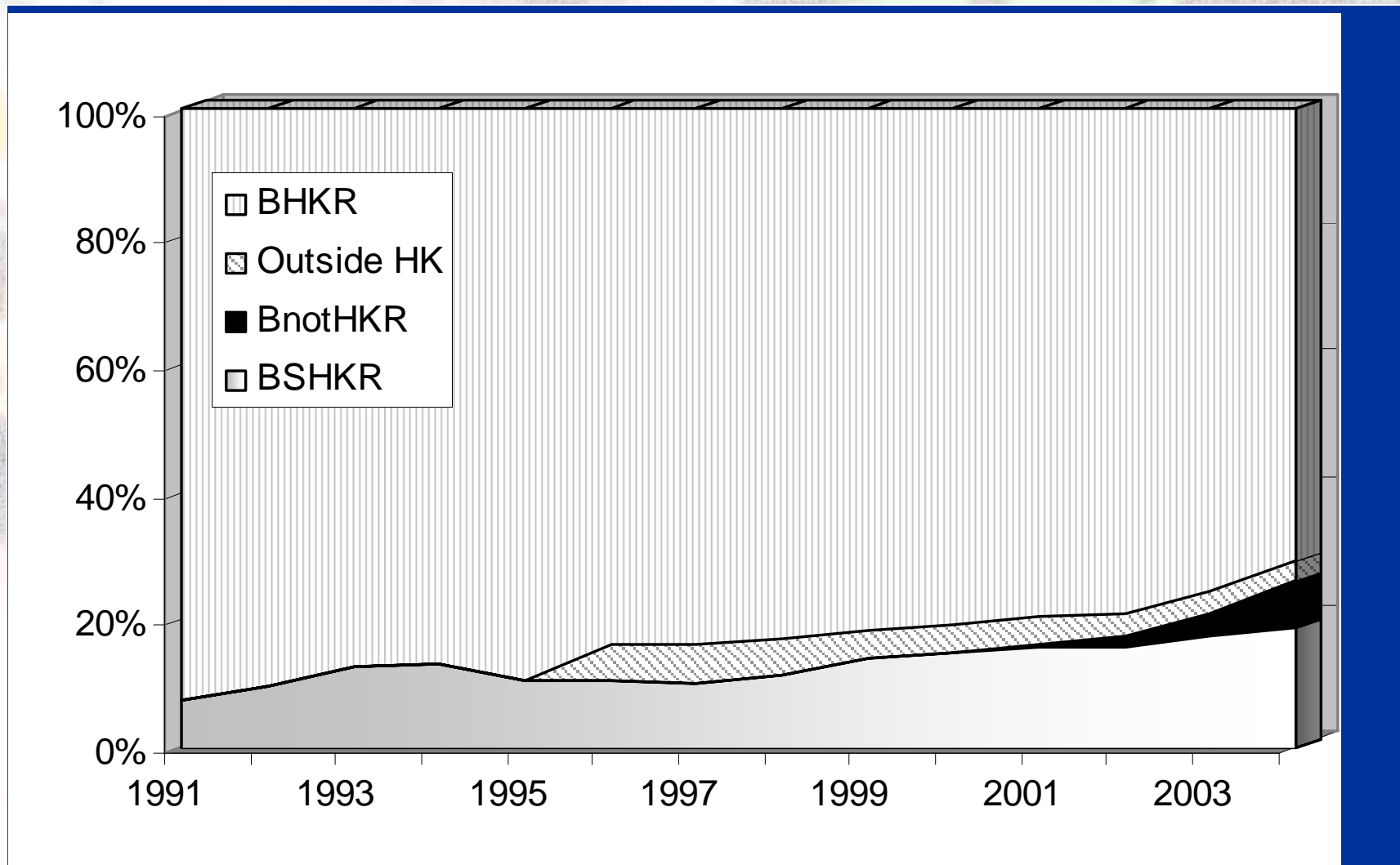
## **Fertility is going to rebound soon** **NOT YET** about 1/3 from non-Hong Kong residents in 2005

- 
- Tempo effect versus Quantum effect
  - Not tempo. But real Quantum effect.
  - In 2001, Total Marital Fertility Rate (TMFR) was still around 2.2.

- It is the **speed** and the **magnitude** of the reduction of the fertility rate,



# Proportion of live births born in Hong Kong, 2001-2004



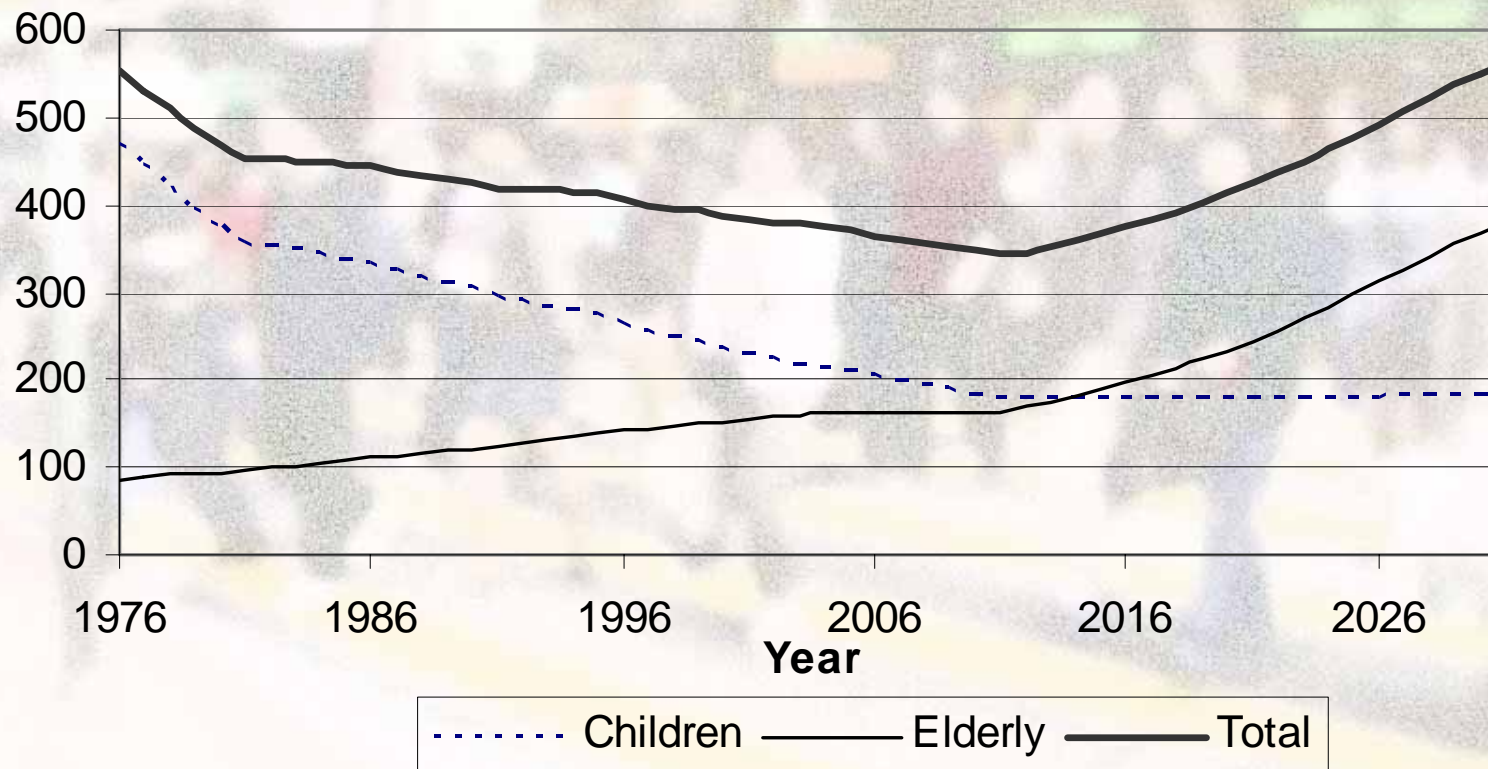
## Demographic Ratio (DR)

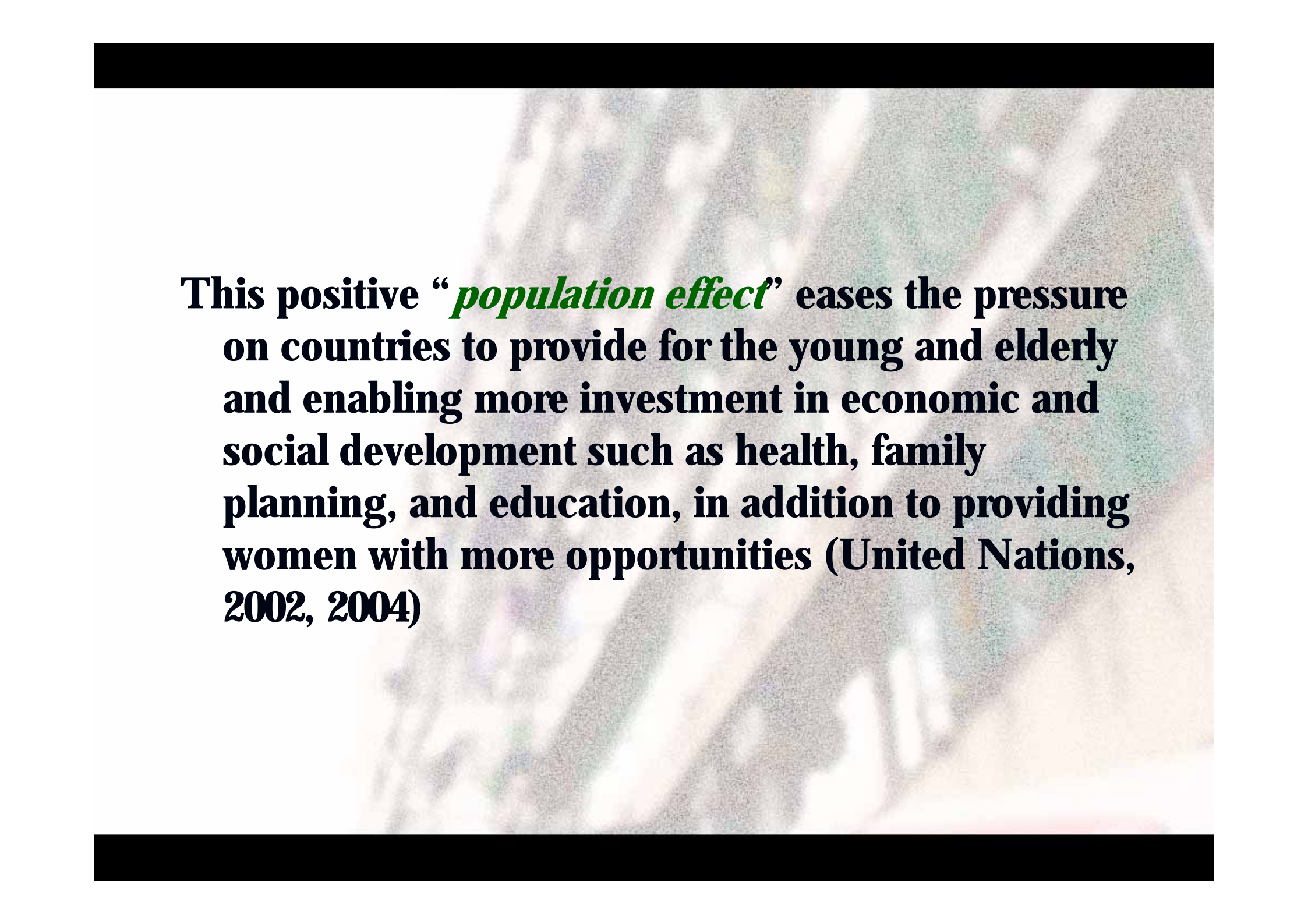
$$DR = \frac{0 - 14 \text{ and over } 65}{15 - 64}$$



# Dependence Ratio

Dependency ratios for Hong Kong population,  
1976 - 2031



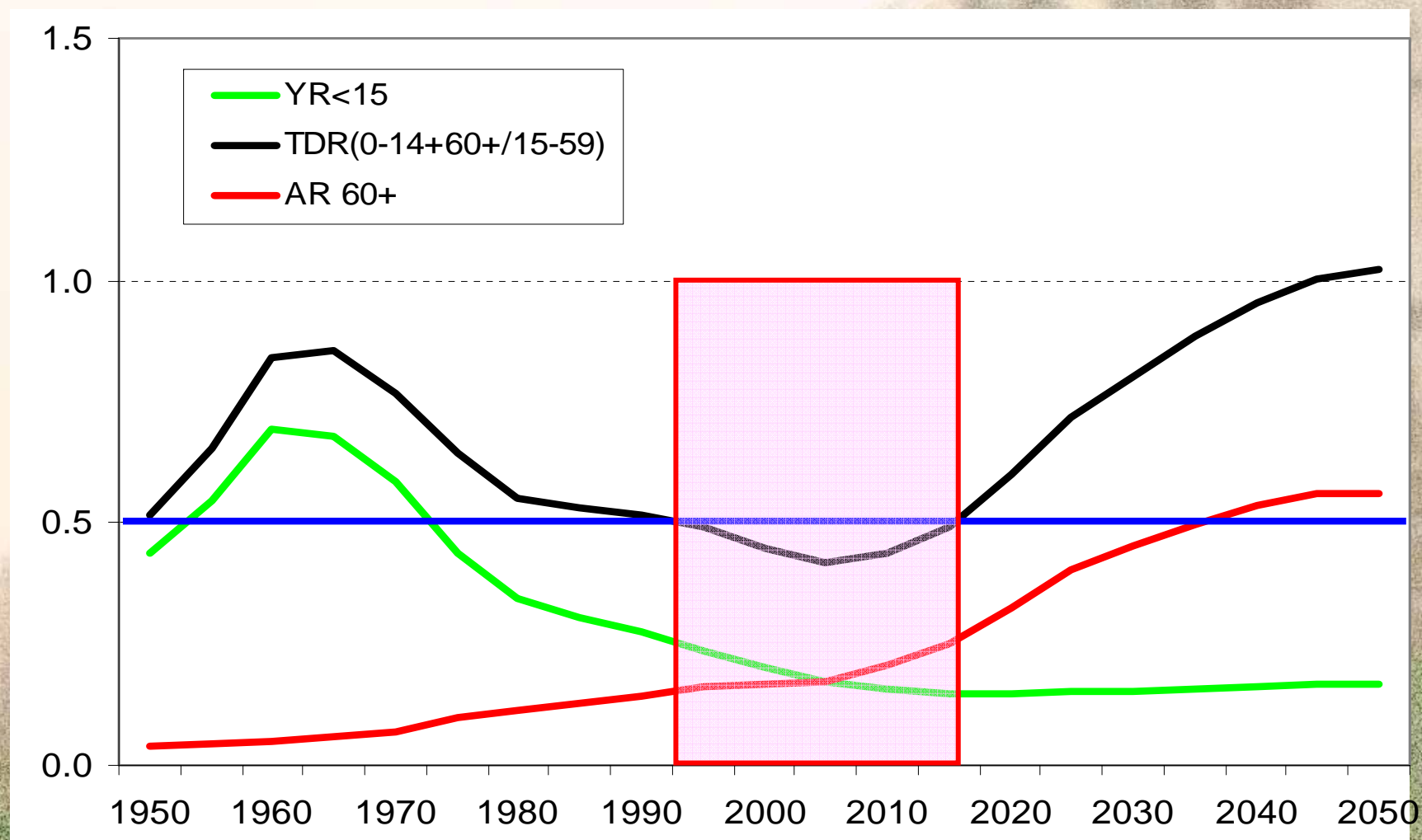


**This positive “*population effect*” eases the pressure on countries to provide for the young and elderly and enabling more investment in economic and social development such as health, family planning, and education, in addition to providing women with more opportunities (United Nations, 2002, 2004)**

# Demographic window

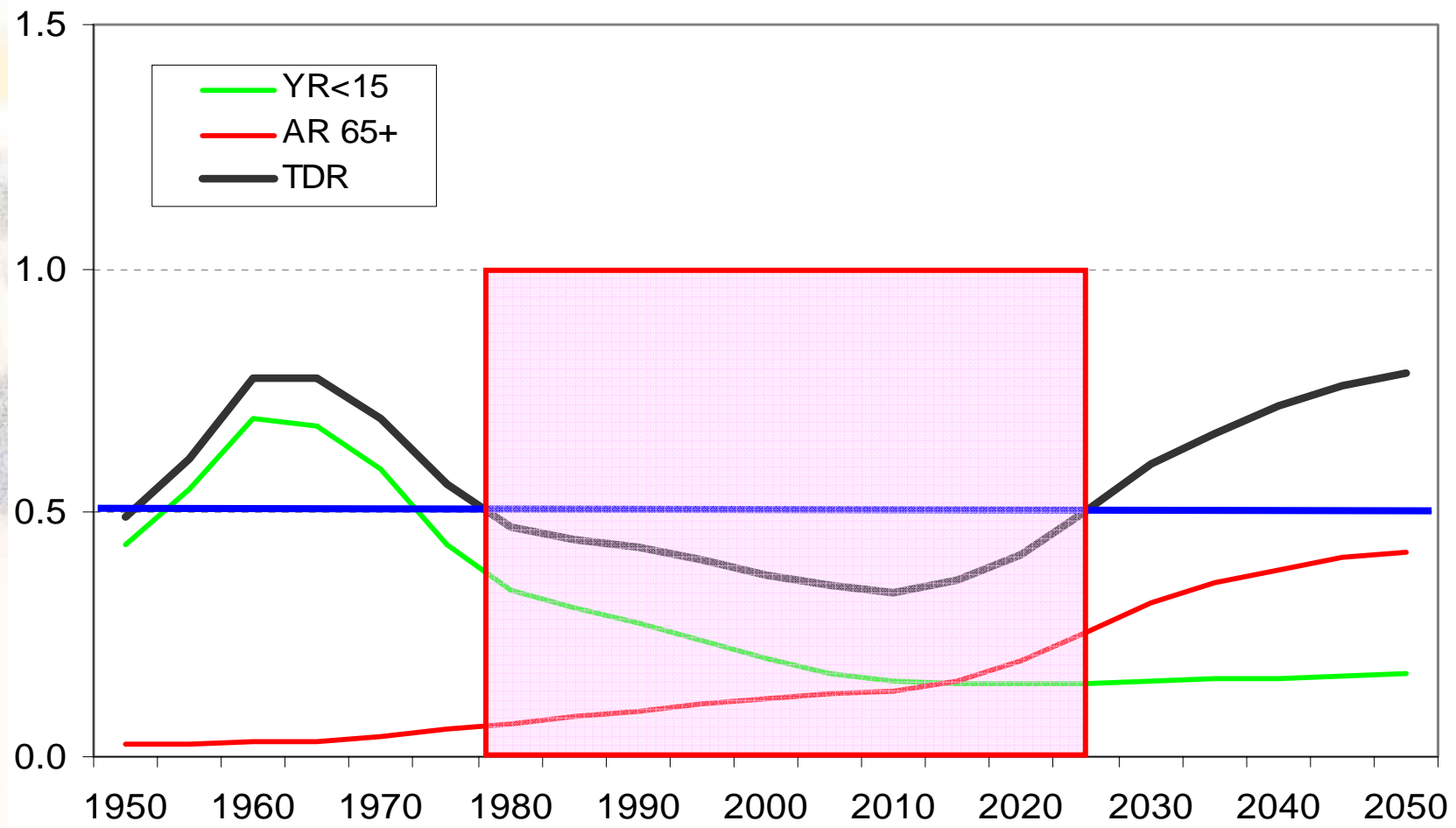
- Benchmark:  
1 dependent to 2 independents  
Total dependency ratio (TDR)=0.5
- When the population's TDR shifts below 0.5, it gives a golden opportunity for the community to improve the quality rather than the quantify of the population.

## Window closes earlier when the age truncating for total dependency ratio changed

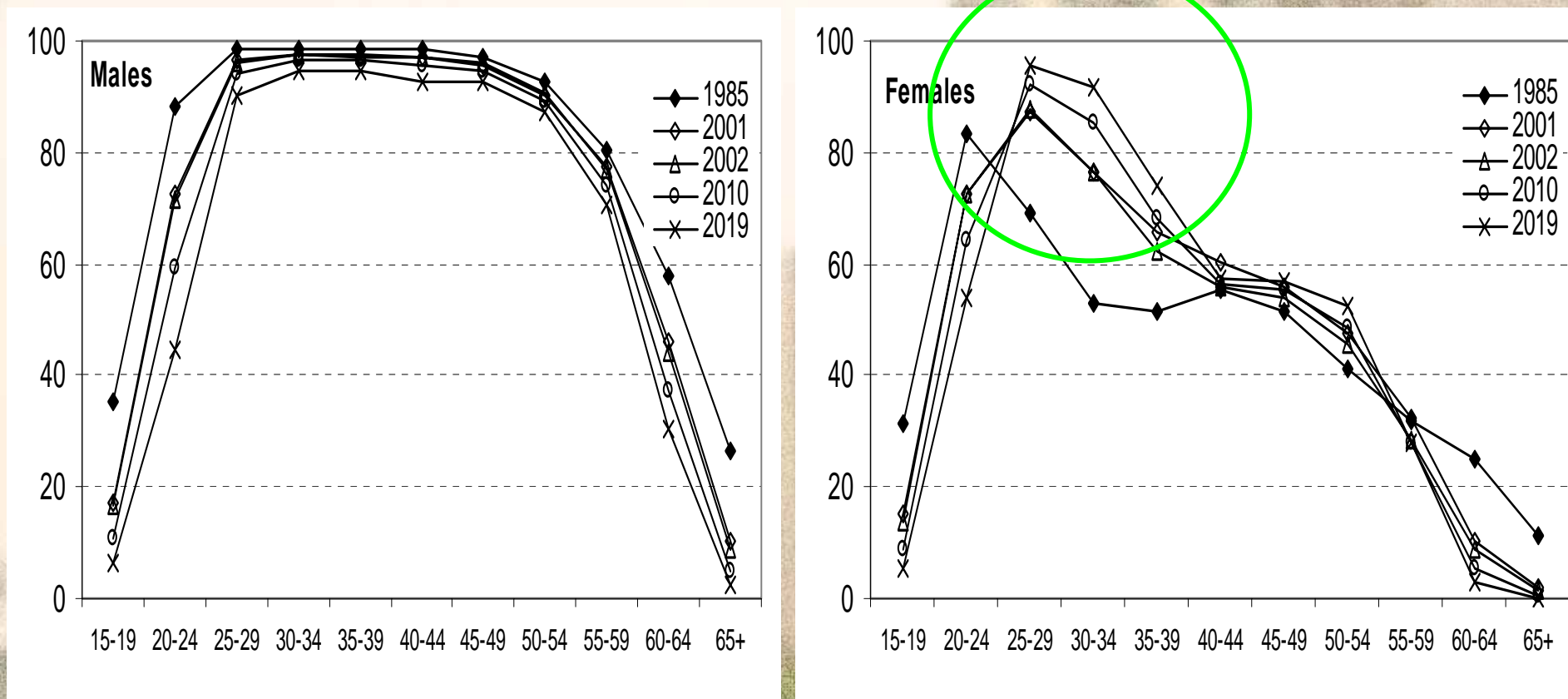


Source: United Nations World Population Prospects: The 2002 Revision

# Change in young ratio <15, ageing ratio 65+ & total dependency ratio in Hong Kong, from 1950 to 2000, prospects to 2050



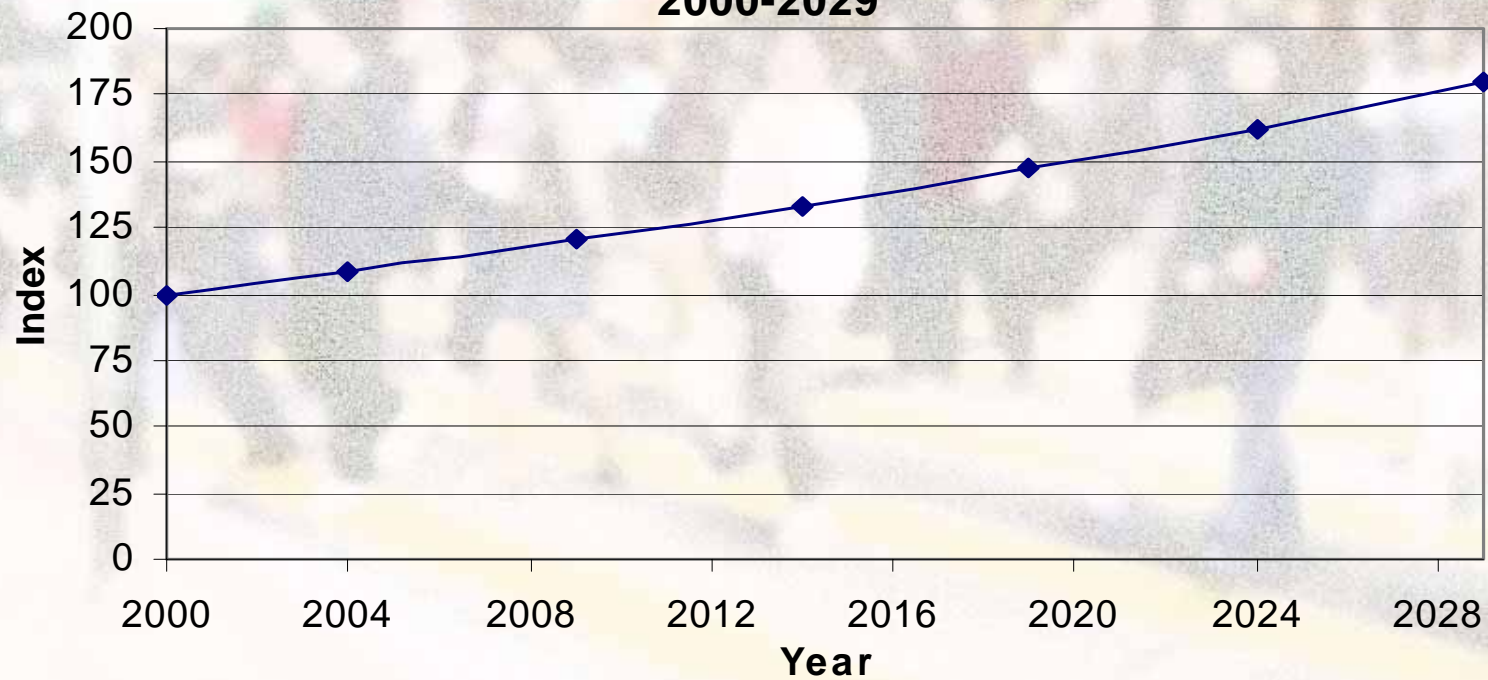
# Change in labour participation rate, by age and sex, Hong Kong, from 1985 to 2001 and prospects up to 2019



Source: General Household Survey 1985-2001, Hong Kong Census and Statistics Department

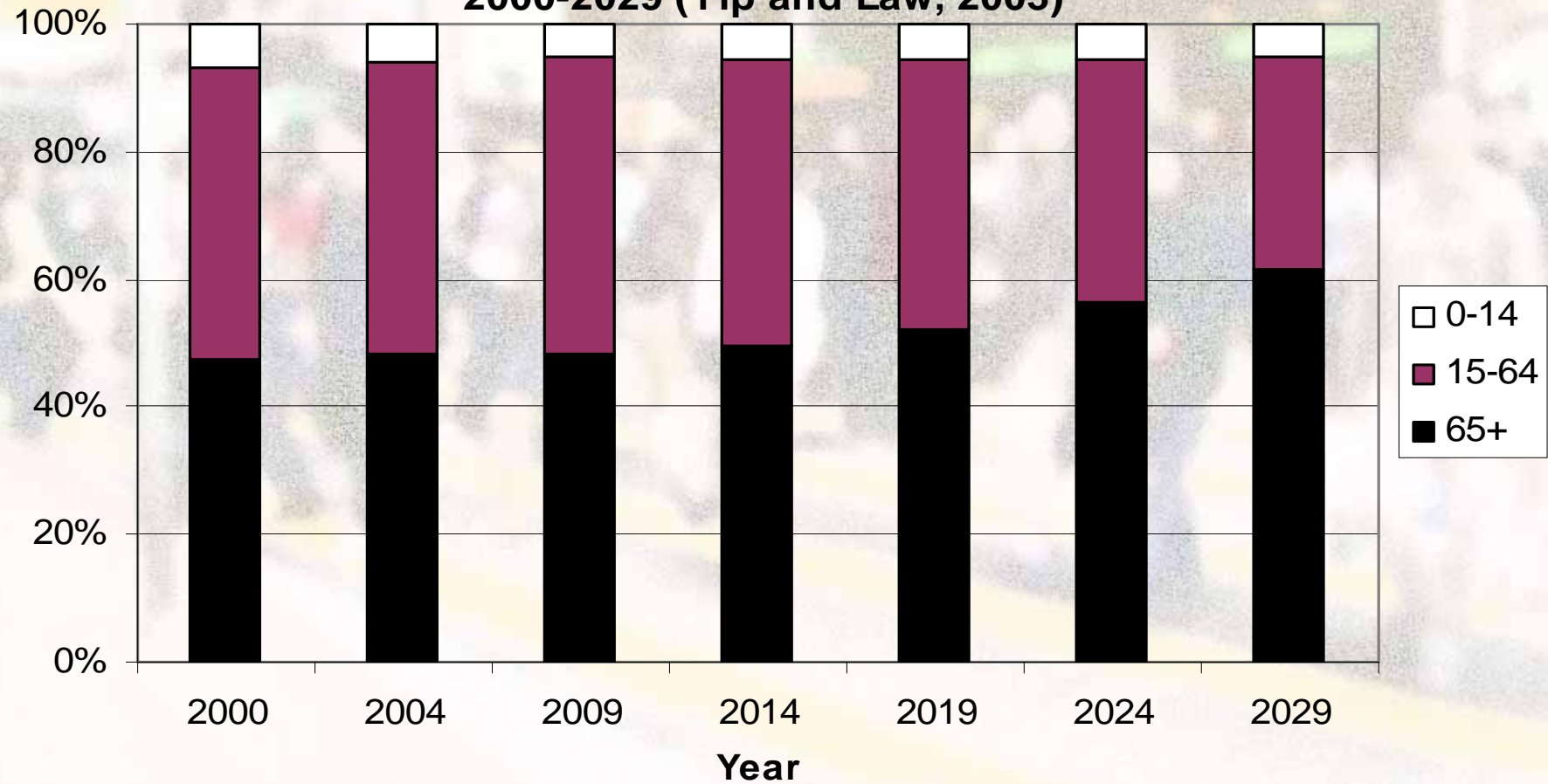
# Implications: Health

Figure 4: Hospital patient days needs index, HKSAR, 2000-2029



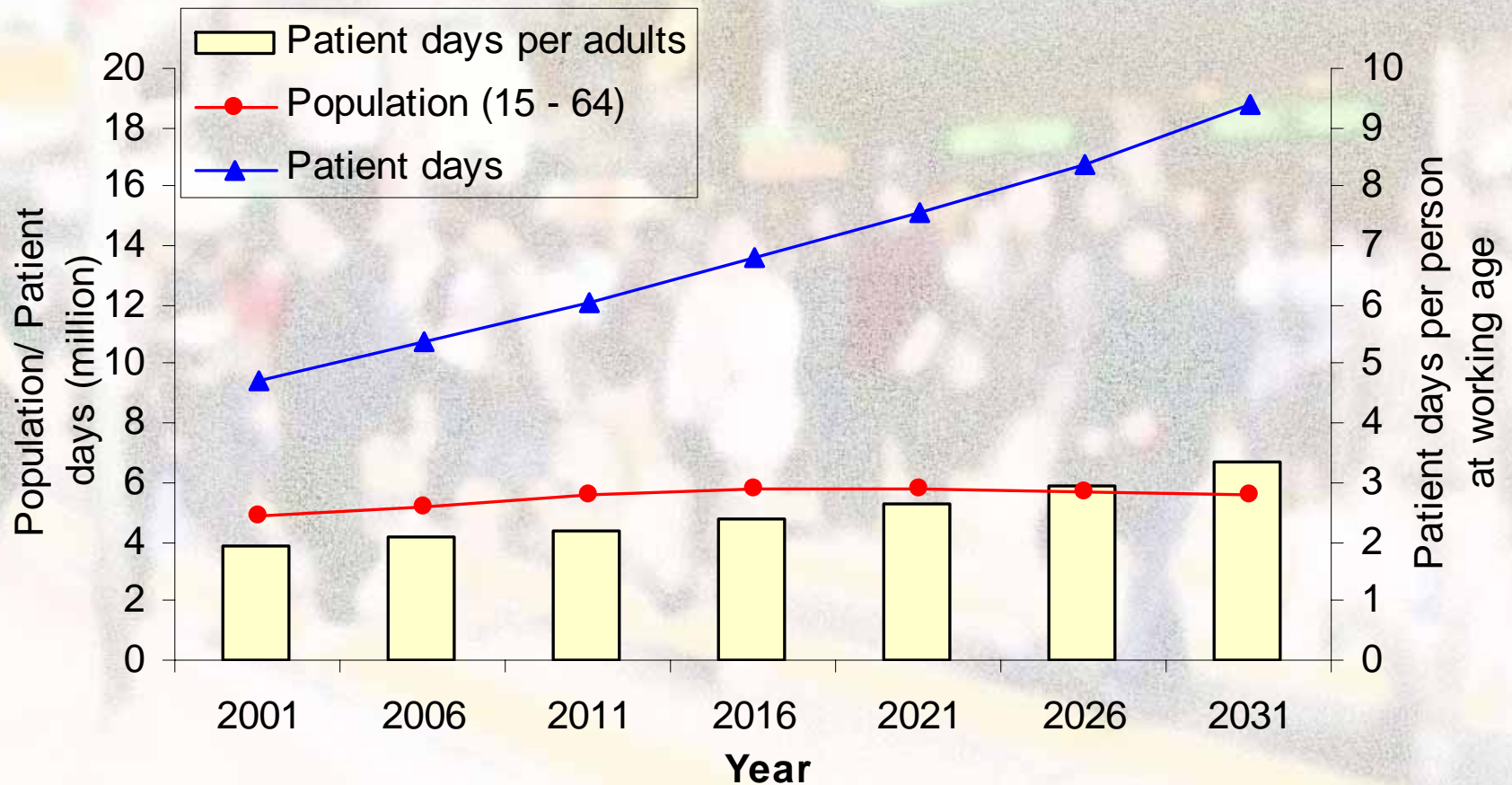
# Health (continue)

Age distribution of of patient days utilisation, HKSAR, 2000-2029 (Yip and Law, 2003)





**Fig. 4.2: Projected patient days, population at working ages and patient days to adult ratios, HKSAR, 2001 - 2031 (Yip and Law, 2003)**

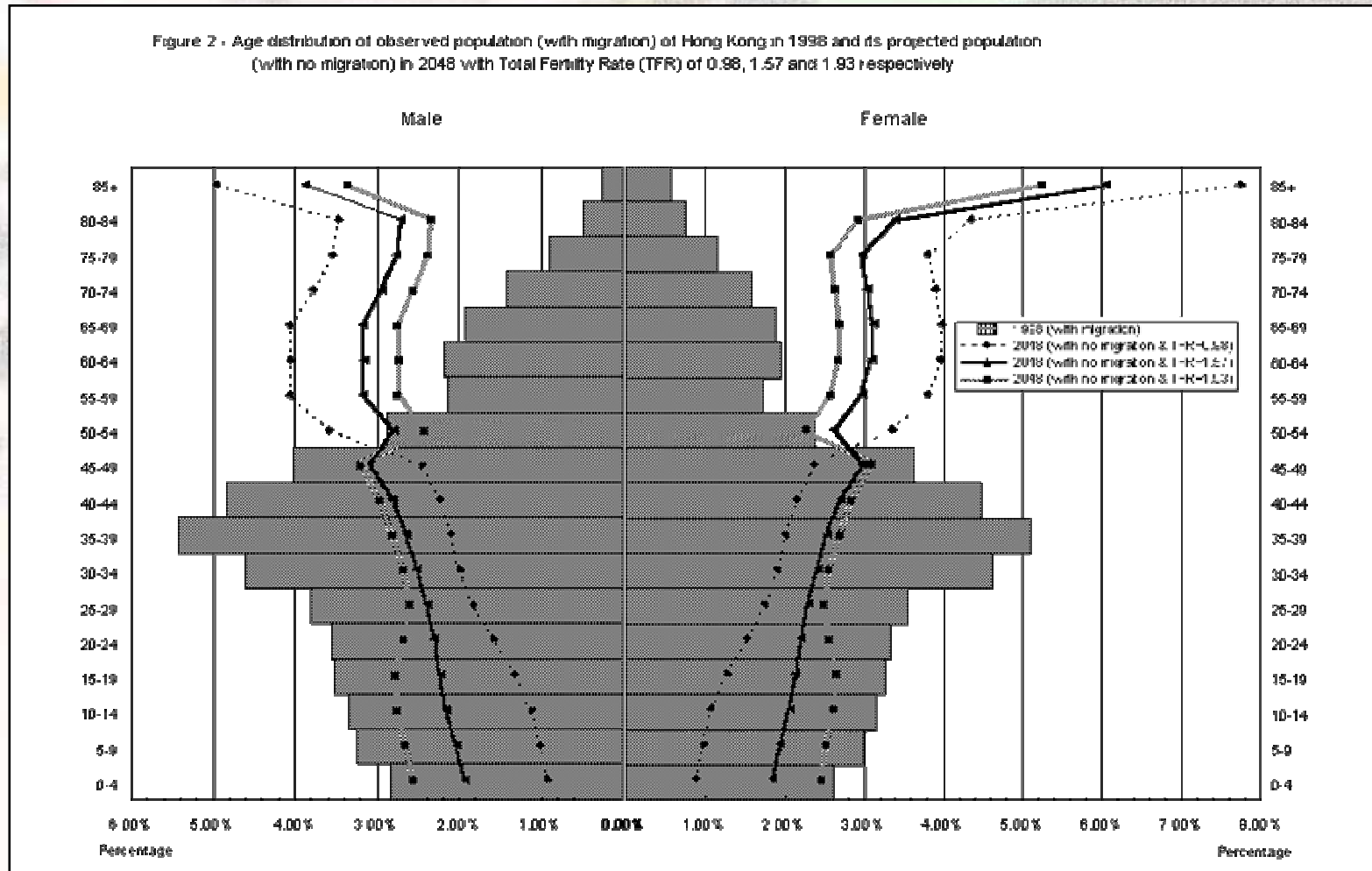


# Health Care implications

- **Sources of Support:**
- Family members support: decreasing
- Government support: Increasing
- Health Care Protection account: The existing cohort of those aged 40 or above might not have enough.

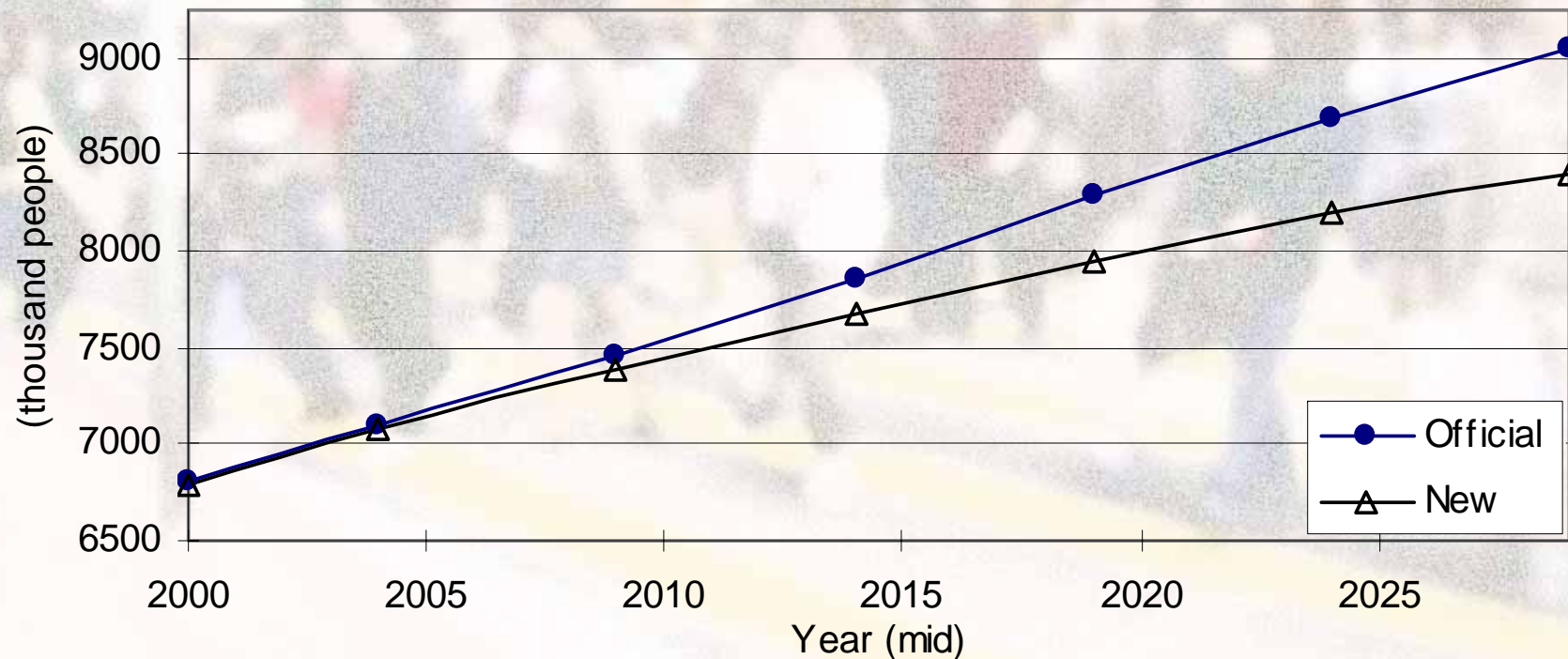
# Migration: slow down ageing

Figure 2 - Age distribution of observed population (with migration) of Hong Kong in 1998 and its projected population (with no migration) in 2048 with Total Fertility Rate (TFR) of 0.98, 1.57 and 1.93 respectively



# The difference between the proposed and the official projection

Comparison of official projection and new projection, HKSAR, 2000-2029





# Three-fold challenges

- How to revert the low fertility:
- Replacement Migration:
- Healthy Population:

## Low fertility

- About 60% reduction is due to change of marital distribution rather than the reduction of marital fertility.
- Promoting fertility, CS suggested to have three. However the married one on average have 2 already.
- Engage the newborns from Mainland born mothers in Hong Kong
- *Family friendly work practice*: including longer maternal or paternal leave for parents, child care facilities, tax reduction and shortening of

working hours.

# Replacement migration

- About more than 80% of the population growth from migration.
- The new comers rejuvenate and inject new blood into the community.
- They are not coming and not very stable (38100 one-way permit holders in 2004; 55,000 in 2005).
- Impact on the labour force: postponement of the retirement age.
- Successful experience in Shanghai about 30% are newly migrants

# Healthy Population

- Life-long health promotion and practice
- Healthy life style.
- Prevention: to prevent unnecessary health cost: for example, abortion, smoking and attempted or completed suicides



- LAW, C.K. and YIP, P.S.F. (2002). Acute care service utilization and the possible impacts of a user-fee policy in Hong Kong. *Hong Kong Medical Journal*, **8**, 348-353.
- LAW, C.K. and YIP, P.S.F. (2002). Healthy Adjusted Life Years of Hong Kong, SAR. *International Journal of Public Health*, **81**, 1-7.
- LAW, C.K. and YIP, P.S.F. (2002). Viability of the health protection account in Hong Kong. *Hong Kong Medical Journal*, **8**, 262-8.
- YIP, P.S.F. and LAW, C.K. (2002). Assessment of the future resources and needs for hospitalization in Hong Kong SAR. *The International Journal of Health Planning and Management*, **17**, 113-122.

- YIP, P.S.F. and LEE, J. (2002). The impact of the changing marital structure on the fertility rate of Hong Kong SAR. *Social Science and Medicine*, **55**, 2159-2169.
- CHEUNG, Y.B. and YIP, P.S.F. (2001). Social patterns of birth weight in Hong Kong, 1984-1997. *Social Science and Medicine*, **52**, 1135-1141.
- YIP, P.S.F., LEE, J, CHAN, B. and AU, J. (2001). A study of demographic changes under sustained below -replacement fertility in Hong Kong SAR. *Social Science and Medicine*, **53**, 1003-1009.