

2012金融與經濟政策研討會：

臺灣與主要國家人口高齡化趨勢

主題：亞洲新經濟時代
來臨台灣財經政策走向

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臺灣地區人口結構趨勢

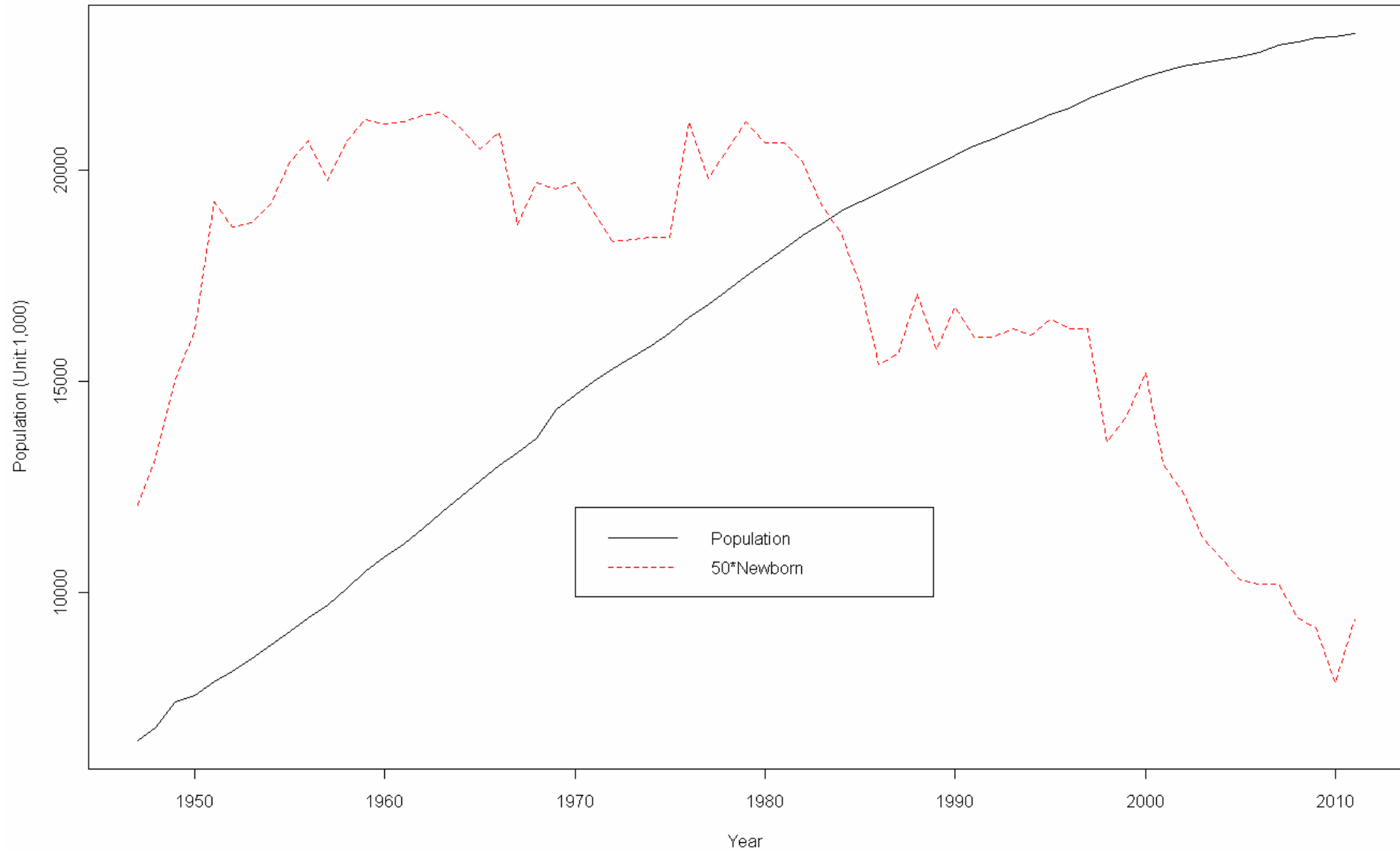
- 臺灣地區在50年內，因為生育率及死亡率快速下降，迅速由「多生多死」、歷經「多生少死」、轉型至「少生少死」的高齡化社會。

→ 總生育率(TFR)由6.0降至1.0！

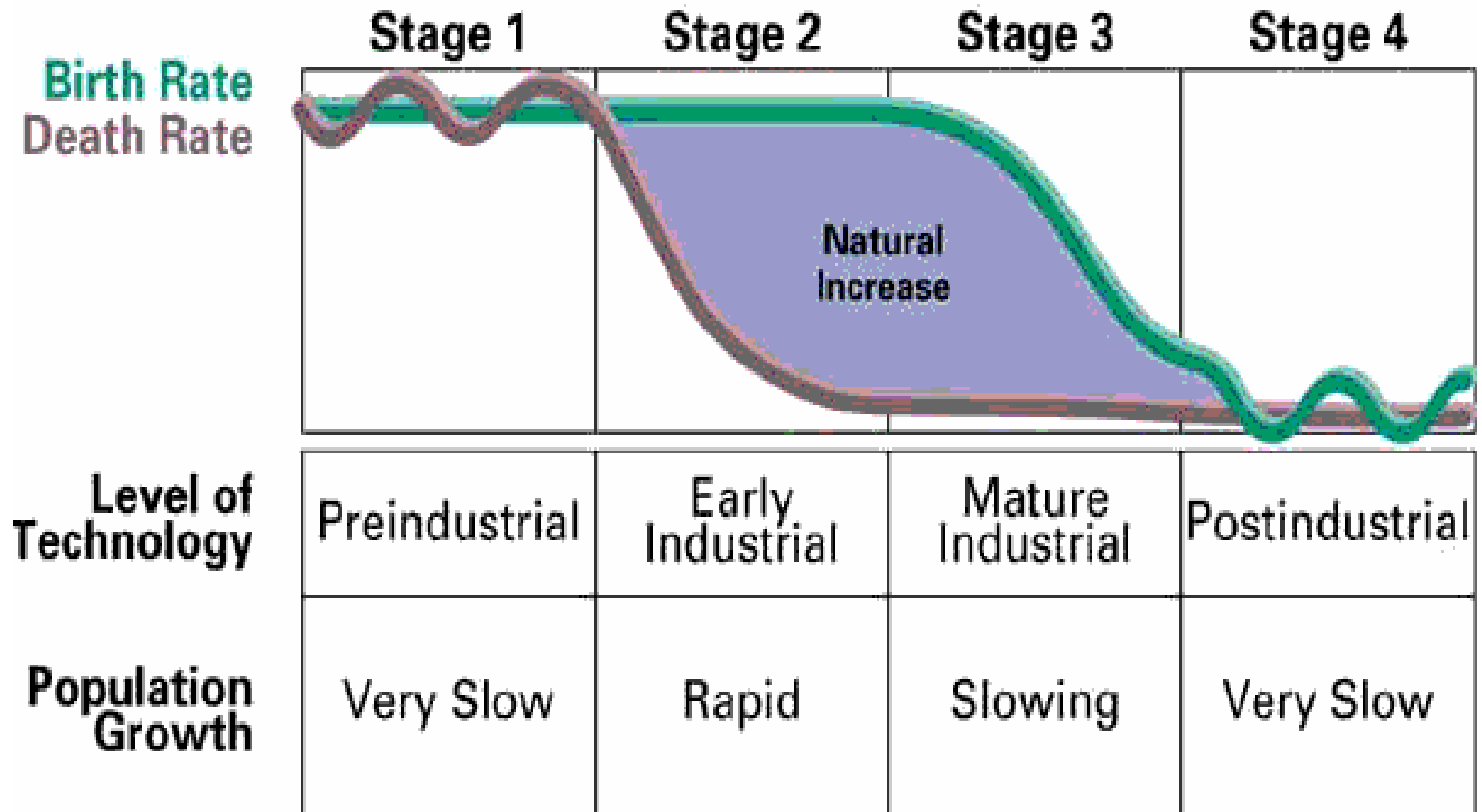
→ 平均壽命增加了大約15歲。

- 臺灣地區人口增長最快約在1950年末至1980年，倍增至二千萬人。（在這二十餘年，每年約有四十萬新生兒。）

臺灣地區歷年人口變化趨勢



人口轉型理論 (Demographic Transition)



註：人口總數在「多生少死」時增幅最大！

- 人口加倍意指：

$$P \cdot e^{rt} = 2P \Rightarrow e^{rt} = 2$$

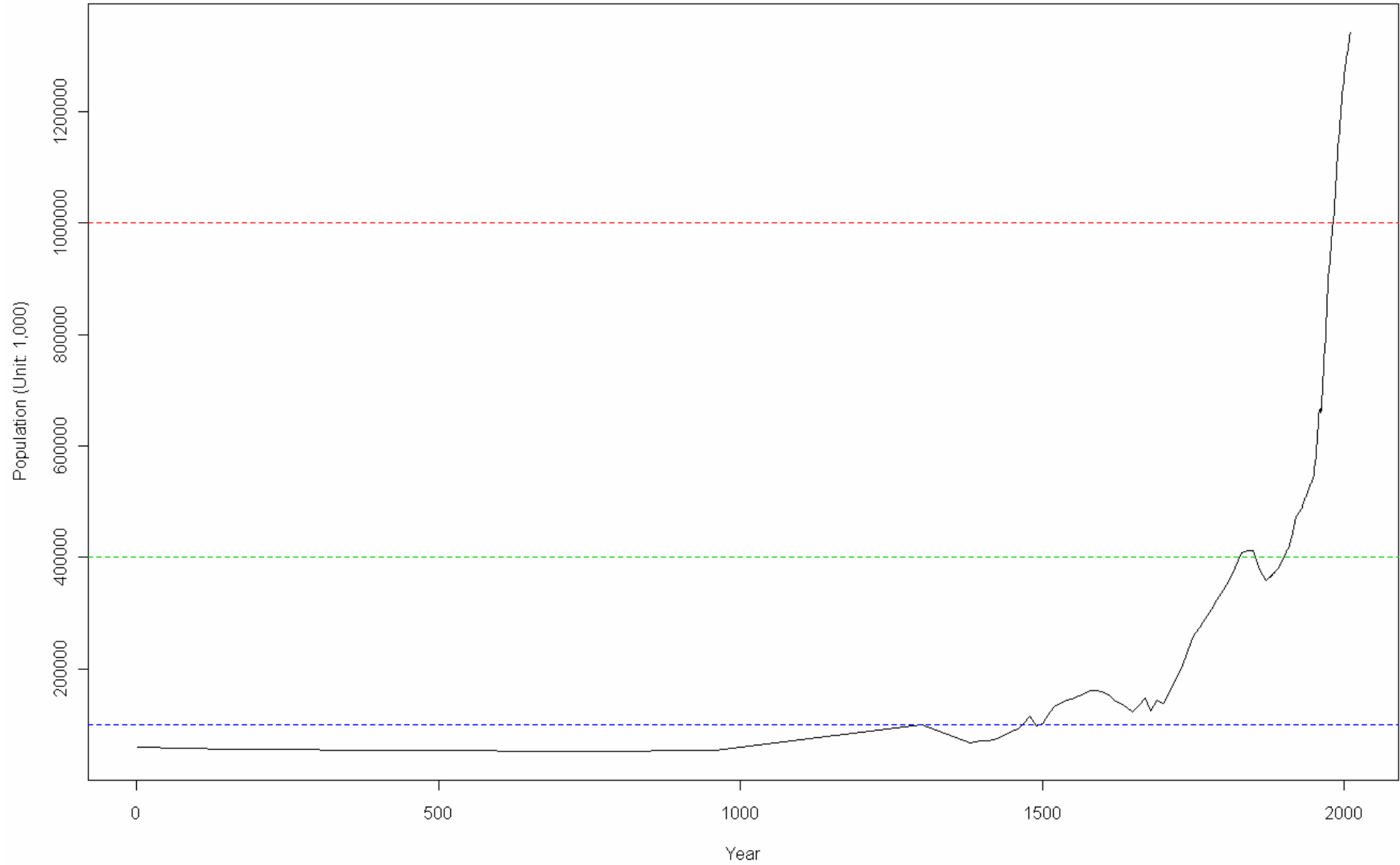
或可改寫為

$$rt = \ln 2 = 0.693 \Leftrightarrow t = \frac{0.693}{r} \approx \frac{70}{100r}$$

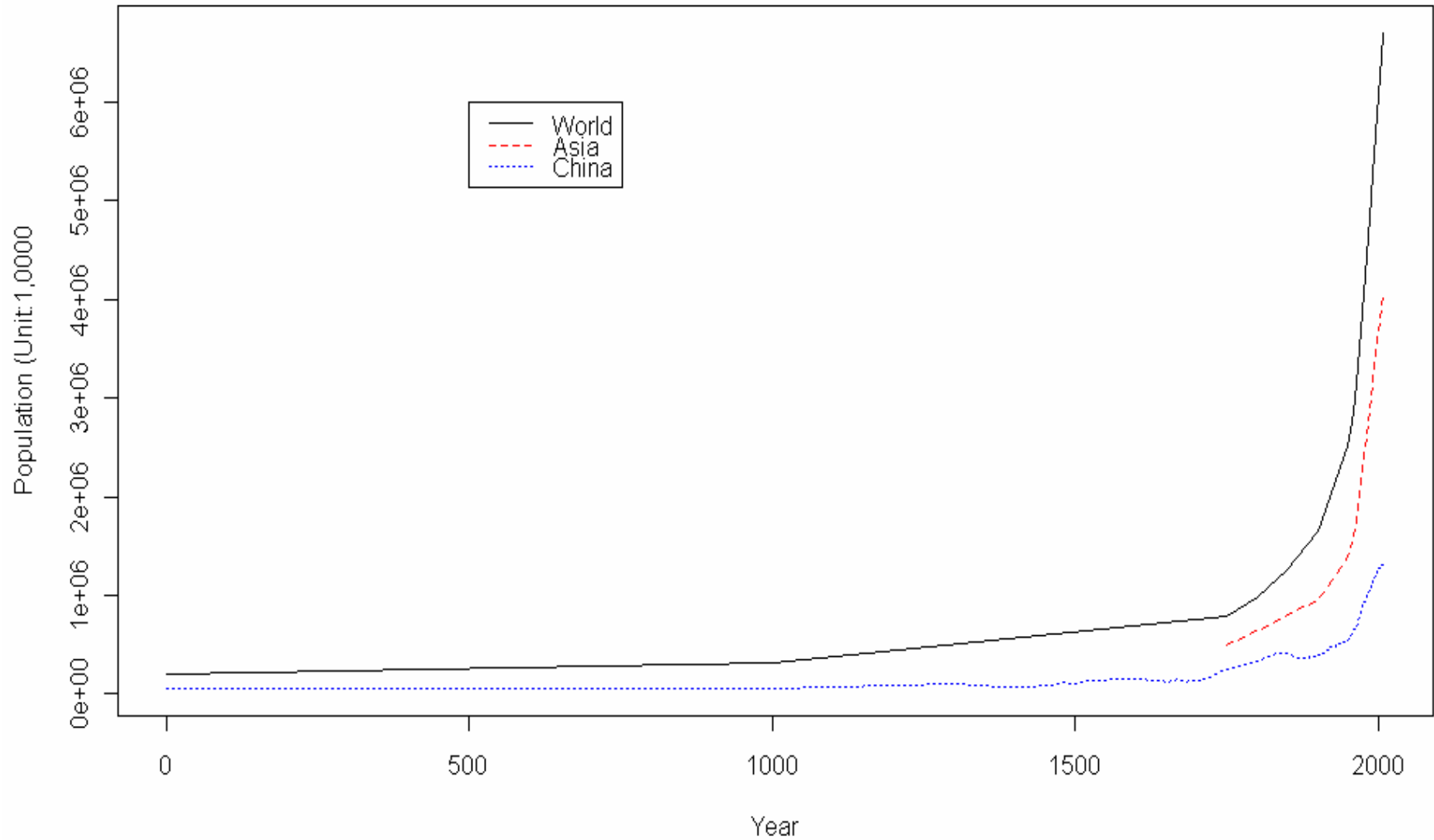
如果每年以 2% 成長，則僅需 35 年人口即能加倍。(中國古代年成長率有時不到 0.1%，因此需要將近 1000 年方能加倍。)

→ 臺灣在 1950~1980 年人口倍增，約只花了 25 年。

中國兩千年來人口趨勢



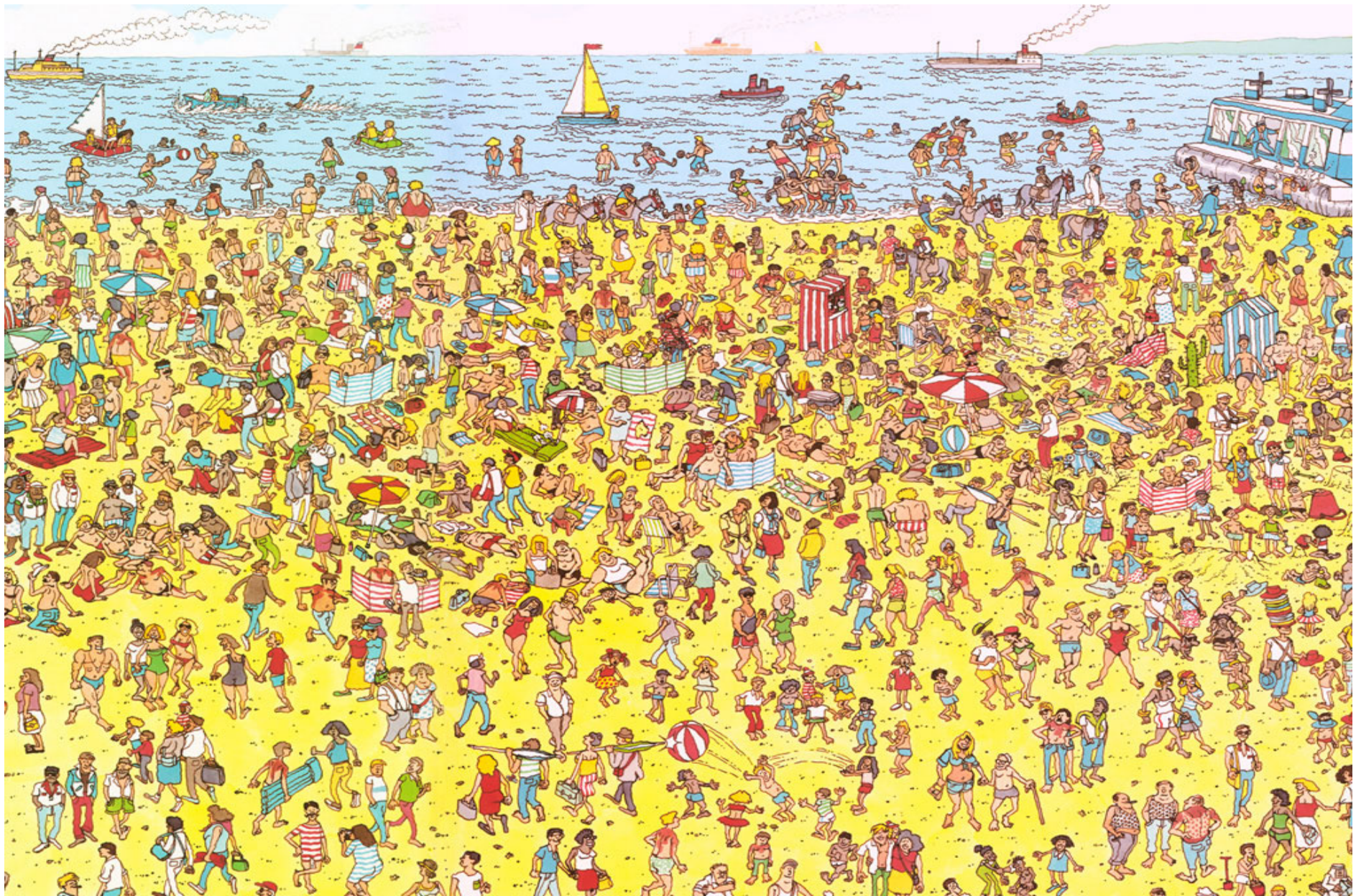
世界及亞洲兩千年來人口趨勢



人口爆炸！！



Where's Waldo ? ?

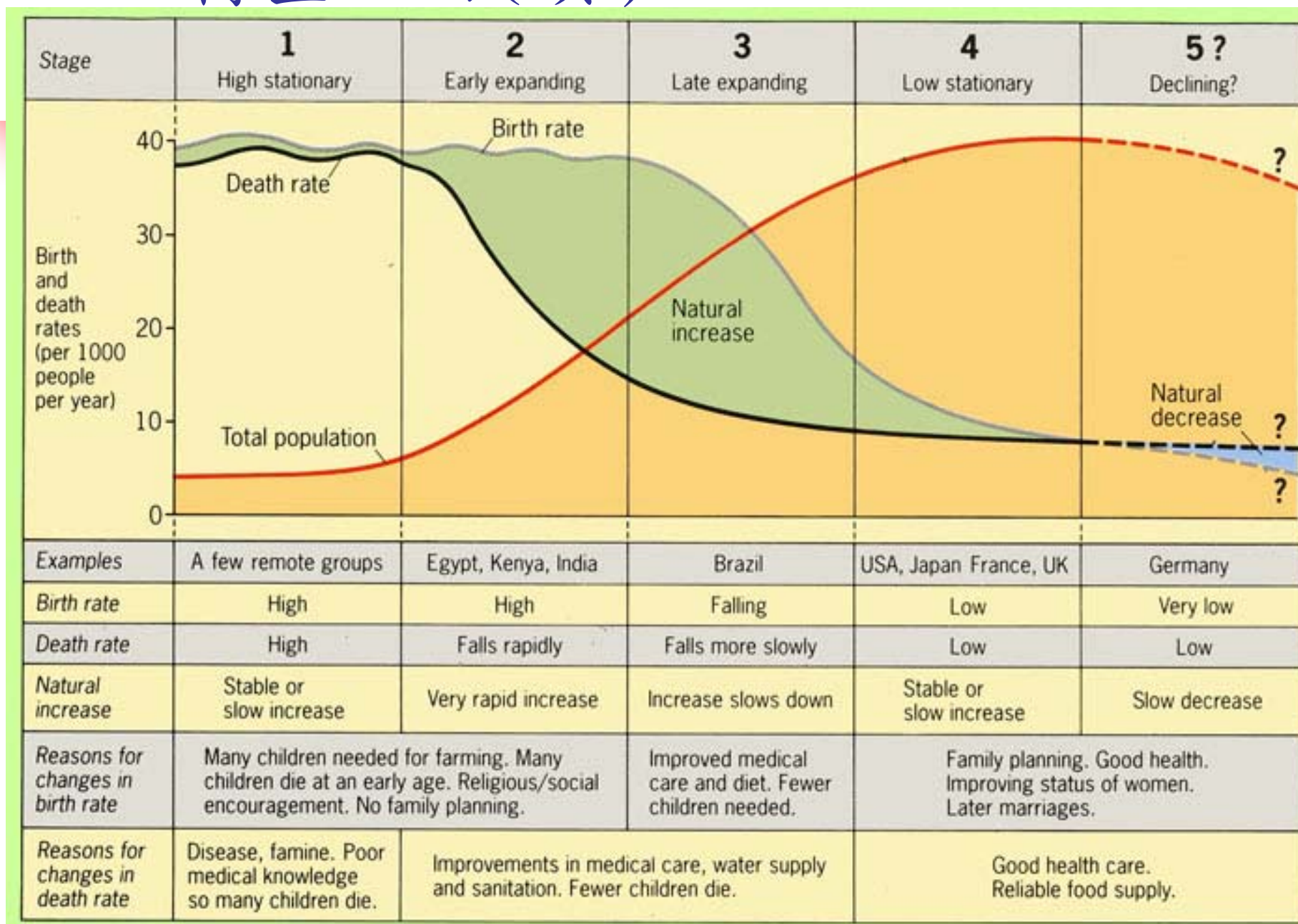


人口往都會地區集中。。





人口轉型理論(續)

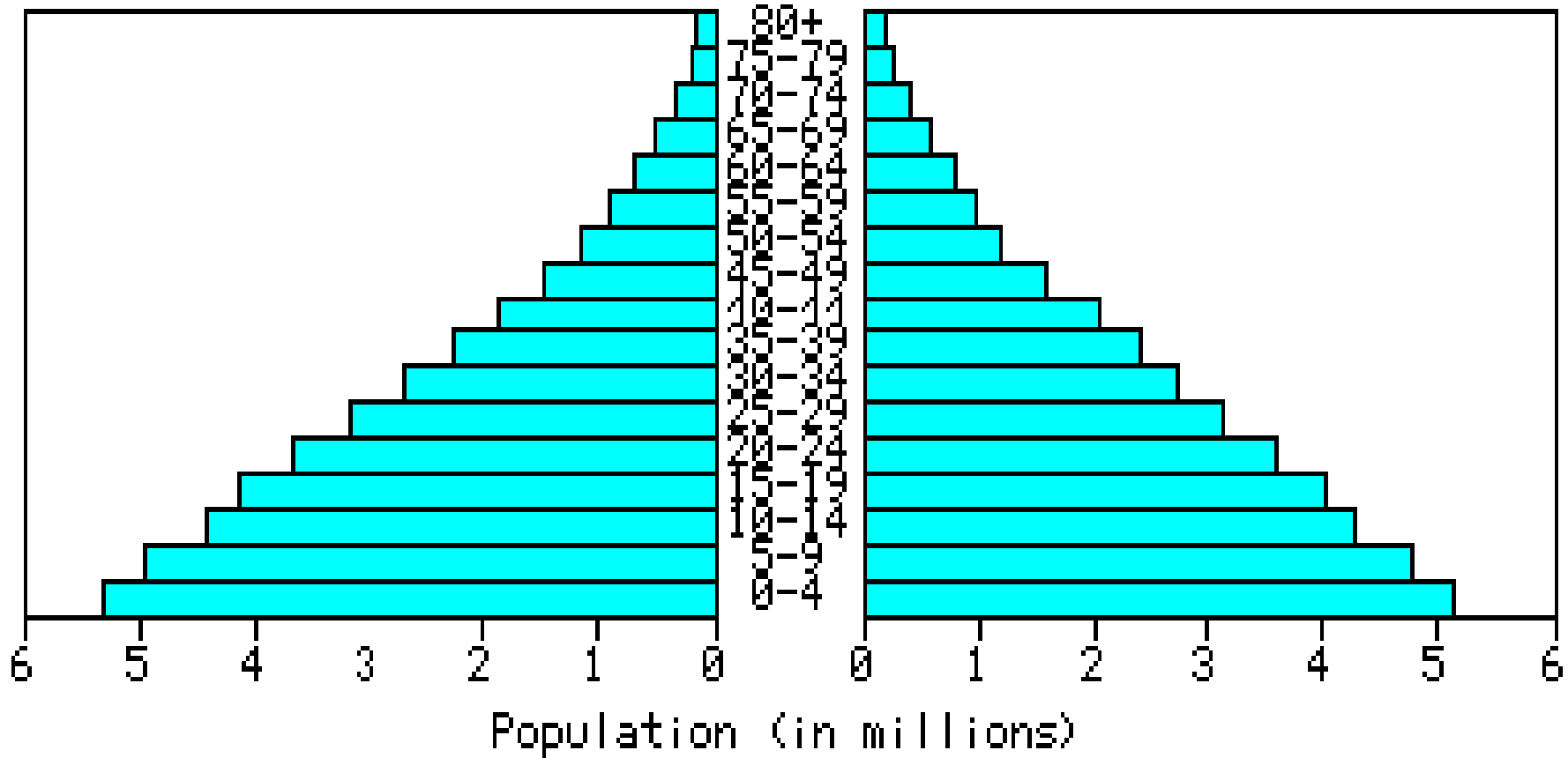


人口快速成長

Philippines: 1997

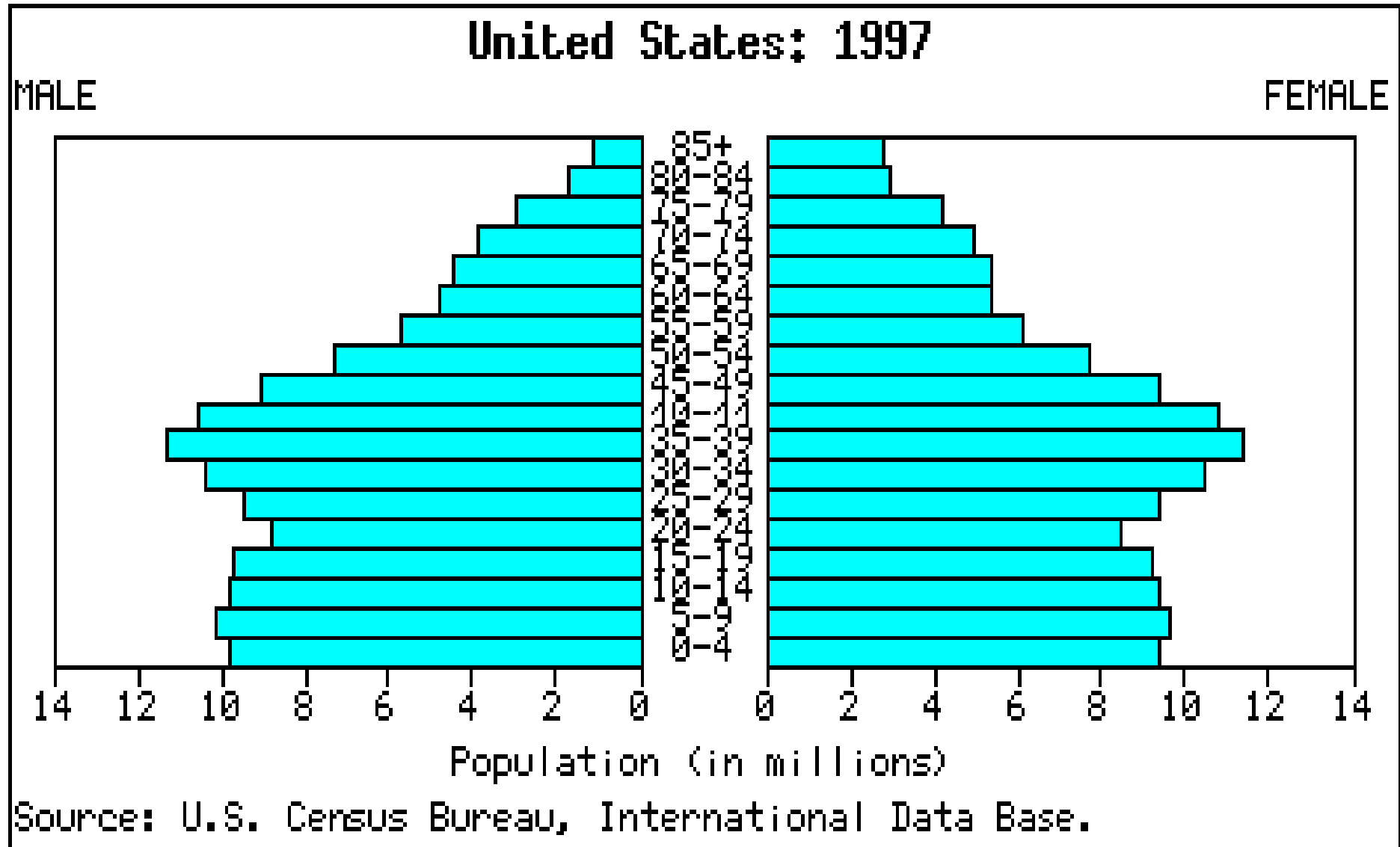
MALE

FEMALE



Source: U.S. Census Bureau, International Data Base.

人口緩慢成長





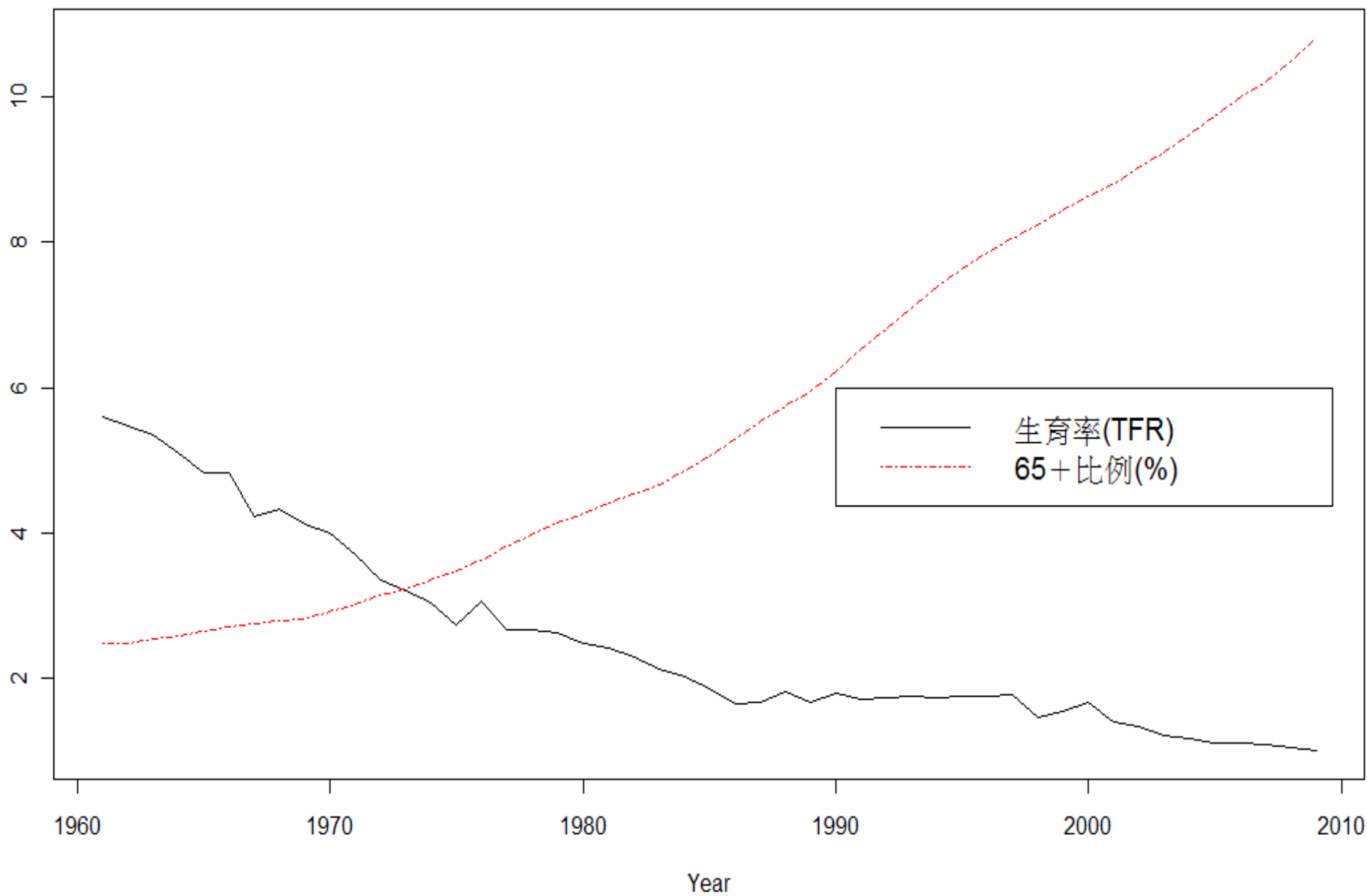
二十一世紀趨勢：老化、移民

- 因為壽命大幅延長、加上生育率的降低，臺灣地區和已開發國家類似，正面臨人口老化的危機。

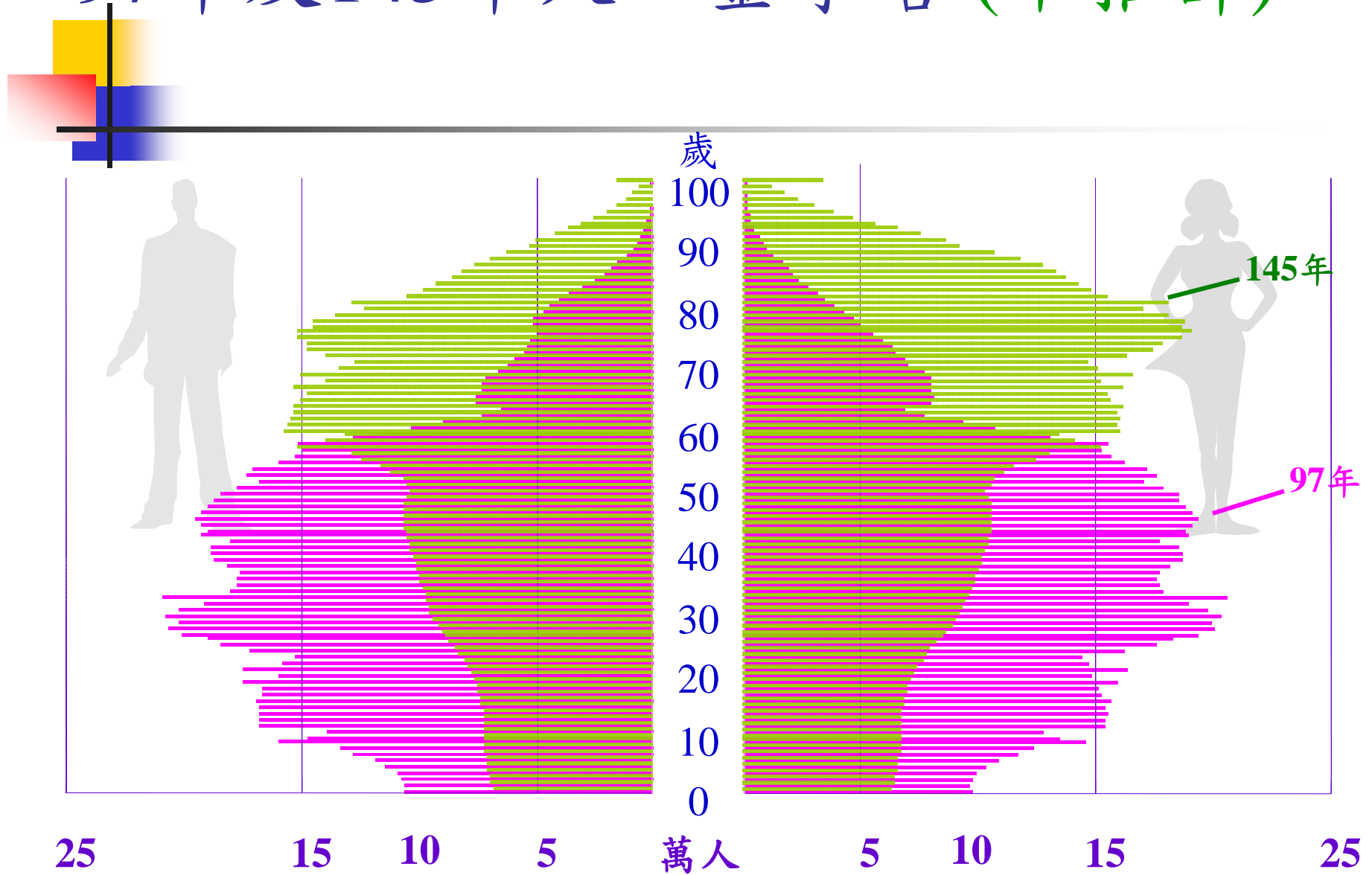
→ 人口老化的原因有二——死亡率的降低、出生率的降低。

- 出生數較少使得勞動人力不足，加上人口老化引發人力需求，移民變成二十一世紀的人口新趨勢。（包括：婚姻、投資、技術等移民。）

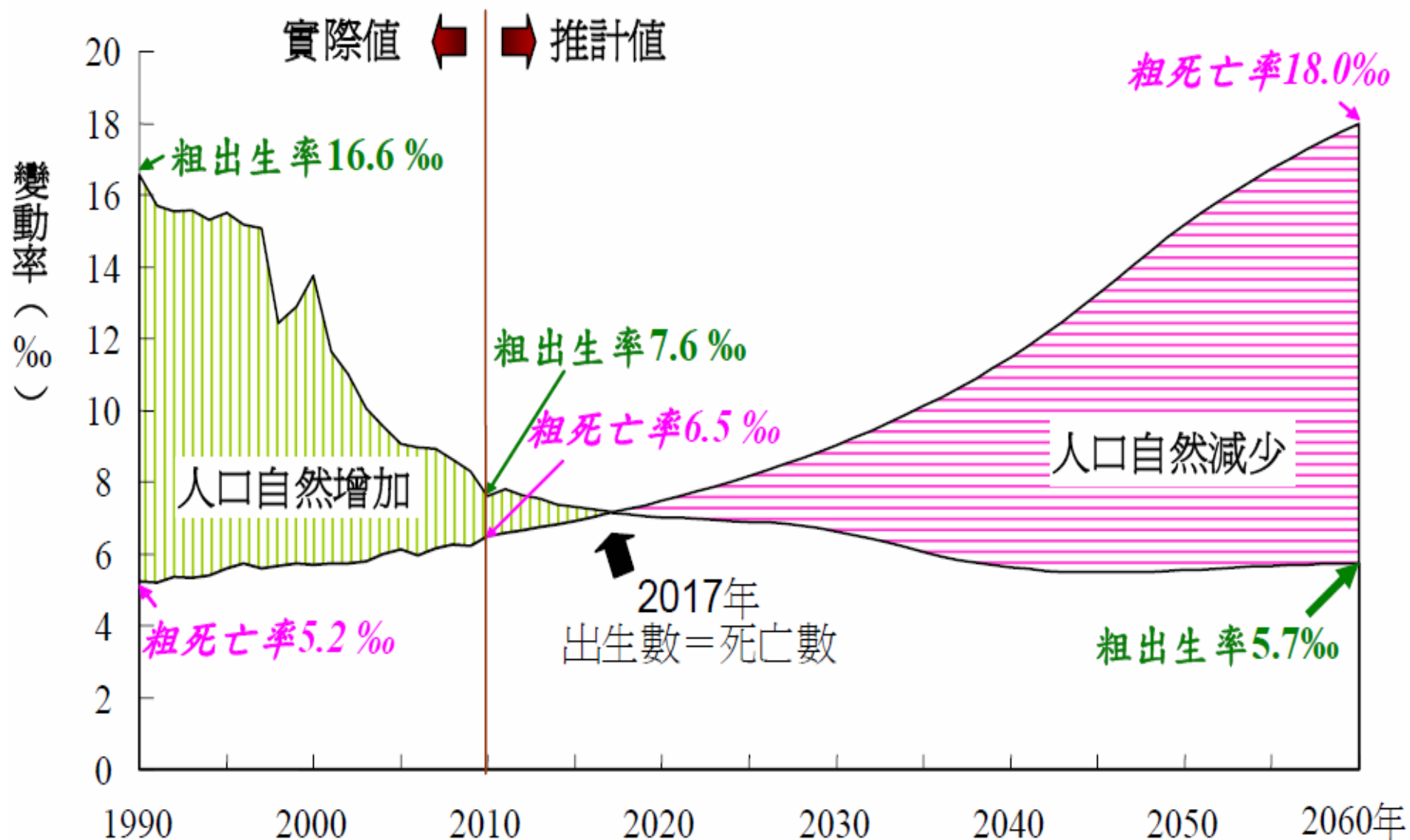
臺灣地區生育率與老年人口比例趨勢圖



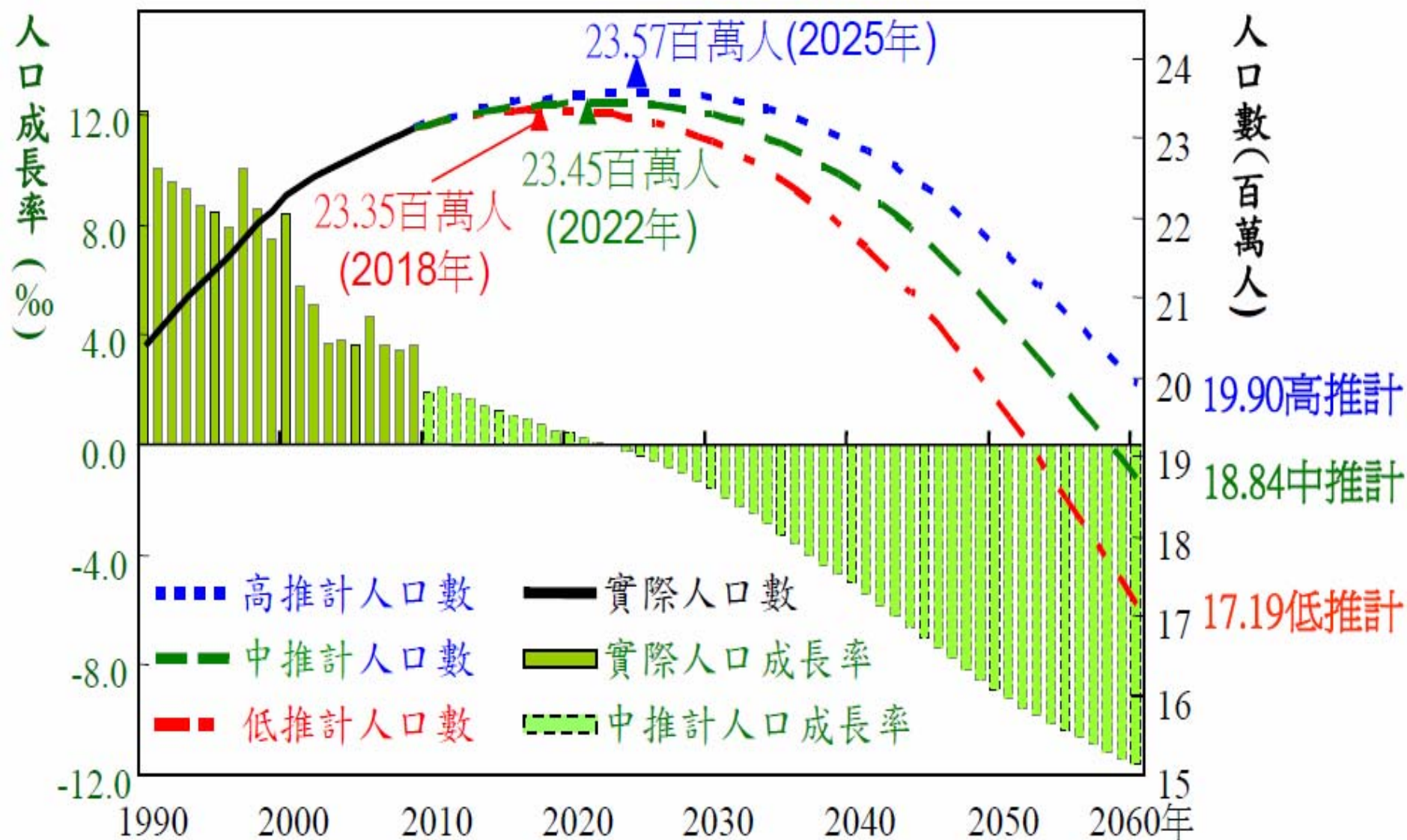
97年及145年人口金字塔 (中推計)



出生率、死亡率及自然增加率變動趨勢—中推計



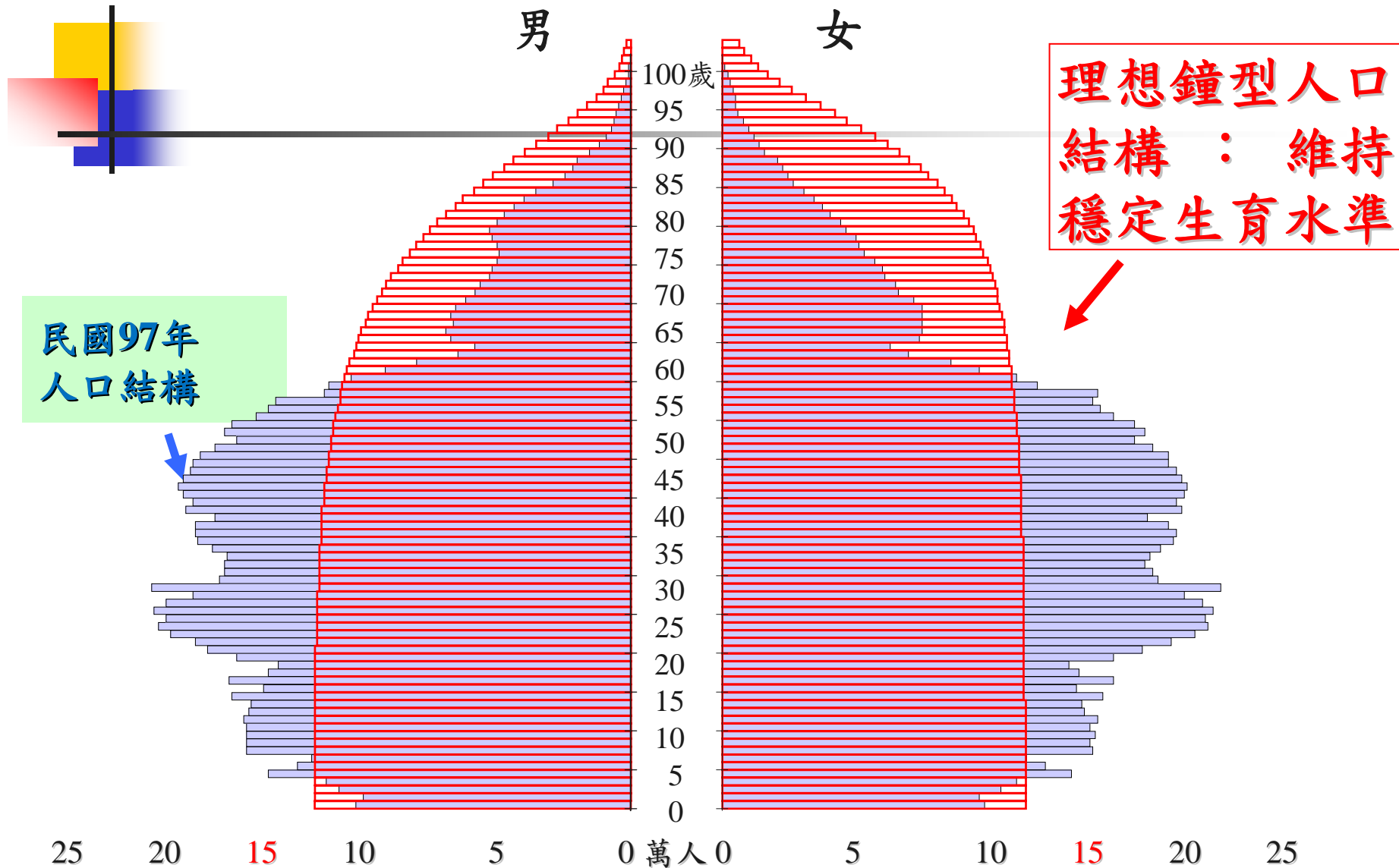
2010年台灣地區人口推估



臺灣未來老年人口推估（經建會2010年中推

估) 年別	總人口 (萬人)	65歲以上高齡人口(萬人)		
		合計	65-79歲	80歲以上
2010	2,316.5	248.6	188.0	60.6
2020	2,343.7	381.3	291.8	89.5
2030	2,330.1	568.3	438.1	130.2
2060	1,883.8	784.3	439.4	344.9
年別	65歲以上人口占 總人口比率(%)	占65歲以上高齡人口比率(%)		
2010	10.7	100.0	75.6	24.4
2020	16.3	100.0	76.5	23.5
2030	24.4	100.0	77.1	22.9
2060	41.6	100.0	56.0	44.0

理想人口結構發展之金字塔



資料來源：行政院經建會中華民國97年至145年人口推計



臺灣地區人口老化迅速

- 臺灣地區的65歲以上老年人口比例，在1993年首度突破7%，進入聯合國WHO的高齡化社會(Ageing Society)。
 - 預期在2025年之前，老年人口比例超過20%（行政院經建會，2010中推計）。
 - 國人每年約延長0.2~0.3歲的壽命，2011年男女兩性平均餘命為75.98、82.65歲（初估），已經高於美國約一歲。



人口老化及壽命延長的影響

- 死亡率降低與壽命延長對生活規劃有重大影響，可大略分為以下三個層面：

(1) 經濟生活（工作人口？）

→ 養兒防老？經濟來源充足？（反向房貸）

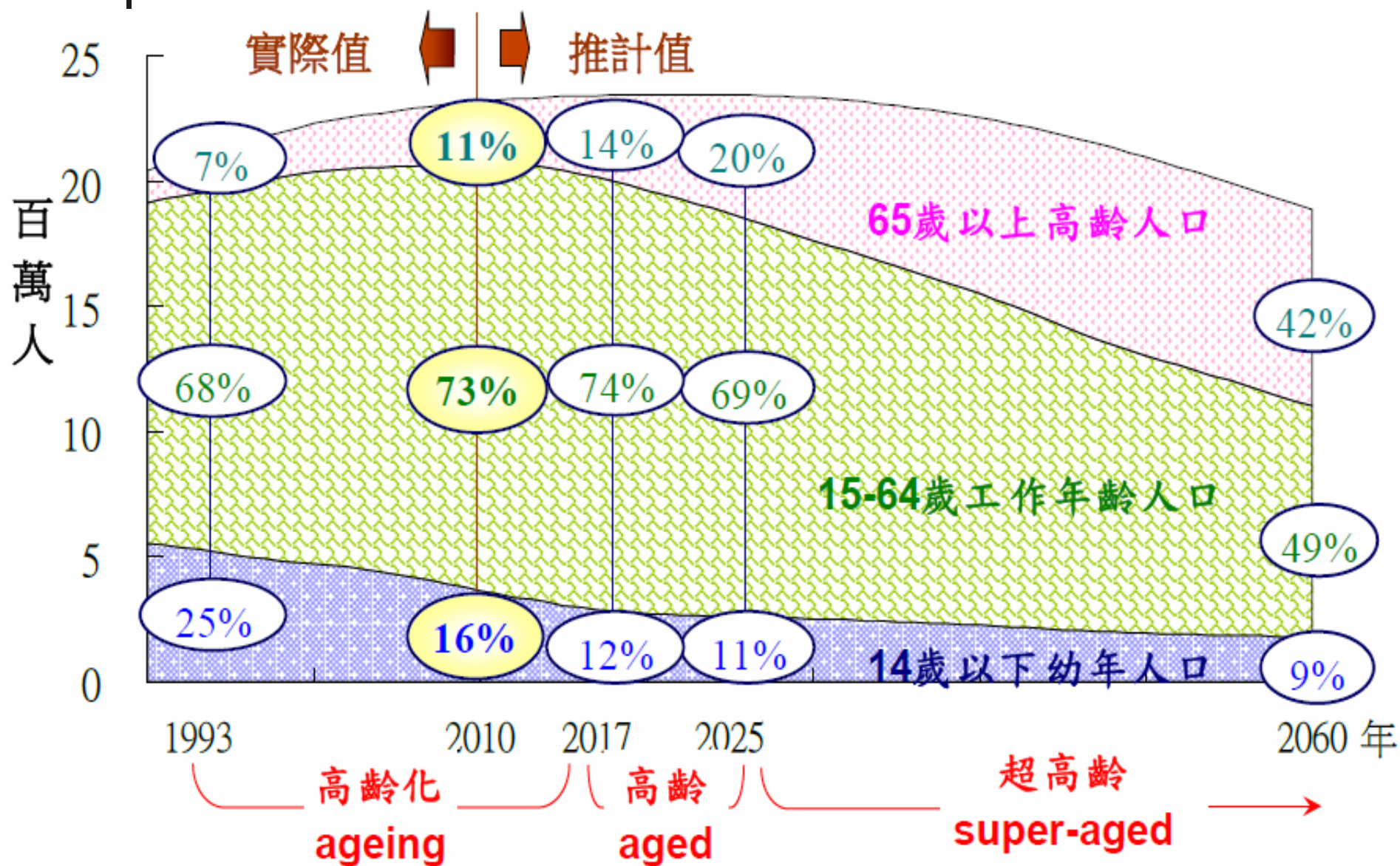
(2) 健康醫療（健保費用？）

→ 醫療使用量、長期照護（外籍看護）

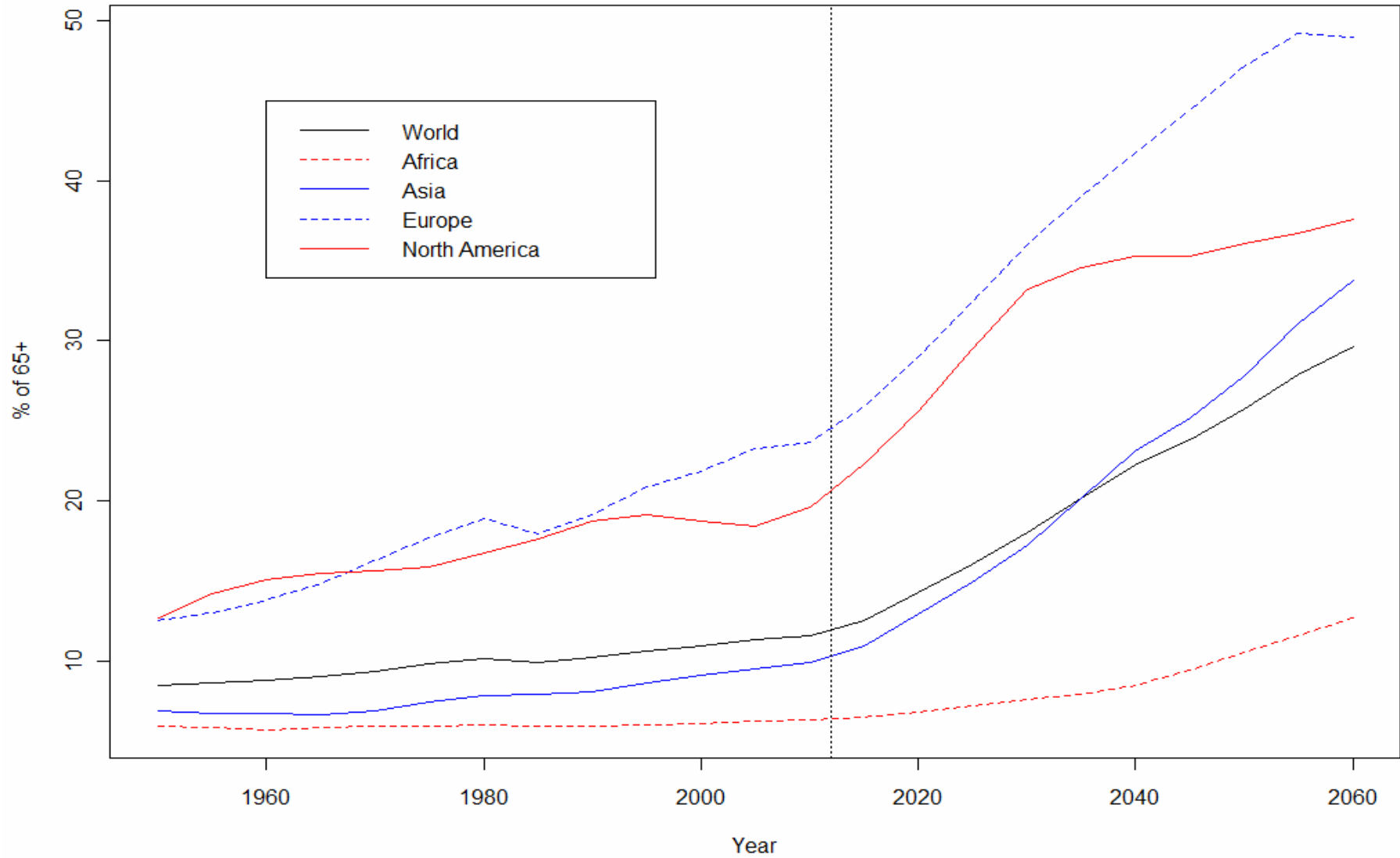
(3) 退休生活（老人社區？）

→ 身心健康、生活重心（退休後的生活安排）

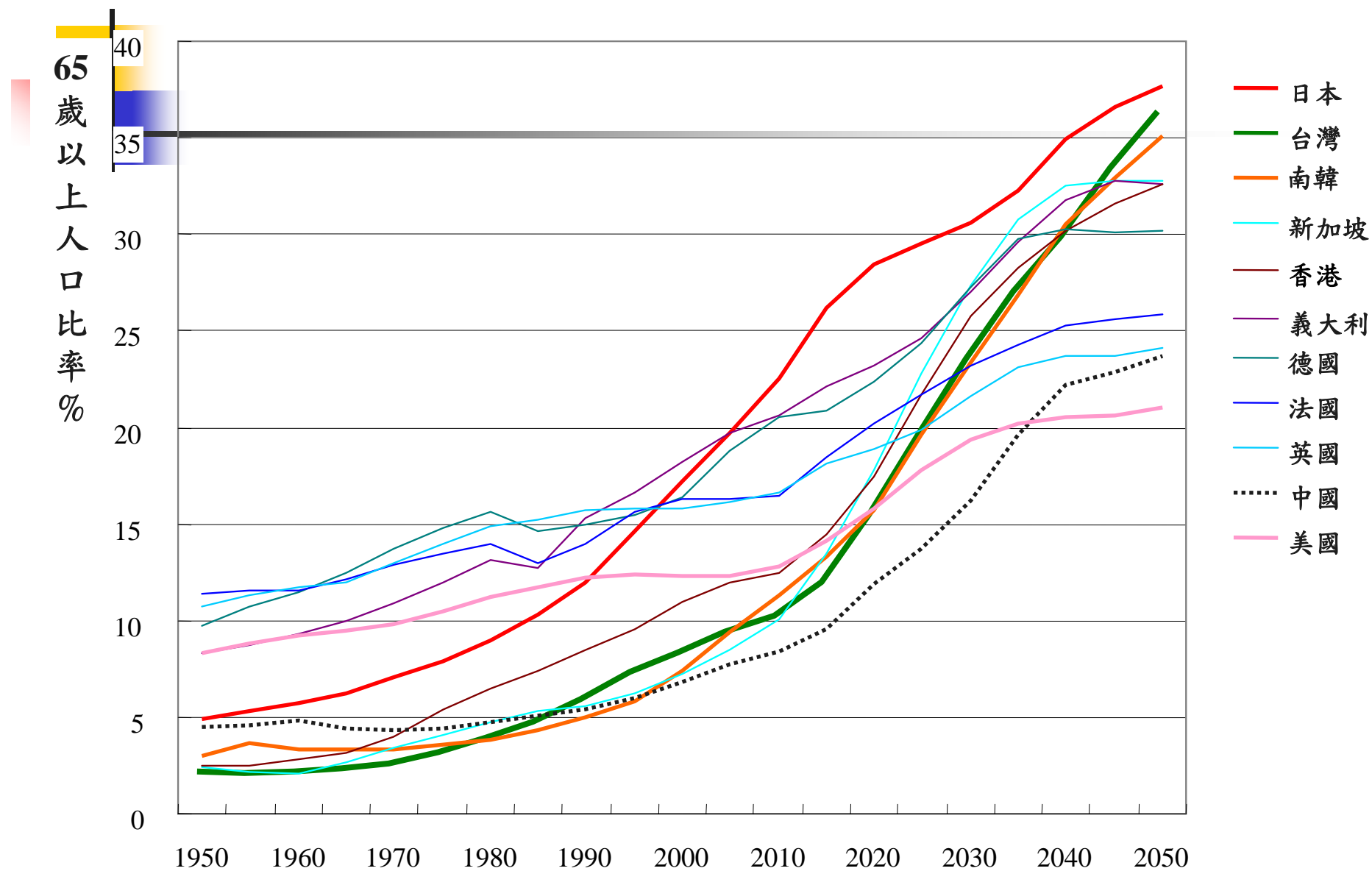
人口結構變動趨勢(中推計結果)



世界人口老龄化（老龄化比例）



主要國家65歲以上人口比例趨勢圖

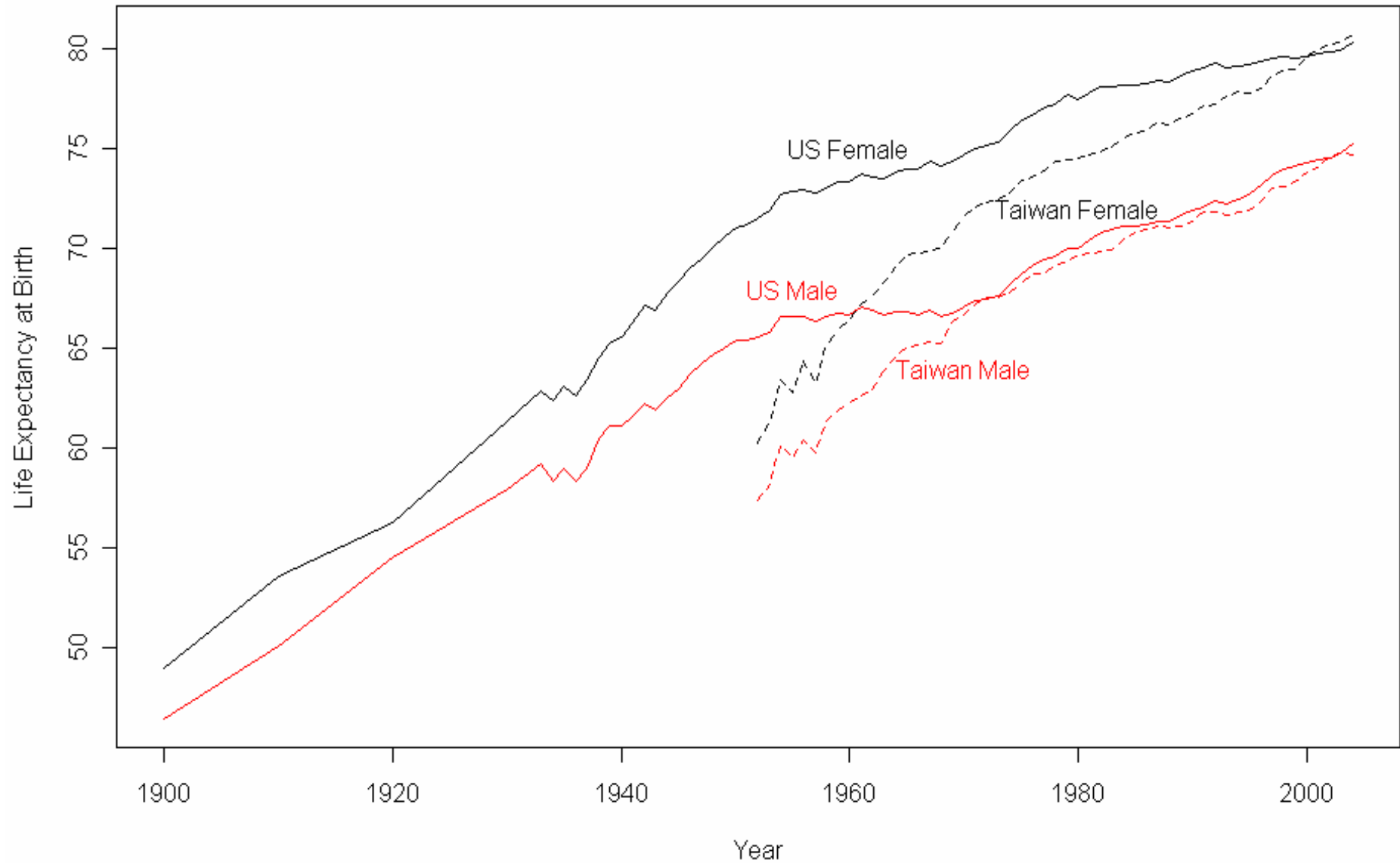


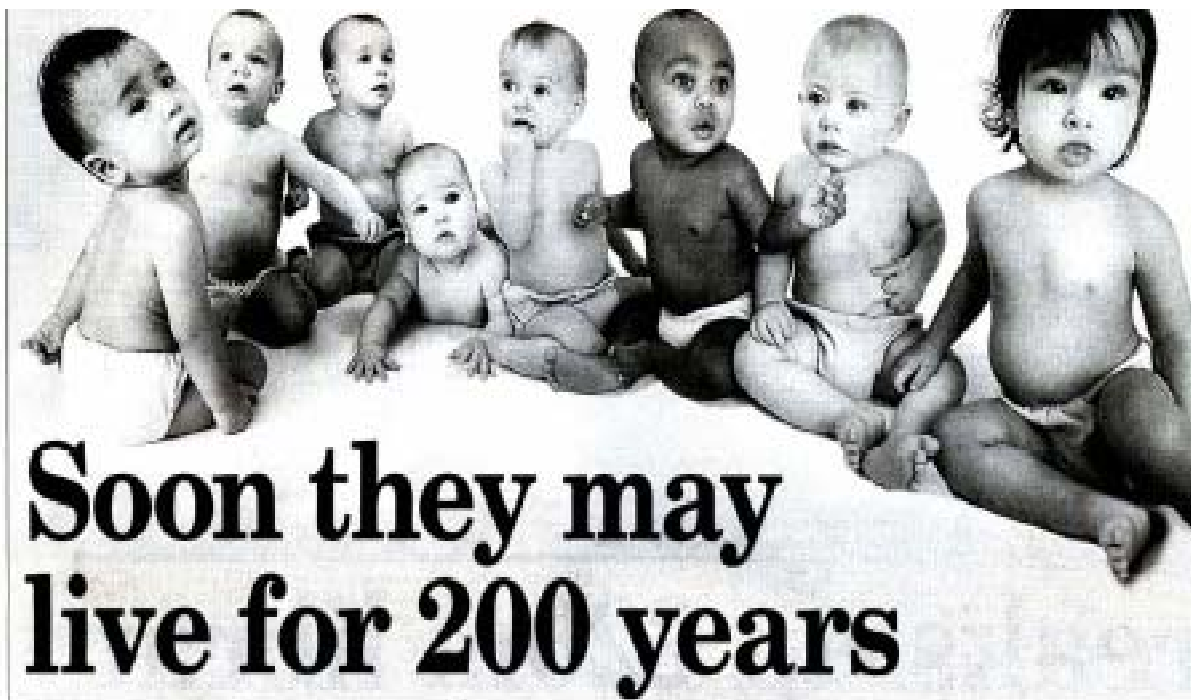


人口紅利 vs. 人口赤字

- 人口紅利是在一個時期內生育率迅速下降，幼齡與老年撫養負擔（扶養比）相對較輕，總人口中勞動人力比重上升。
 - 隨著人口老化，勞動人口比例減少，扶養比及社會負擔將大幅增加！
- 臺灣社會福利及醫療支出等需求變成重大負擔，人力短絀將是重大問題（人口赤字！）
 - 歐洲五豬、金磚五國及開發中國家也類似，人口老化是二十一世紀必須面對的問題。

美國與臺灣地區居民平均壽命變化趨勢





This day may come when people will celebrate the start of middle age on their 100th birthday. Some of the world's most eminent experts on aging have predicted that average life expectancy in the developed world could rise to 200 years by the end of the century.

From the end of the 19th century to the present day, the average life span has almost doubled. In new research some scientists predict a jump of even greater proportions over the next 100 years, thanks to advances in genetic medicine.

Out of 60 experts on aging who were asked to predict life expectancy for a baby born in 2100, more than half believed it would be more than 100 years. Seven who were interviewed in the research project for the *Journal of Anti-Aging Medicine* believed it could be between 150 and 200.

If such a change were to happen, it would mean a world dominated by the over-100s and a radical increase in the retirement age.

In the past century, increases in life expectancy were a result of cleaner living conditions and

Roger Dobson and Nina Goswami

the defeat or control of mass infectious diseases, such as smallpox and tuberculosis. Over the next century, scientists say genetic advances will push the average life span significantly higher.

Michael Fessler, clinical professor of medicine at Michigan State University, was among the experts who thought life expectancy could rise to 200 years or more. He said: "People haven't realized it, but we are in a similar position to the 1870s with regard to stopping the spread of infectious diseases."

"As you get older, your cells slowly stop repairing themselves. I think we are going to be able to reverse that process and, through genetic intervention, will be able to tell the cells to repair themselves."

Other experts interviewed for the study agreed that dramatic advances in genetic research may unlock the secrets to long life in this century. Elizabeth Blackburn, professor of biochemistry at the University of California San Francisco, said

life expectancy could reach 175 years in 2100.

She said: "In experiments in small animals, when some genes are mutated away from their natural form, they can increase life span twofold. We don't yet have an easy picture of how this might work in humans, but it's theoretically possible. We know there is a genetic component [affecting aging] but don't yet know whether it will be a few genes or a large number."

The sequencing of the human genetic code — or genome — is the main reason for the predictions of such dramatic increases in average life spans. The breakthrough was made four years ago by two parallel projects to map human DNA, a private-sector venture led by American scientist Dr Craig Venter and the international state-funded human genome project, in which the Sanger Centre in Cambridge played a leading role.

The code offers huge potential in the battle against ageing and research has already shown that transplanted aged skin cells can be rejuvenated by manipulation of DNA. Other scientists are less convinced, however, believing the human body has a fixed limit on life span that it will not be possible to breach.

To date, though, there is no evidence of life expectancy leveling off. A male born in England in the 1850s had a life expectancy of just over 40 years while a female had a life expectancy of 42. By 2000, a man's life expectancy was 76 years and a woman's 80. The increase is expected to continue over the next few decades.

Professor Tom Kirkwood, head of biogerontology at Newcastle University's Institute for Ageing and Health, said many in the scientific community had been surprised that life expectancy is still rising.

He said: "Most people would have predicted that, with the removal of most causes of premature death through infectious disease, life expectancy would start to reach a plateau. What has taken people by surprise is

that over the past 25 years we have seen expectancy increase, which tells us the ageing process is undergoing change."

Kirkwood believes most of the gains in life expectancy have already been made and that there is little prospect of a genetic breakthrough this century that will reverse ageing. He estimates life expectancy will be 90 by the year 2100.

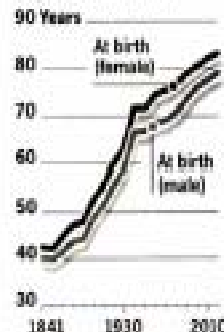
He said: "Living for 200 years is unrealistic. To do that we would have to wipe out things like cancer, heart disease and other major health problems. Despite the billions being spent on these areas, that type of eradication of disease is frustratingly slow."

It is not just genetic advances that may boost longevity. Research on animals has shown that reducing caloric intake can increase life span by 30%.

Scientists are now trying to develop a "magic bullet" that could simulate the effect of calorie restriction without people having to eat less. Research published last week suggested this could be done by a protein, Sirt1, which controls when cells store or release fat.

The great leap

Life expectancy in England and Wales



Unlocking the secrets to long life

DNA
Scientists believe interventions in the ageing genes may be able to counteract the effects of old age



Nutrition
A significant reduction in caloric intake may be able to increase lifespan by up to 50%. Scientists are now trying to devise drugs that will mimic the effects of eating less



Beating disease
Human trials are already being conducted on cancer vaccines that stimulate the body to attack cancerous cells. In future decades, it may be possible to reverse heart disease by replacing diseased cells with healthy functioning ones



Stem cell research
Doctors last month announced that within the next decade people may be able to grow new teeth from stem cells implanted in their gums. As the method develops, faulty organs could be replaced or repaired as the body begins to deteriorate



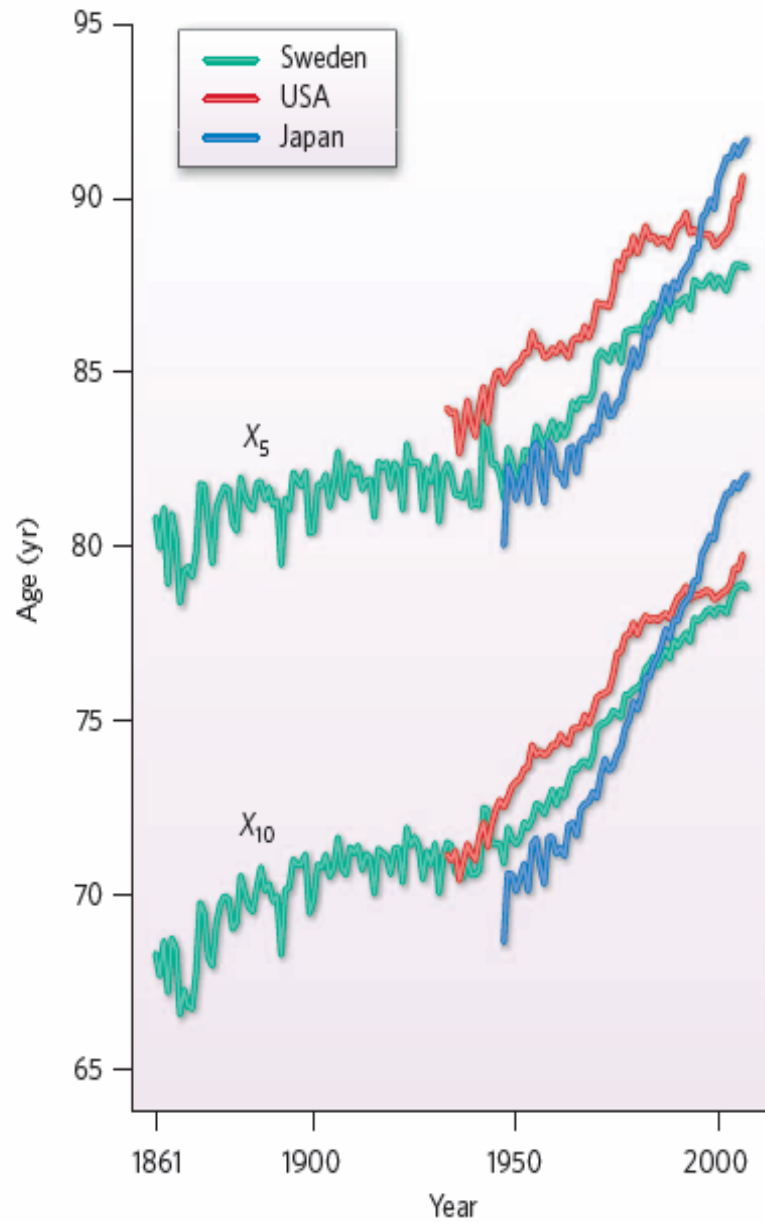
The longest recorded lifespan for a human.
Jeanne Louise Calment, a Frenchwoman, was born on February 21, 1875 and died in 1997 at the age of 122 years and 164 days



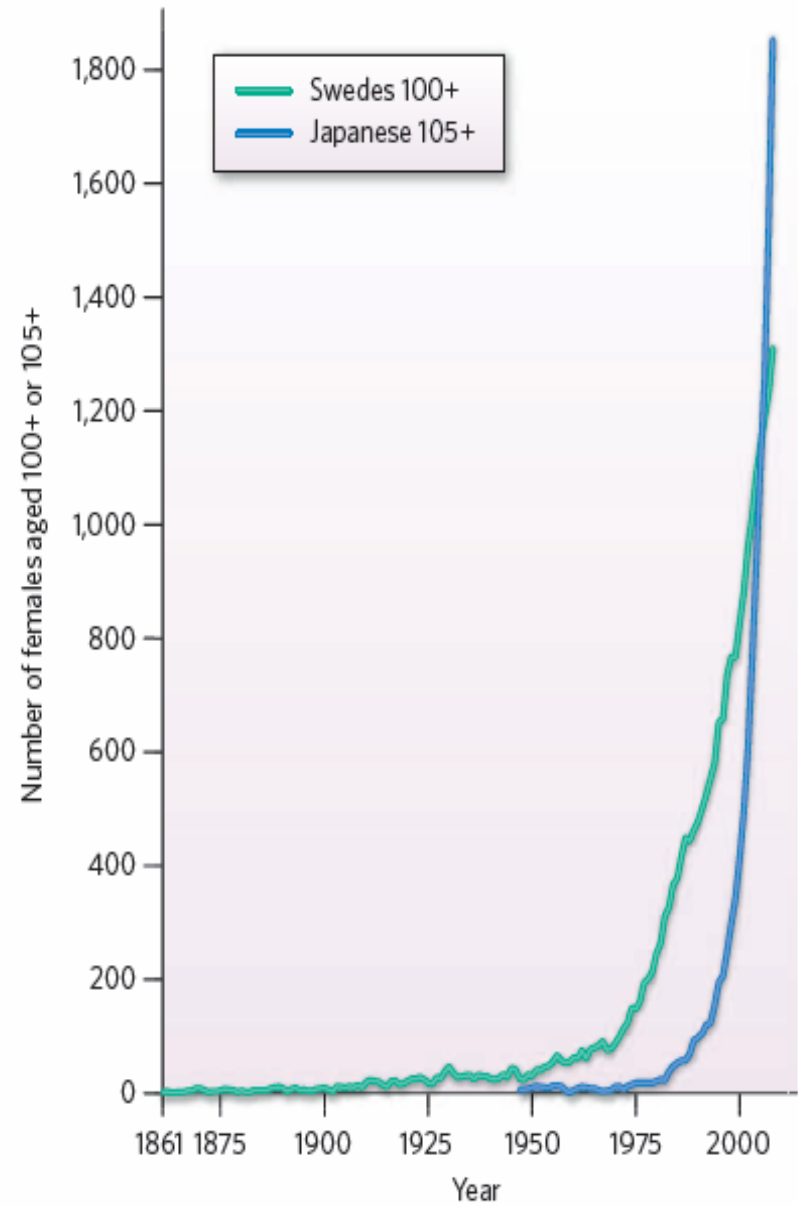
Andorra in the Pyrenees has the highest life expectancy in the world, at 83 years. Mozambique has the lowest life expectancy in the world, at 51 years

Older, bolder and better
The Magazine, pages 28-38

平均餘命為五、十歲的年齡



百歲人瑞的總人數



主要死因由傳染病轉為中老年與慢性疾病

1935年台灣地區五大主要死因

順序	1	2	3	4	5
主要死因	肺炎	腹瀉腸炎	其他傳染病 與寄生蟲病	呼吸器官結核	先天性弱質
佔總死亡 人數比例	21.07%	12.16%	7.12%	6.78%	6.02%

2005年台灣地區五大主要死因

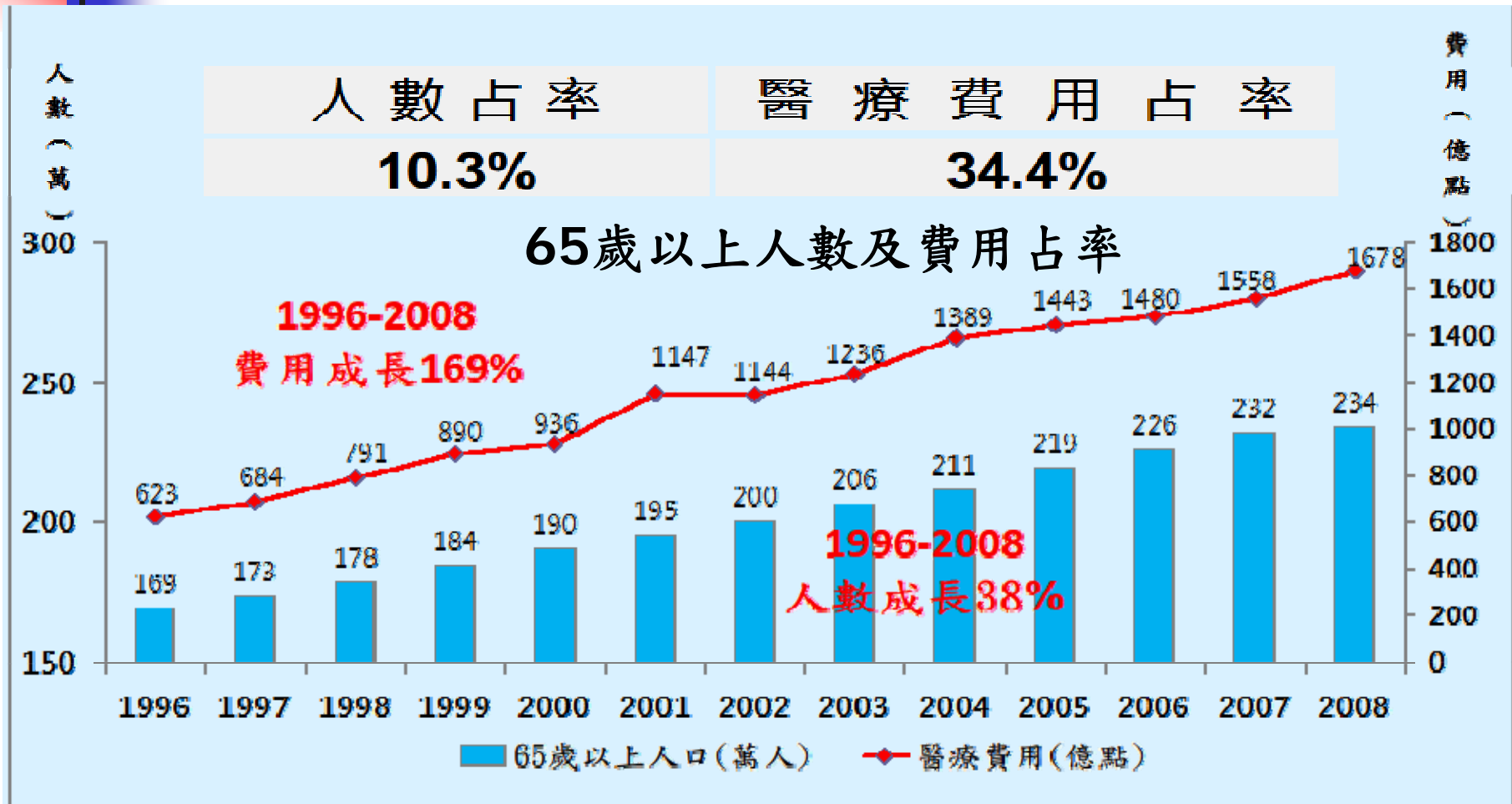
順序	1	2	3	4	5
主要死因	惡性腫瘤	腦血管疾病	心臟疾病	糖尿病	事故傷害
佔總死亡 人數比例	26.79%	9.46%	9.33%	7.56%	6.02%

資料來源：「台灣的人口變遷與社會變遷」與衛生署網頁。

■台灣醫療有三個世界第一：洗腎人口比例、葉克膜使用比例、植物人比例。

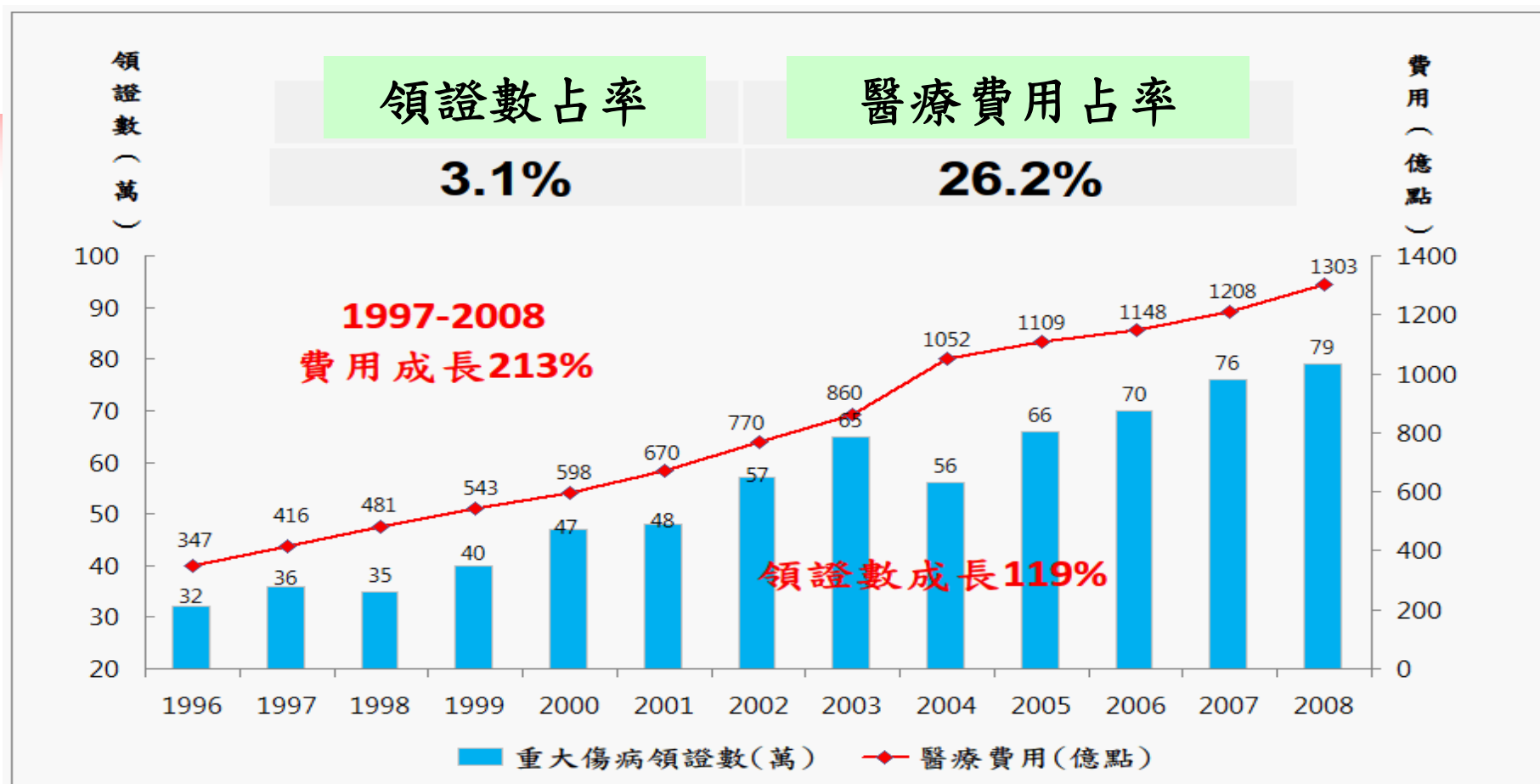
人口老化對醫療費用的影響

65歲以上人數及費用占率



資料來源：中華民國醫師公會 www.tma.tw/jkbcxw/lecture/簡報播放檔.pps

醫療費用成長原因-重大傷病



- 健保開辦的時重大傷病人數占總人口的1.5%，現已達3.1%，醫療費達26.2%。
- 癌症病人每人年的醫療費用大約是全人口平均的6.4倍、洗腎為29.4倍、呼吸器依賴者為37.6倍、血友病患者為94.6倍。

台灣長期照顧者人數



平均照顧失能家人六年半

超過1/4照顧者守在病榻十年以上

資料來源：家庭照顧者關懷協會

臺灣未來的老年現象？



經常在政大校園看到的景象！





報告完畢，

敬請指教！

