

RETIREMENT SECURITY IN SINGAPORE: ENHANCED ANNUITIES

Robert L. Brown, FCIA, FSA, ACAS, PhD

Professor of Actuarial Science

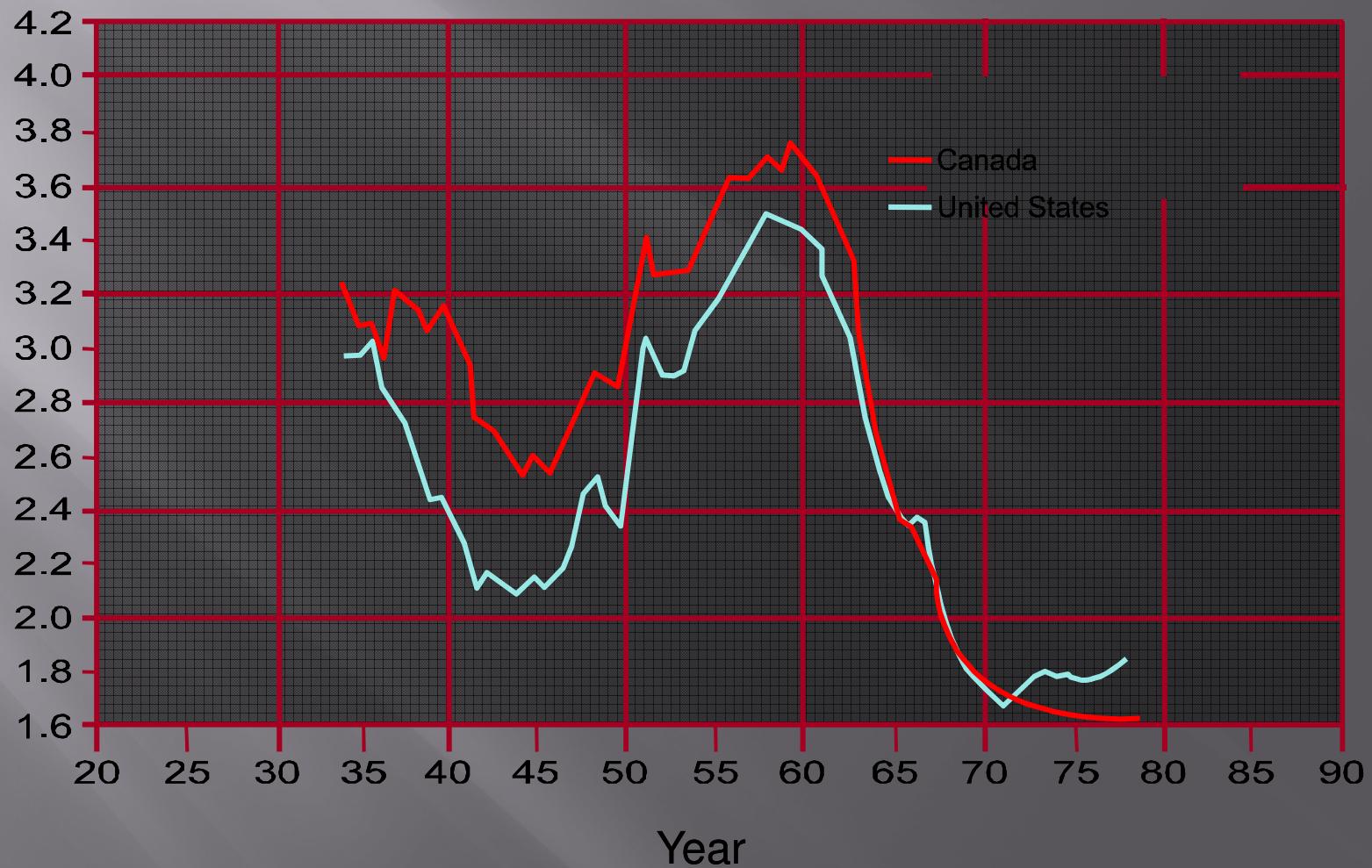
University of Waterloo

(Retired)

APRIL 18, 2011

Total Fertility Rates

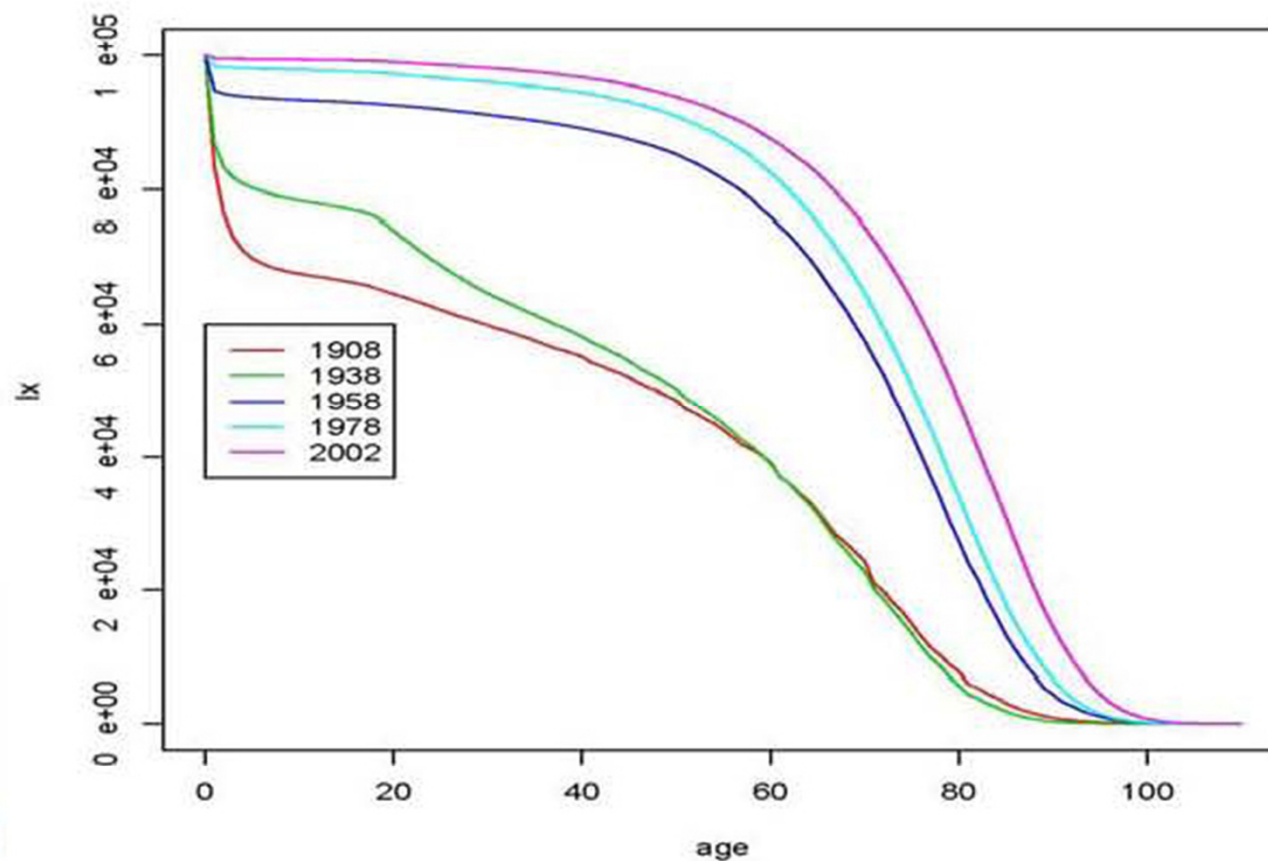
▣ 1922 to 1988



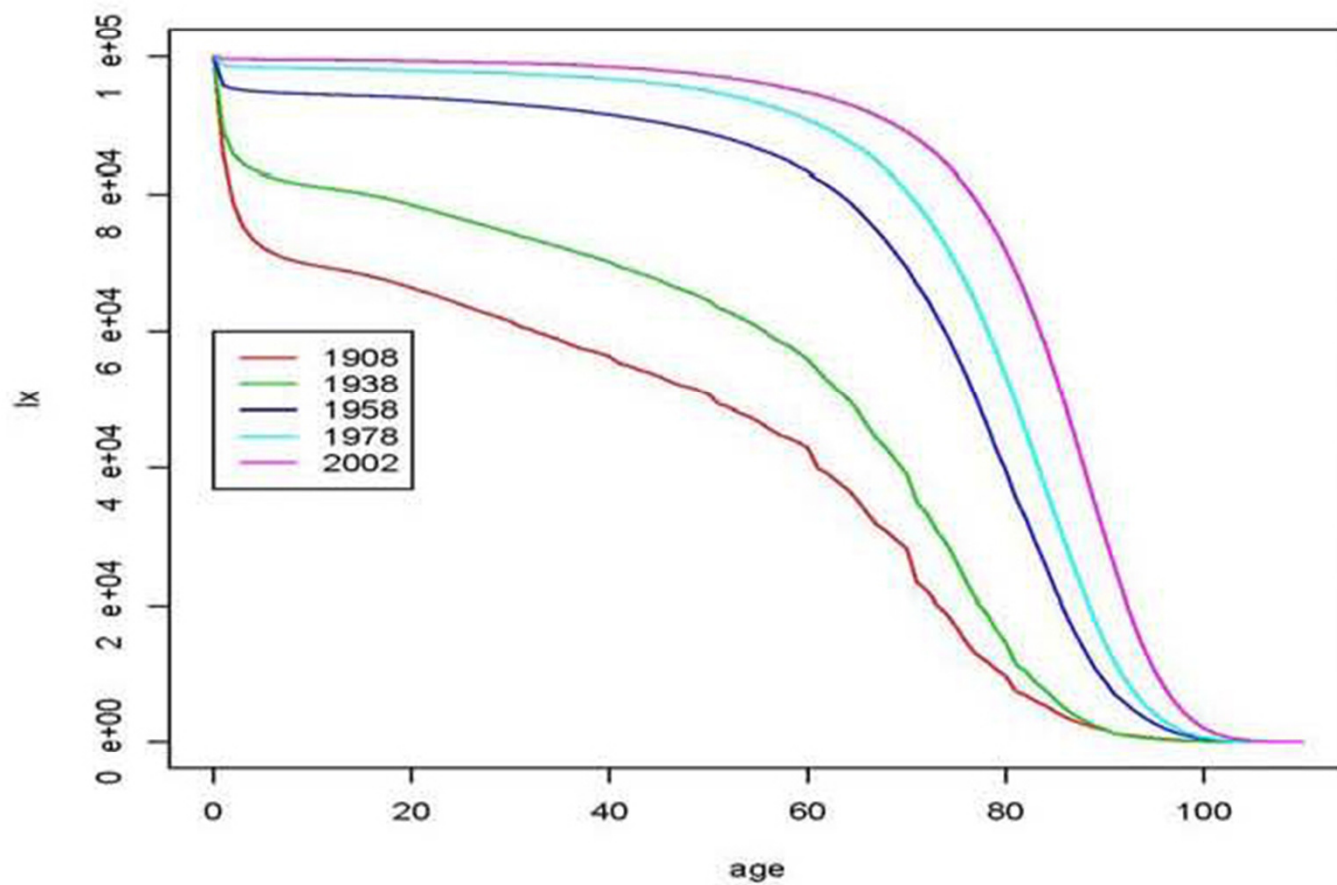
Life Expectancy In the United States

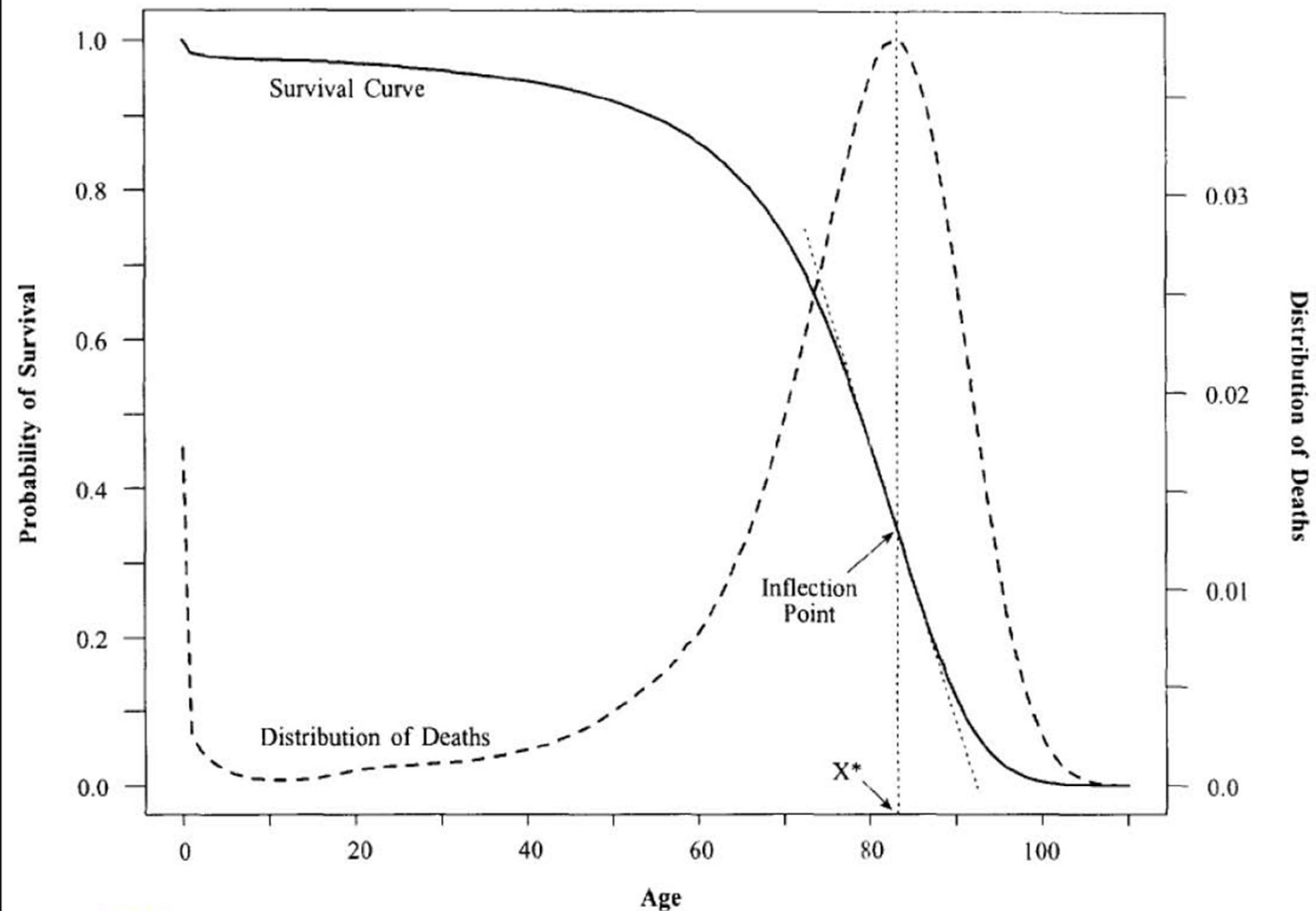
Year	At Birth		At Age 65	
	Male	Female	Male	Female
1920	55.6	57.6	12.2	12.7
1960	66.8	73.2	12.9	15.8
1990	71.8	78.8	15.1	19.0
2007	75.4	80.4	17.2	19.9
2008	75.3	80.3	17.1	19.8

Rectangularization – Male l_x Curve



Rectangularization – Female l_x Curve

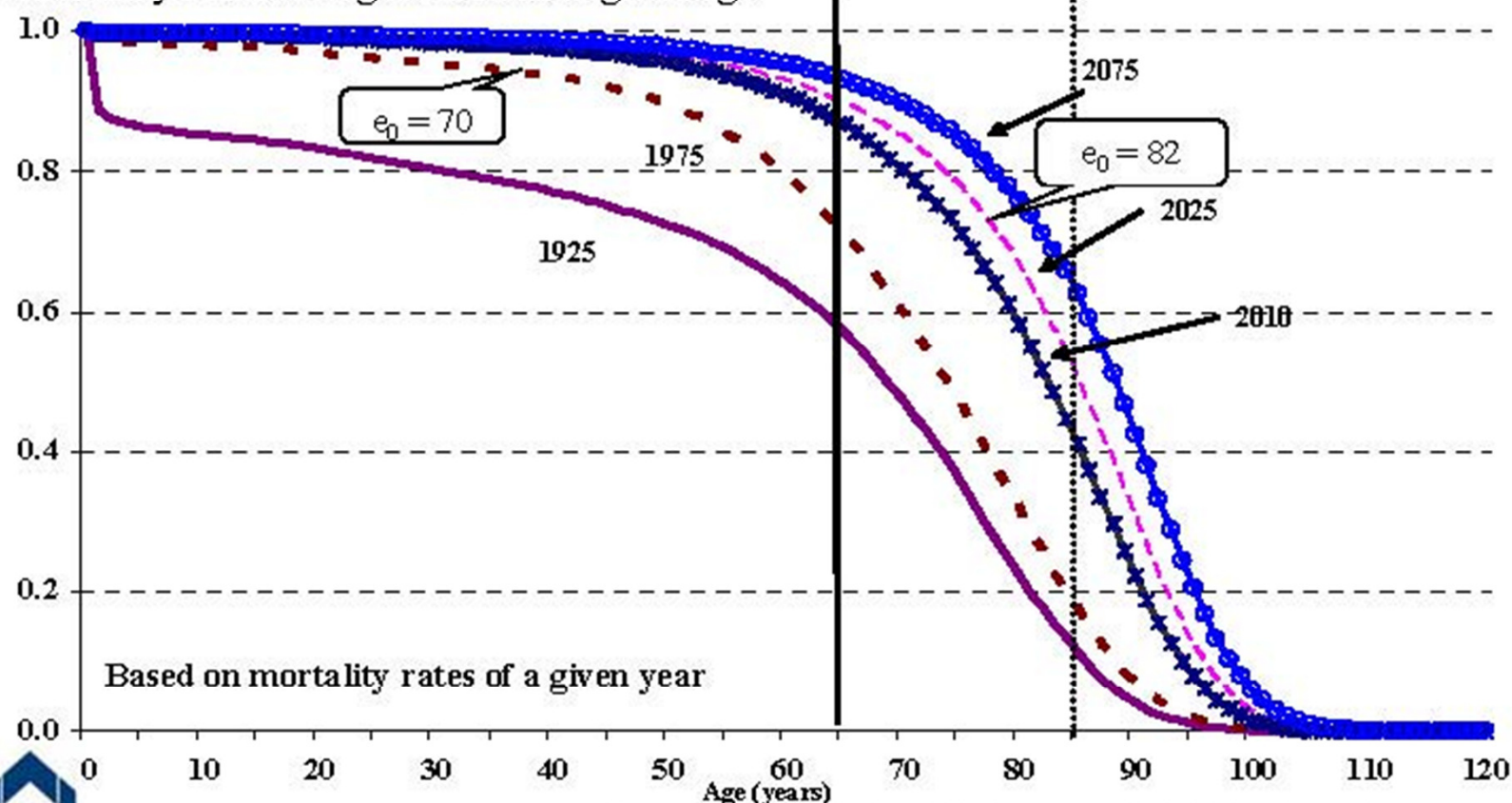




Mortality Compression (Wilmoth and Horiuchi, 1999)

70% of males could expect to die between ages 12 and 83 (1925),
between 67 to 92 (2010) and between 75 and 96 (2075)

Probability of surviving from birth to given age



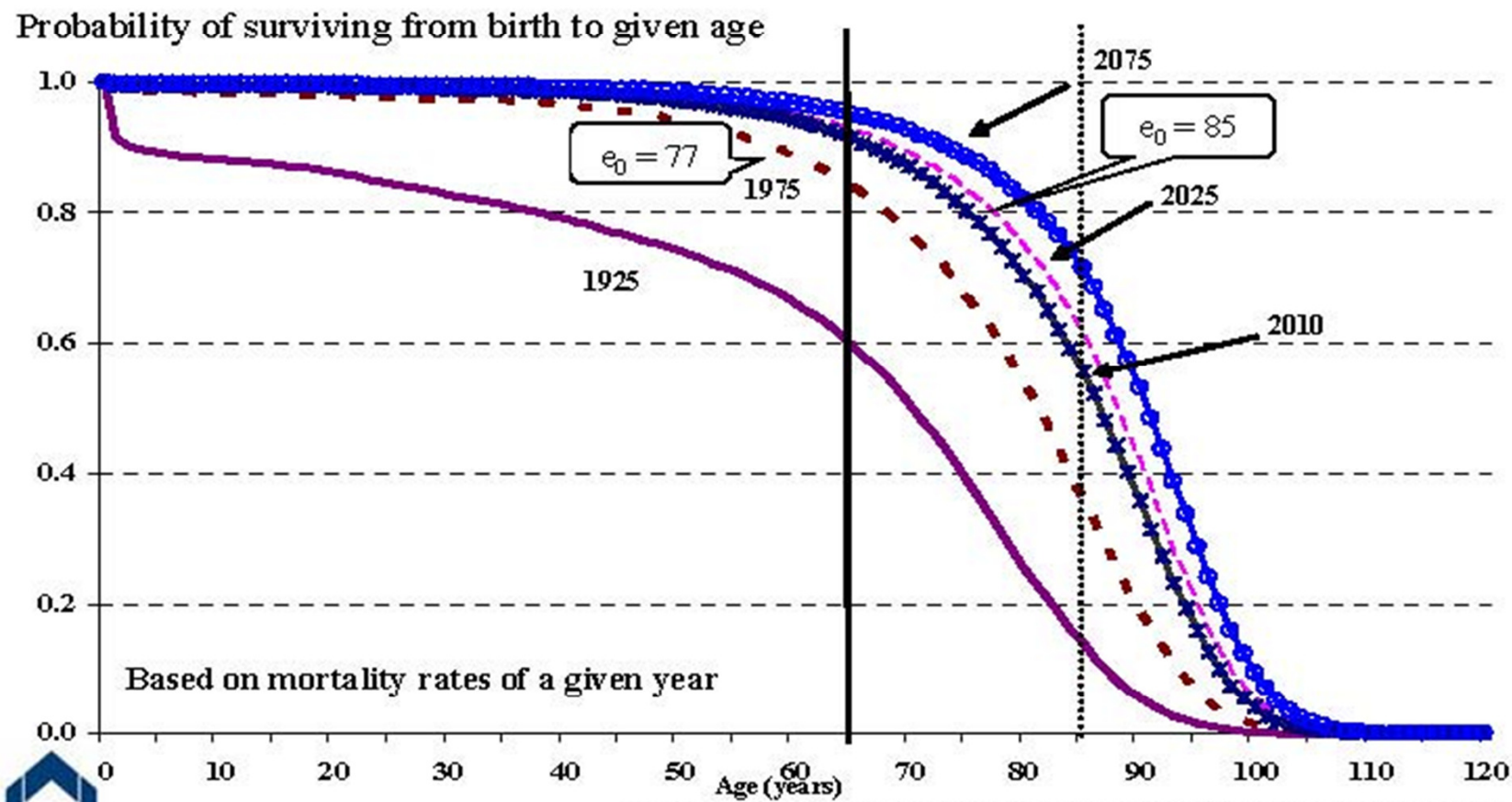
Source : Office of the Chief Actuary, 25th CPP Actuarial Report



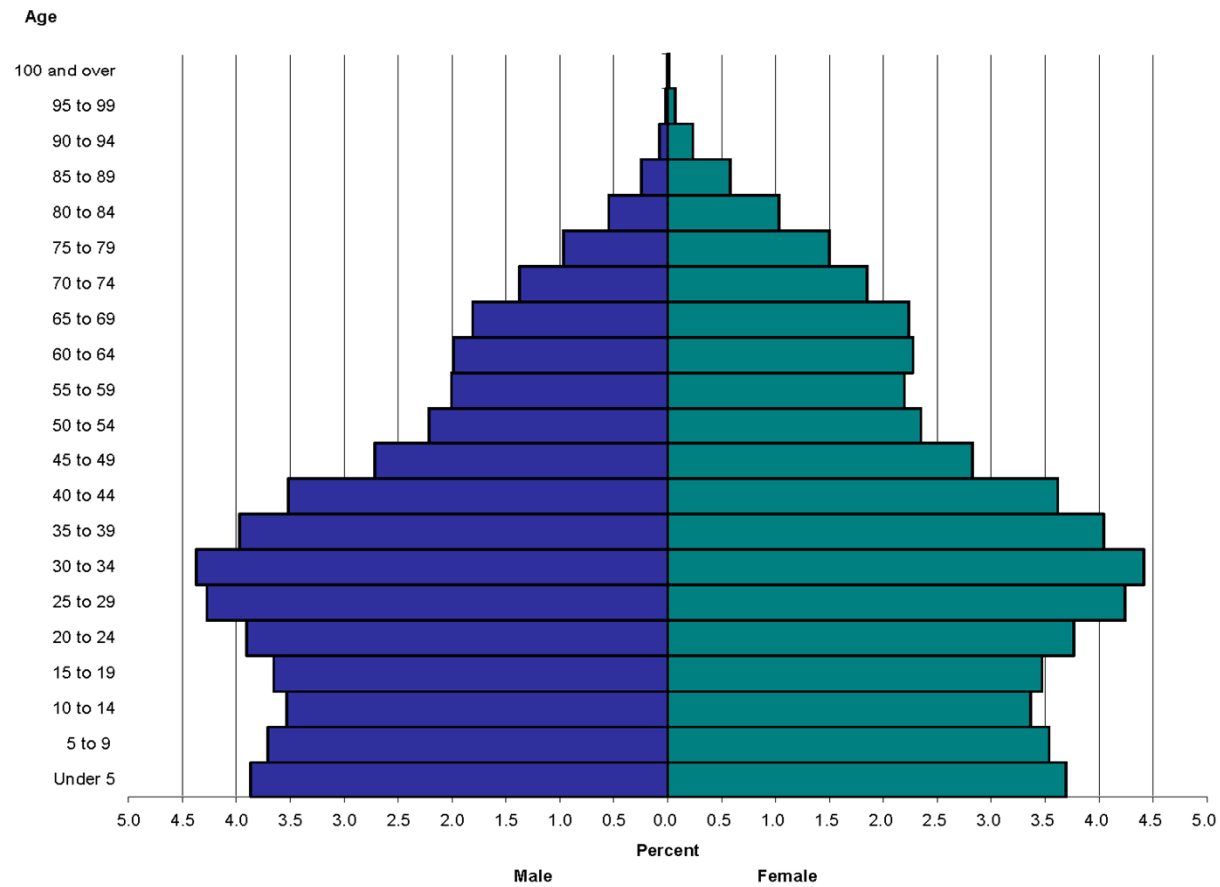
OSFI
BSIF

Office of the Chief Actuary Bureau de l'actuaire en chef

70% of females could expect to die between ages 24 and 84 (1925),
between 72 and 95 (2010) and between 79 and 98 (2075)

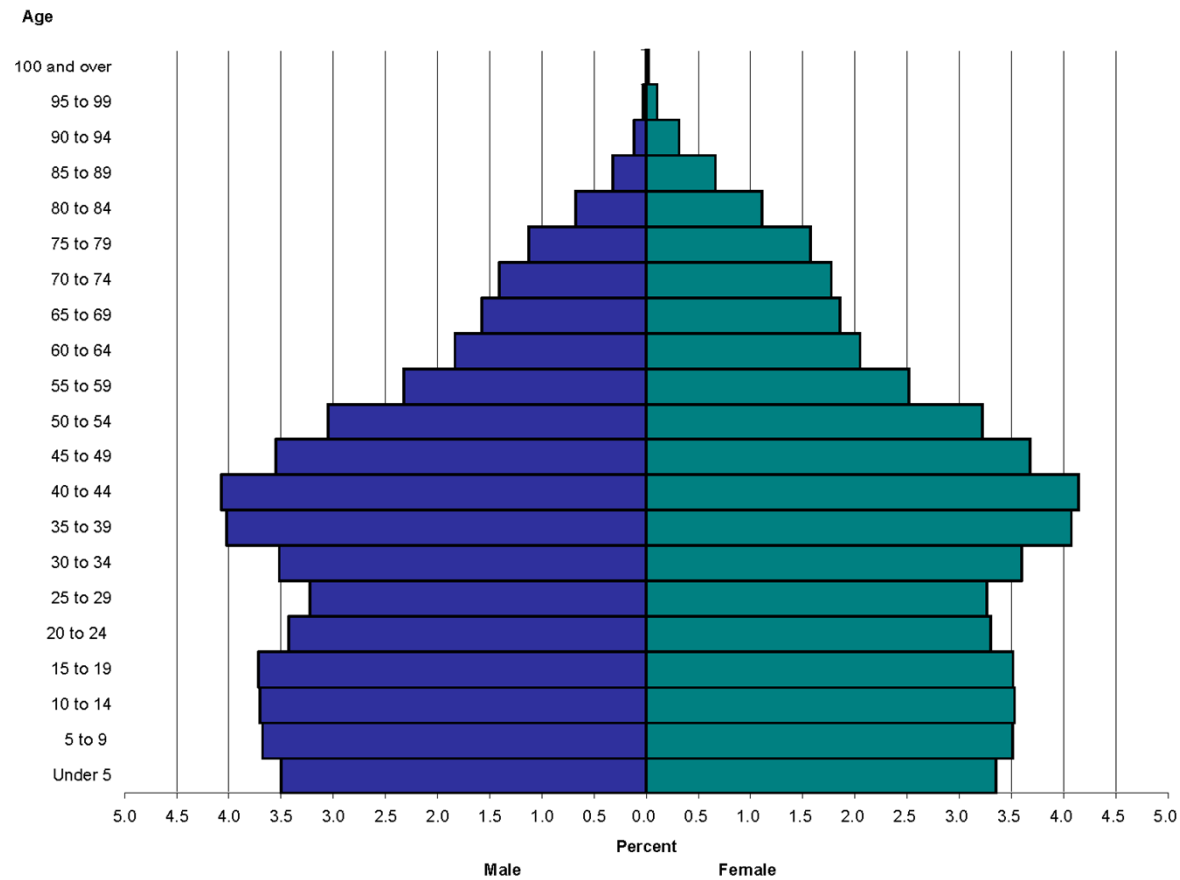


(NP-P1) Resident Population of the United States as of July 1, 1990.



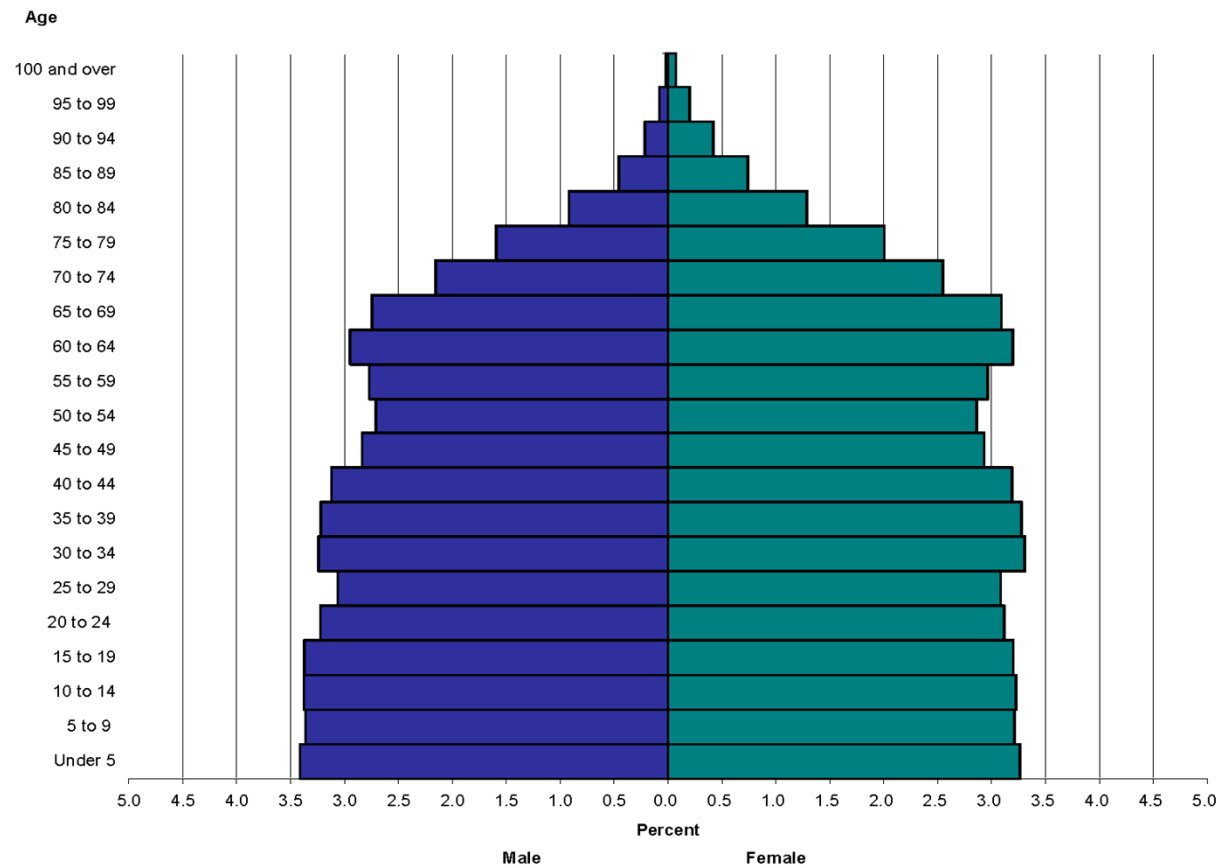
Source: National Estimates Program, Population Division, U.S. Census Bureau, Washington, D.C. 20233

(NP-P2) Projected Resident Population of the United States as of July 1, 2000, Middle Series.



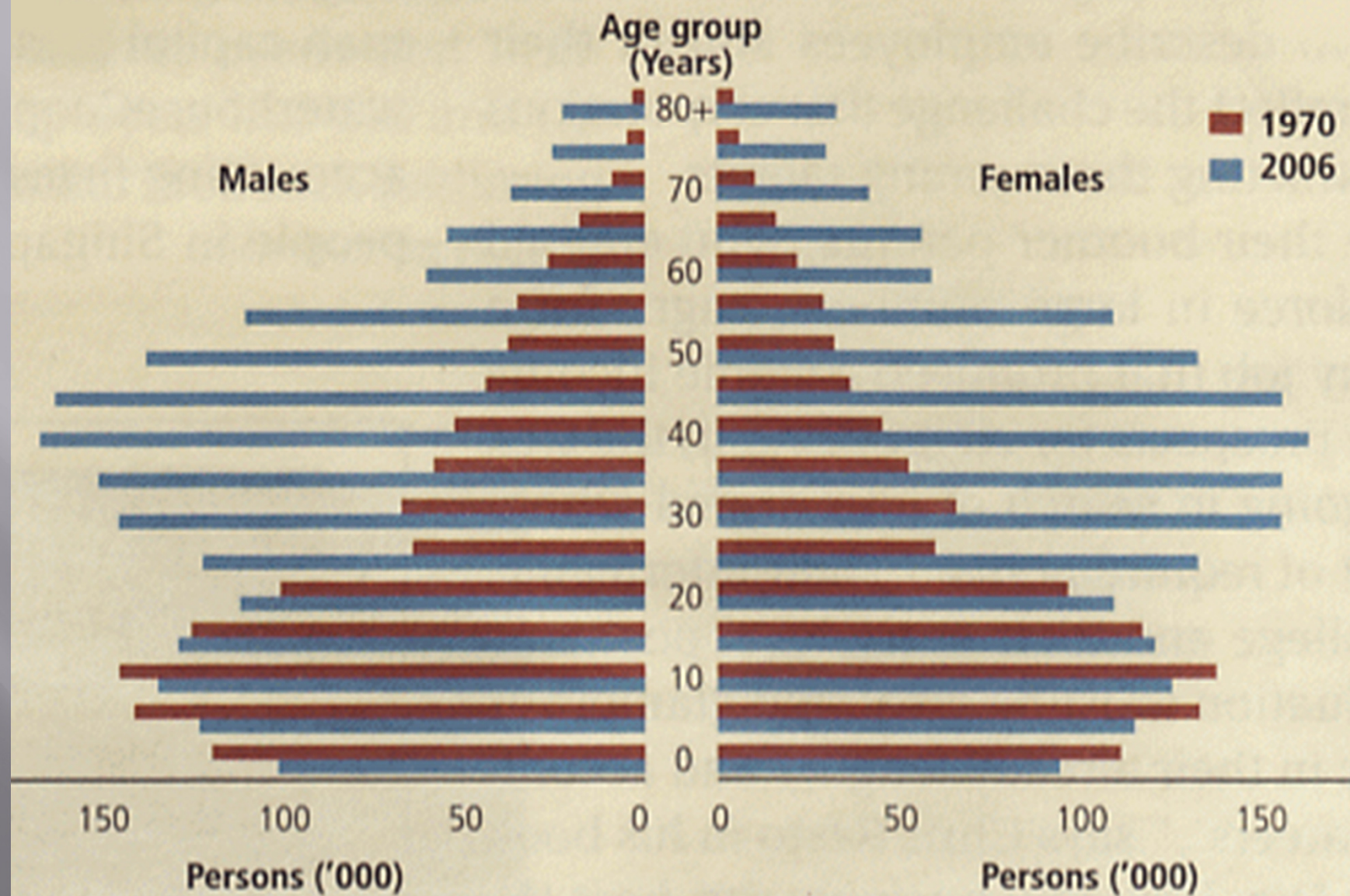
Source: National Projections Program, Population Division, U.S. Census Bureau, Washington, D.C. 20233

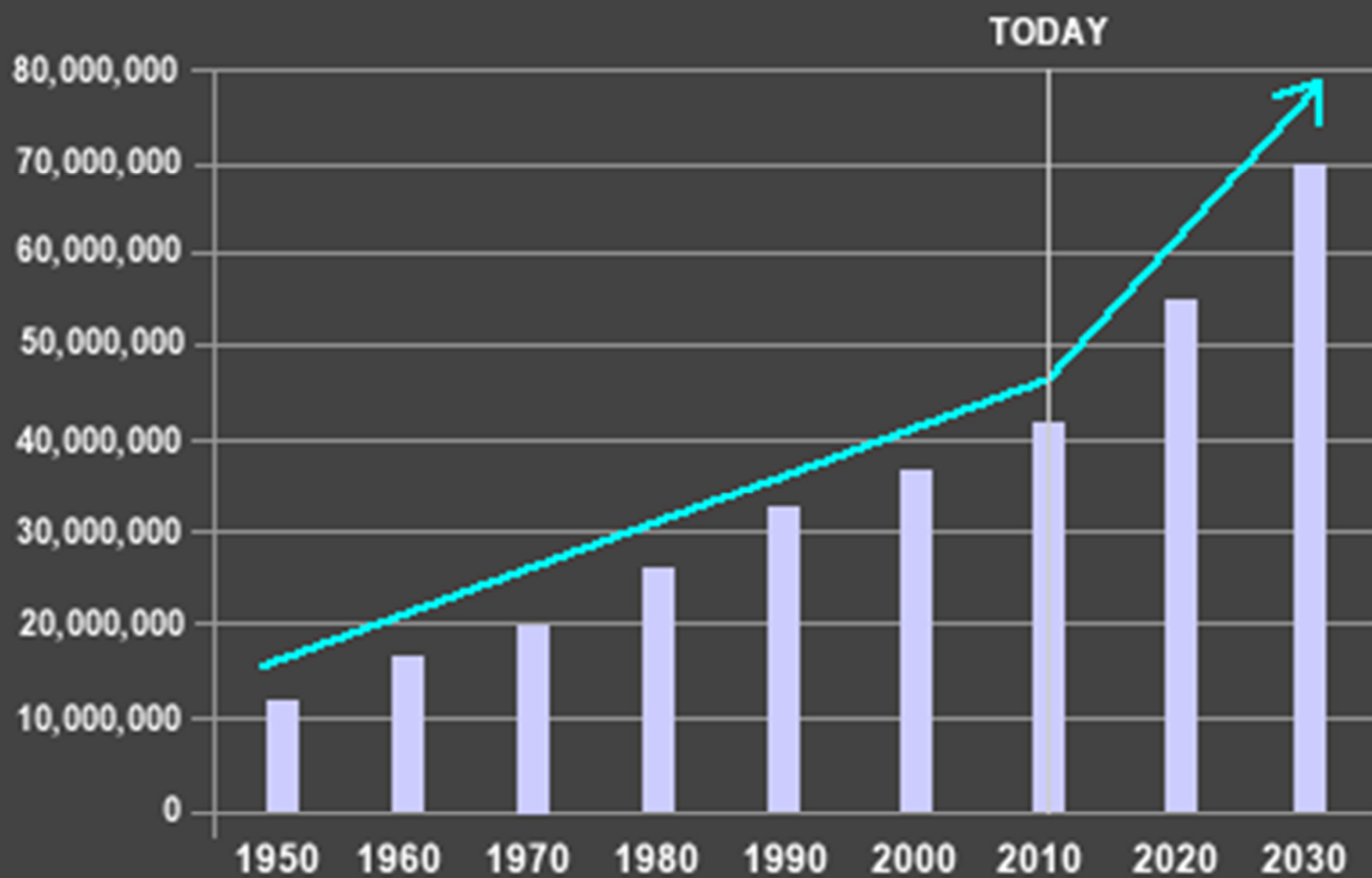
(NP-P3) Projected Resident Population of the United States as of July 1, 2025, Middle Series.



Source: National Projections Program, Population Division, U.S. Census Bureau, Washington, D.C. 20233

Age pyramid of resident population

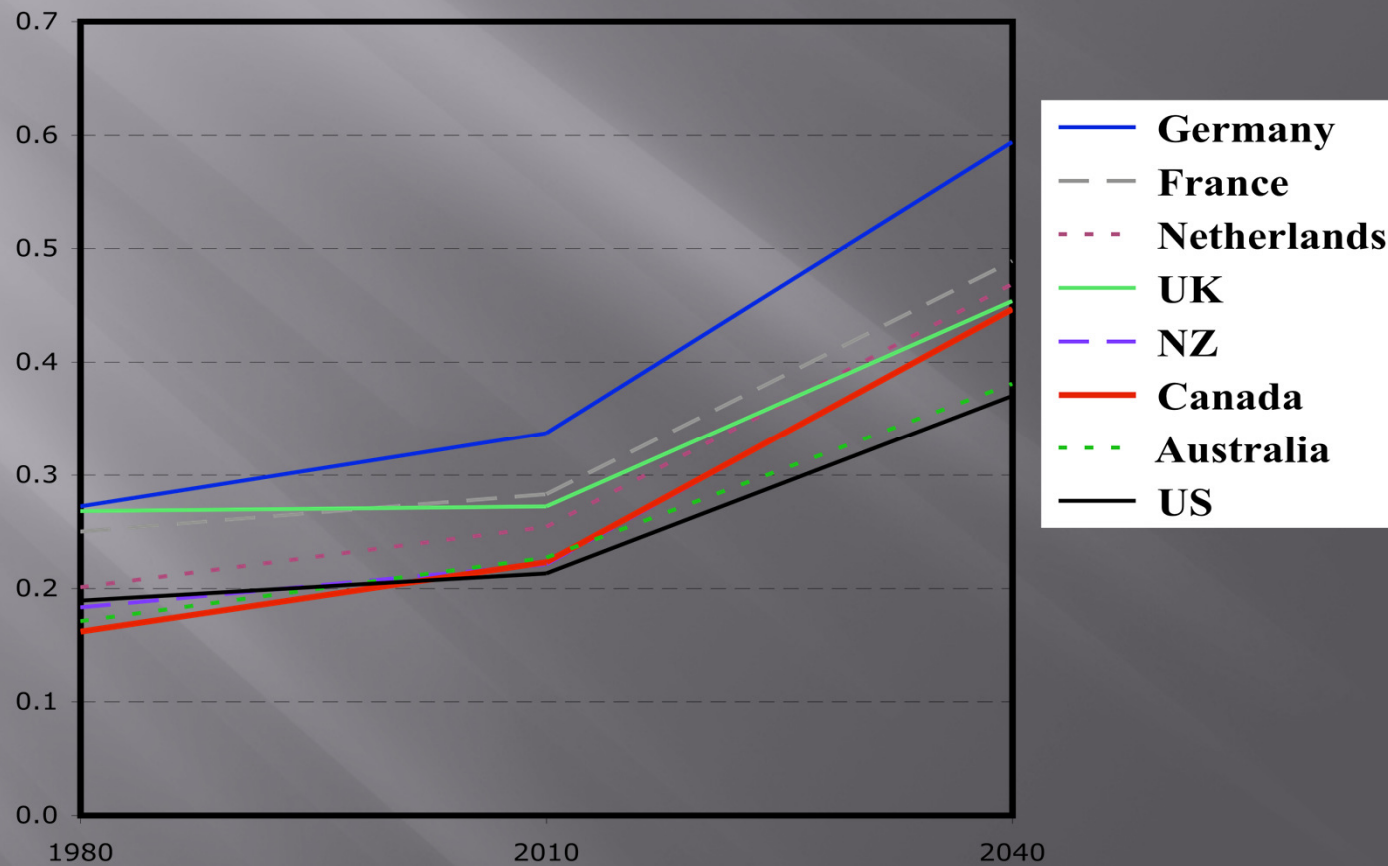




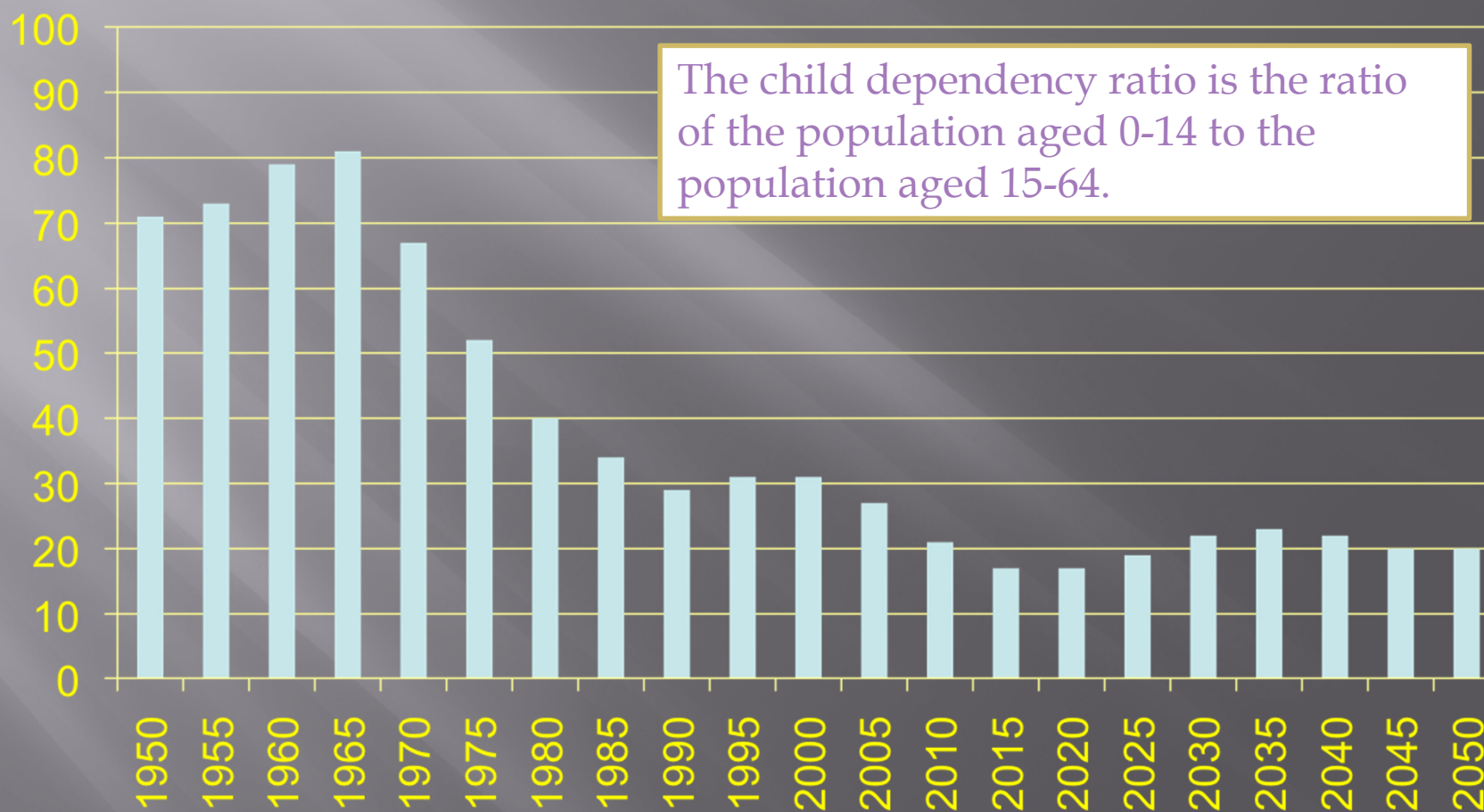
U.S. POPULATION OF THOSE 65 AND OLDER Source: U.S. Bureau of the Census

Dependency rate trends

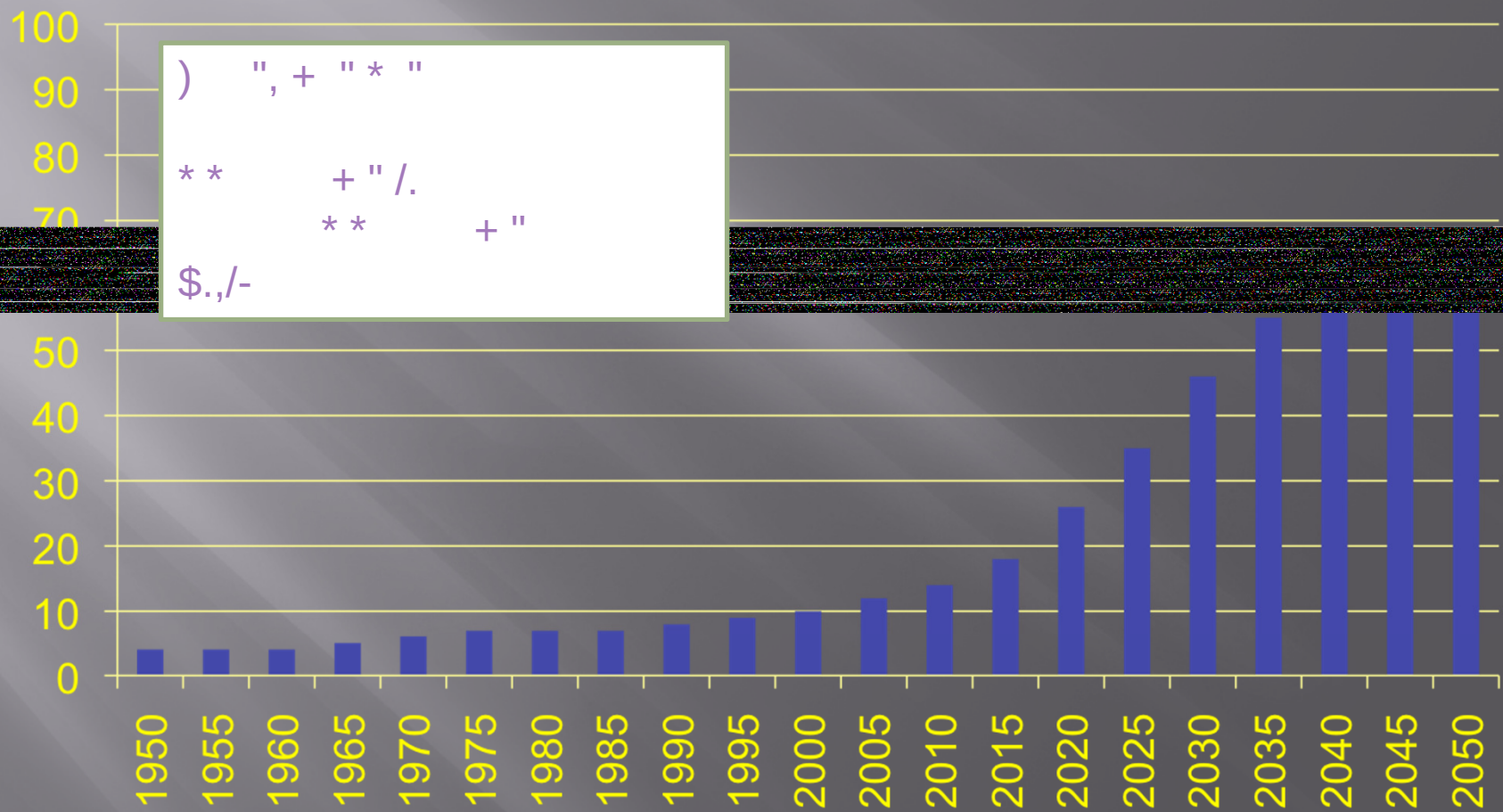
Ratio of population age 65+ to population age 20-64



Singapore Child Dependency Ratios



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision

	ADR(2005)	ADR (2050)	Growth
Singapore	12	58	380%

Seniors' poverty rates

% below 0.5 x median income -- family size adjusted

NZ

Netherlands

Canada

Sweden

France

Germany

UK

US

Australia

Incomes of seniors vs workers

After-tax income -- family-size adjusted

France

Germany

Canada

Sweden

Netherlands

US

UK

Australia

NZ

Cost of current public pensions

% of GDP

Australia

Canada

NZ

Netherlands

UK

US

Sweden

Germany

France

• " " " 2
 " " " 3* " 4 " 4

• 3* 4 44 4* "

• 4 2 " ** " 4 2
 + 4 4 "

WHAT HAVE WE LEARNED?

- ▣ Baby Boom about to retire
- ▣ Life Expectancy up
- ▣ Dependency ratio up
- ▣ DB plan coverage down
- ▣ DC and IRA coverage up

WHAT HAVE WE LEARNED?

Mortality (Life Expectancy) varies by:

- ▣ Income levels
- ▣ Work background (industrial history)
- ▣ Obesity
- ▣ Smoking habits

WHAT DO WE KNOW?

- ▣ 84.8% of American workers in an employer retirement plan will be offered a lump sum at retirement (51.8 million workers)
- ▣ Only 20% of 401(k) plans offer an annuitization option to its members (fear of fiduciary liability)
- ▣ In total, less than 5% of employer retirement plan participants who take a lump sum annuitize

DECUMULATION RISK

- ▣ Longevity risk
- ▣ Inflation
- ▣ Poor investment choices
- ▣ Unplanned expenses
- ▣ Too conservative or too liberal consumption

THE LONGEVITY RISK

Probability of a married couple, each 65 surviving
to
age:

	80	90	100
Both	50.6%	9.5%	0.1%
Wife Only	25.4	28.5	4.4
Husband	16.0	15.5	1.5
At least one	92.0	53.5	6.0

THE ANNUITY ADVANTAGE

- ▣ Provides longevity insurance through the grouping of policyholders
- ▣ For those who survive, it pays out more than a non-life annuity through the benefit of survivorship

WHY DON'T PEOPLE ANNUITIZE?

- ▣ Loss of liquidity
- ▣ Might do better on one's own
- ▣ IC friction (costs)
- ▣ Those with higher financial literacy do not annuitize
- ▣ Maybe I can get a better price if I wait (especially given today's low "i")
- ▣ No risk classification

THE HIGH COST OF ANNUITIES

- ▣ Very low “i” today
- ▣ The Insurer must cover future mortality improvement (not mitigated by the law of large numbers)
- ▣ Insurer must assume adverse selection (applicants will always know more about themselves than the Insurer)
- ▣ Transaction costs can be 18 to 20%
- ▣ 10% is because of guarding against adverse selection

THE ANSWER

- ▣ Risk Classification
- ▣ Results in Enhanced Annuities
- ▣ Those in poor health pay less
- ▣ Pricing/risk classification is mirror image to Life Insurance

ENHANCED ANNUITIES IN THE U.K.

- ▣ First six months of 2010 sold £1.26B = \$2.00 B \$US
- ▣ Up 41% from 2nd half of 2009
- ▣ Full year 2009: £ 1.78B
- ▣ Now 1/3rd of all annuities sold in the UK (by premium volume)
- ▣ Fastest growing annuity product
- ▣ Now 22% of the total market
- ▣ And PROFITABLE (partly because it had been ignored)

ENHANCED PROFITS

ENHANCED ANNUITIES

RISK CLASSIFICATION FOR
ANNUITANTS

QUESTION PERIOD