Bureau du surintendant
des institutions financières

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Office of the Superintendent
of Financial Institutions

Office of the Chief Actuary

Mortality of Canada Pension Plan and Old Age Security Beneficiaries: Implications for Public Pensions

14th International Conference of Social Security Actuaries and Statisticians

ISSA • AISS • IVSS

23 September 2003

INSTITUTO MEXICANO DEL SEGURO SOCIAL
SEGURIDAD Y SOLIDARIDAD SOCIAL

IMSS

Presentation

- Canadian Mortality Trends
- Mortality Projections – Living to 100 years
- CPP Retirement Beneficiary Mortality
- CPP Survivor Beneficiary Mortality
- Future Challenges – World Comparison

# Life Expectancy at Birth (LTC)
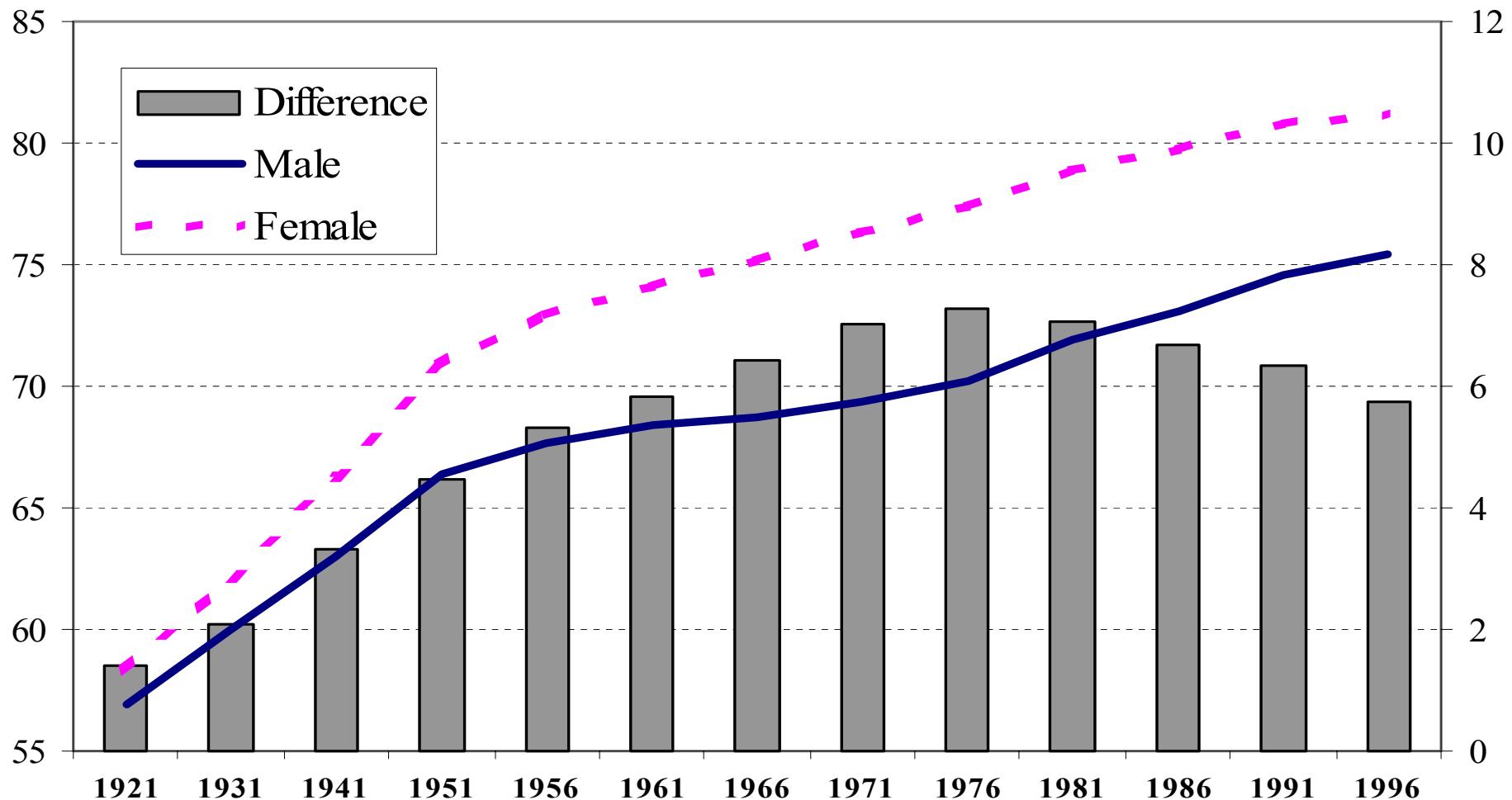
# Life Expectancy at Age 65 (LTC)
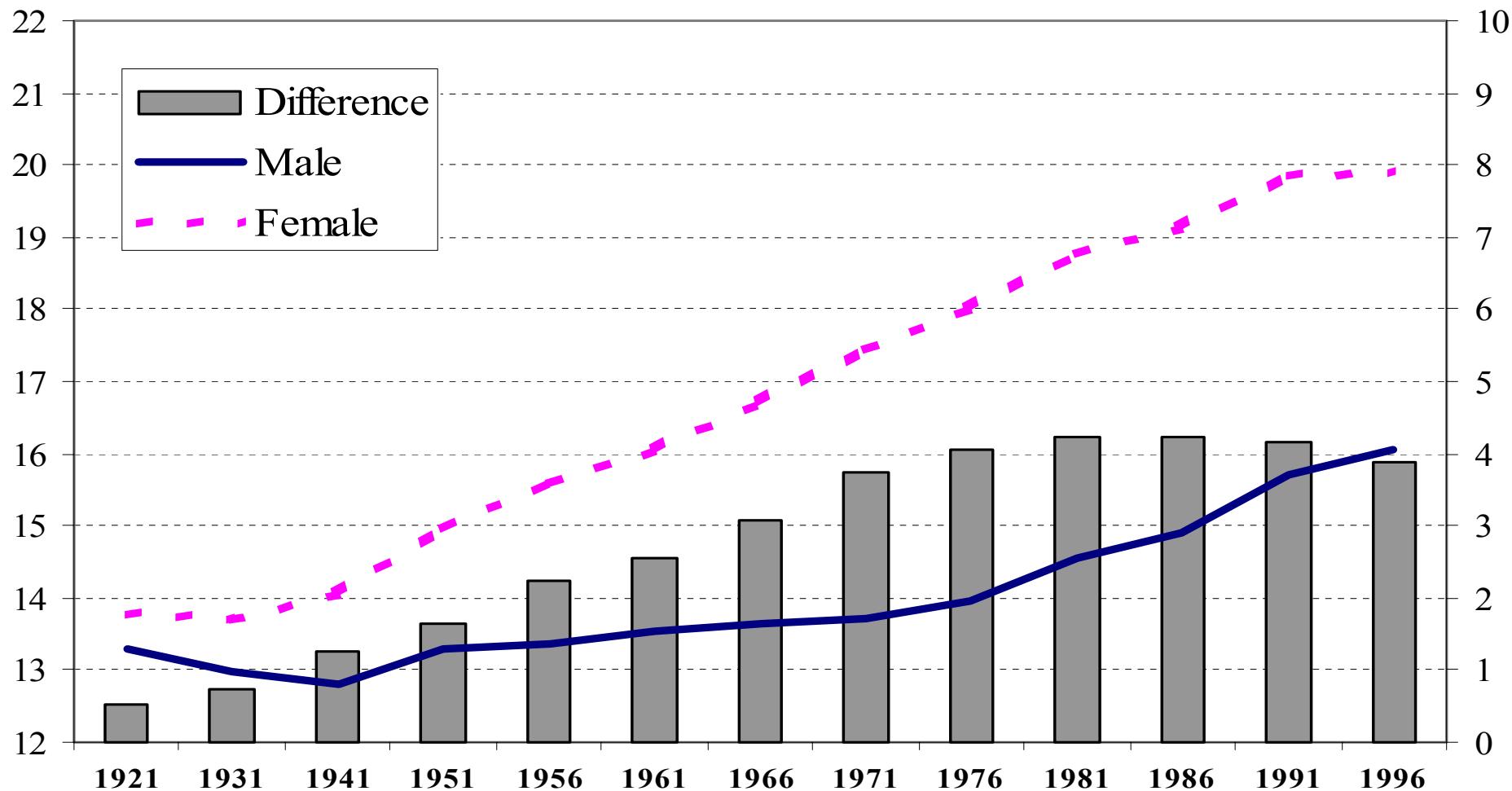
Probability of surviving

« 70% of males would die between 74 and 94 »
Globe and Mail, March 2002

1996 M

2050 M

1921 M

$e_0=85$

$e_0=75$

$e_0=57$

Age
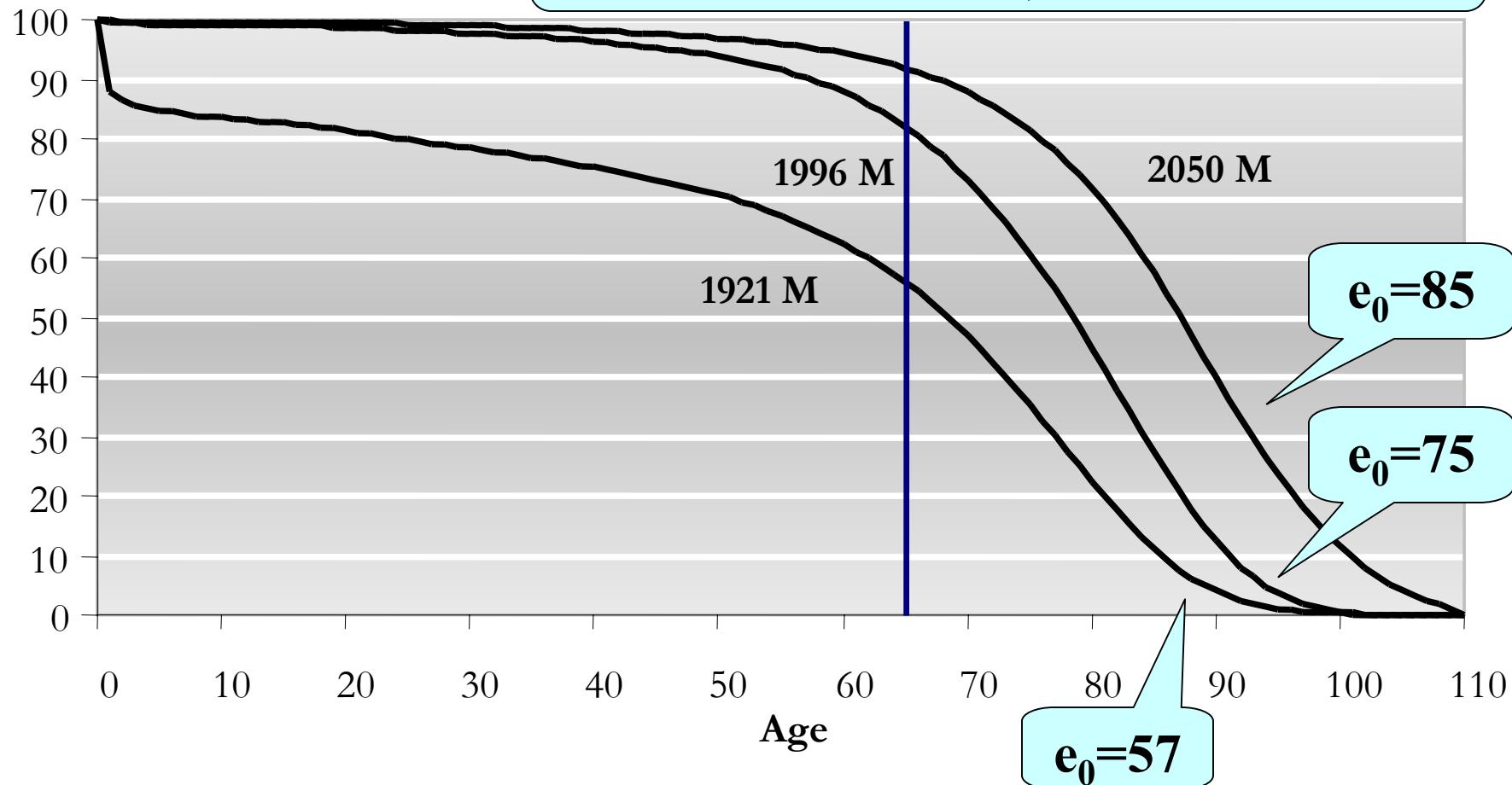
Probability of surviving

« 70% of females would die between 77 and 96 »
Globe and Mail, March 2002

$e_0=88$

$e_0=81$

$e_0=58$

1996 F

2050 F

1921 F

Age
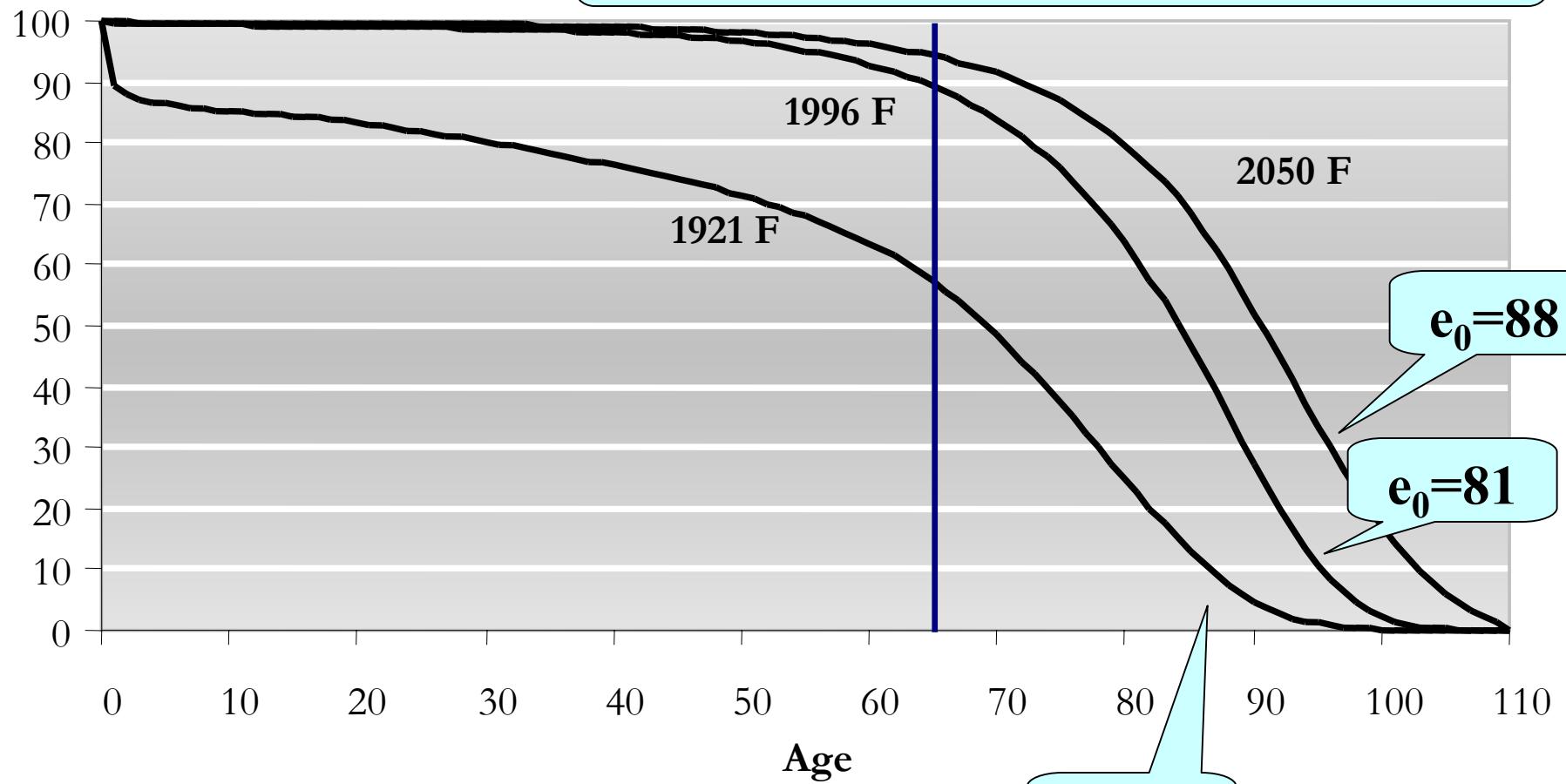
Average Annual Population-Weighted Mortality Improvement Rates
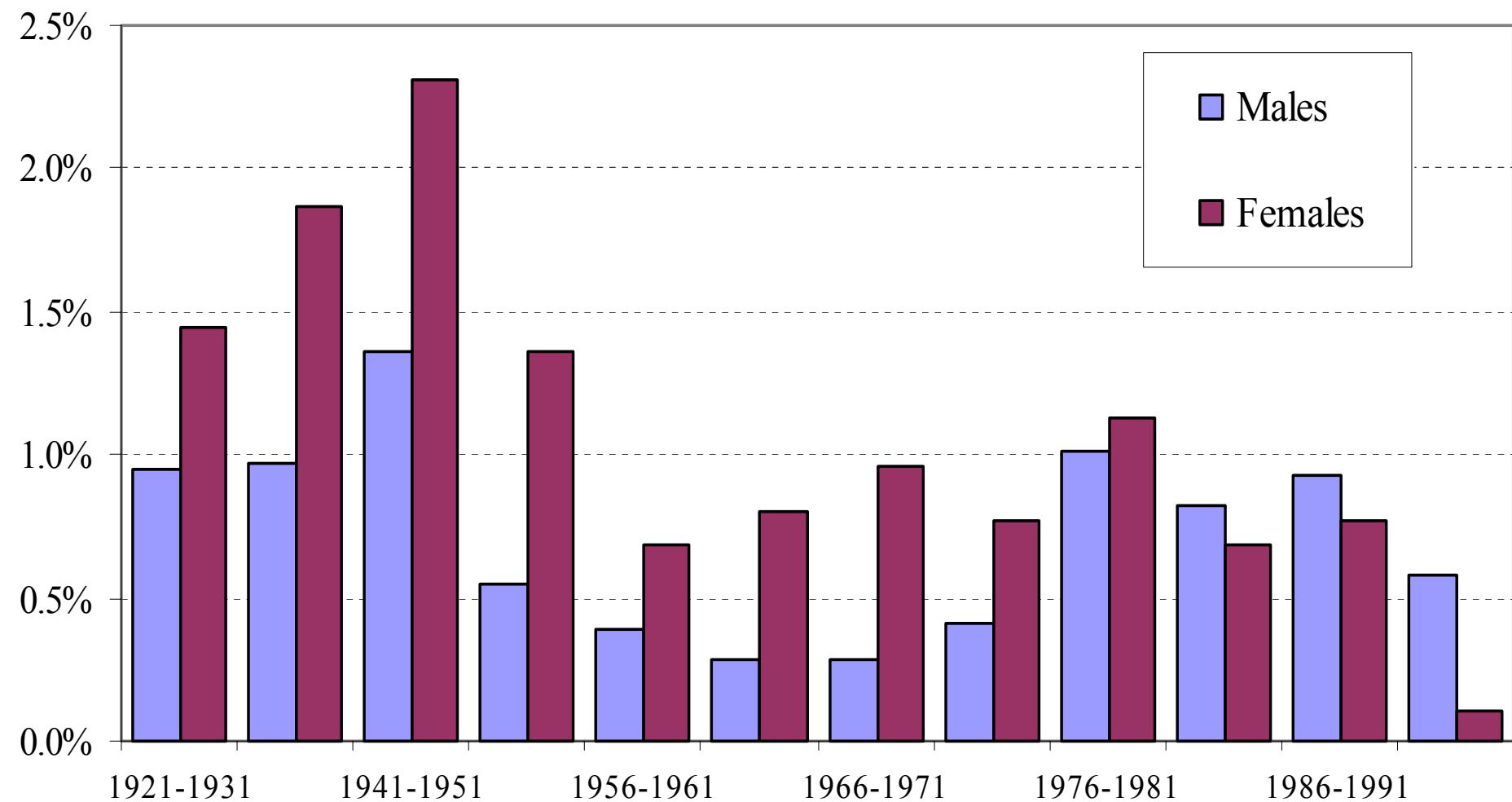
Comparison of Survival Curves for Males
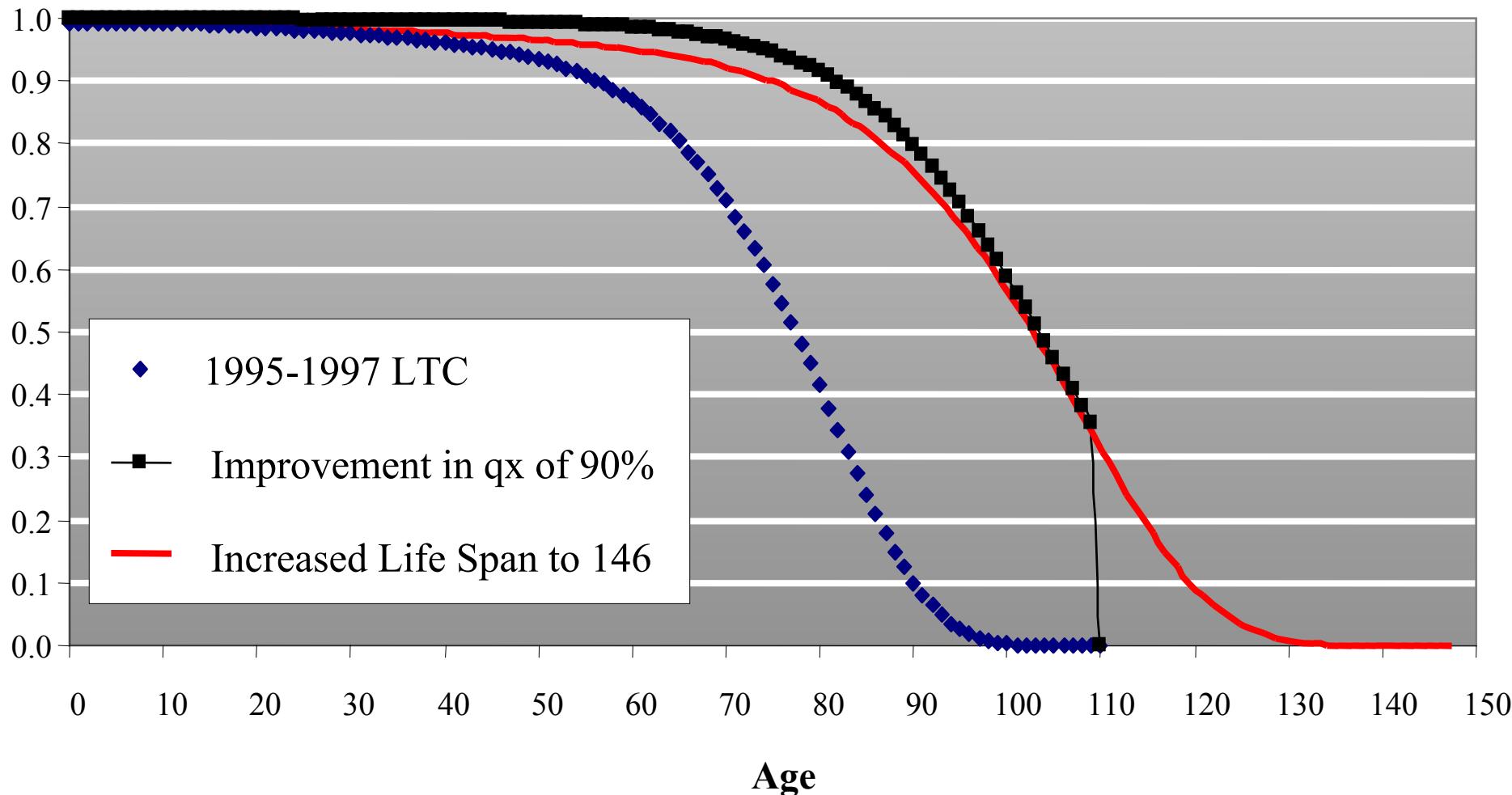
Comparison of Survival Curves for Females
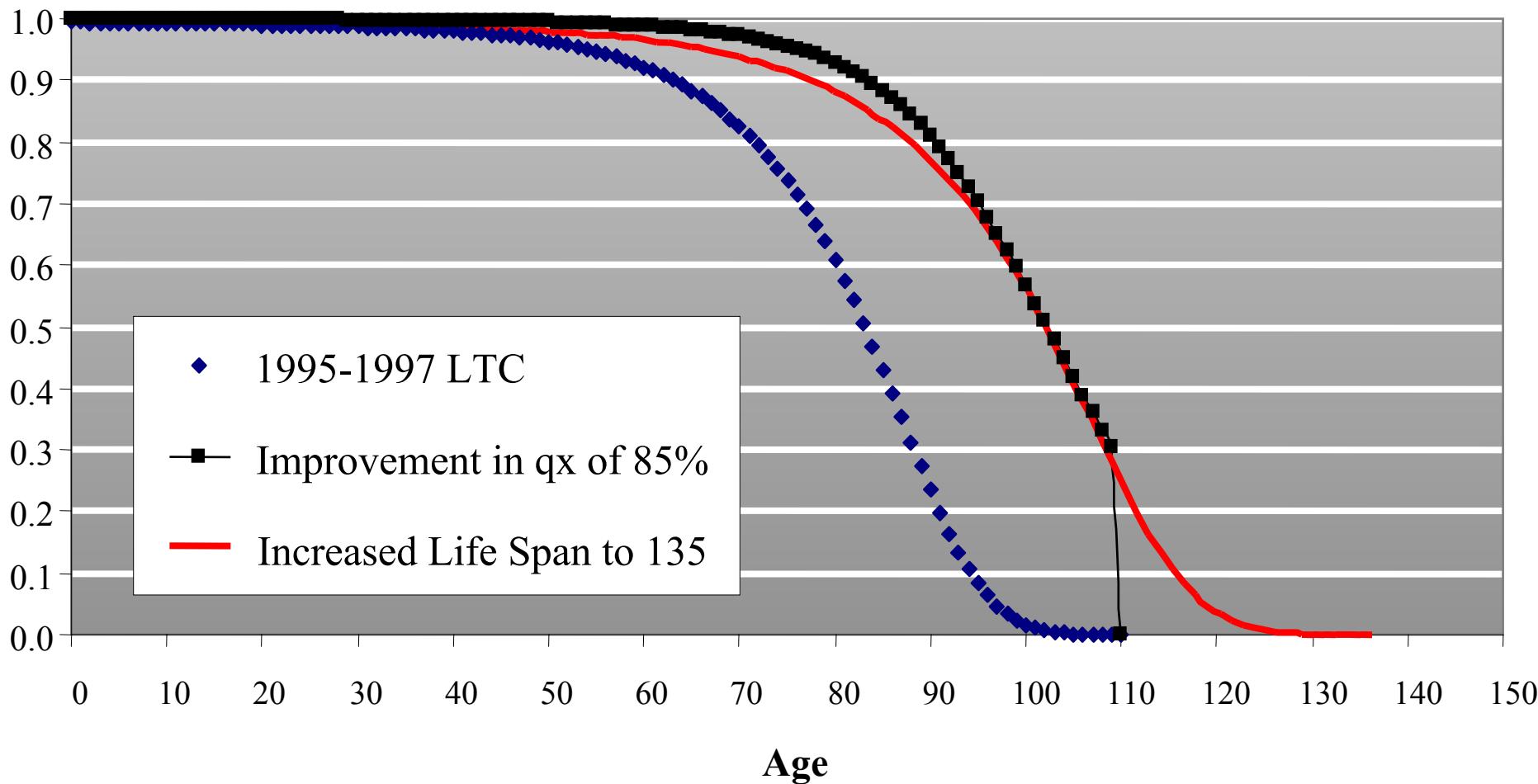
Life Expectancy at Age 65 - Male
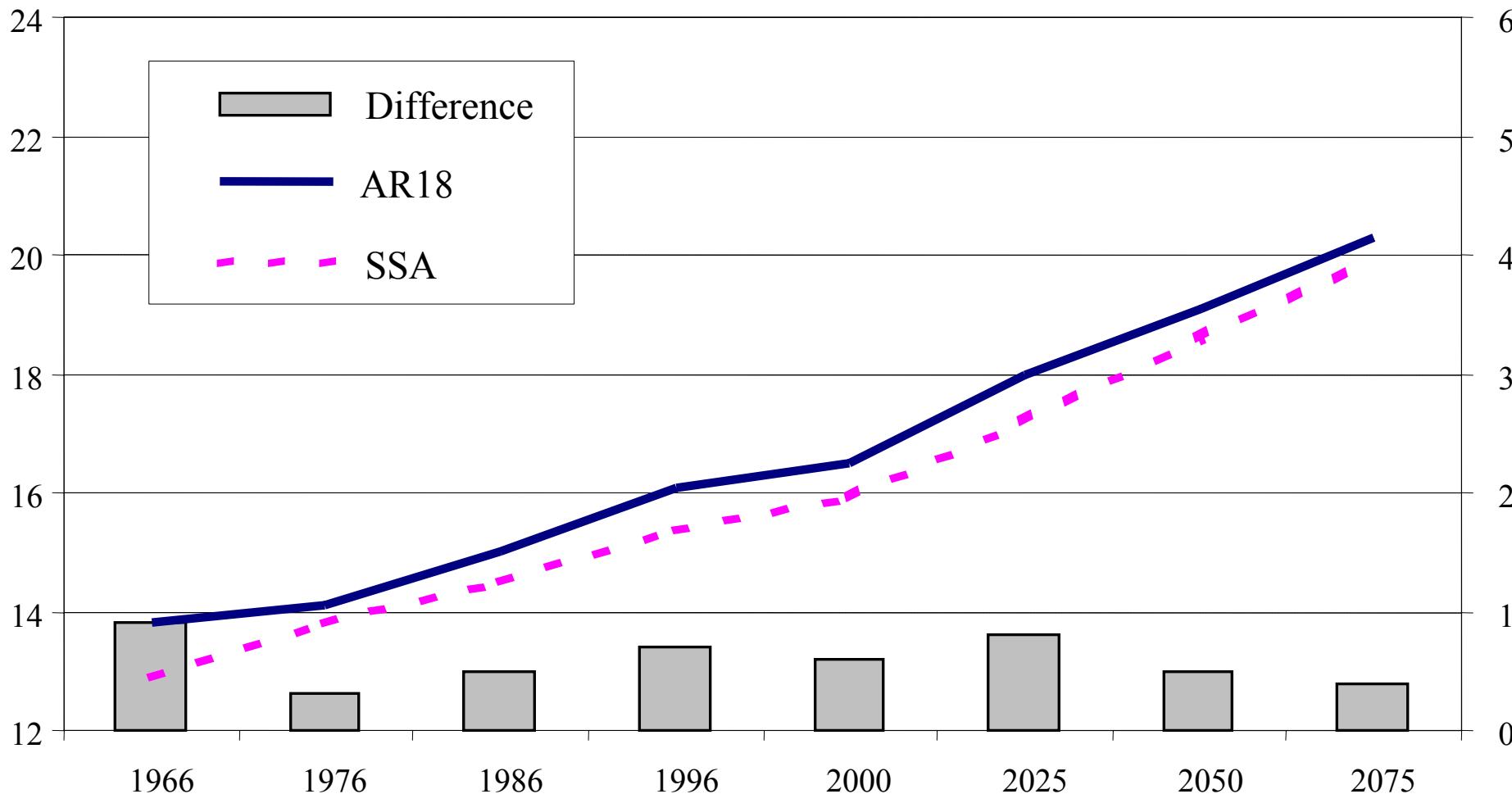
Life Expectancy at Age 65 - Female
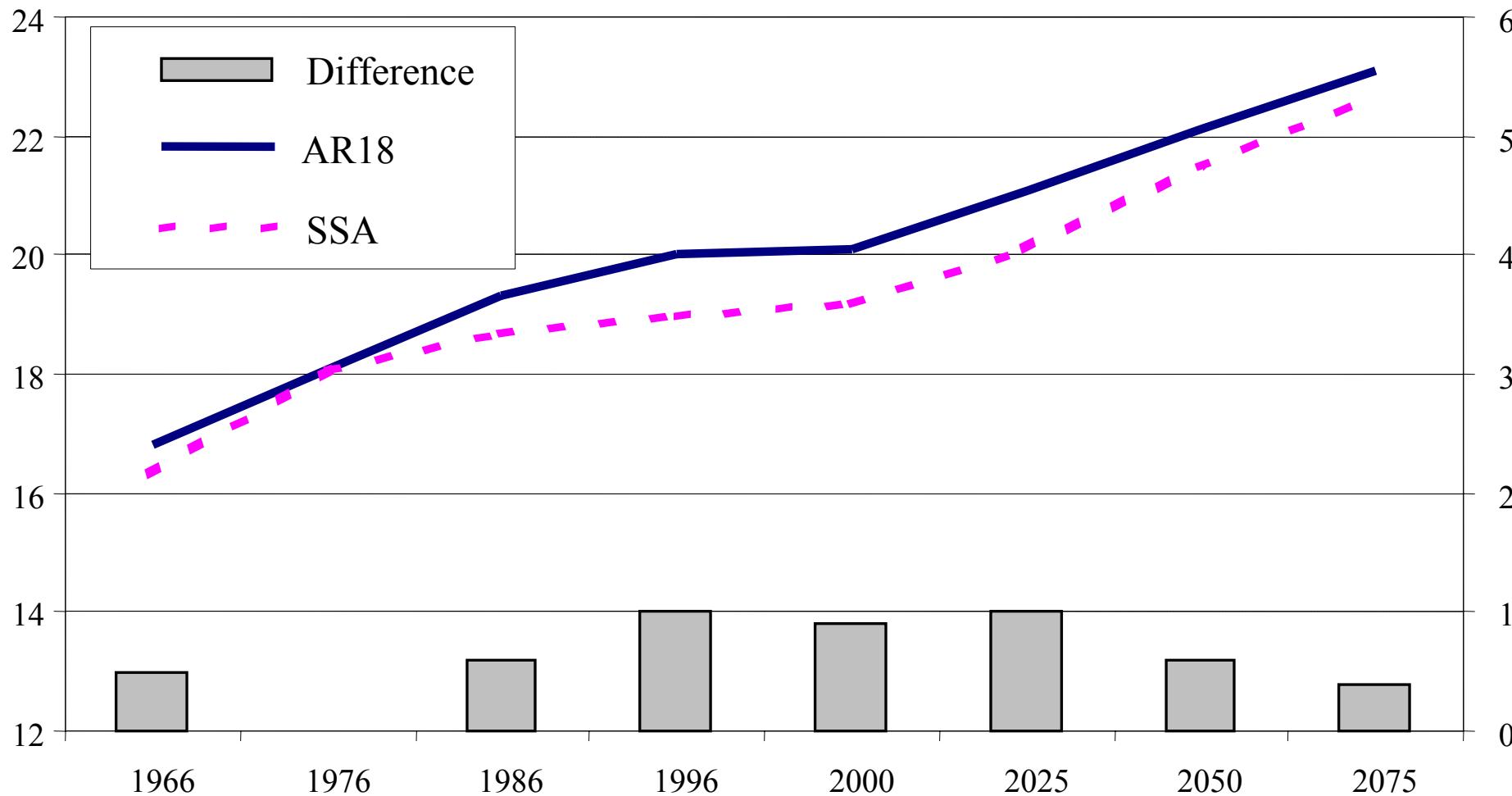
Probability of Surviving from Birth to Age 18
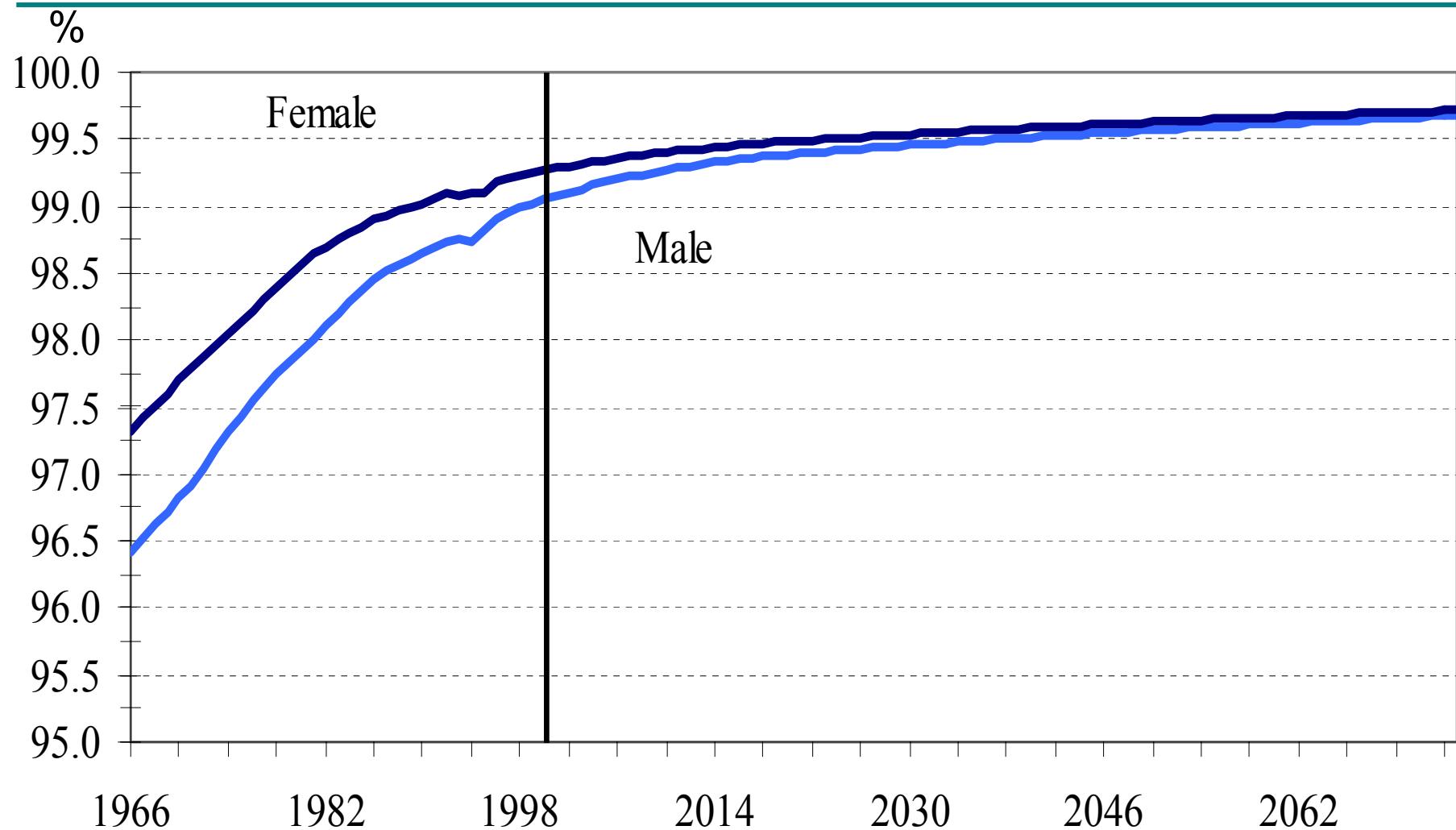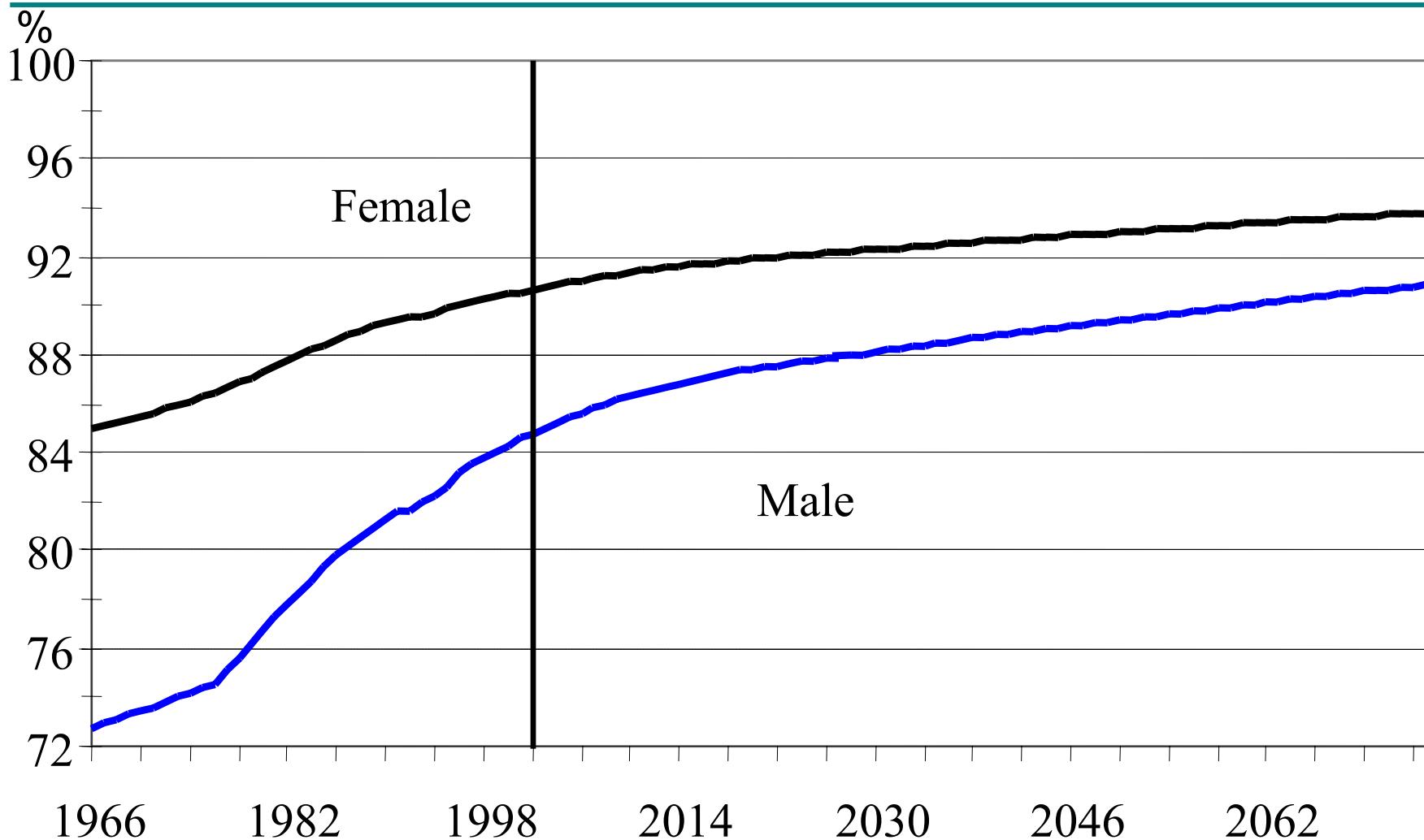
Probability of Surviving from Age 18 to Age 65

Probability of Surviving from Age 18 to Age 65
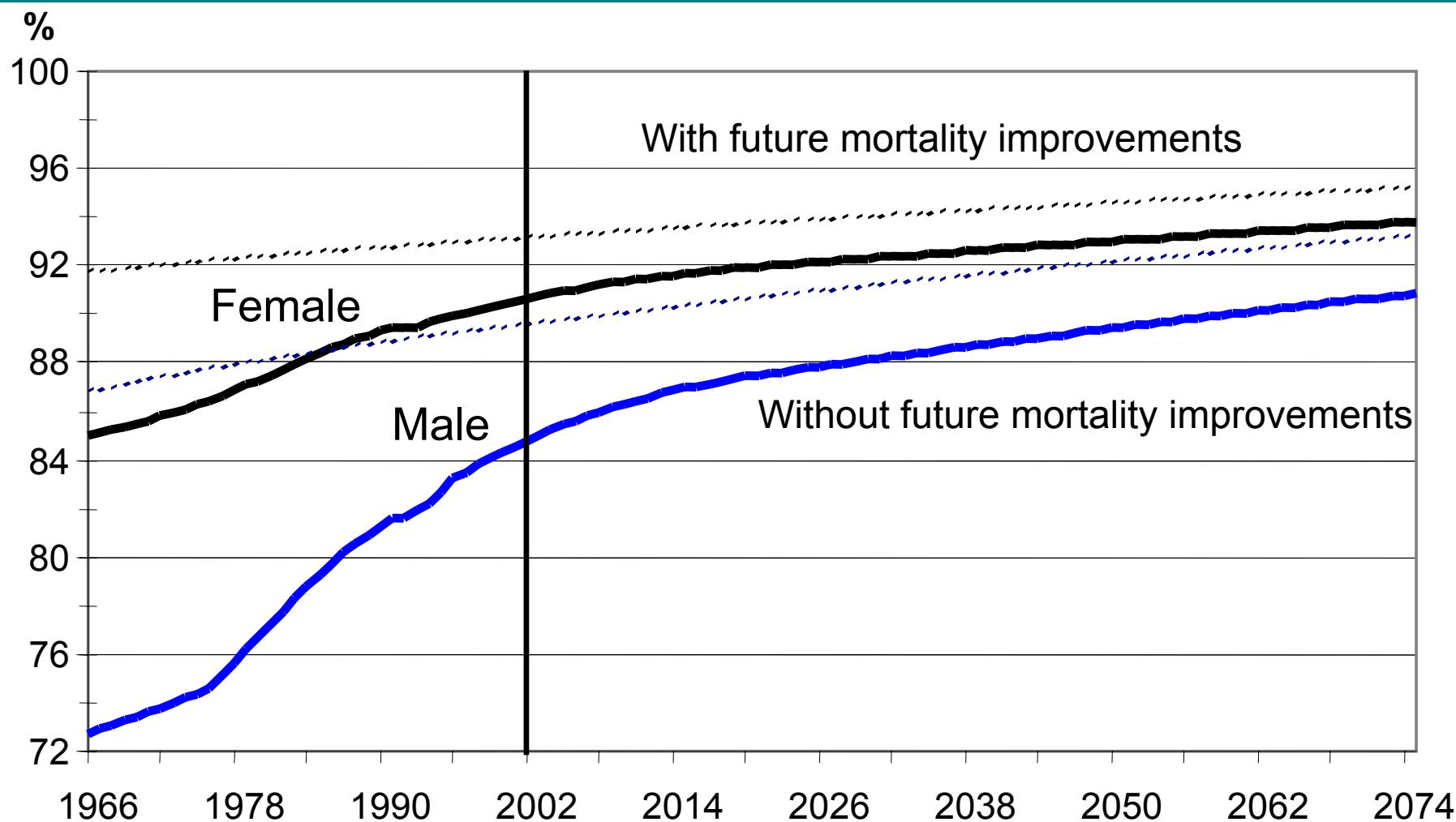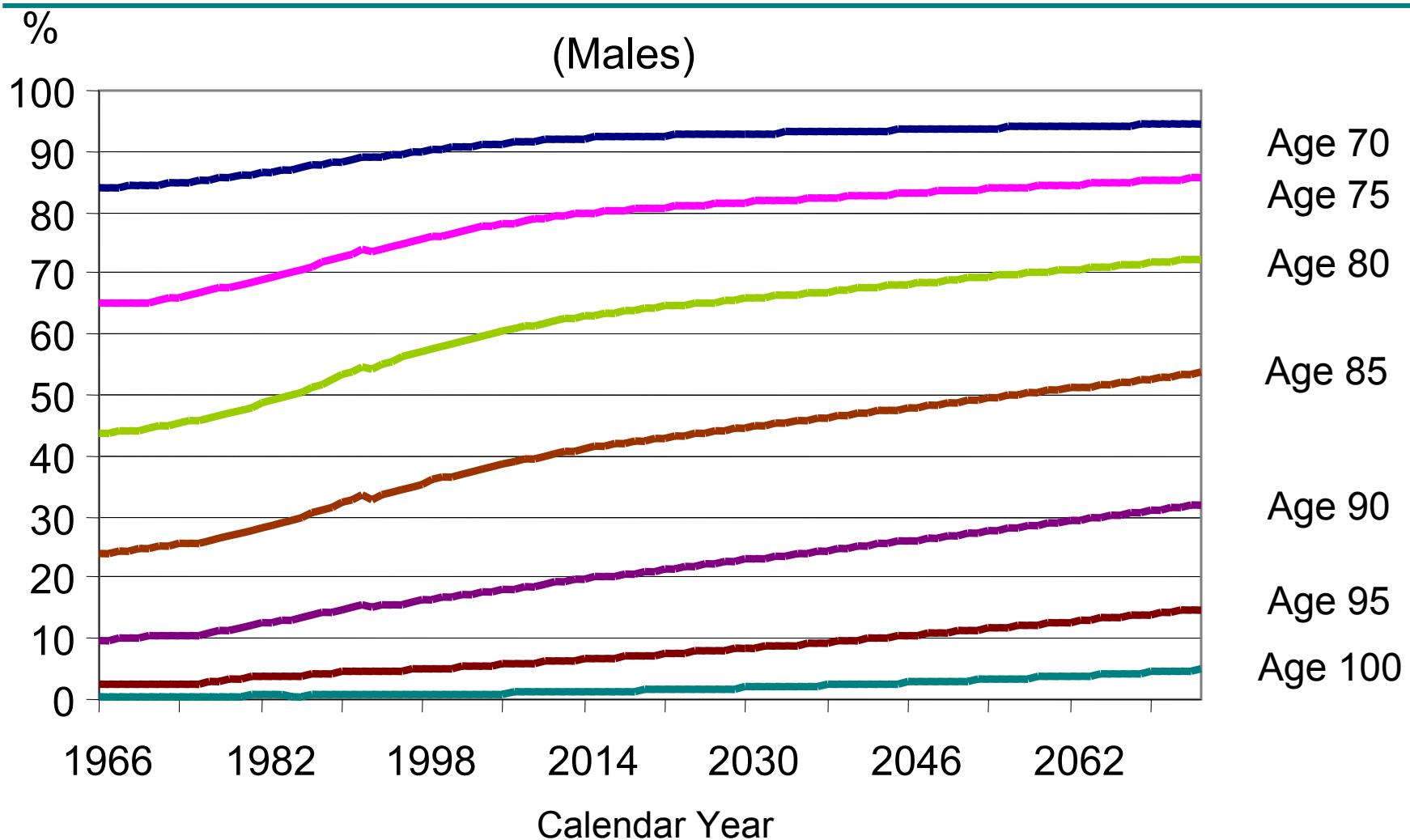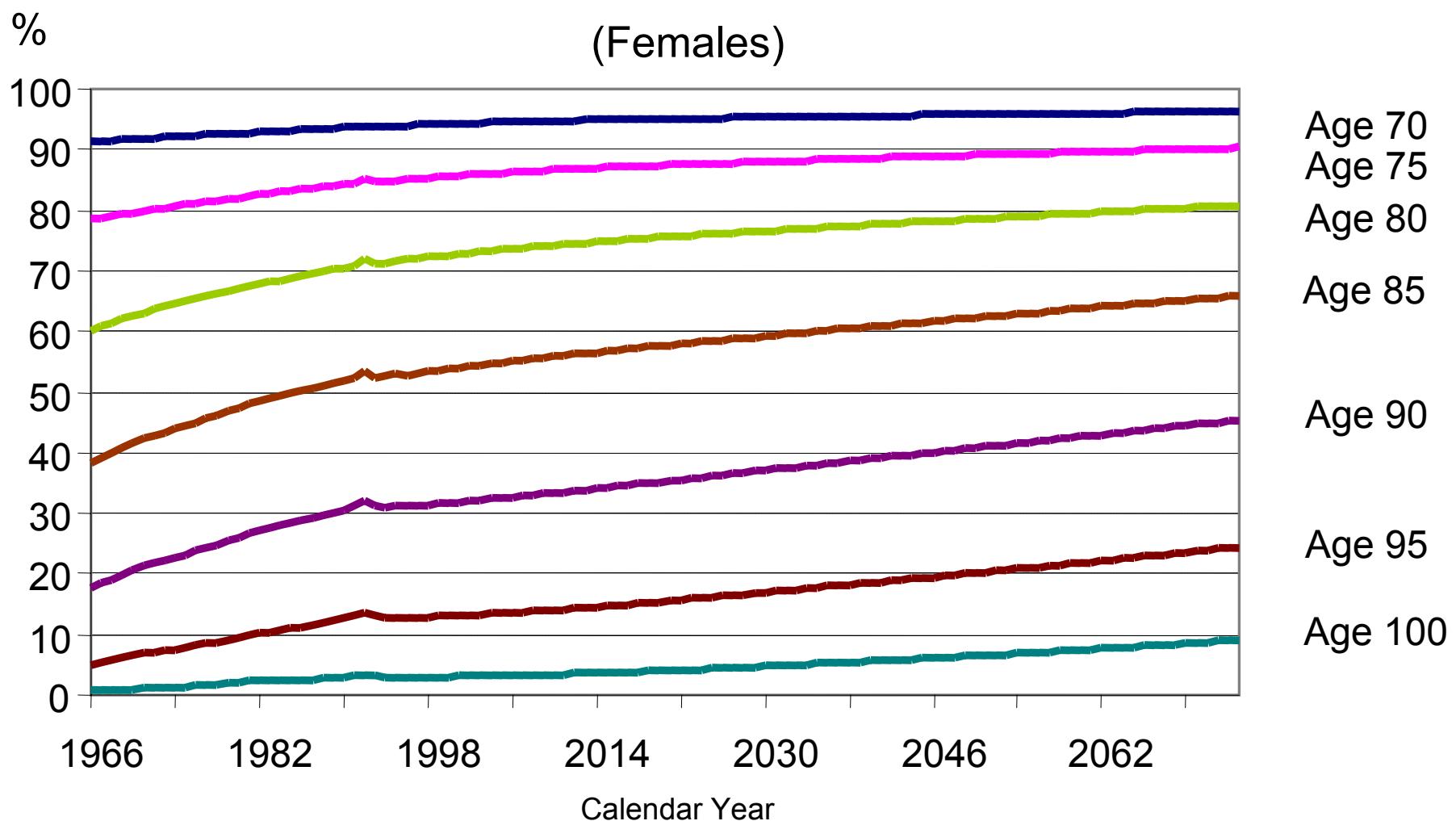
%

With future mortality improvements

Female

Male

Without future mortality improvements

100
96
92
88
84
80
76
72

1966   1978   1990   2002   2014   2026   2038   2050   2062   2074

Probability of Surviving from Age 65 To

(Males)

Probability of Surviving from Age 65 To

(Females)

Probability of Surviving from Age 65 to Age 80

%

With future mortality improvements

Female   Male

Without future mortality improvements

1966   1978   1990   2002   2014   2026   2038   2050   2062   2074

CPP Retirement Beneficiary Mortality Ratios
(By Level of Pension – Males)

(CPP vs LTC-Q)

Legend:
- 0-25%
- 25-50%
- 50-75%
- 75-100%

Age

CPP Retirement Beneficiary Mortality Ratios
(By Level of Pension – Females)

(CPP vs LTC-Q)

Legend:
- 0-25%
- 25-50%
- 50-75%
- 75-100%

Age
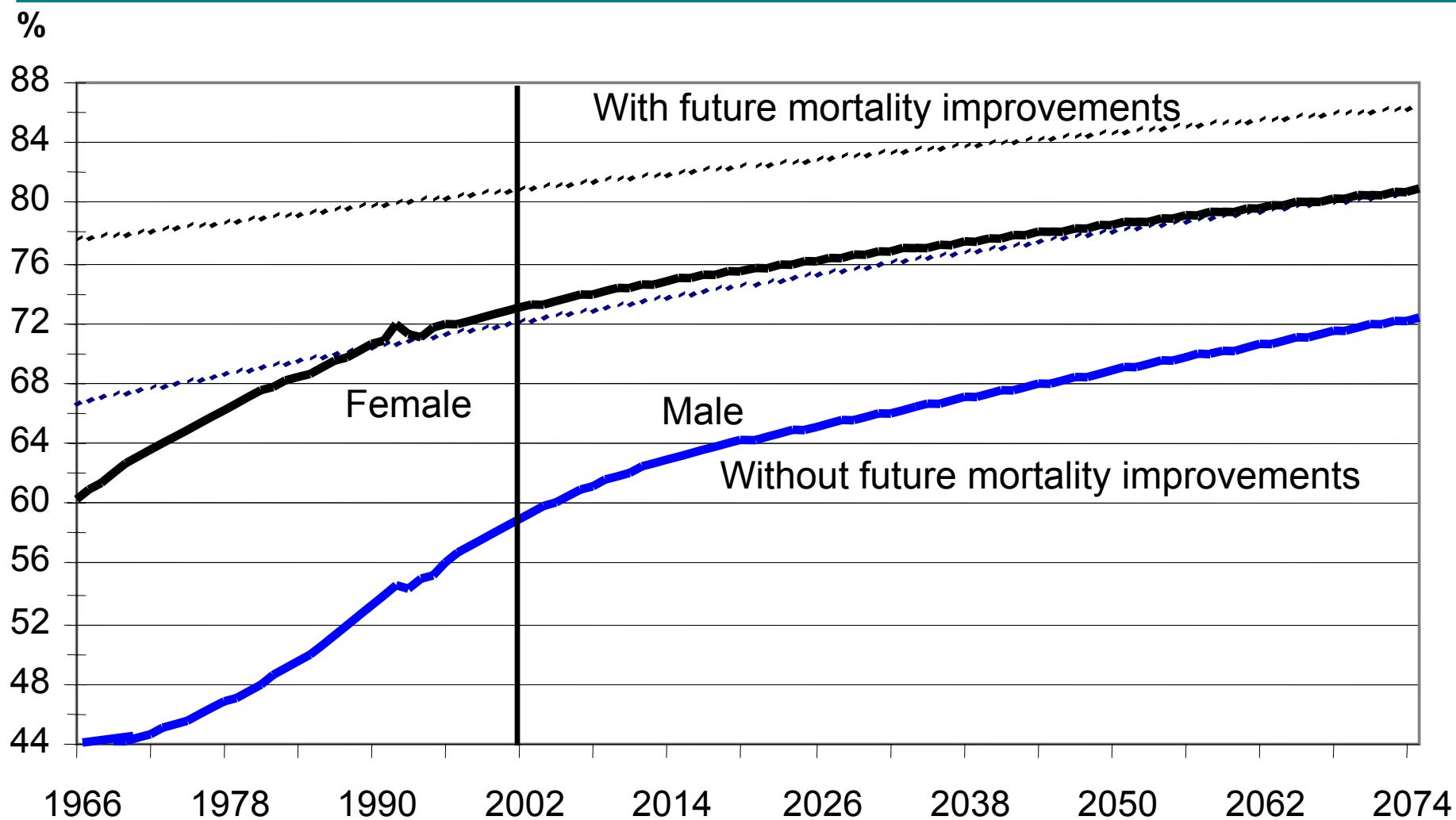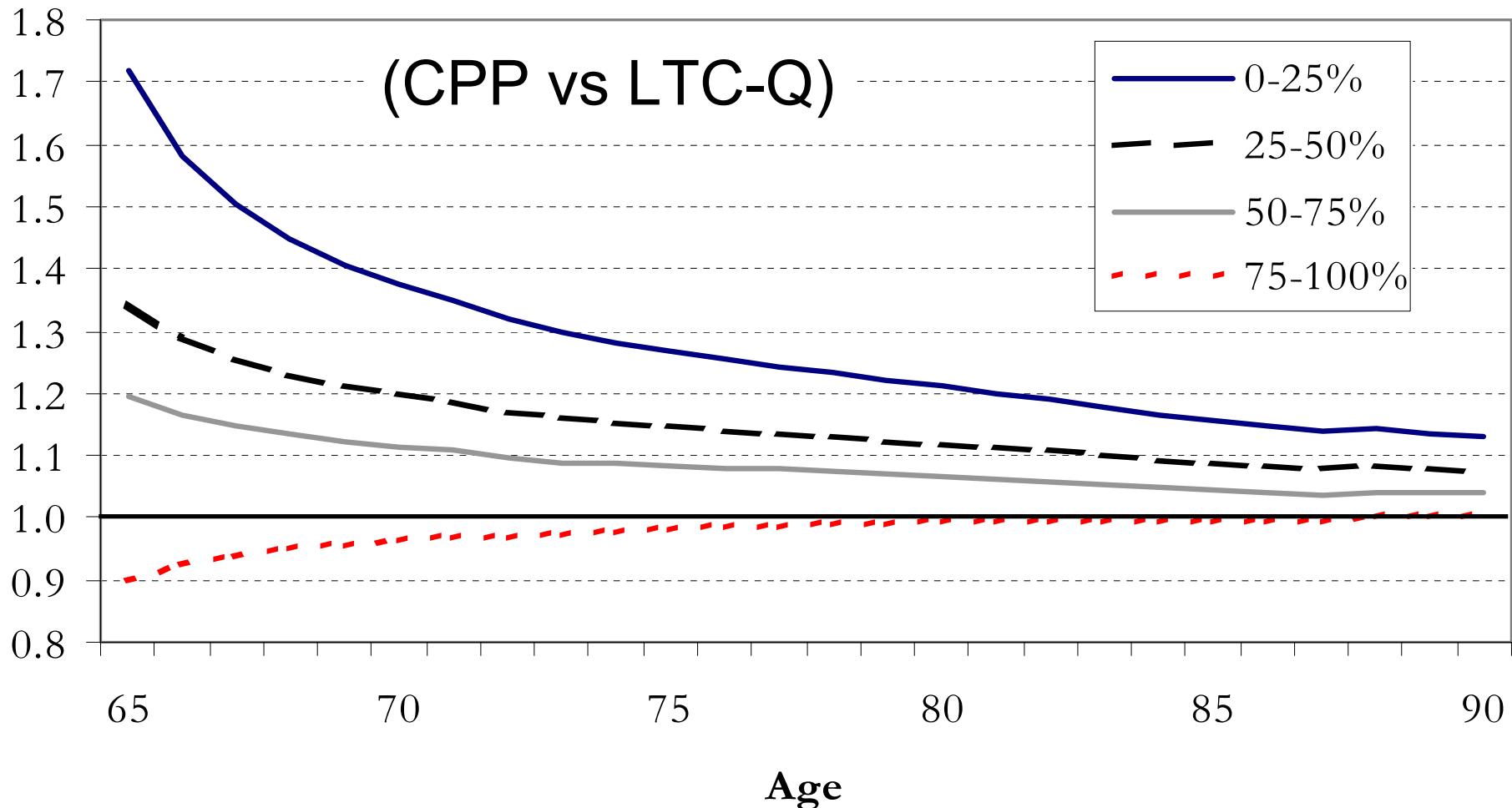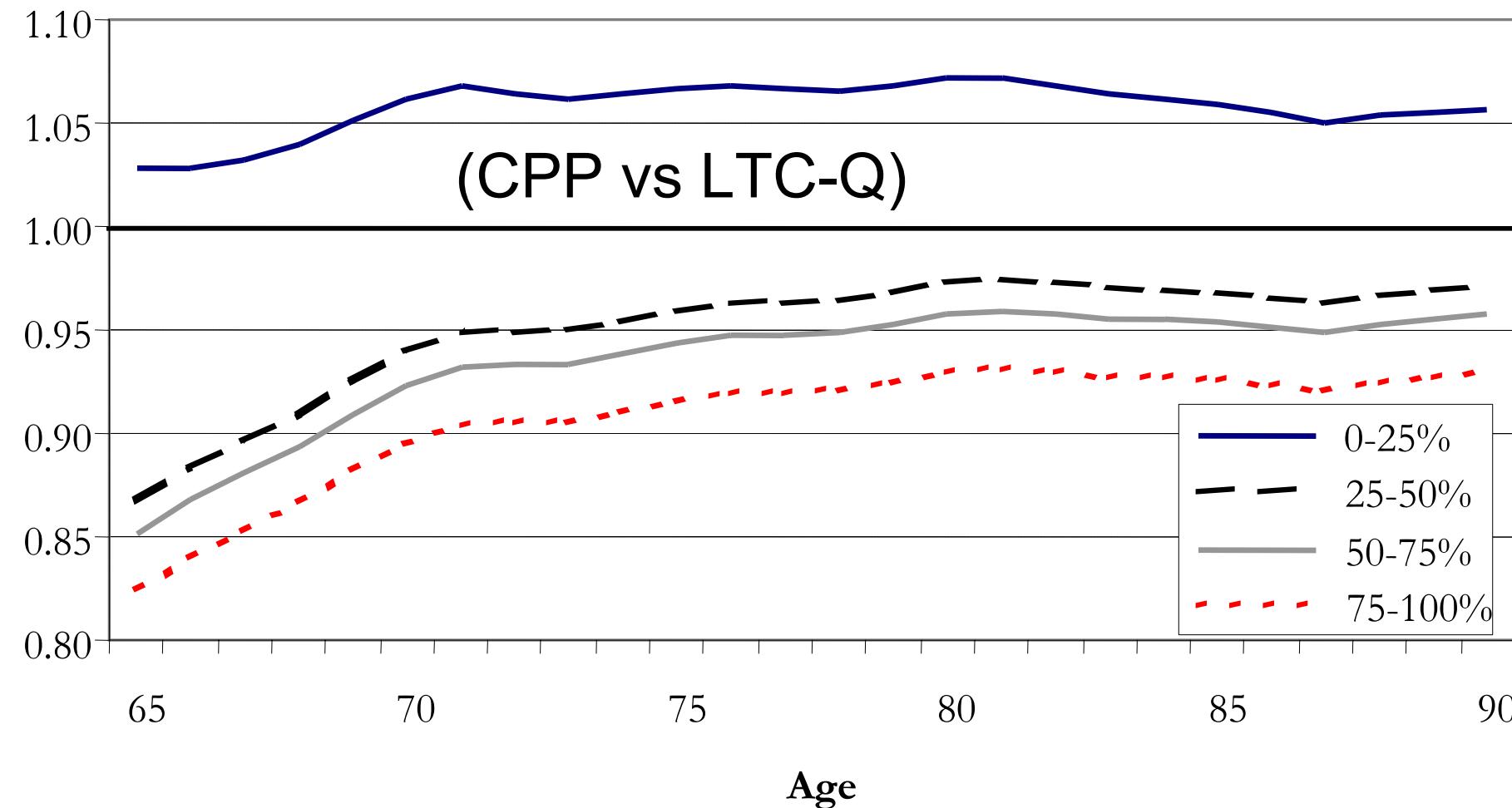
CPP Retirement Beneficiary Life Expectancies (By Level of Pension - Males)

Number of years

Age	0-25%	25-50%	50-75%	75-100%	All	1995-97 C-QLT
60	17.7	18.9	19.5	20.6	20.1	20.0
65	14.2	15.1	15.6	16.4	16.0	16.2
70	11.4	12.0	12.4	12.9	12.6	12.8
75	8.8	9.2	9.5	9.9	9.7	9.9
80	6.6	6.9	7.1	7.4	7.2	7.3
85	4.8	5.0	5.2	5.3	5.2	5.3
90	3.4	3.6	3.7	3.8	3.7	3.8

CPP Retirement Beneficiary Life Expectancies
(By Level of Pension - Females)

<div align="center">

Number of years

Age	0-25%	25-50%	50-75%	75-100%	All	1995-97 C-QLT
60	23.7	24.7	24.8	25.2	24.5	24.1
65	19.5	20.3	20.5	20.7	20.2	20.0
70	15.7	16.3	16.5	16.7	16.2	16.1
75	12.1	12.7	12.8	13.0	12.6	12.5
80	9.0	9.5	9.6	9.7	9.4	9.3
85	6.5	6.8	6.9	7.1	6.8	6.7
90	4.5	4.8	4.8	4.9	4.7	4.7

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CPP Survivor Beneficiary Mortality Ratios

(CPP vs LTC-Q)

Males

Females

Age
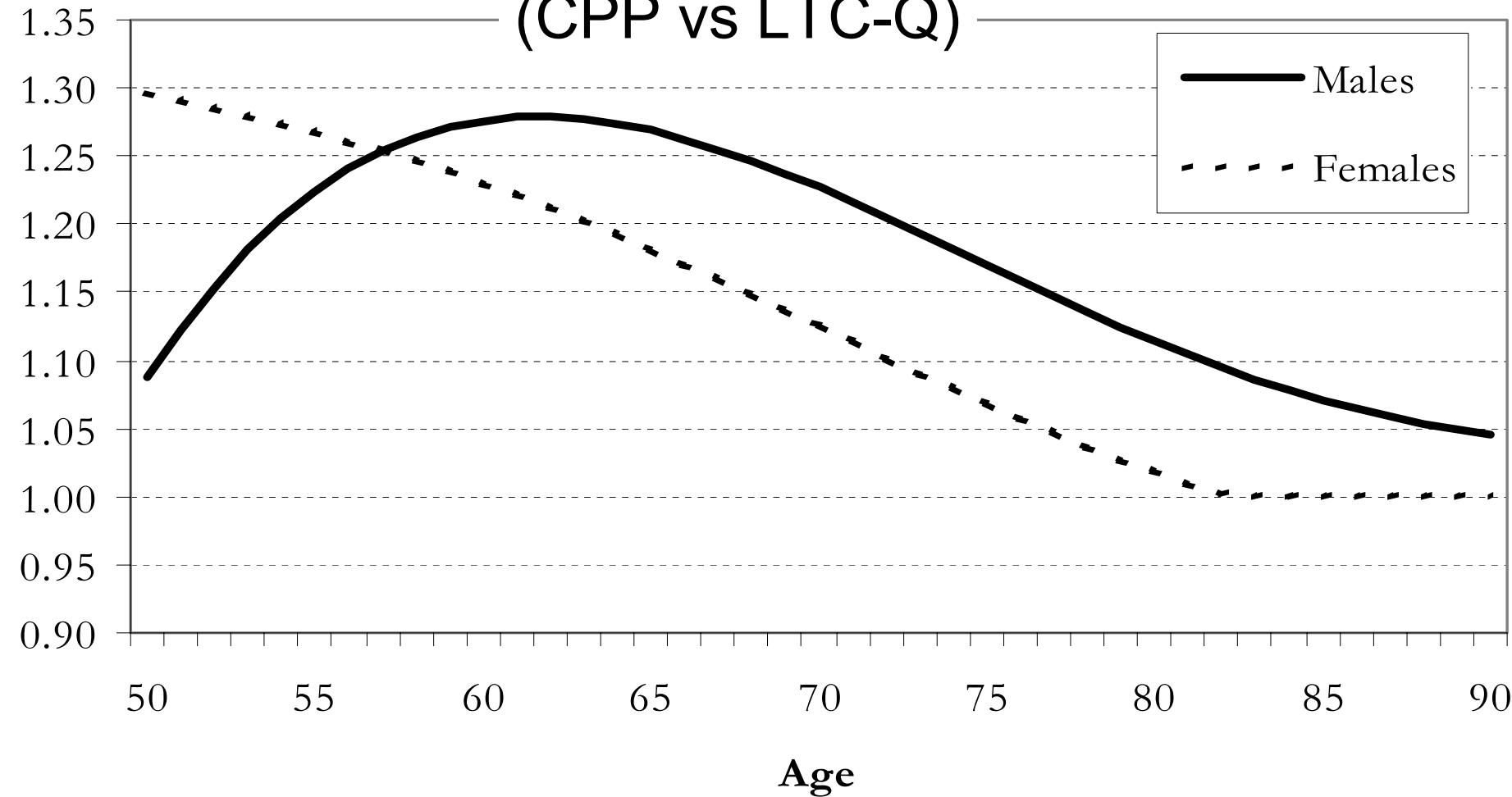
CPP Survivor Life Expectancies

Age	Males		Females	
	General Population	CPP	General Population	CPP
50	28.5	26.9	33.0	32.2
55	24.2	22.7	28.5	27.8
60	20.0	18.7	24.1	23.6
65	16.2	15.1	20.0	19.6
70	12.8	12.0	16.1	15.9
75	9.9	9.3	12.5	12.4
80	7.3	7.0	9.3	9.3
85	5.3	5.1	6.7	6.7
90	3.8	3.7	4.7	4.7

Evolution of OAS Beneficiaries
(in thousands)

Age Group	2000 #	2000 %	2050 #	2050 %
65-69	1,098	29 %	2,300	24 %
70-79	1,783	47 %	3,919	41 %
80+	896	24 %	3,364	35 %
All	3,777	100 %	9,584	100 %

Expected total population in 2050: 41 million

Future challenges

- Life expectancy at birth of 100 is practically impossible in the next half century unless there are dramatic medical and scientific breakthroughs.

- Future mortality improvements are expected to come more slowly and at older ages, as mortality rates at younger ages are already very low.

- In the context of CPP, more and more contributors are expected to reach the retirement age of 65.

- CPP retirement beneficiaries are expected to receive their benefit for a longer period.
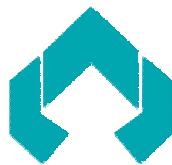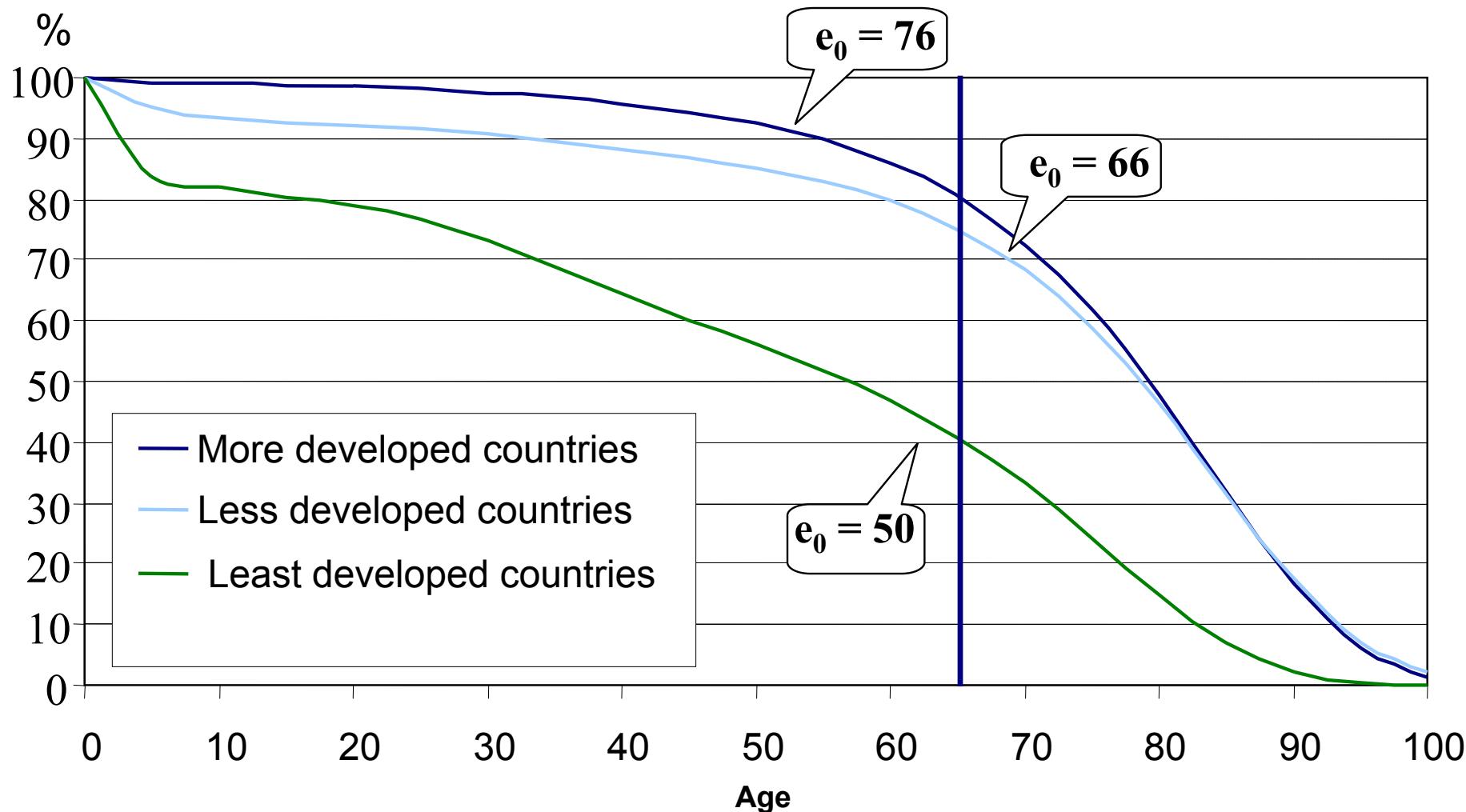
# Probability of Surviving
(World comparison)

United Nations Population Division, Period 2000-2005

Probability of Surviving
(World comparison)

$e_0 = 76$

$e_0 = 66$

$e_0 = 57$

$e_0 = 50$

%

Age

Legend:
- More developed countries
- Less developed countries
- Least developed countries
- Canada Males (1921)

United Nations Population Division, Period 2000-2005

Probability of Surviving
(World comparison)
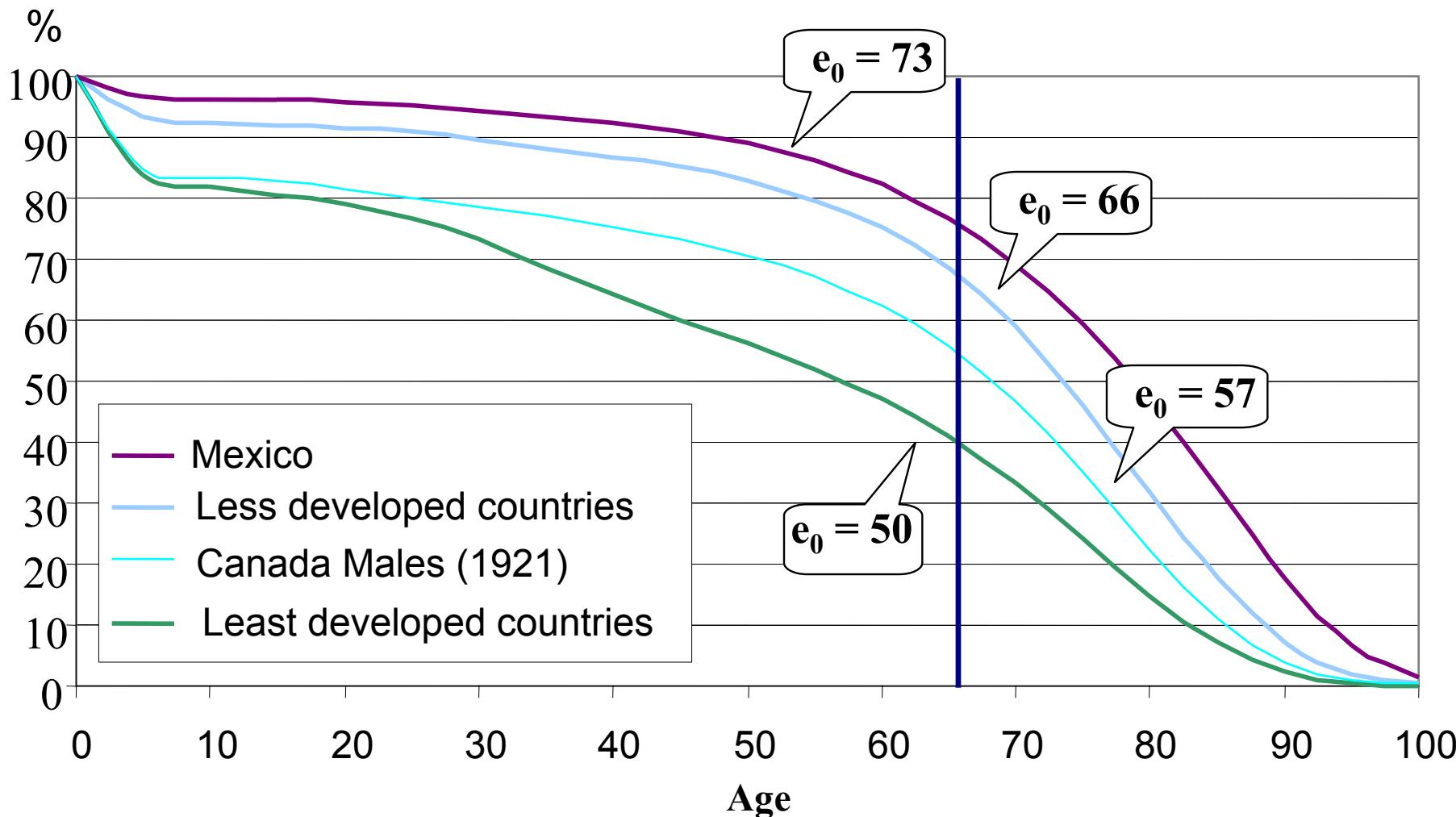
Life Expectancy at Birth

Countries	(In 1980)	(In 2000)		(In 2050)
Japan	- 5	**82**	(9th)	+ 6
United States	- 4	**77**	(3rd)	+ 5
Mexico	- 5	**73**	(11th)	+ 7
China	- 4	**71**	(1st)	+ 6
Brazil	- 5	**68**	(5th)	+ 10
Russia	+ 1	**67**	(6th)	+ 7
India	- 9	**64**	(2nd)	+ 10
Nigeria	- 4	**51**	(10th)	+ 13
Zambia	+ 20	**32**	(74th)	+ 20

Since 1980, the difference in e_0 between the best and the worst country has actually increased from around 40 to 50 years !