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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***



**37th Annual Meeting of the Canadian Economics Association**

31 May 2003



**Carleton**  
UNIVERSITY

# Presentation

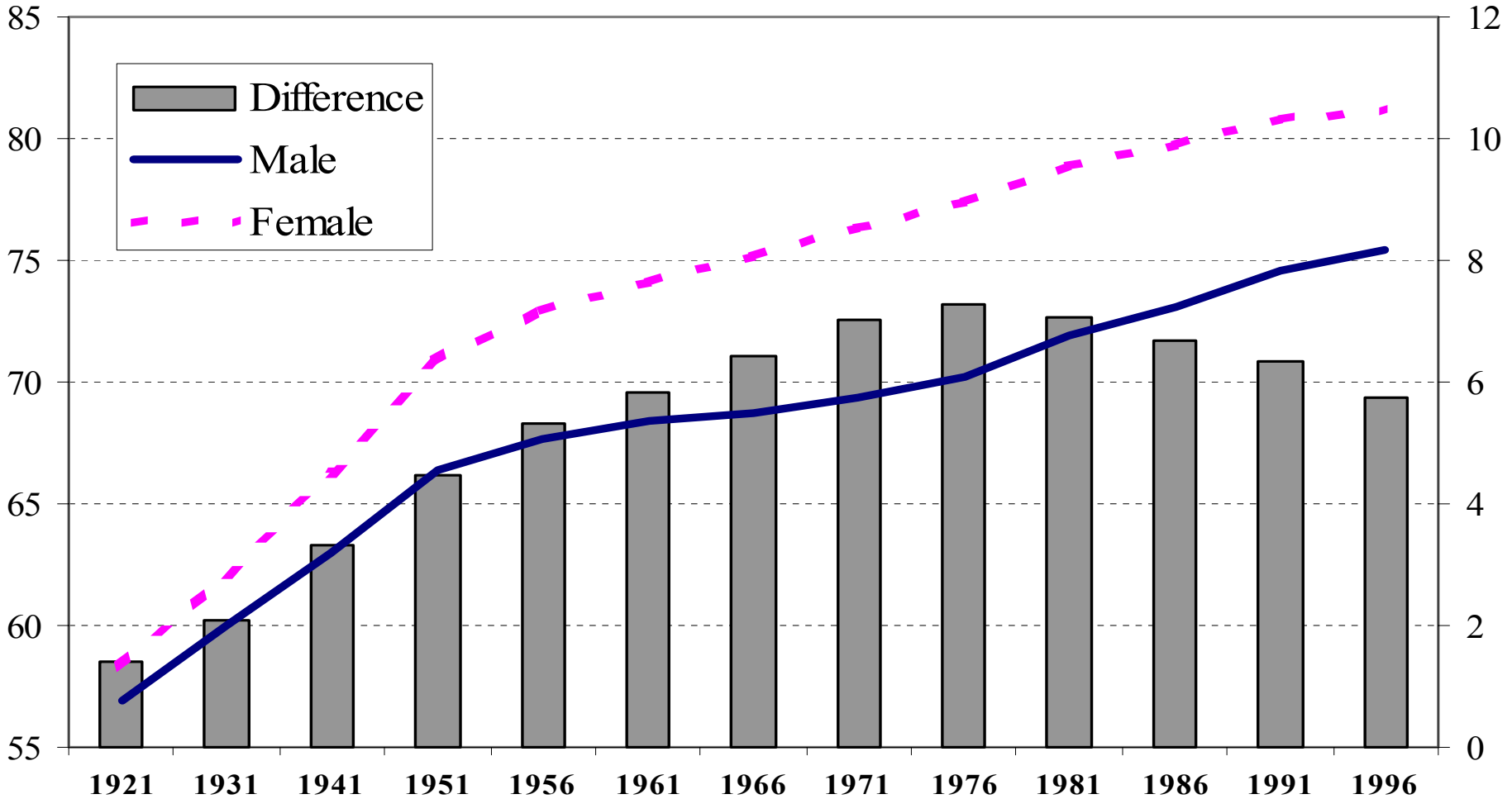
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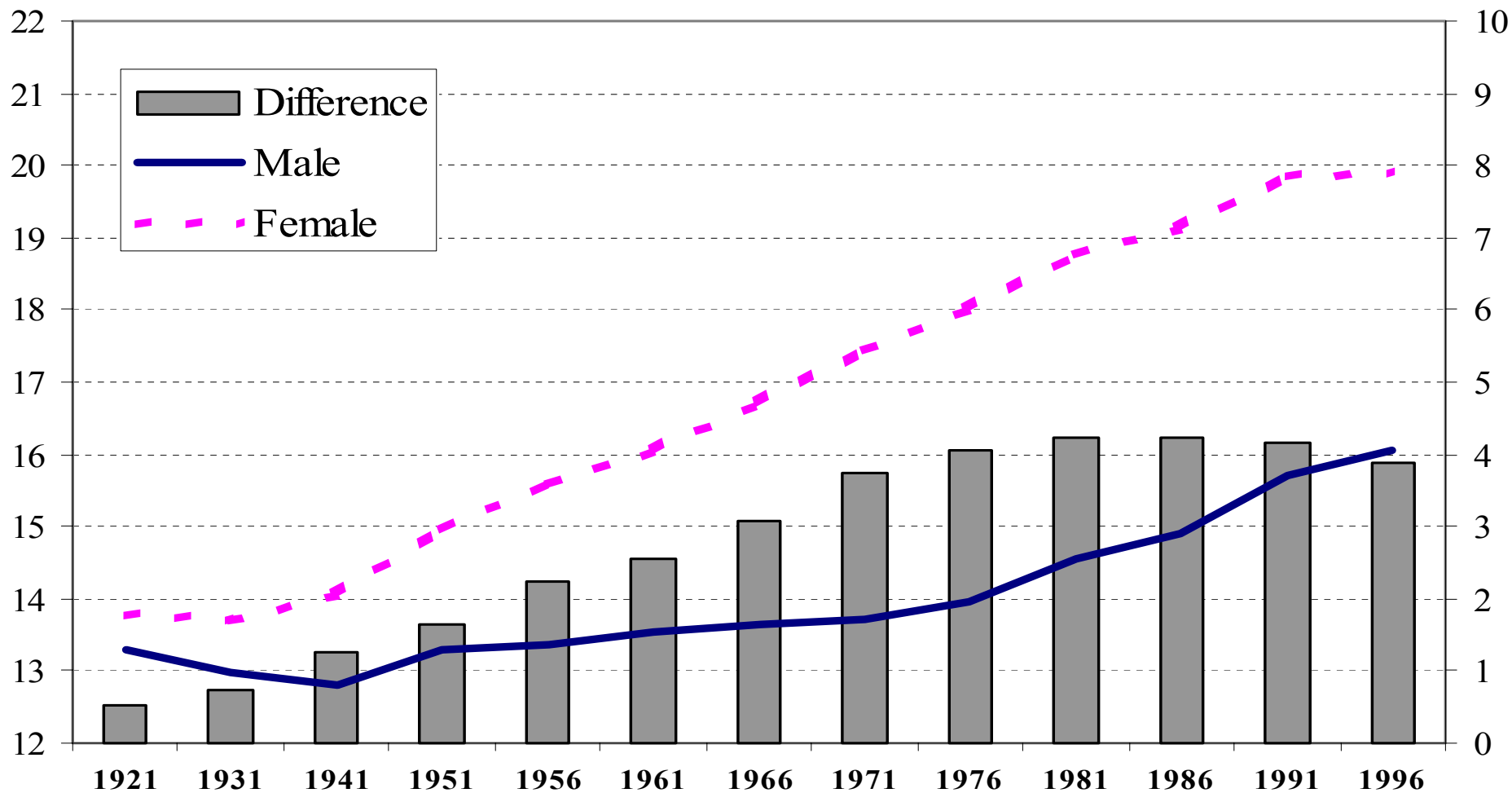
- Canadian Mortality Trends
- Mortality Projections
- CPP Retirement Beneficiary Mortality
- CPP Survivor Beneficiary Mortality
- OAS Beneficiary Mortality
- Future Challenges



# Life Expectancy at Birth (LTC)



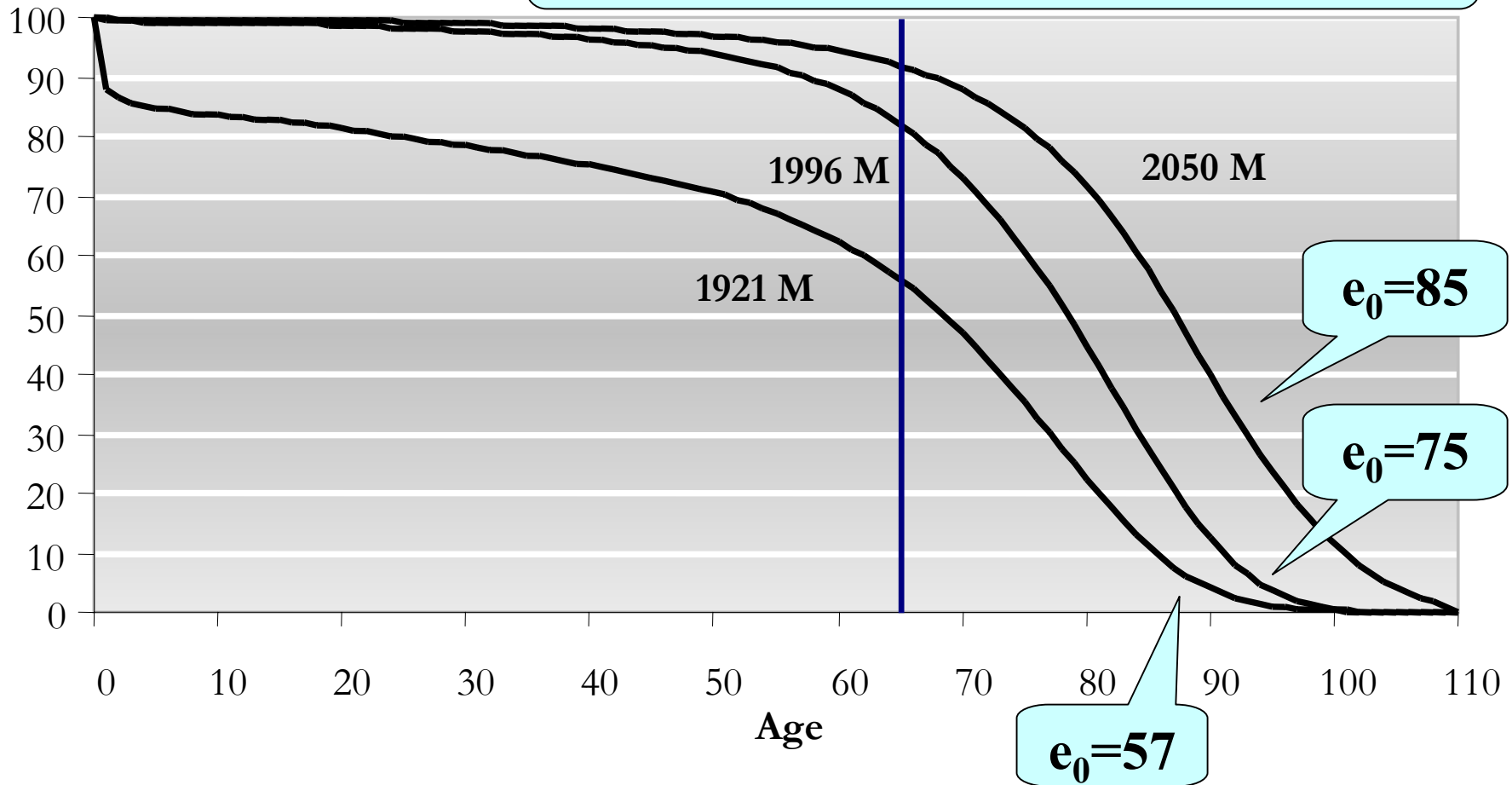
# Life Expectancy at Age 65 (LTC)





# Probability of surviving

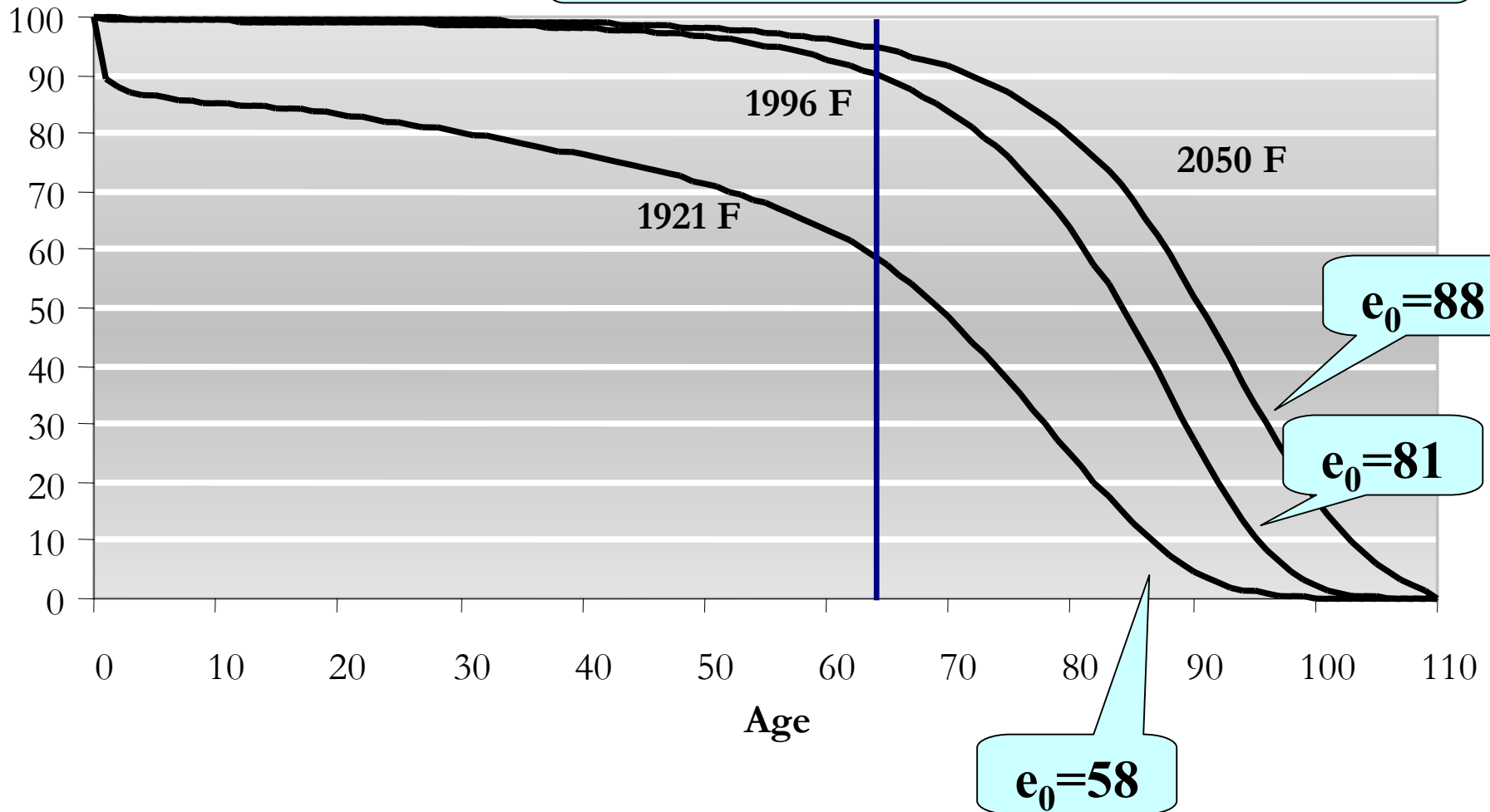
« 70% of males would die between 74 and 94 »  
*Globe and Mail, March 2002*





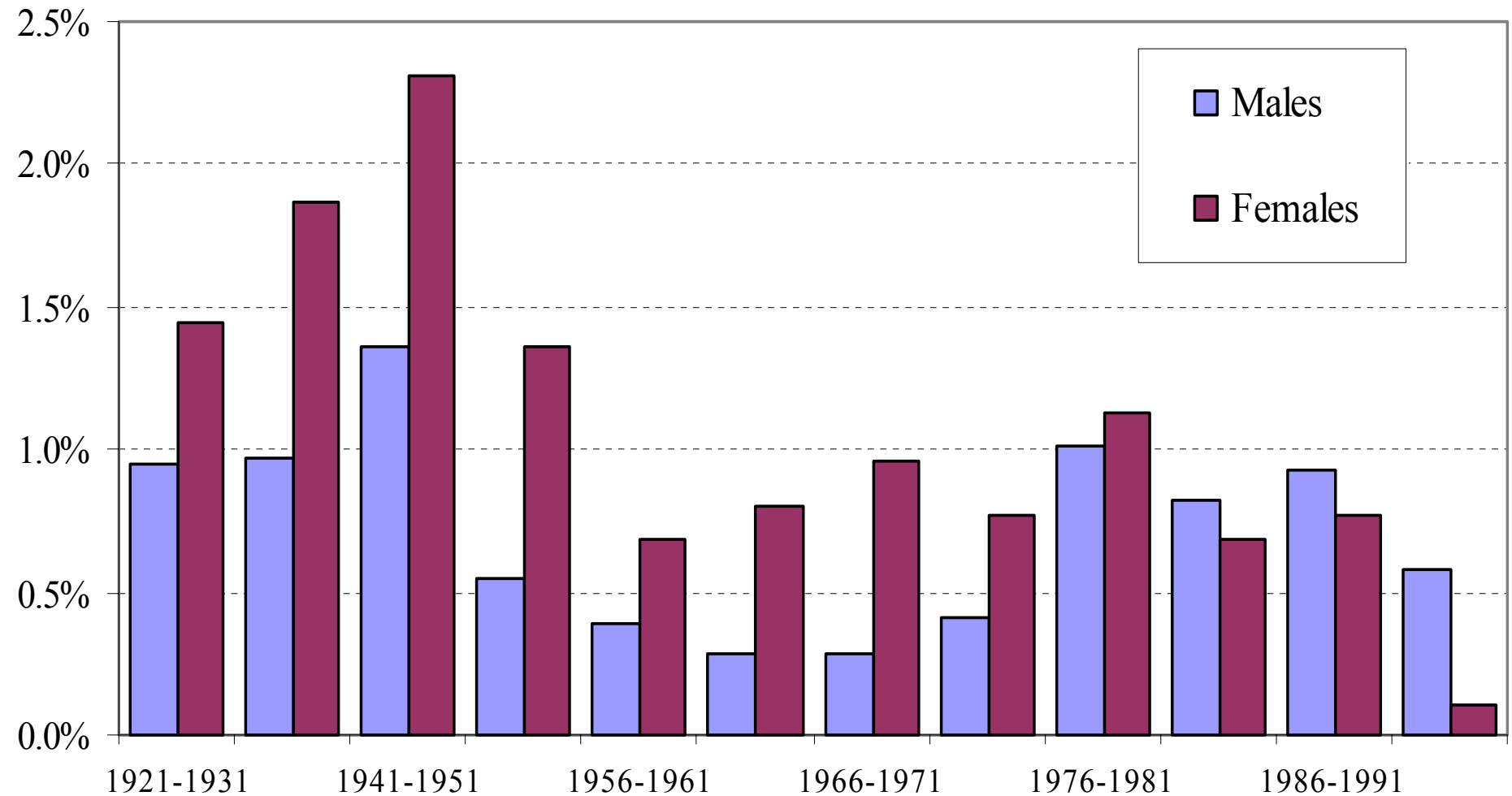
# Probability of surviving

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

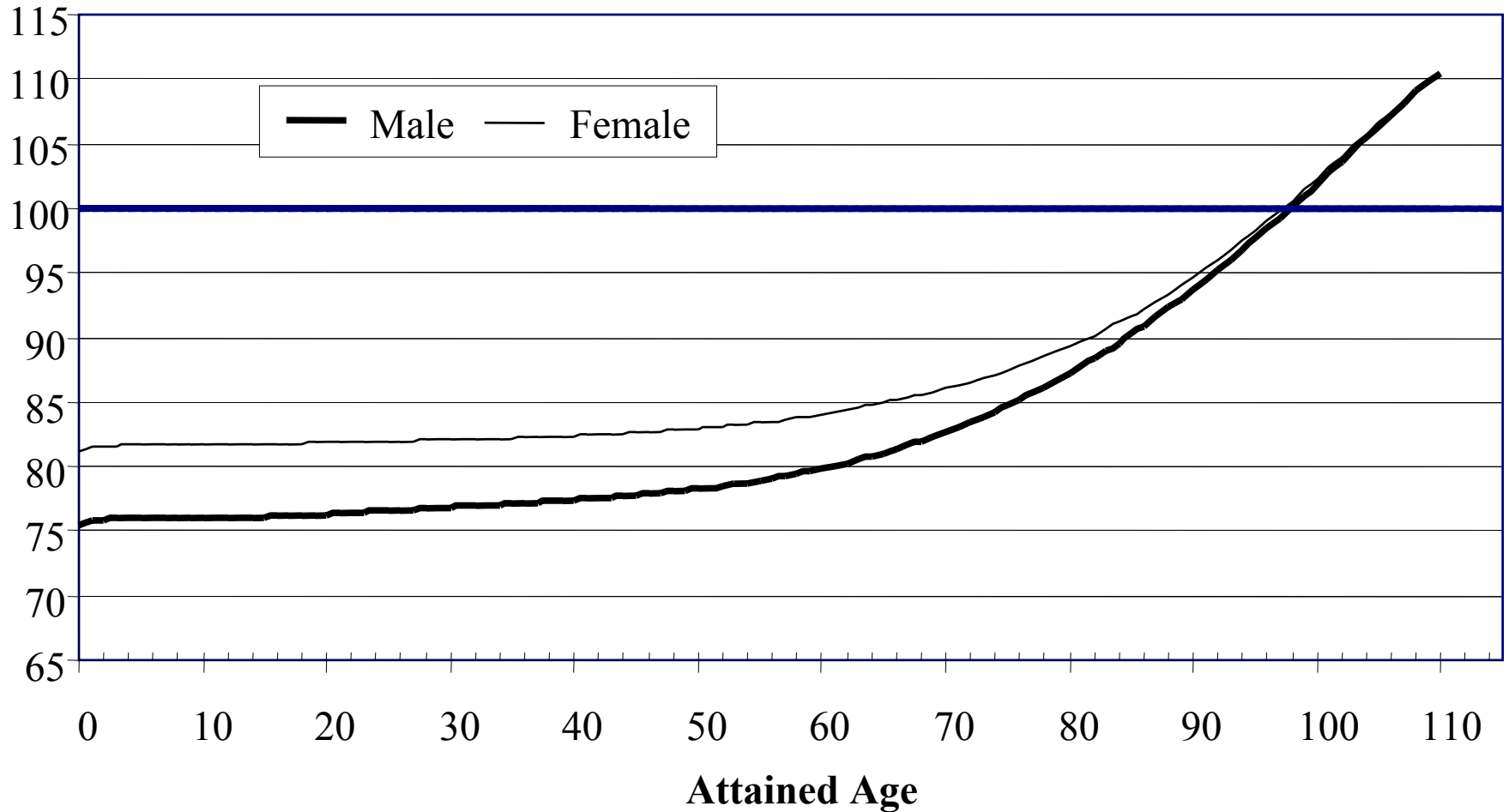




# Average Annual Population-Weighted Mortality Improvement Rates

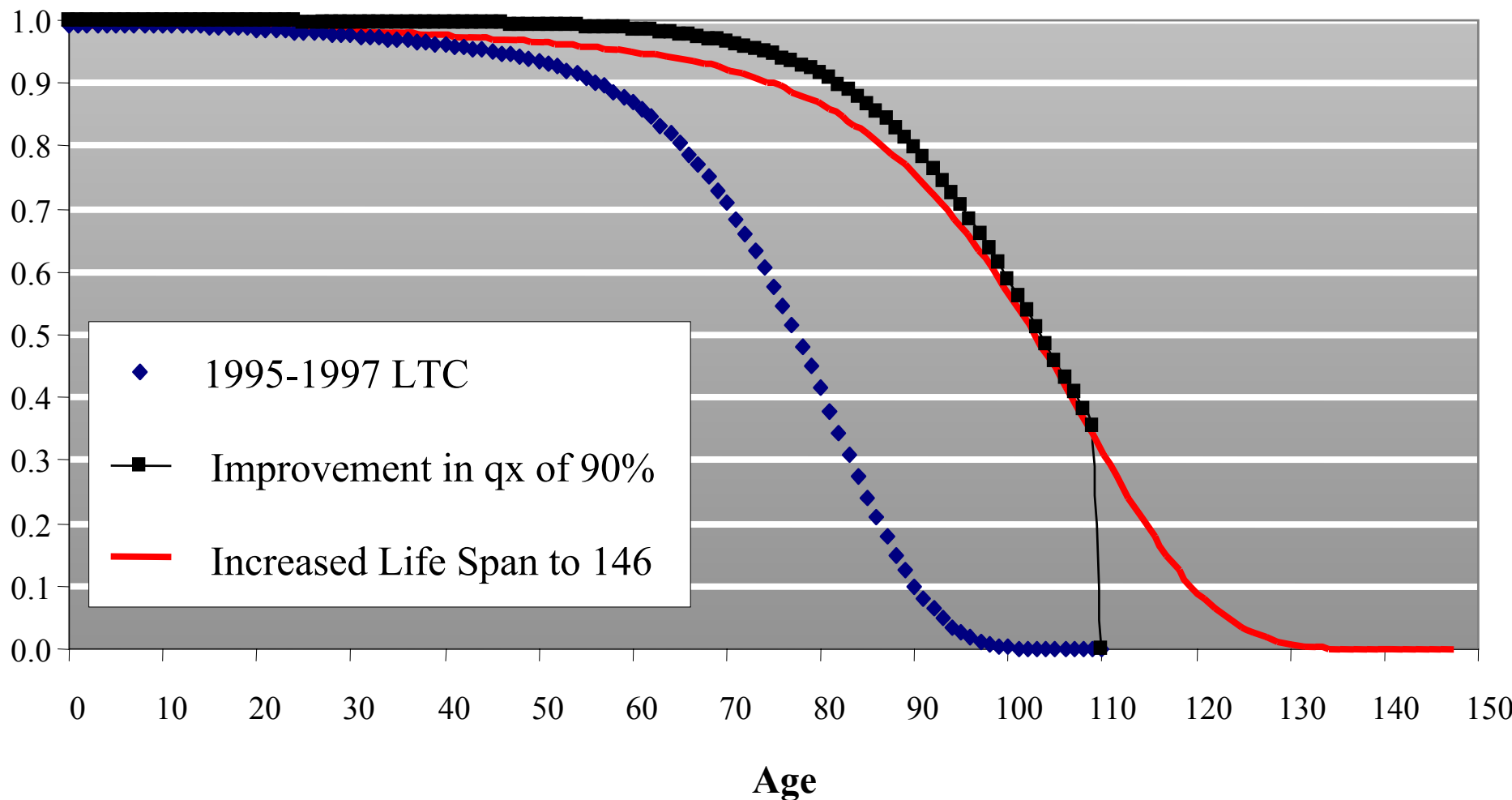


# Expected Average Age at Death by Attained Age

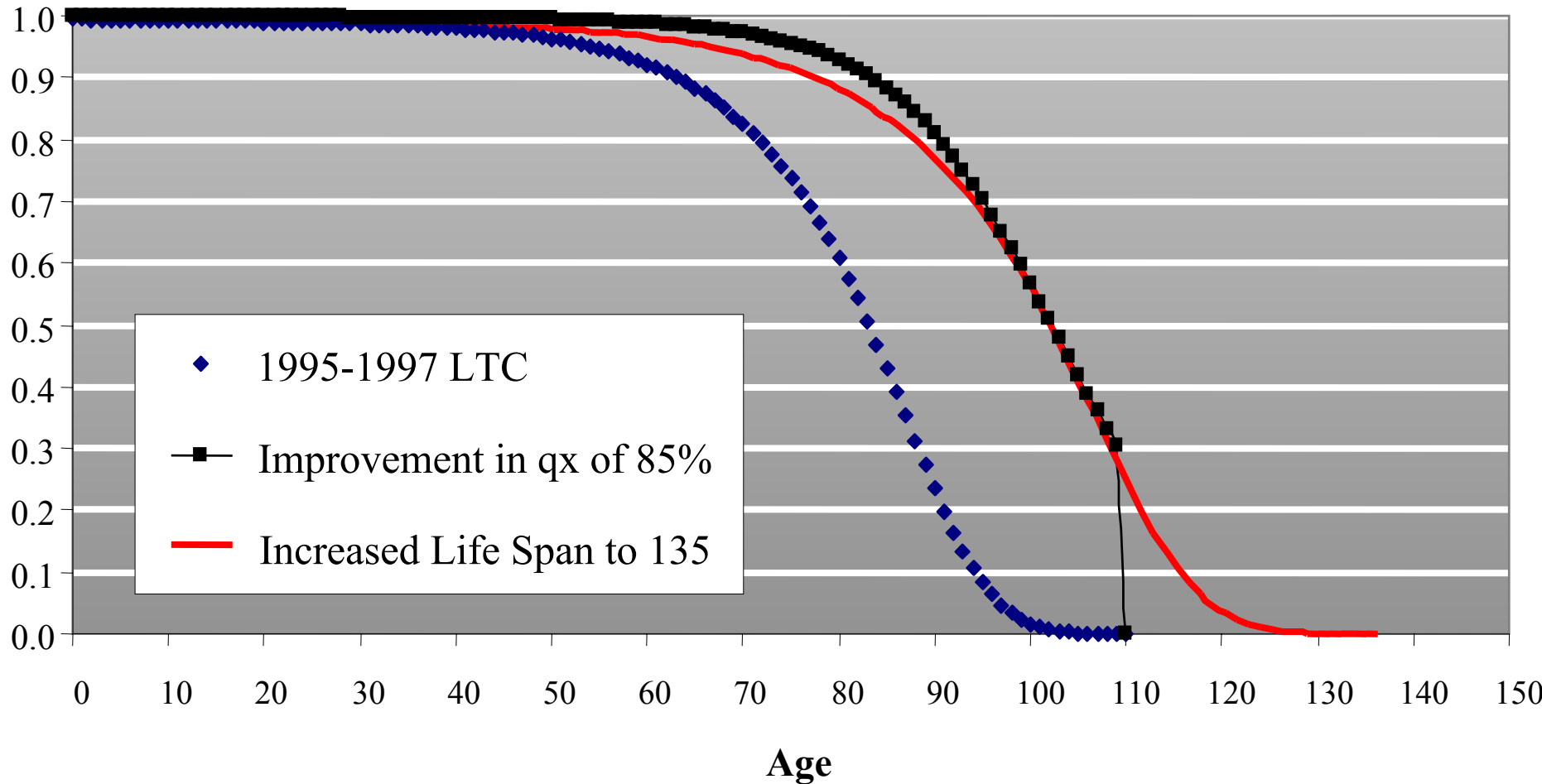




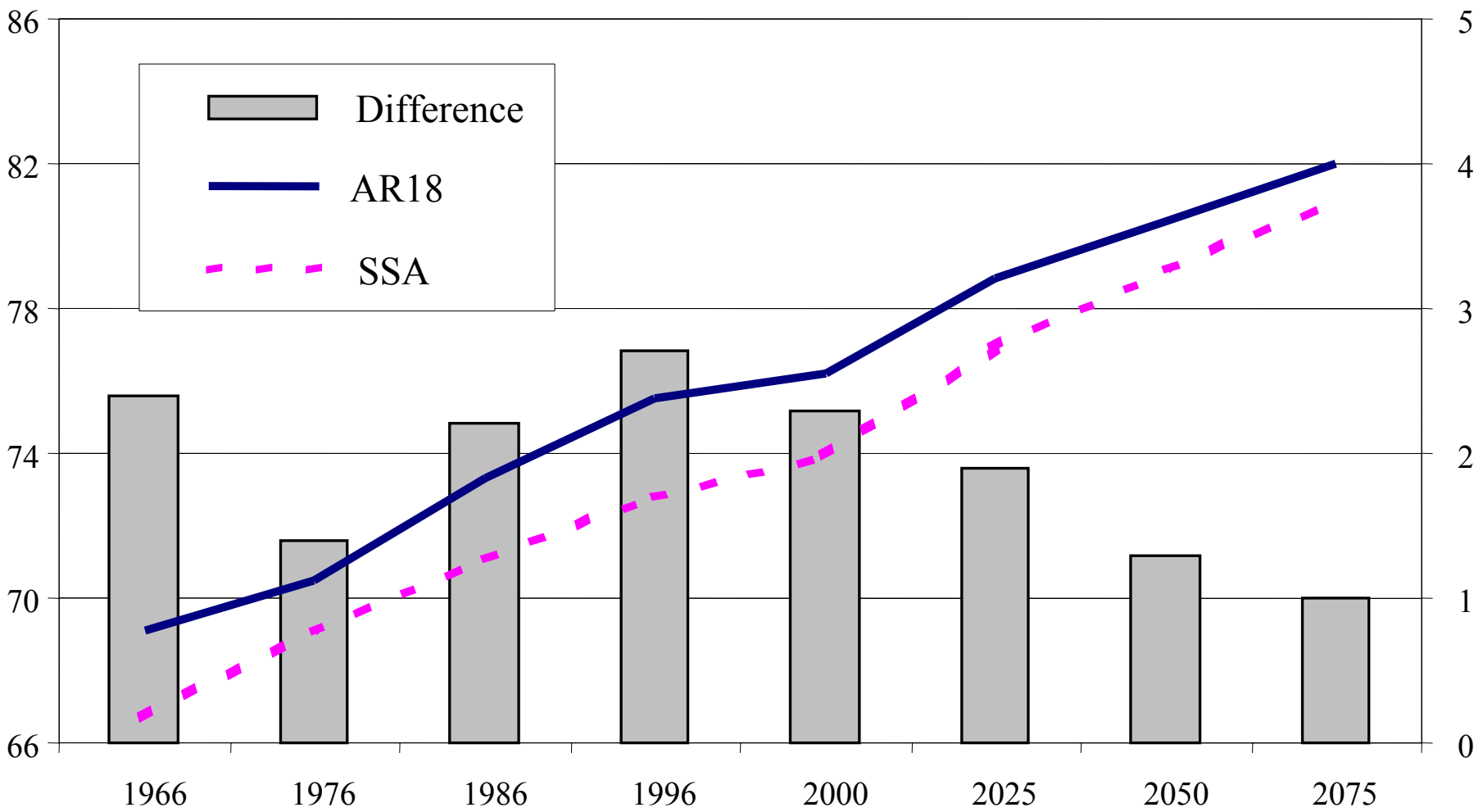
# Comparison of Survival Curves for Males



# Comparison of Survival Curves for Females

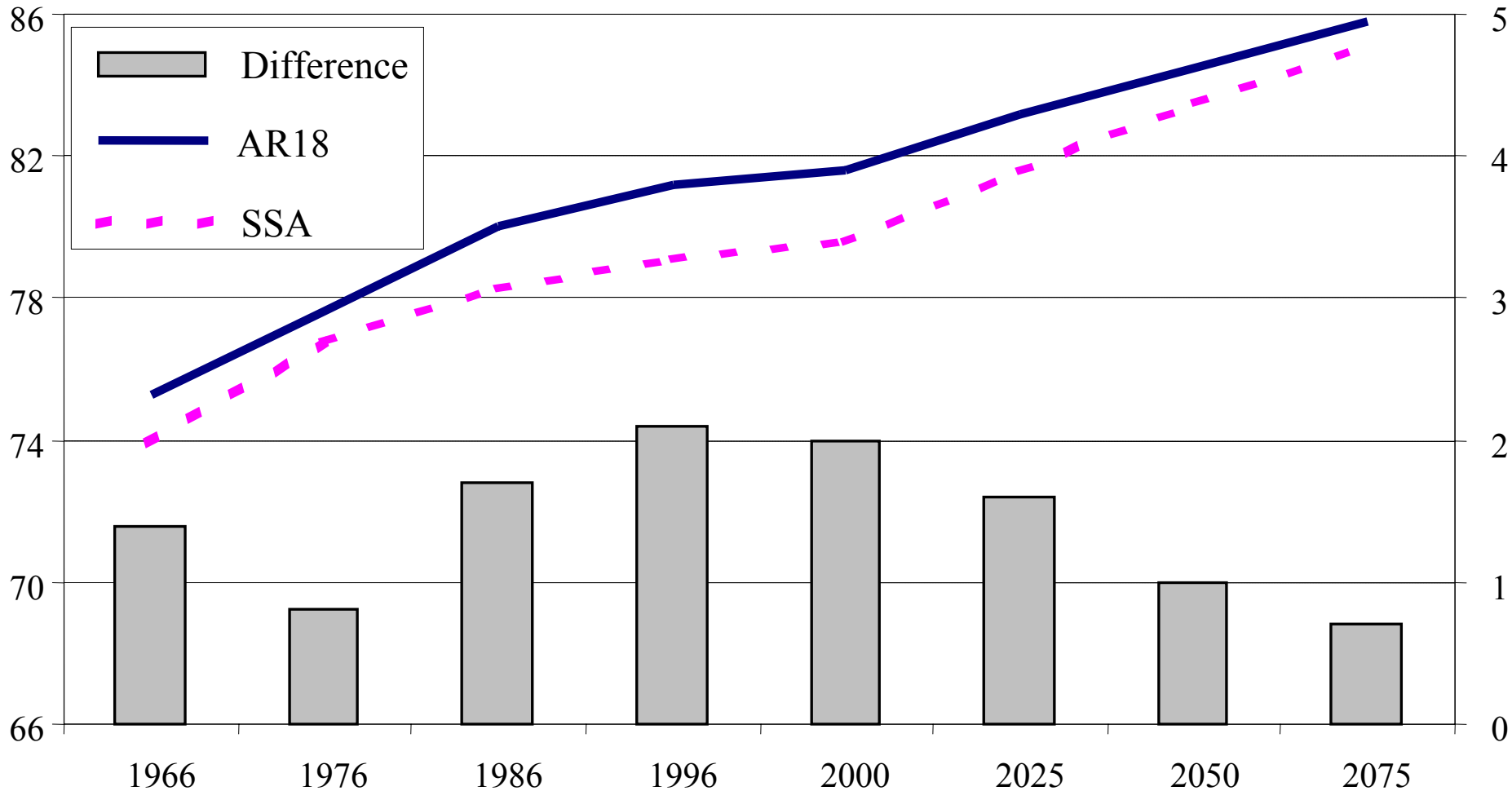


# Life Expectancy at Birth - Male



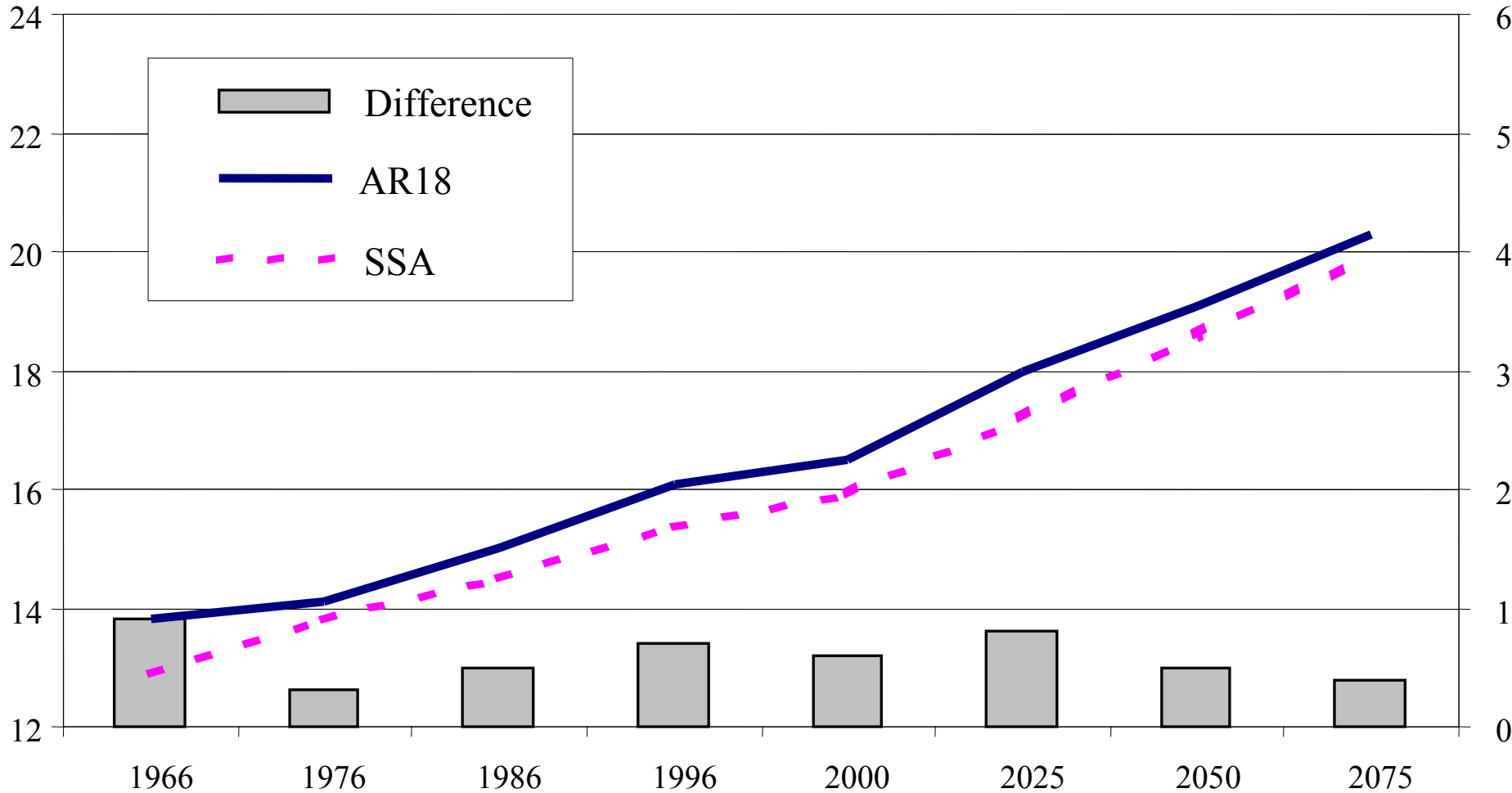


# Life Expectancy at Birth - Female

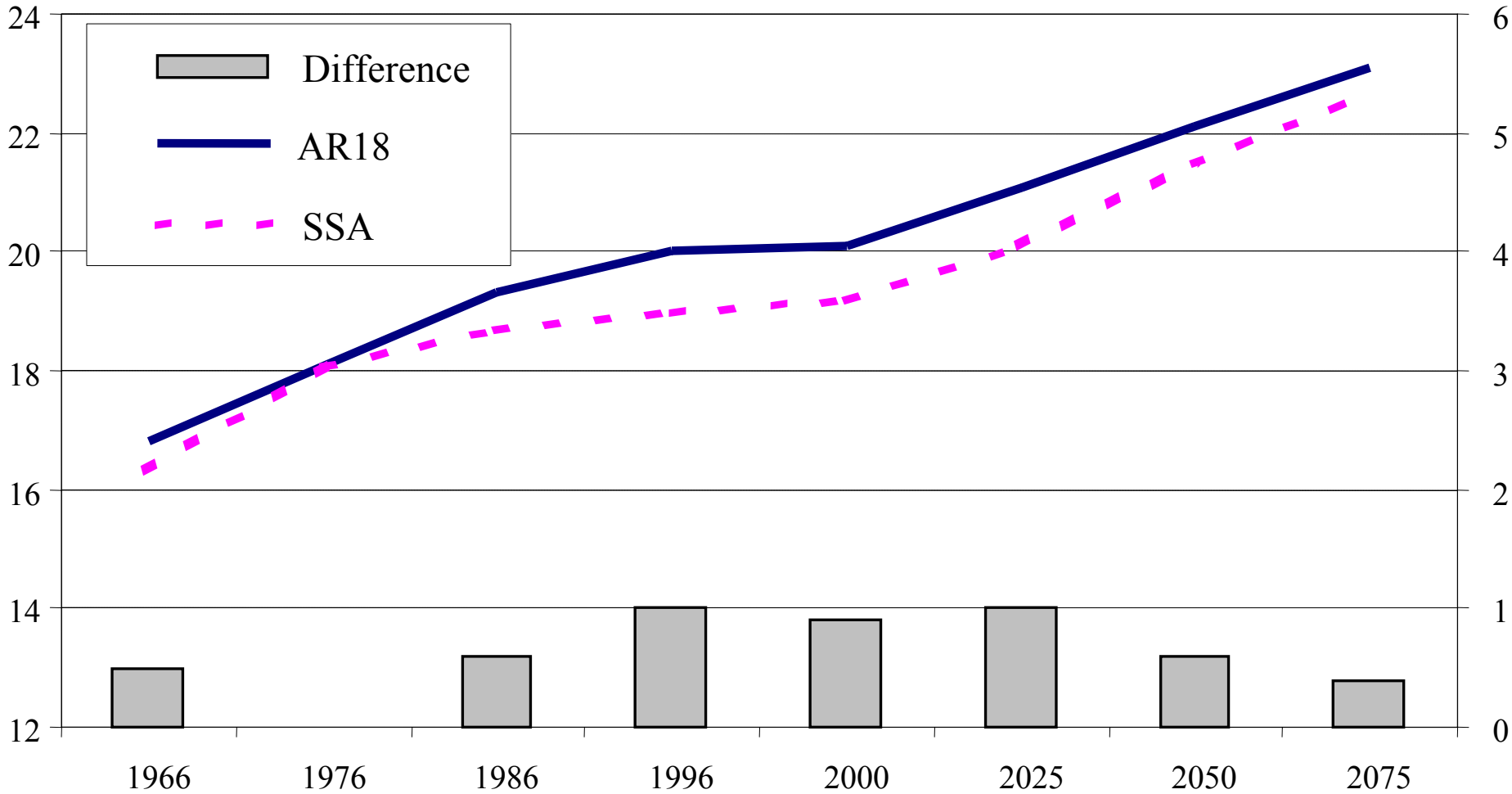




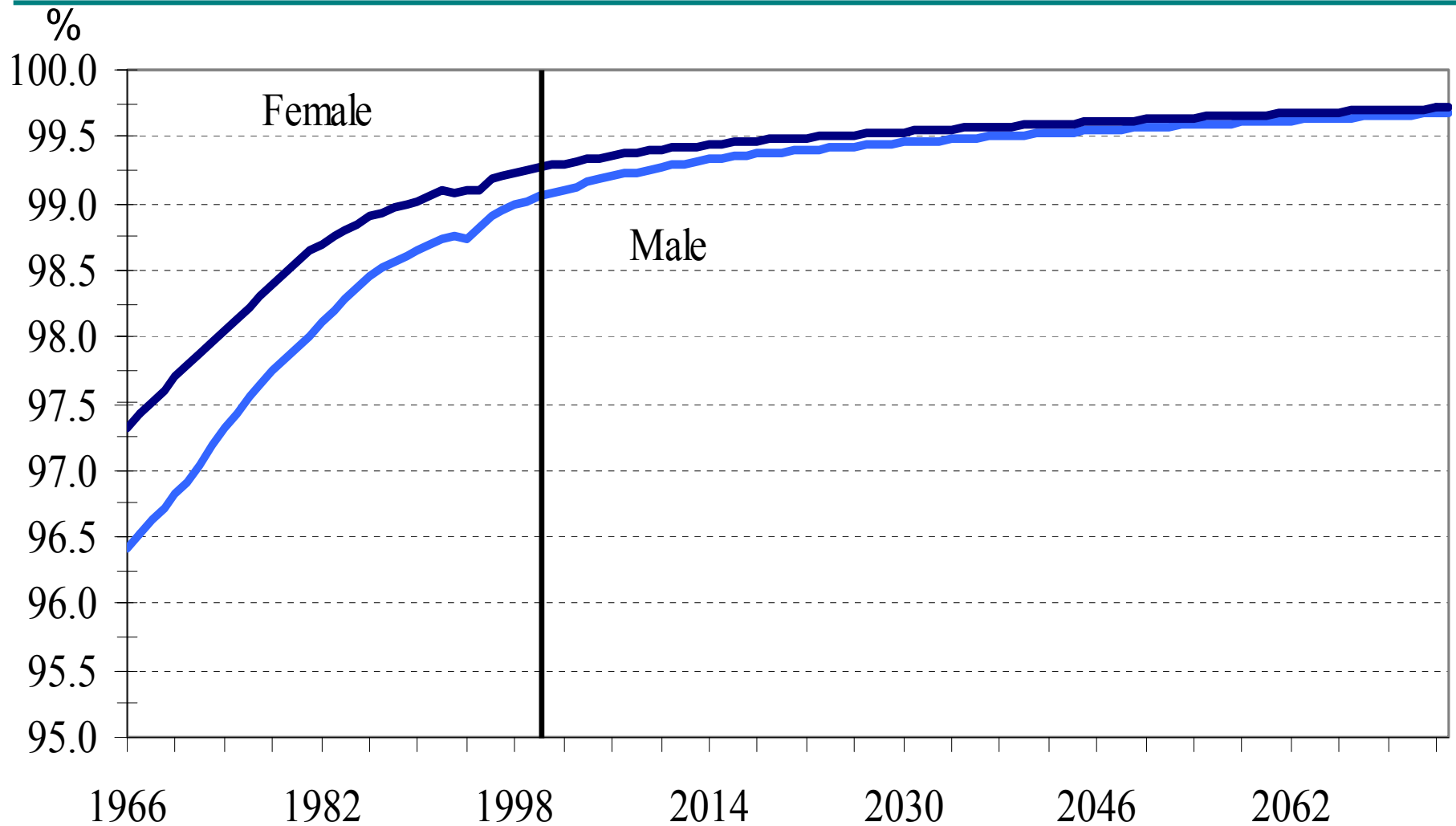
# Life Expectancy at Age 65 - Male



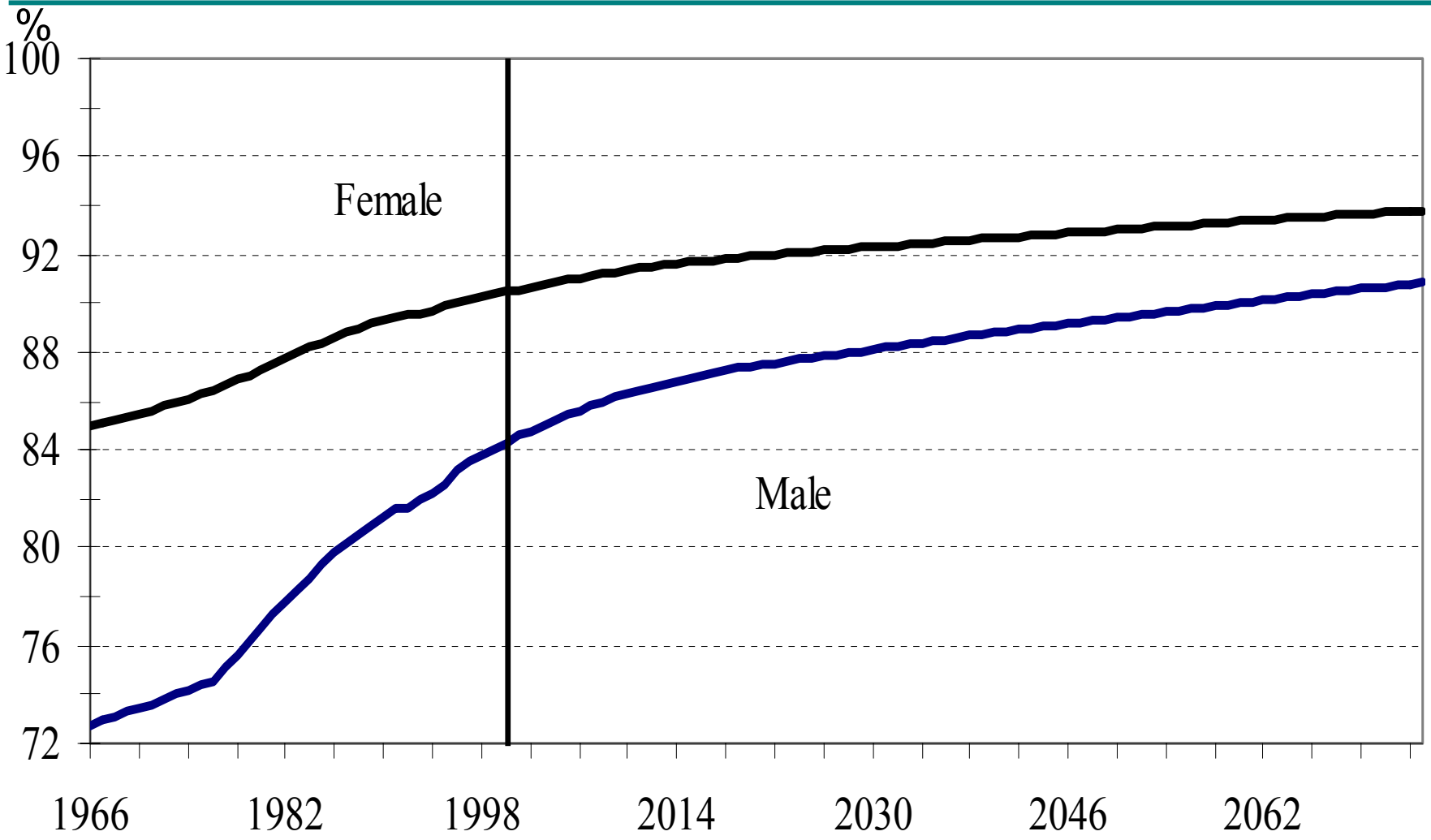
# Life Expectancy at Age 65 - Female



# Probability of Surviving from Birth to Age 18

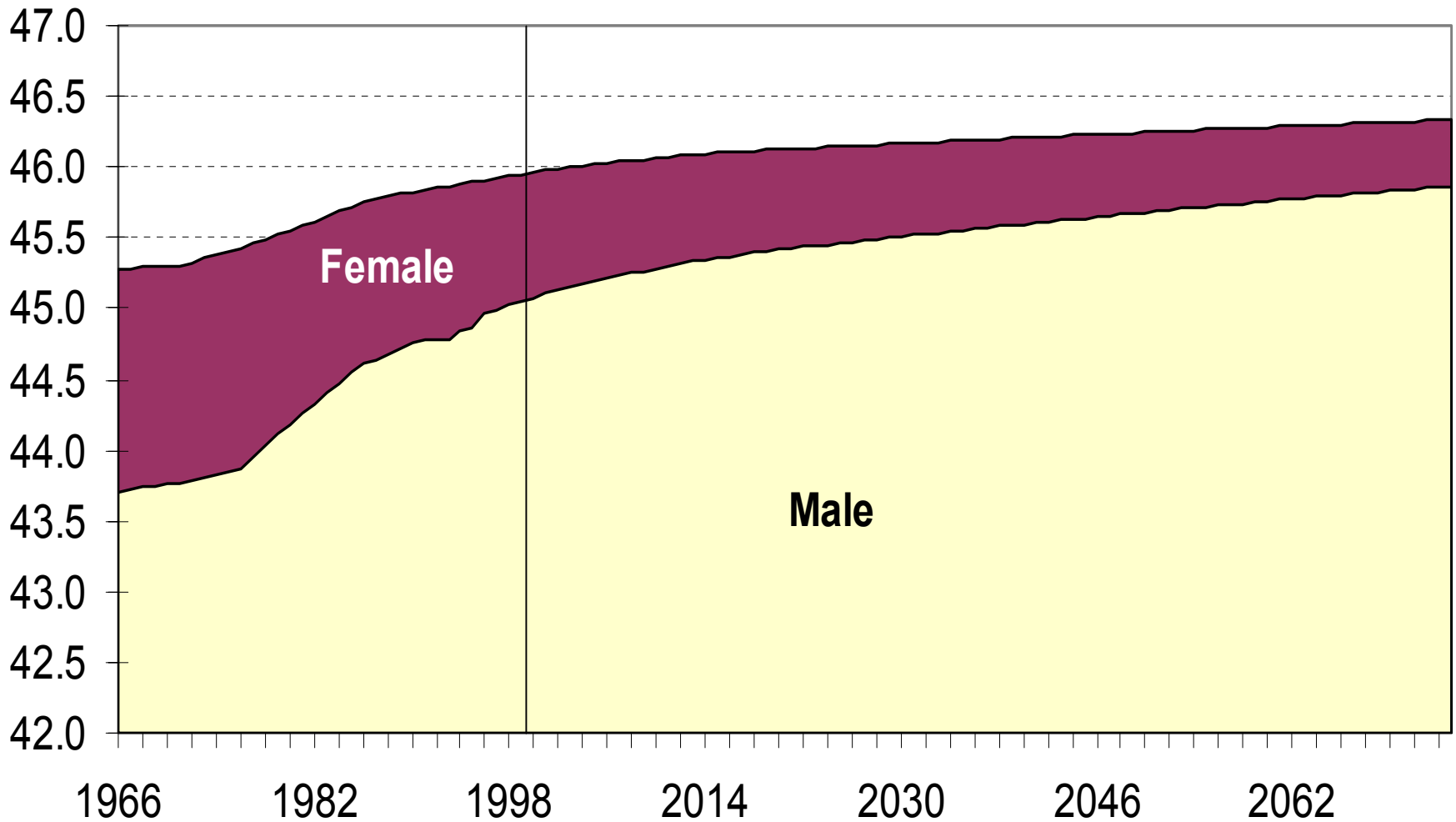


# Probability of Surviving from Age 18 to Age 65



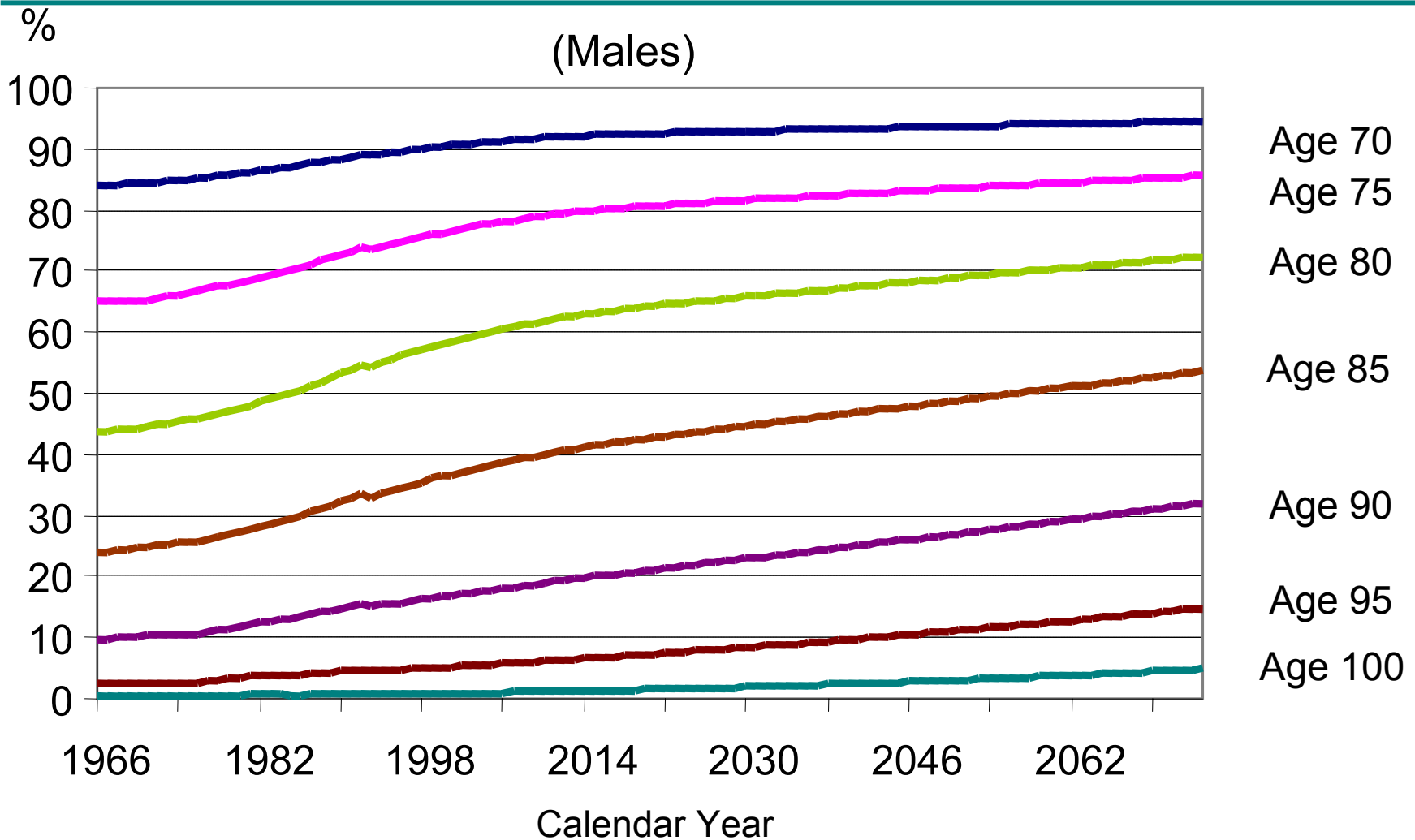


# Average Number of Years lived Between the Ages 18 and 65



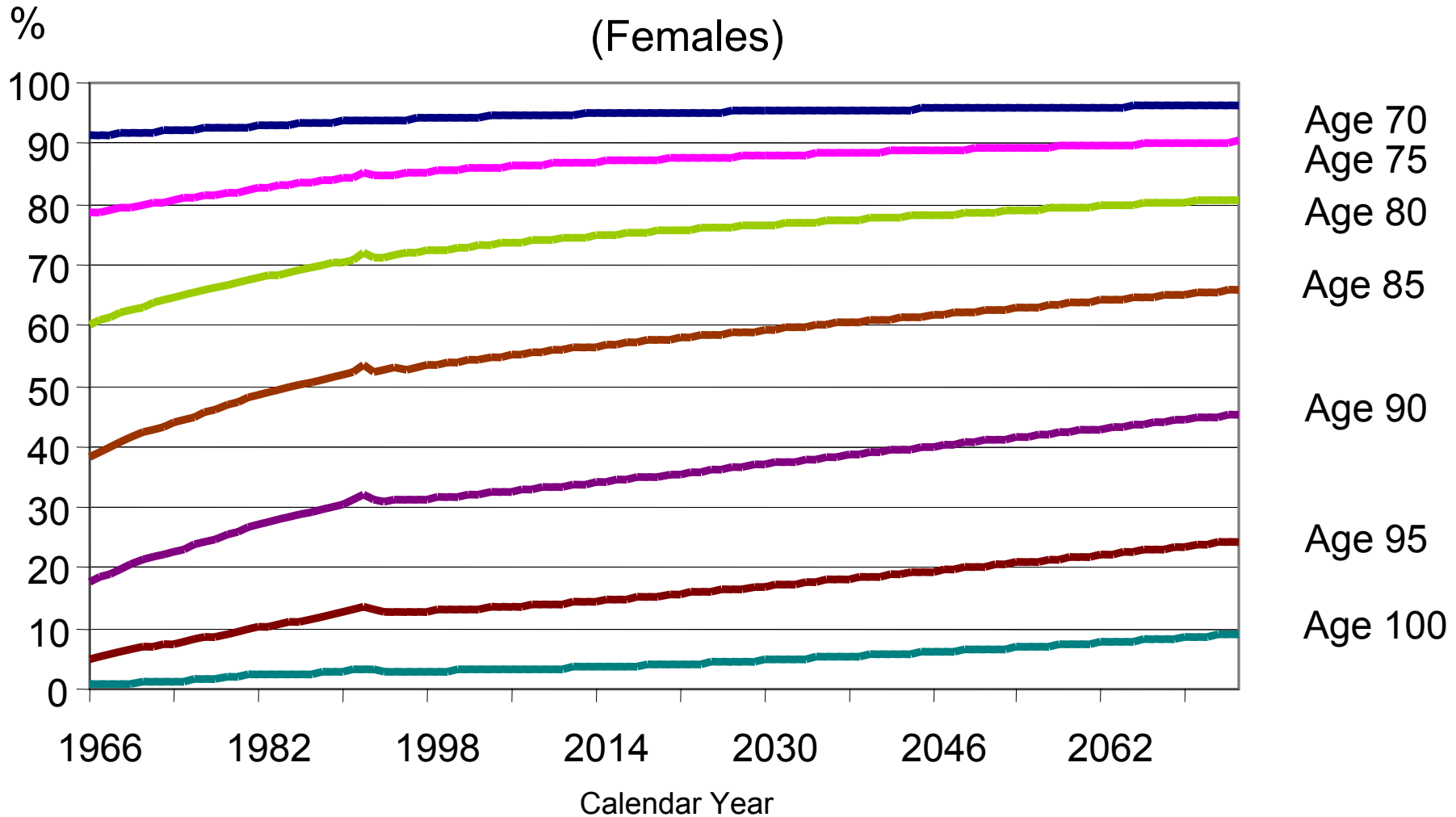


# Probability of Surviving from Age 65 To

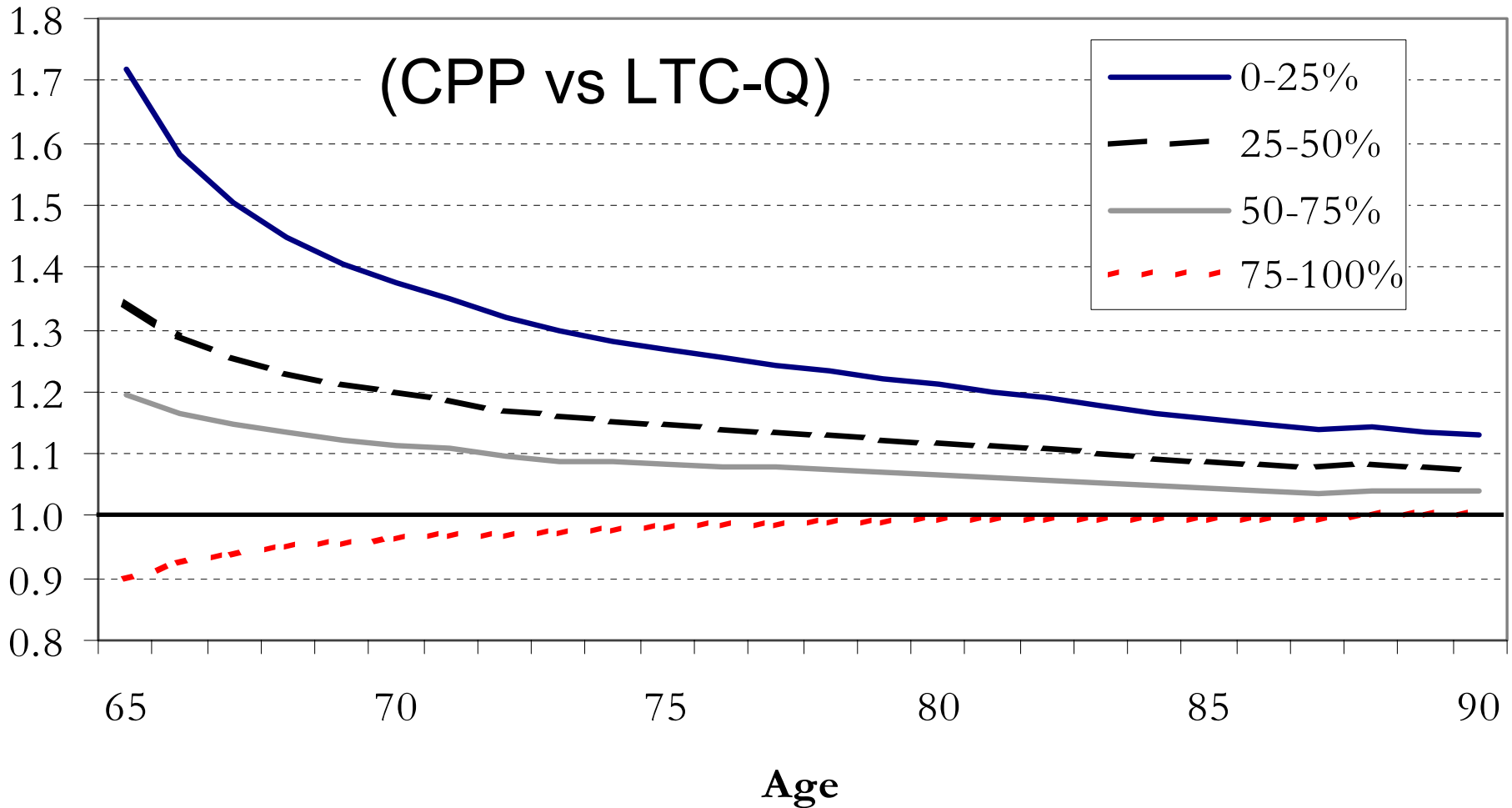




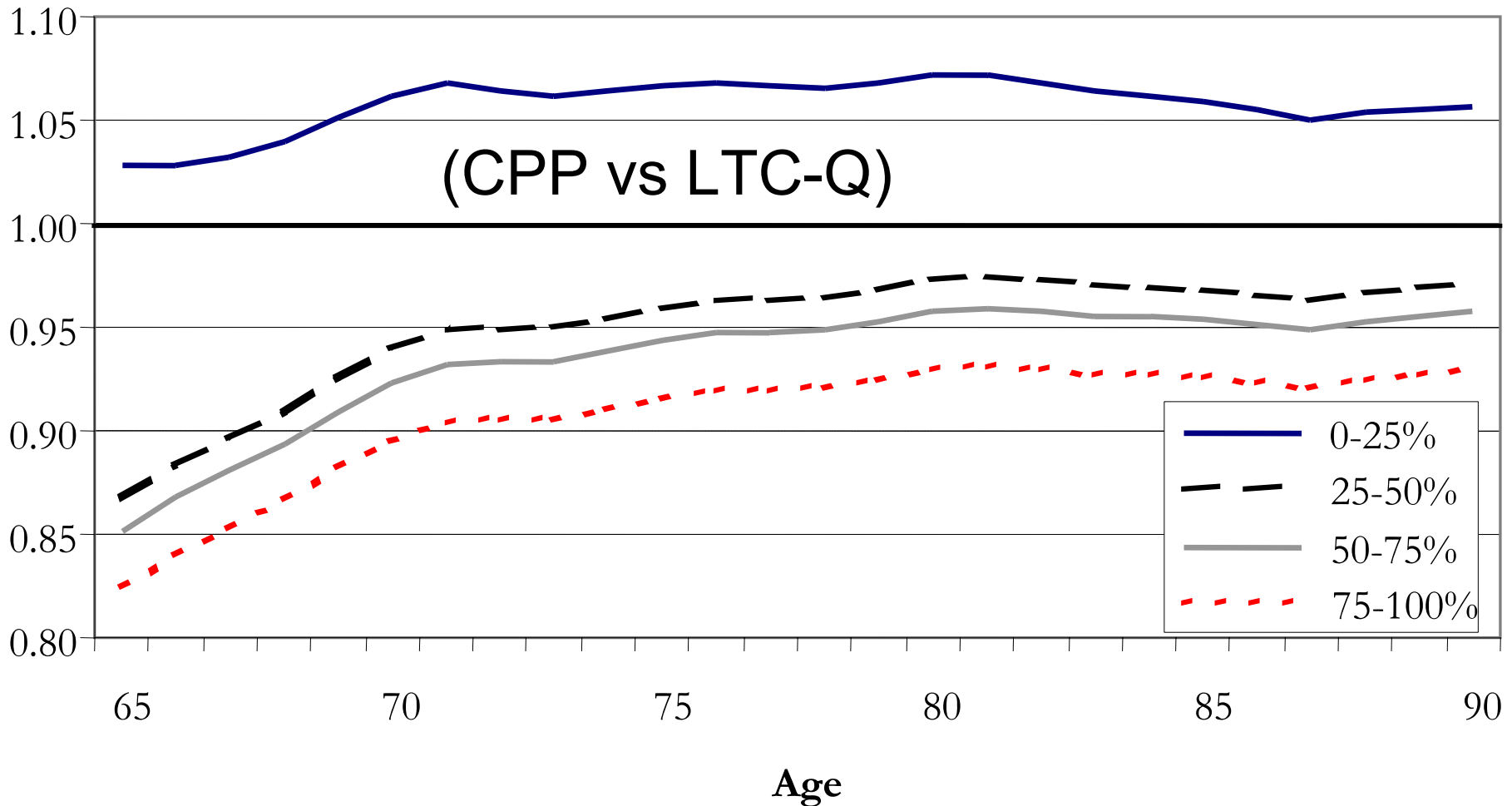
# Probability of Surviving from Age 65 To



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



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



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



Number of years

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



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



## Number of years

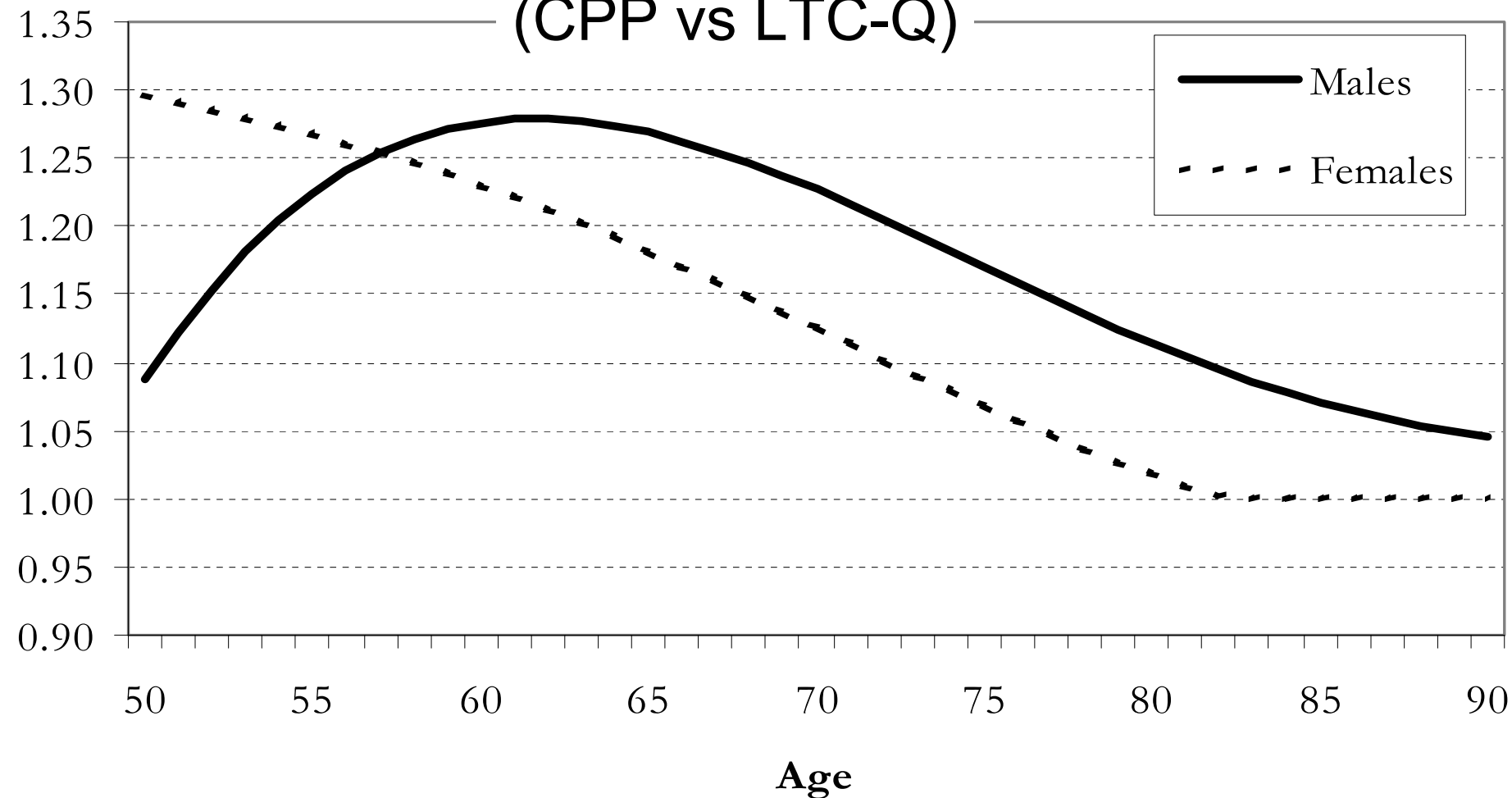
<b>Age</b>	<b>0-25%</b>	<b>25-50%</b>	<b>50-75%</b>	<b>75-100%</b>	<b>All</b>	<b>1995-97 C-QLT</b>
<b>60</b>	23.7	24.7	24.8	25.2	24.5	24.1
<b>65</b>	19.5	20.3	20.5	20.7	20.2	20.0
<b>70</b>	15.7	16.3	16.5	16.7	16.2	16.1
<b>75</b>	12.1	12.7	12.8	13.0	12.6	12.5
<b>80</b>	9.0	9.5	9.6	9.7	9.4	9.3
<b>85</b>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



# CPP Survivor Beneficiary Mortality Ratios



(CPP vs LTC-Q)





# 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 - Male (in thousands)

Age Group	1985		2000		2025		2050	
	#	%	#	%	#	%	#	%
<b>65-69</b>	393	36.2%	530	32.7%	1,136	33.4%	1,137	25.8%
<b>70-79</b>	518	47.8%	786	48.5%	1,606	47.3%	1,880	42.8%
<b>80+</b>	173	15.9%	304	18.8%	656	19.3%	1,381	31.4%
<b>All</b>	1,084	100.0%	1,620	100.0%	3,398	100.0%	4,398	100.0%

# Evolution of OAS Beneficiaries - Female

(in thousands)



Age Group	1985		2000		2025		2050	
	#	%	#	%	#	%	#	%
<b>65-69</b>	465	31.3%	568	26.3%	1,186	29.6%	1,163	22.4%
<b>70-79</b>	684	46.0%	997	46.2%	1,813	45.3%	2,039	39.3%
<b>80+</b>	338	22.7%	592	27.4%	1,007	25.1%	1,983	38.2%
<b>All</b>	1,487	100.0%	2,157	100.0%	4,006	100.0%	5,186	100.0%

# 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.