



QUANTIFYING RISK, ENABLING OPPORTUNITY

ASSA Continual Statistical Investigations Committee (CSI)

Report on Pensioner Mortality 2005 – 2010

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Investigations currently underway

- Assured Lives
 - New generation (2003 to 2013) – busy graduating results
 - Old generation (2003 to 2010) – data almost ready to rerun
- Annuitant
 - Data received for 2004 to 2014 – data review in progress
- Lump Sum Disability and Critical Illness
 - Decision to focus on new generation – data review will commence in 2017
- Commence data collection for other studies
 - Funeral, repeat Pensioner, Africa.....others?

Background to Pensioner analysis

- First study of SA in-fund pensioner mortality
- Six year period 2005 to 2010
- Includes 22 largest defined benefit funds
- And largest pensioner payroll administrator
- Scope of investigation – provide information to actuaries re mortality risks of pensioners
- 854,390 records
 - Lives analysis – 2.8m yrs exposure
 - Amts analysis (subset only) – 984,761 yrs exposure

Data and Statistics

Overall mortality rates by calendar year

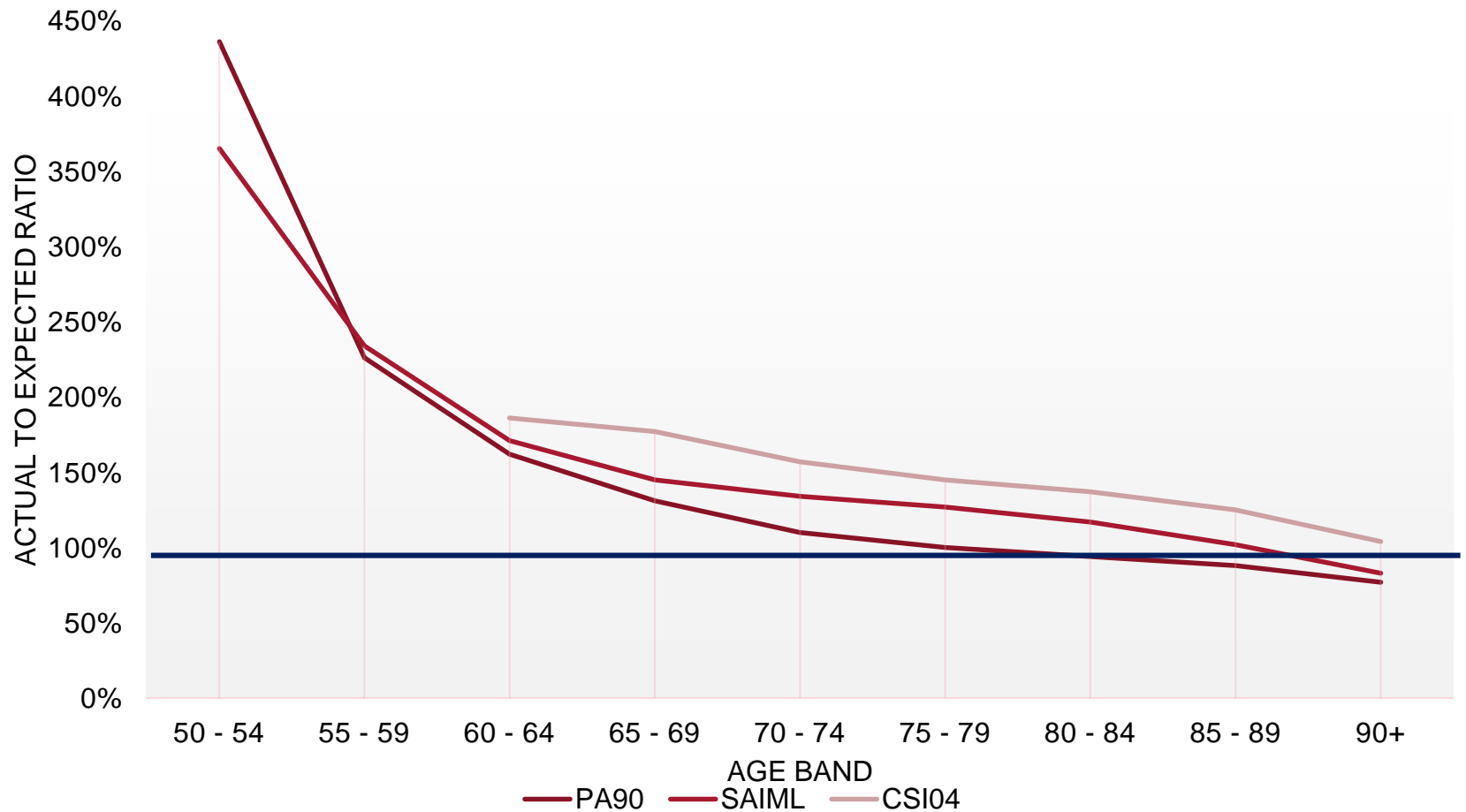
Calendar Year	Observed mortality rate
2005	46.3
2006	43.5
2007	43.3
2008	40.3
2009	44.6
2010	40.2
All years	43.1

➤ Previous retail annuitant studies

- SAIML/FL98 – crude mortality rate 31.4
- CSI Annuitant Report 2004 – crude mortality rate 31.2

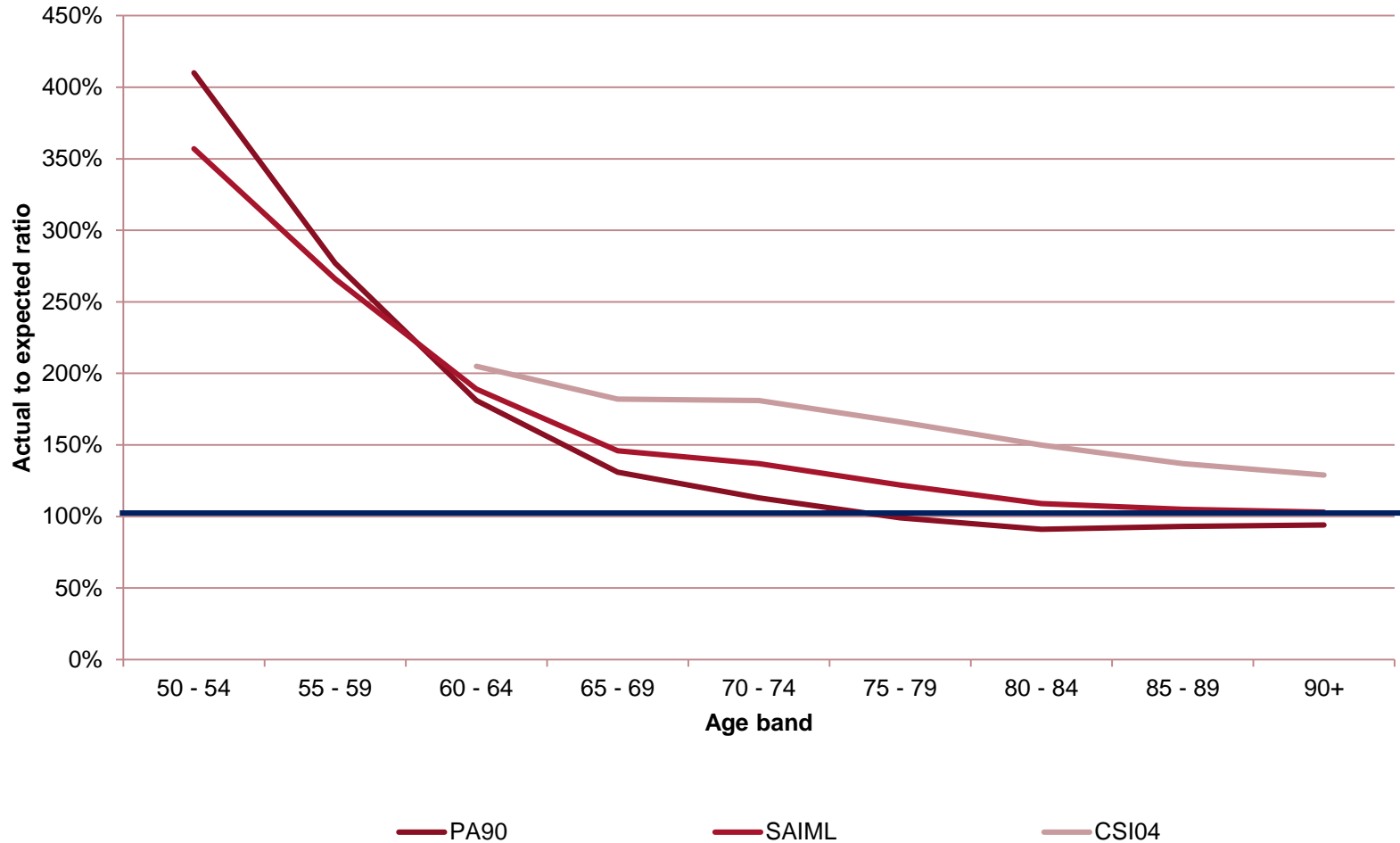
Comparison to Mortality Bases

Comparison to main bases: Male principal pensioners



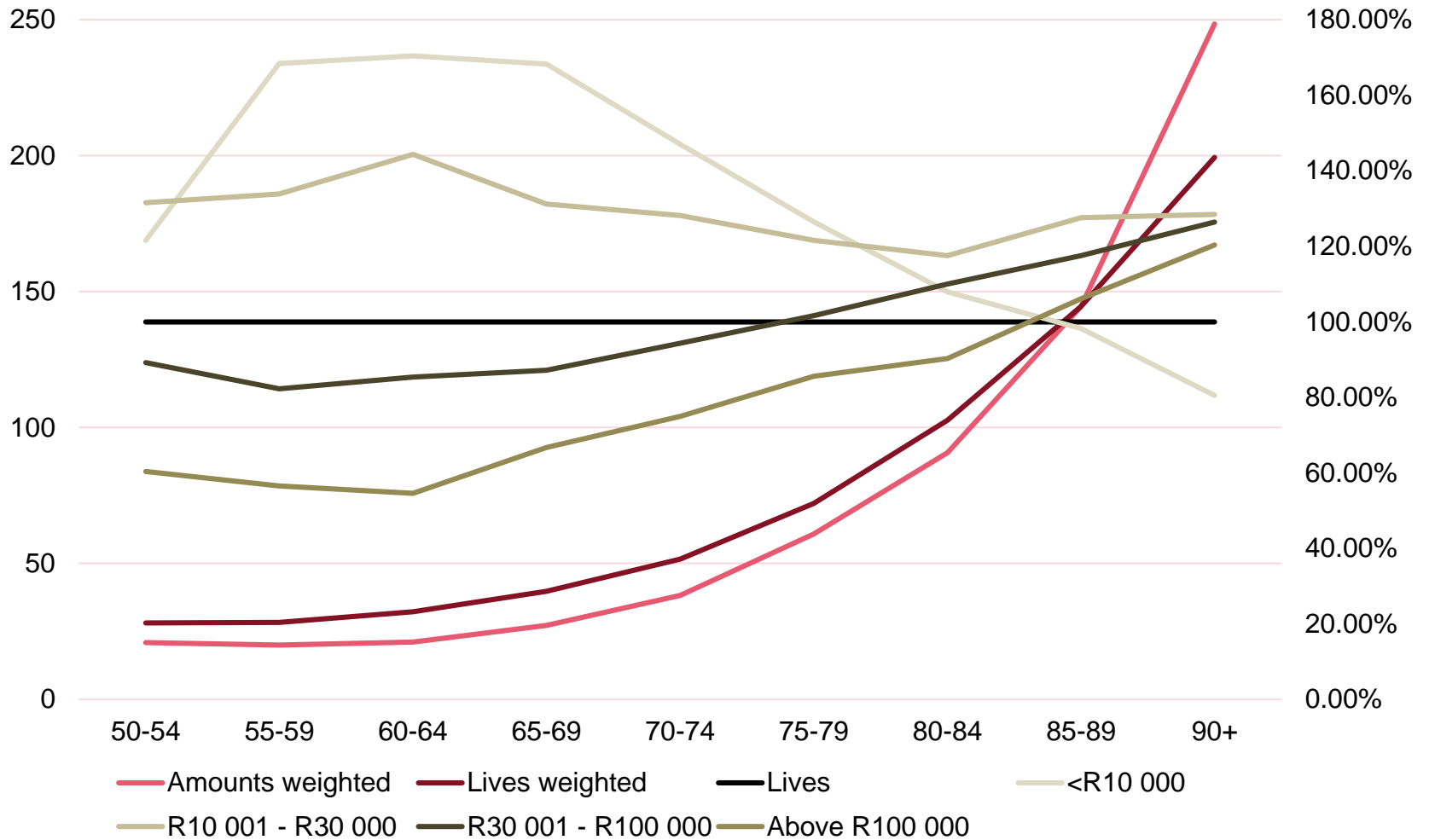
Comparison to Mortality Bases

Comparison to main bases: Female principal pensioners



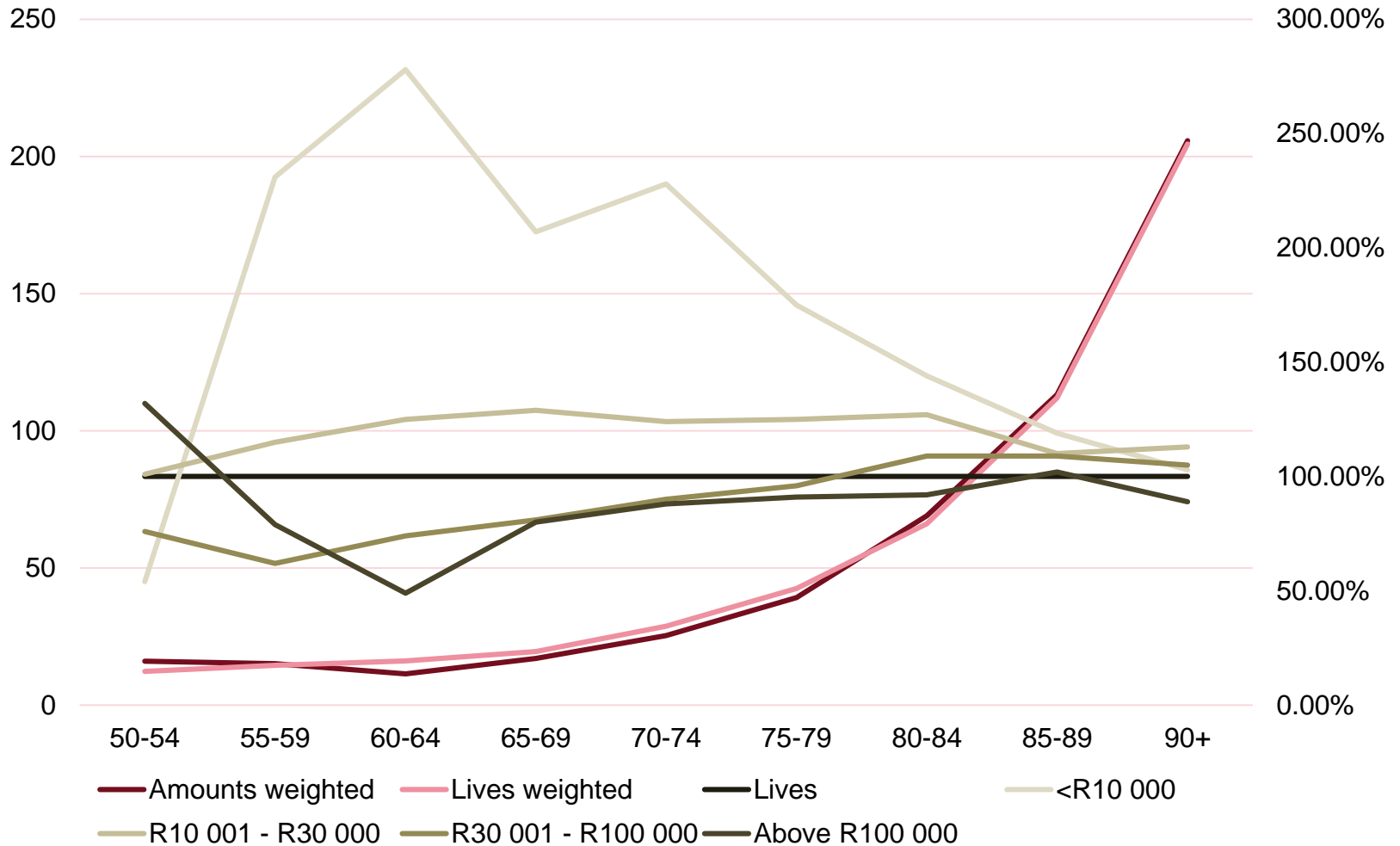
Amounts vs. Lives

Male principal pensioners



Amounts vs. Lives

Female principal pensioners

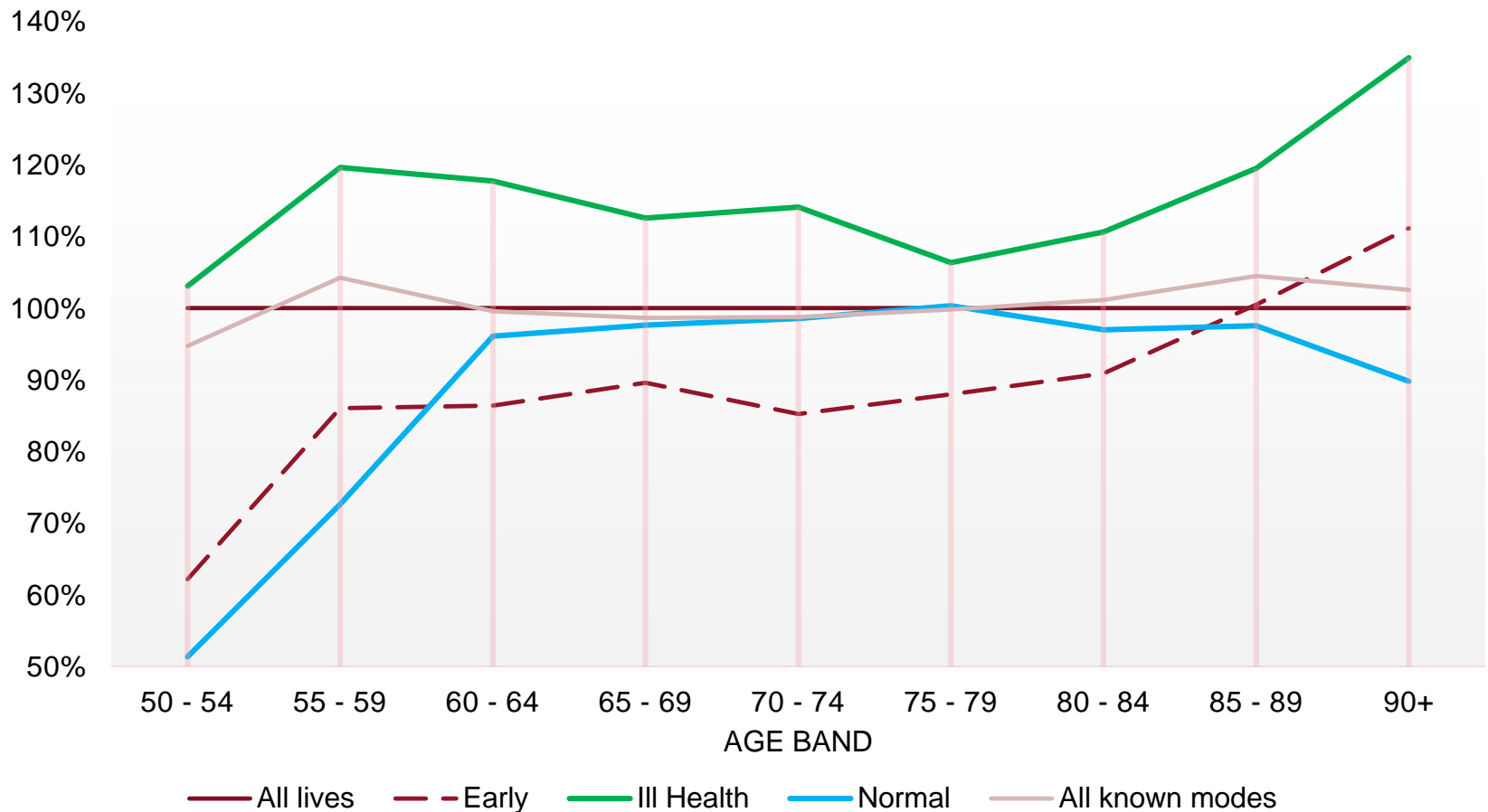


Mortality by retirement mode

	Normal retirement	II-health early retirement	Normal-health early retirement
Proportion of exposure	40%	33%	21%
Average age at retirement	60.9 years	50.5 years	55.9 years
Average annual pension amount:			
Males	R110 000	R90 000	R155 000
Females	R60 000	R55 000	R90 000

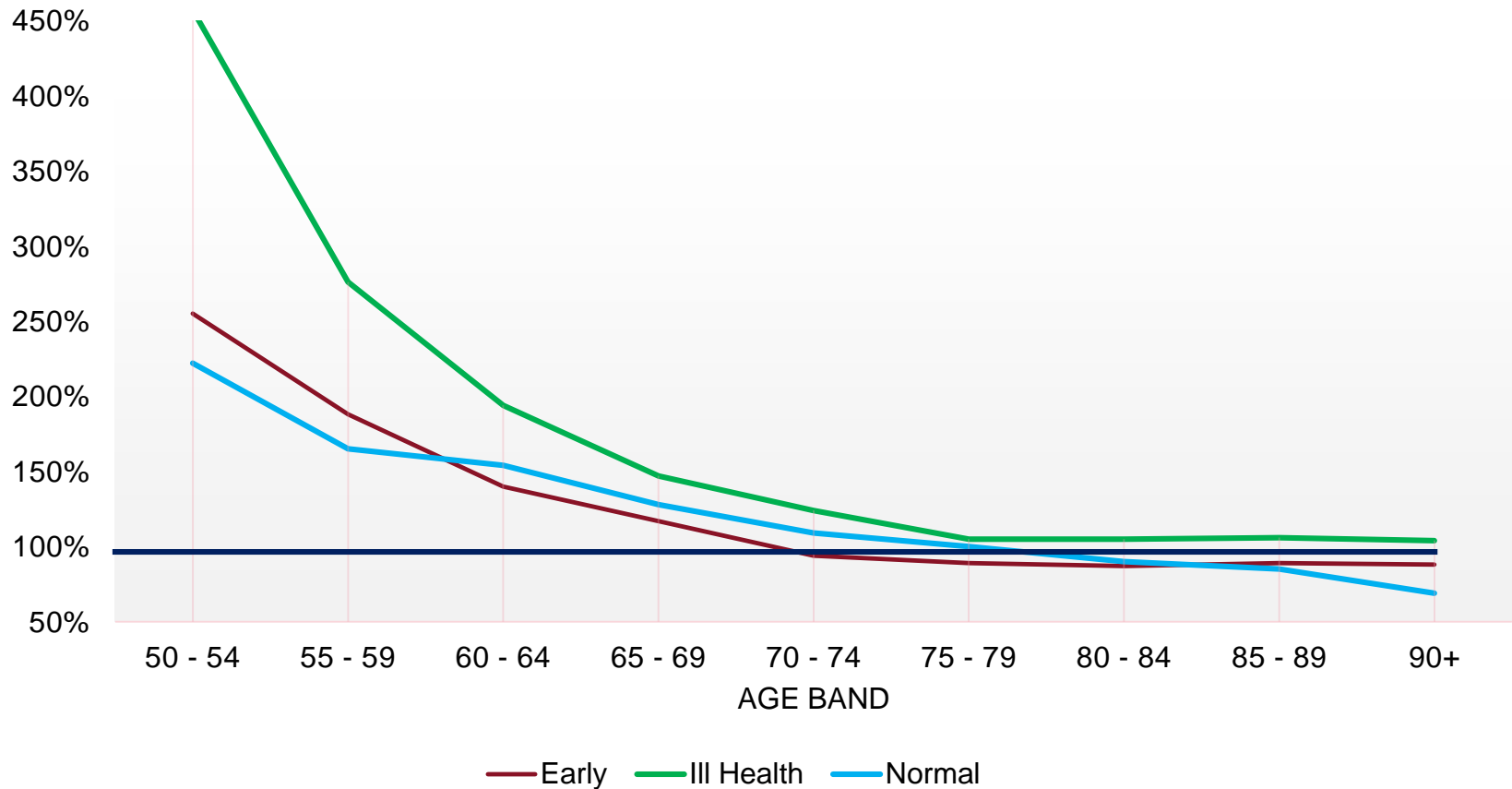
Mortality by retirement mode: Male principal pensioners

Mortality as a % of 'All lives' rates



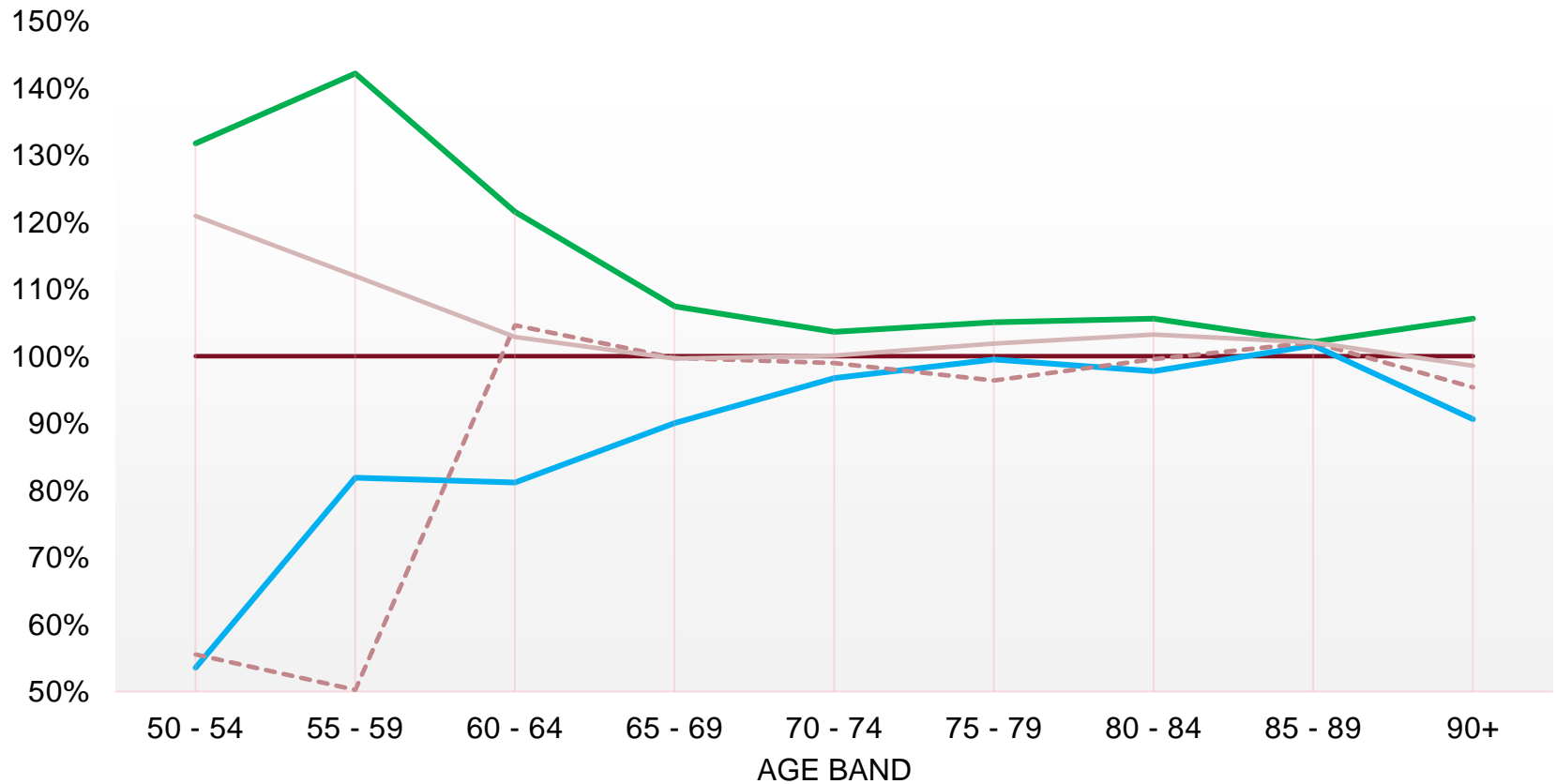
Mortality by retirement mode: Male principal pensioners

PA(90) Actual to Expected Ratios



Mortality by retirement mode: Female principal pensioners

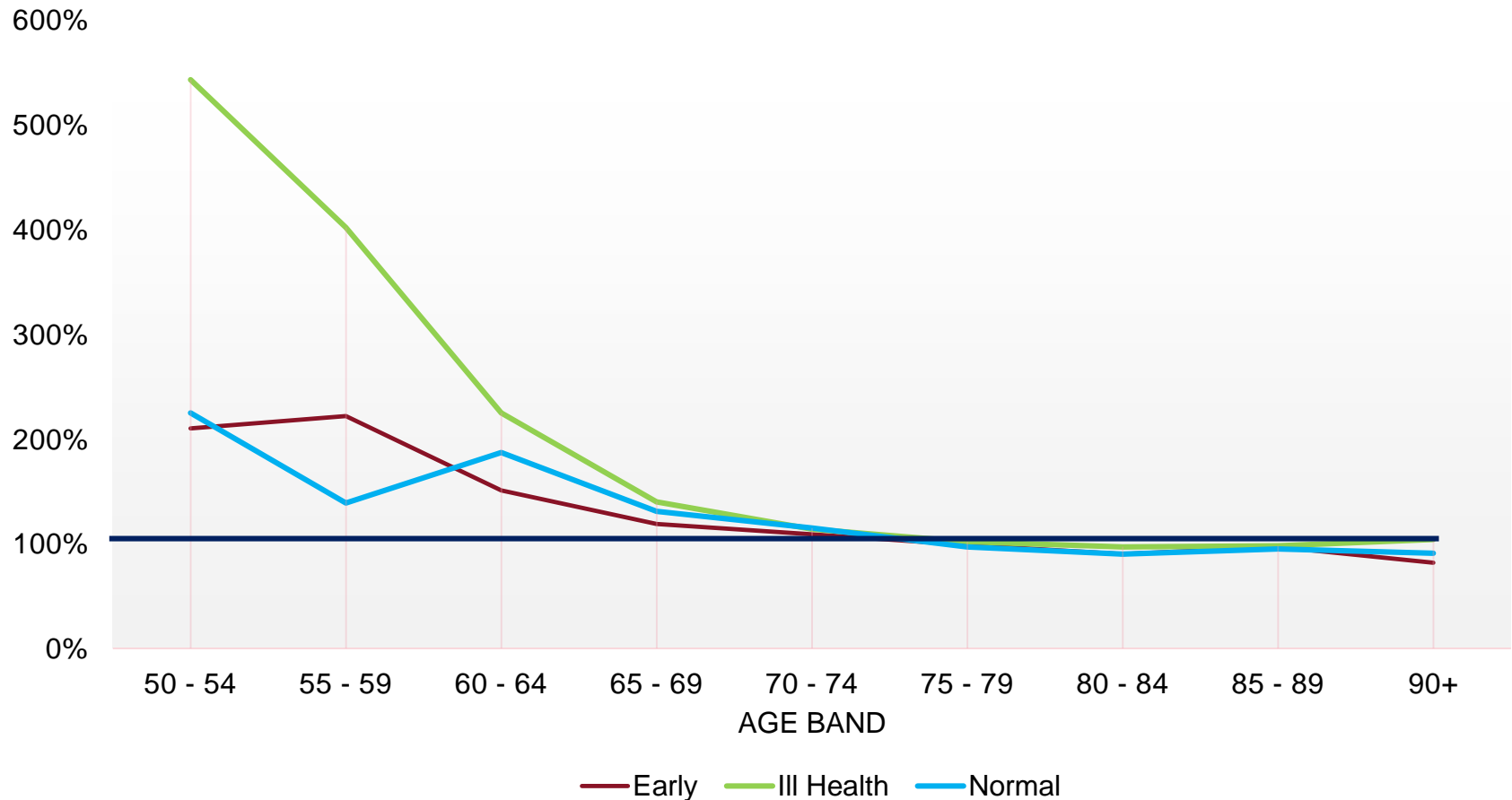
Mortality as a % of 'All lives' rates



— All lives — Early — Ill Health - - - Normal — All known modes

Mortality by retirement mode: Female principal pensioners

PA(90) Actual to Expected Ratios



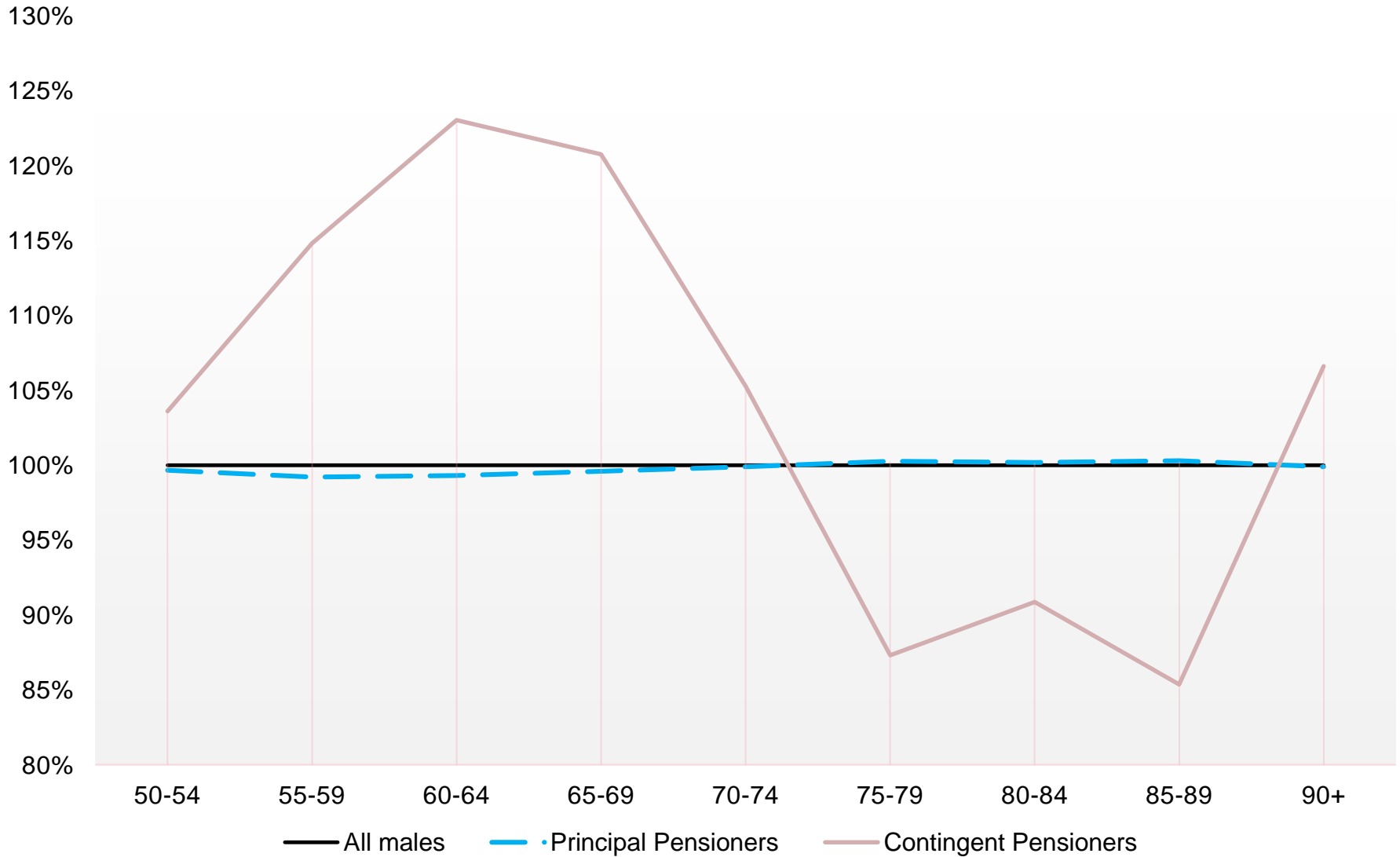
Mortality by retirement mode

- Ill health early retirement 40% higher than normal for ages < 65
- Thereafter mortality is close until age 85, and then 25% higher
- Normal early-retirement mortality higher than normal for ages 50 -60
 - Suggests some ill-health early retirement categorised as normal-health early retirement
- After stripping out ill-health retirements
 - Mortality normal retirements still higher than PA(90) before age 65
 - After age 69, mortality of male normal retirement gradually drops below PA(90) (difference in shape)
 - After age 69, mortality female normal retirement broadly consistent with PA(90)

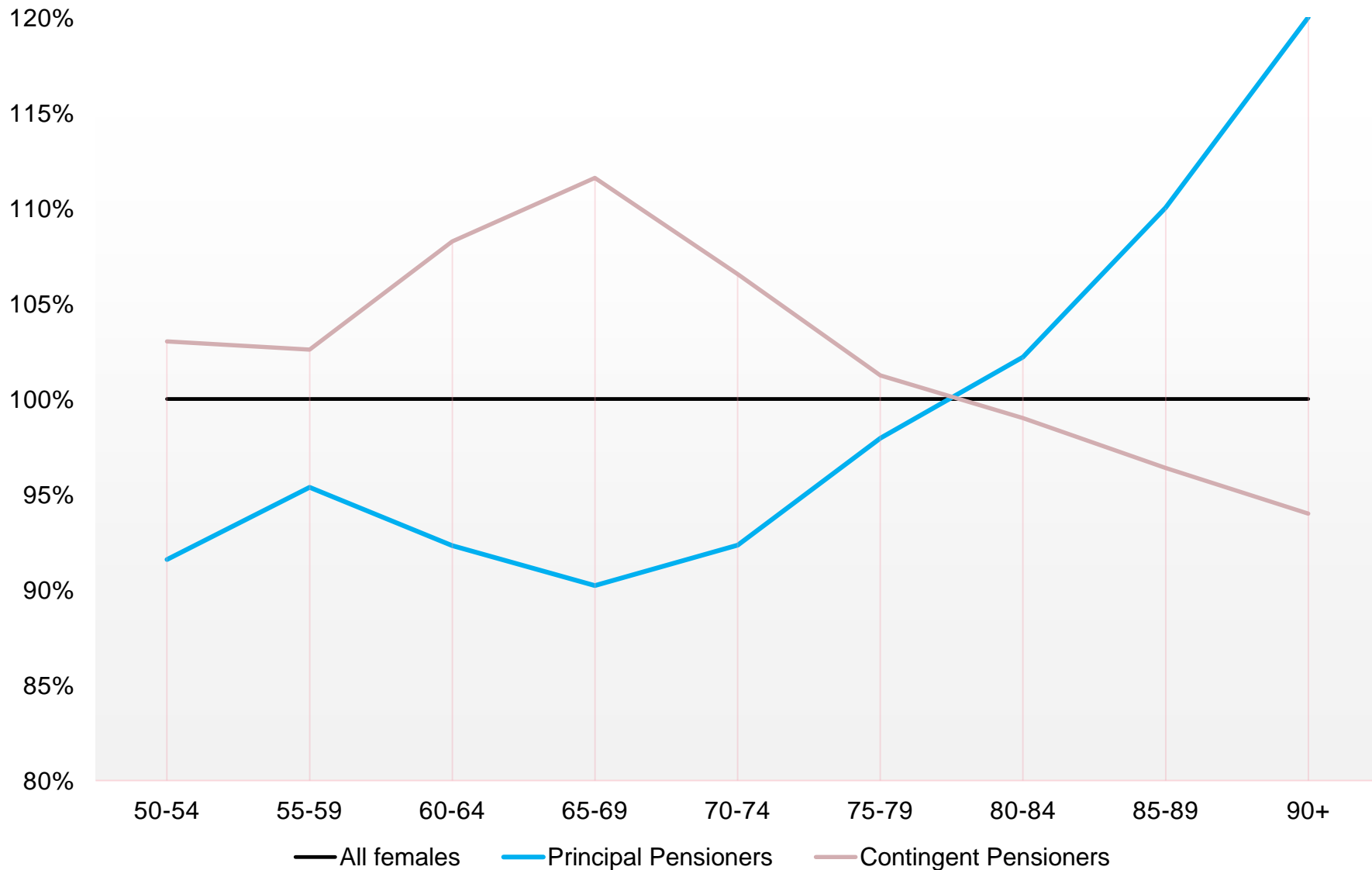
Mortality by pension type

	% of Total Male exposure		% of Total Female Exposure	
	Male Principal	Male Contingent	Female Principal	Female Contingent
50-54	91%	9%	27%	73%
55-59	95%	5%	36%	64%
60-64	97%	3%	52%	48%
65-69	98%	2%	54%	46%
70-74	98%	2%	46%	54%
75-79	98%	2%	38%	62%
80-84	98%	2%	31%	69%
85-89	98%	2%	26%	74%
90+	98%	2%	23%	77%

Male pensioner and widower mortality



Female pensioner and widow mortality



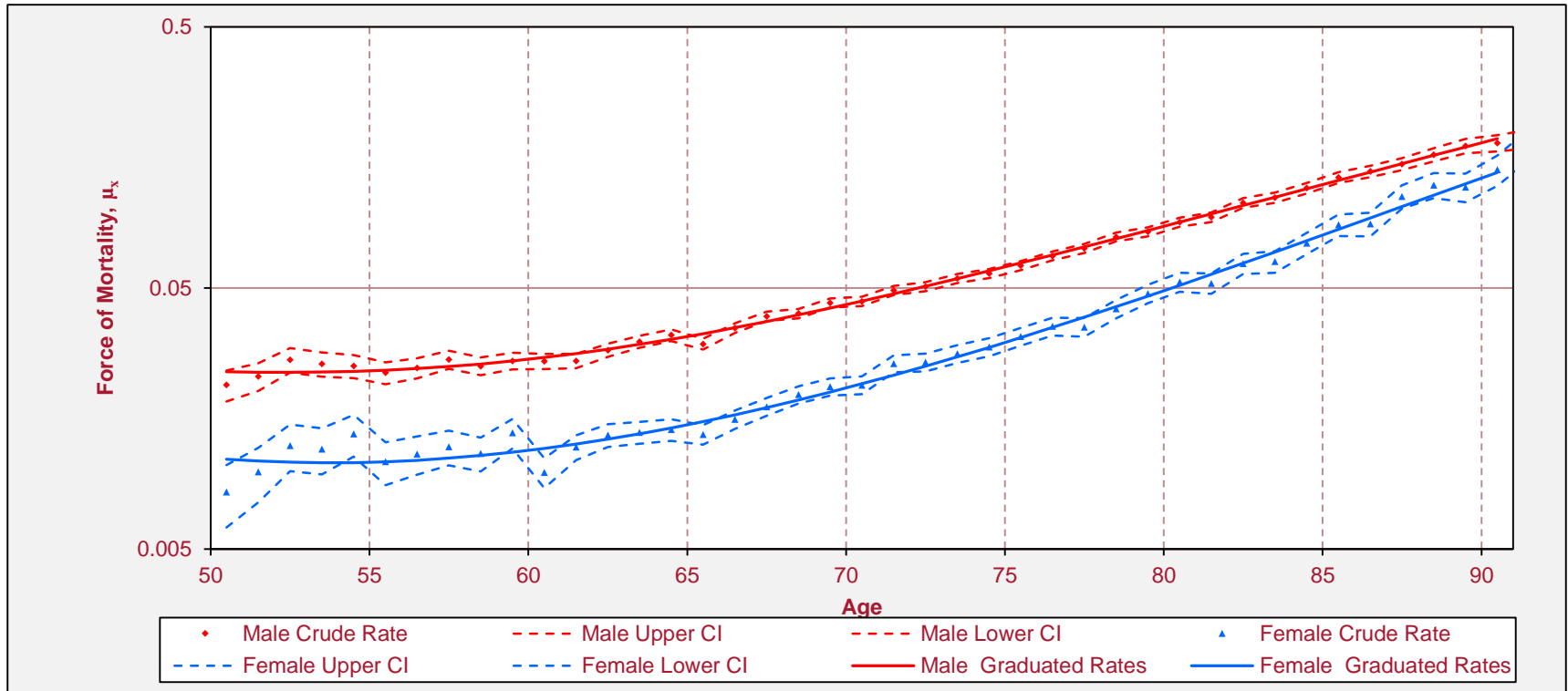
Graduation Dataset

- *Male and Female data covers ages 50 – 99*

Amount Band	Female		Male		Total Exposure	Total Deaths
	Exposure	Deaths	Exposure	Deaths		
LESS THAN R10K	50 105	2 340	106 691	8 965	156 796	11 305
R10K TO R30K	235 503	6 088	299 142	17 028	534 645	23 116
MORE THAN R30K	399 306	9 056	820 608	39 195	1 219 914	48 251
Grand Total	684 913	17 484	1 226 442	65 188	1 911 355	82 672

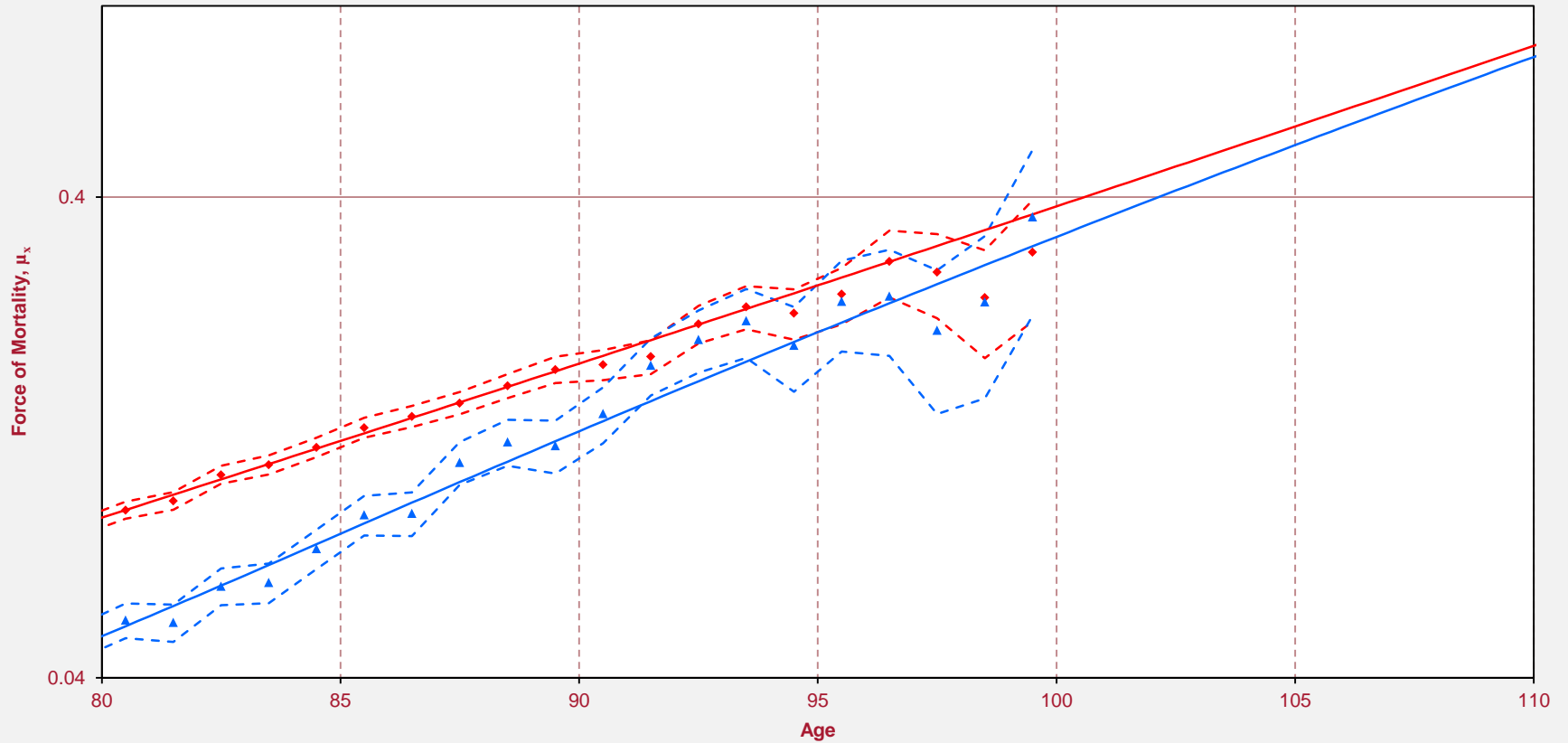
- *Data excluded*
 - *Dependents (dropped widow pension type)*
 - *Pension amount unknown*

Graduated rates between 50-90

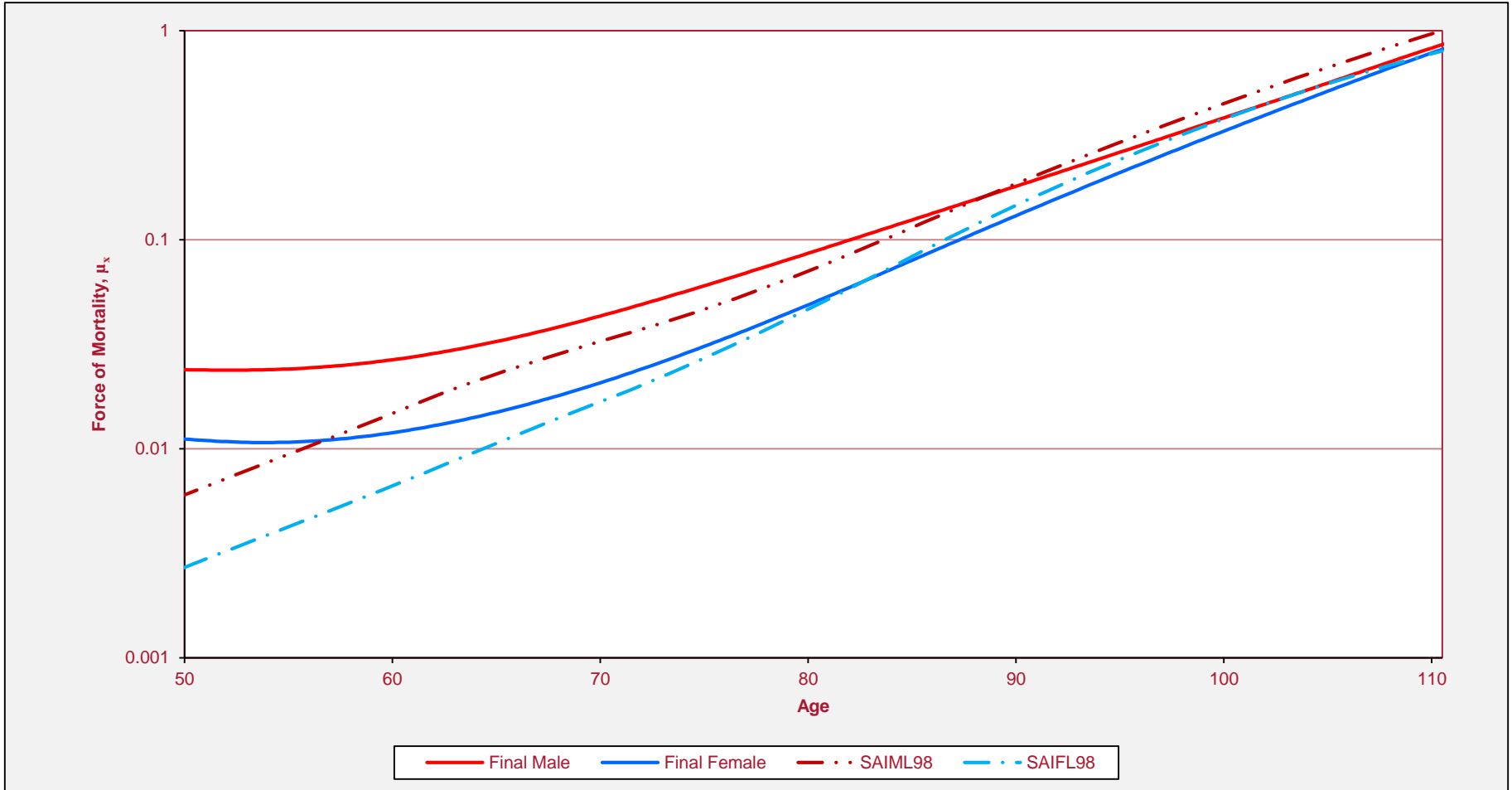


	Ages 50 - 90		Ages 66 - 90	
	Male GM(2,2)	Female GM(0,4)	Male GM(2,2)	Female GM(0,4)
Chi-squared test statistic (TS)	56.88*	74.32*	22.00	31.67
Critical value (CV) (at 5% significance)	52.19	52.19	32.67	32.67

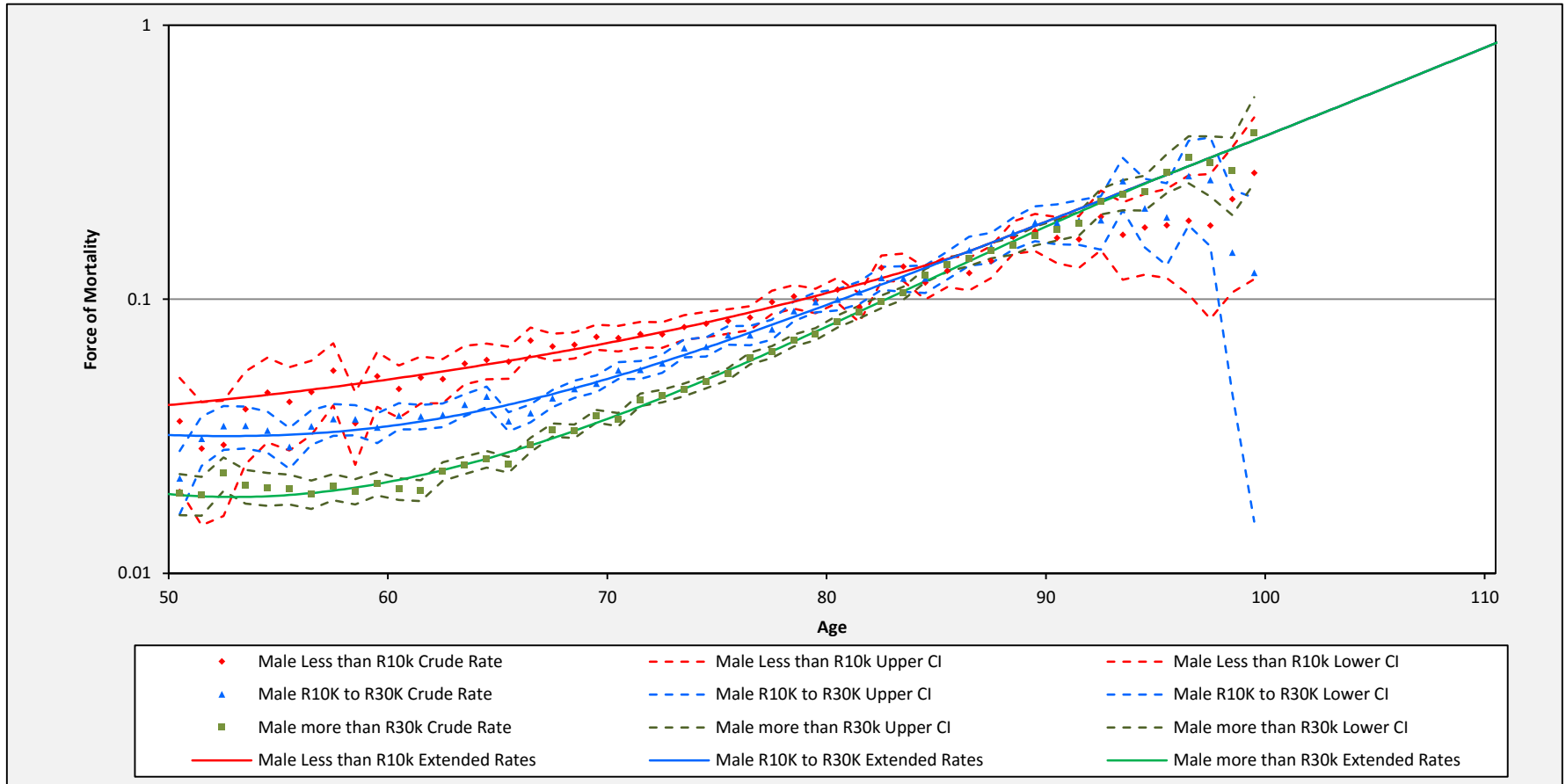
Extending Rates to 110



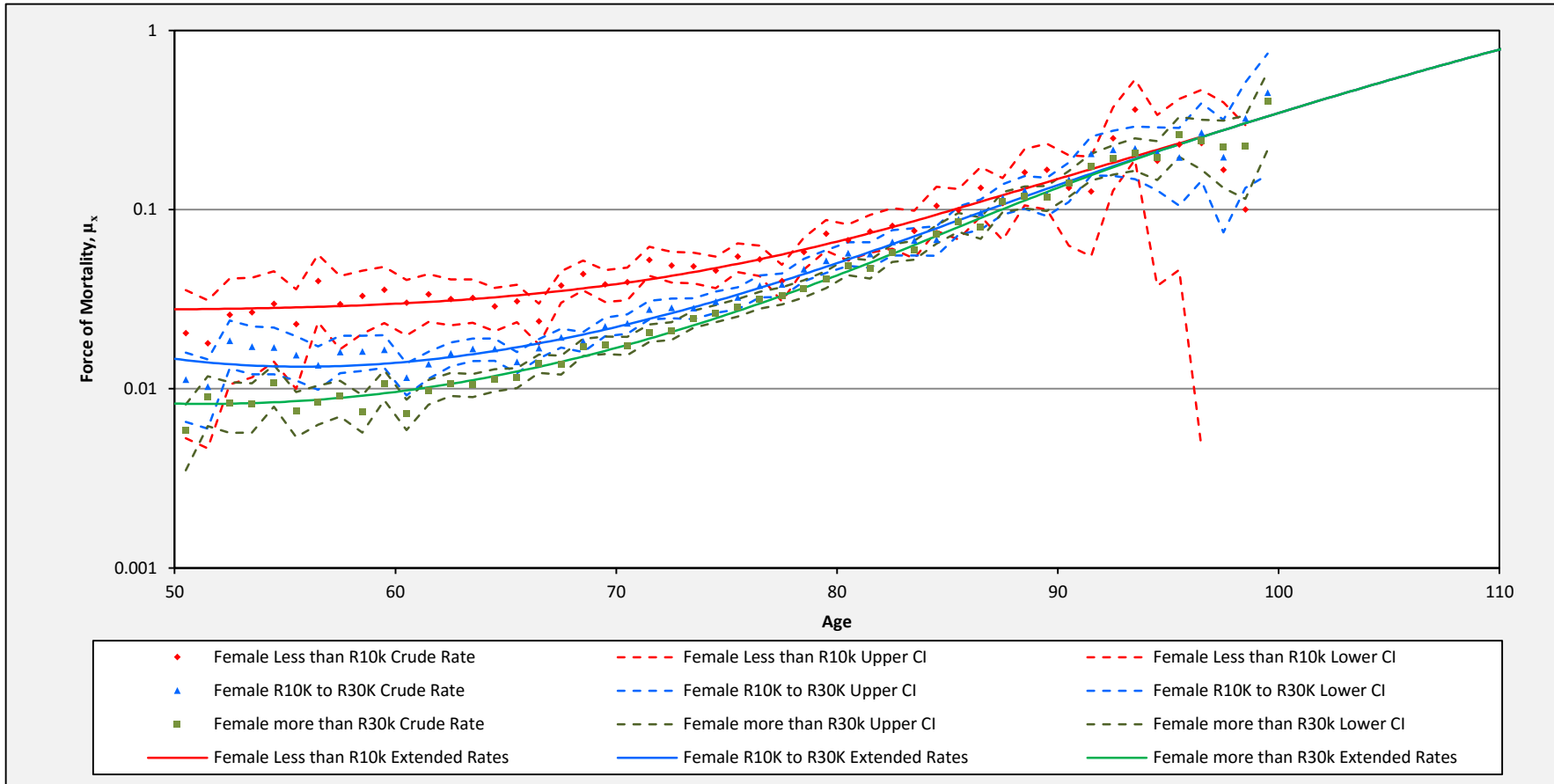
Final Aggregated Rates



Male Graduated Rates by Amount Band



Female Graduated Rates by Amount Band



Summary of findings

1. PA(90), SAIML/FL98, CSI04 not good fits
 - Shape is wrong
 - At least for ages before 60 (males) and 63 (females)
2. Mortality by amounts is significantly lower than by lives
 - Males only...
3. Type of retirement (early, normal, ill health) is important
4. Mortality by pension type (main, spouse) is less important