



Continuous Mortality Investigation

Institute and Faculty of Actuaries

CMI update

Cobus Daneel, Chair of CMI Mortality Projections Committee

28 February 2025

Agenda

- SAPS Committee
 - Multi-factor analysis of the SAPS dataset
- CMI Mortality Projections Model
 - Up to CMI_2023
 - Plans for CMI_2024
- Questions

Multi-factor analysis of the SAPS dataset

CMI Working Paper 194: Multi-factor analysis of the mortality experience of pensioners for 2015 to 2022

Overview of analyses & dataset

Published in Working Paper 194 (same dataset as WP190)

Period of analysis is 2015-2022 (excluding 2020 and 2021)

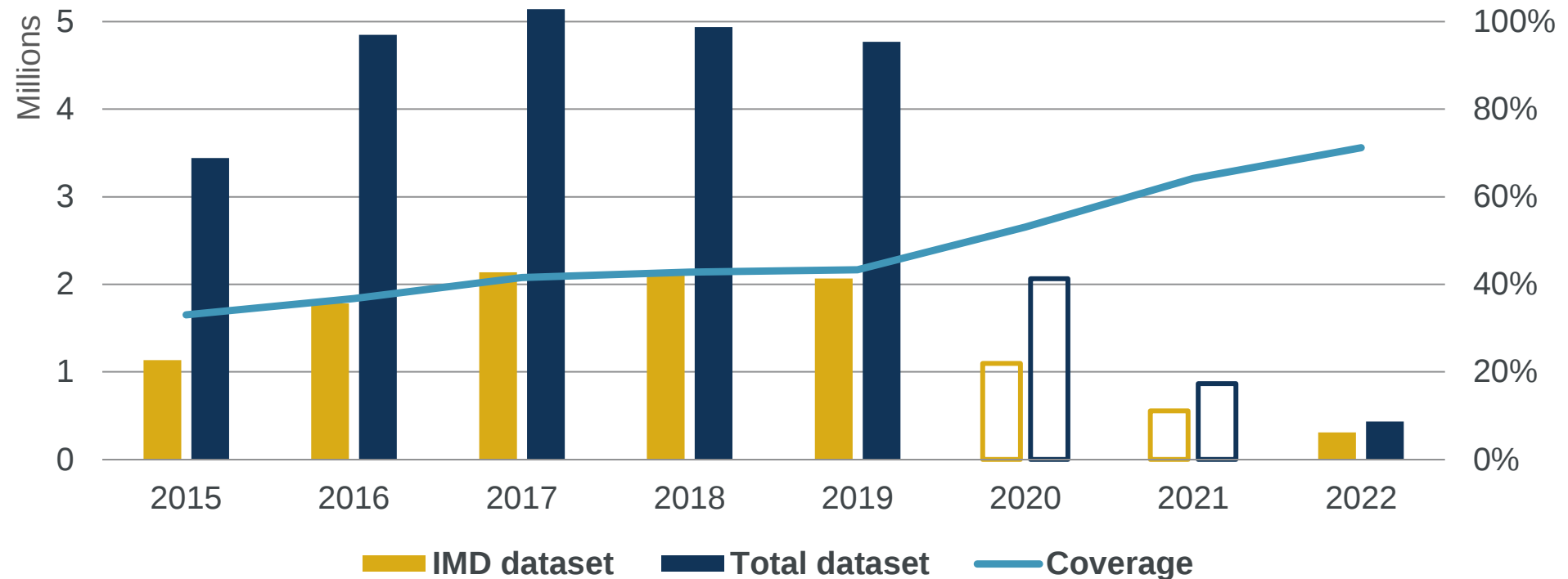
One-, two- and three-way analyses considering pension amount, IMD, region and industry

Analysis of lives-weighted A/Es, with expected deaths calculated using the S4 tables, projected with Core CMI_2023

GLM analysis using a model considering the effects of multiple factors simultaneously, giving an indication of the importance of each factor

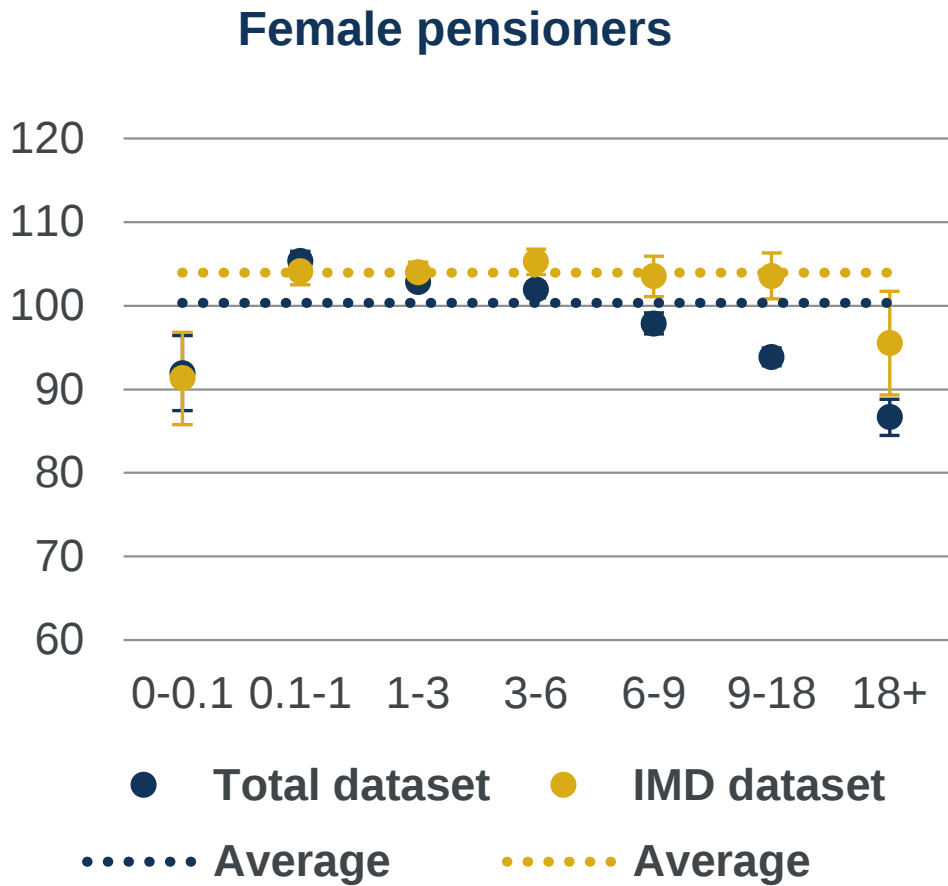
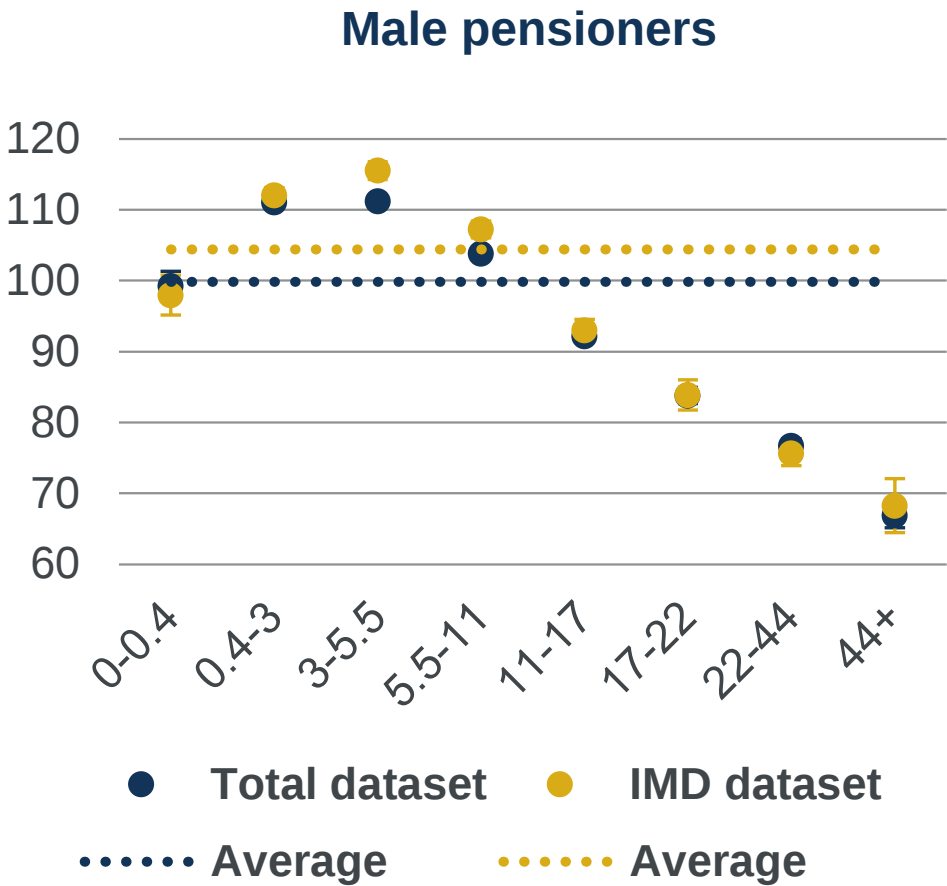
Total dataset and IMD dataset

Chart 2B Lives-weighted exposure, by dataset and calendar year



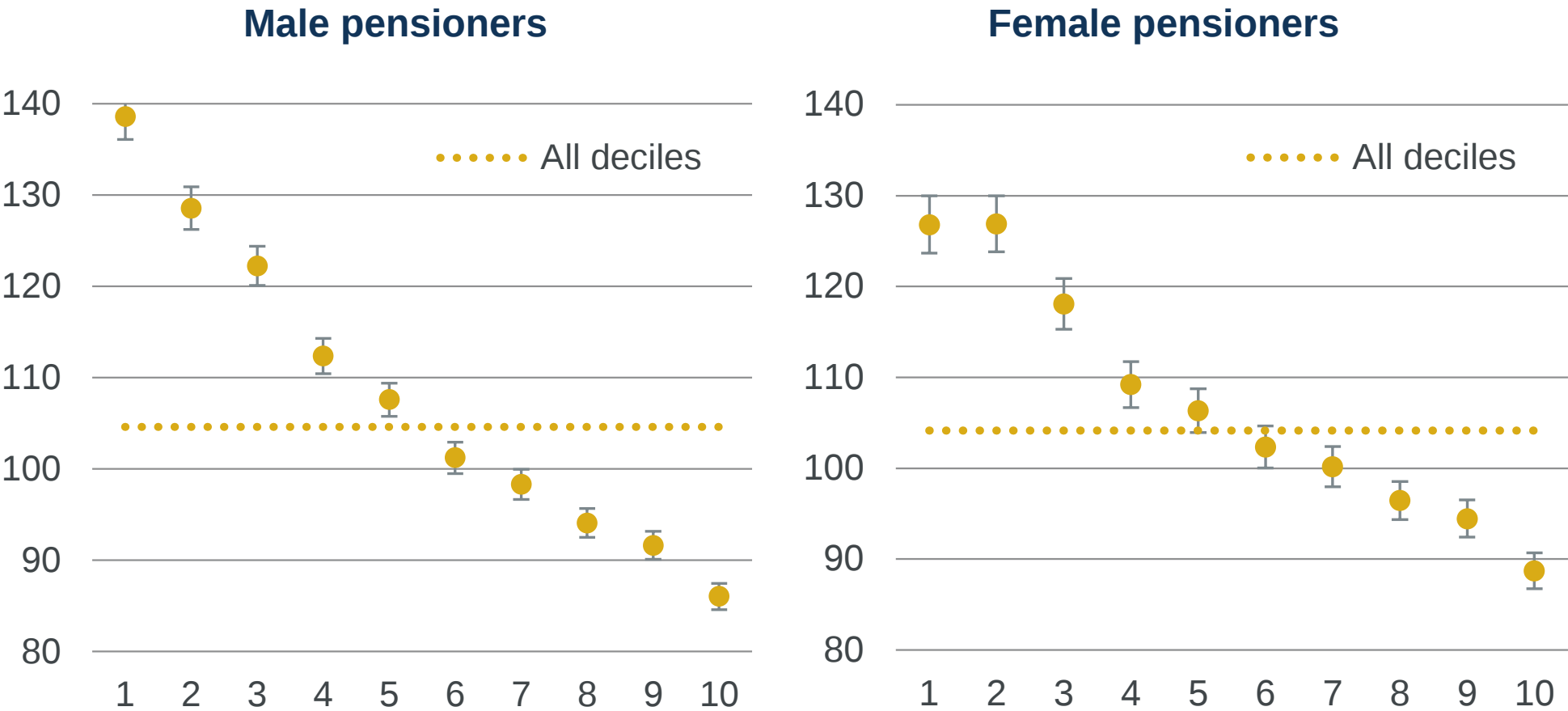
Pension amount band

Chart 3B 100 A/E comparisons against S4 Series table with projection



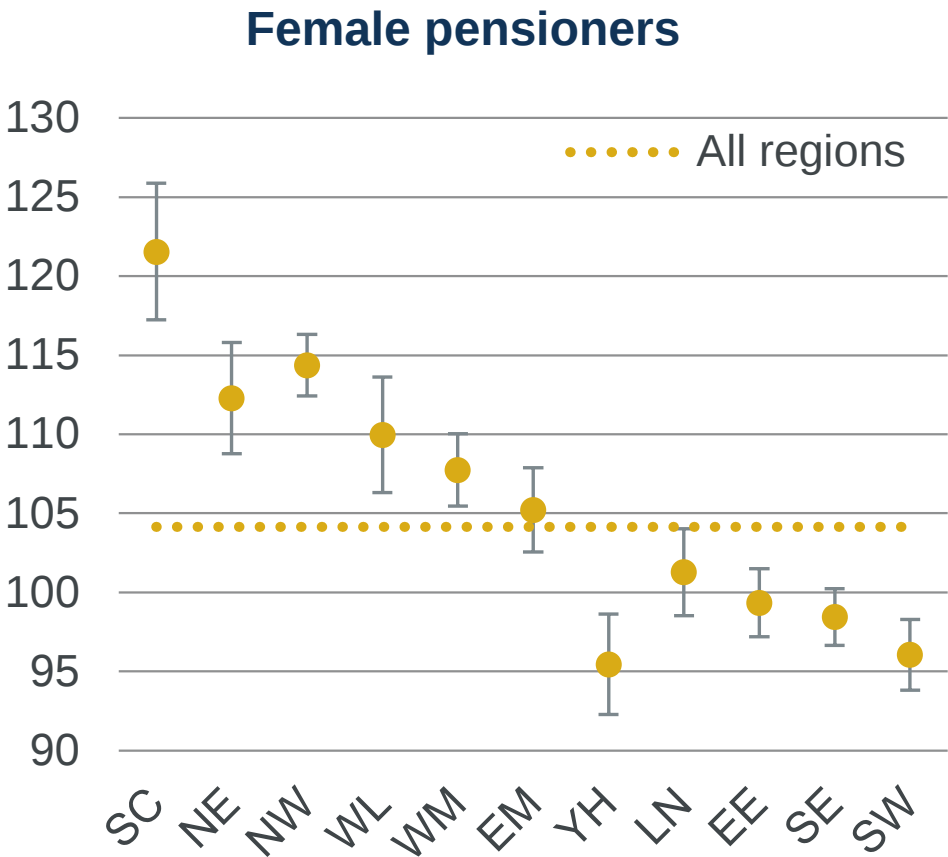
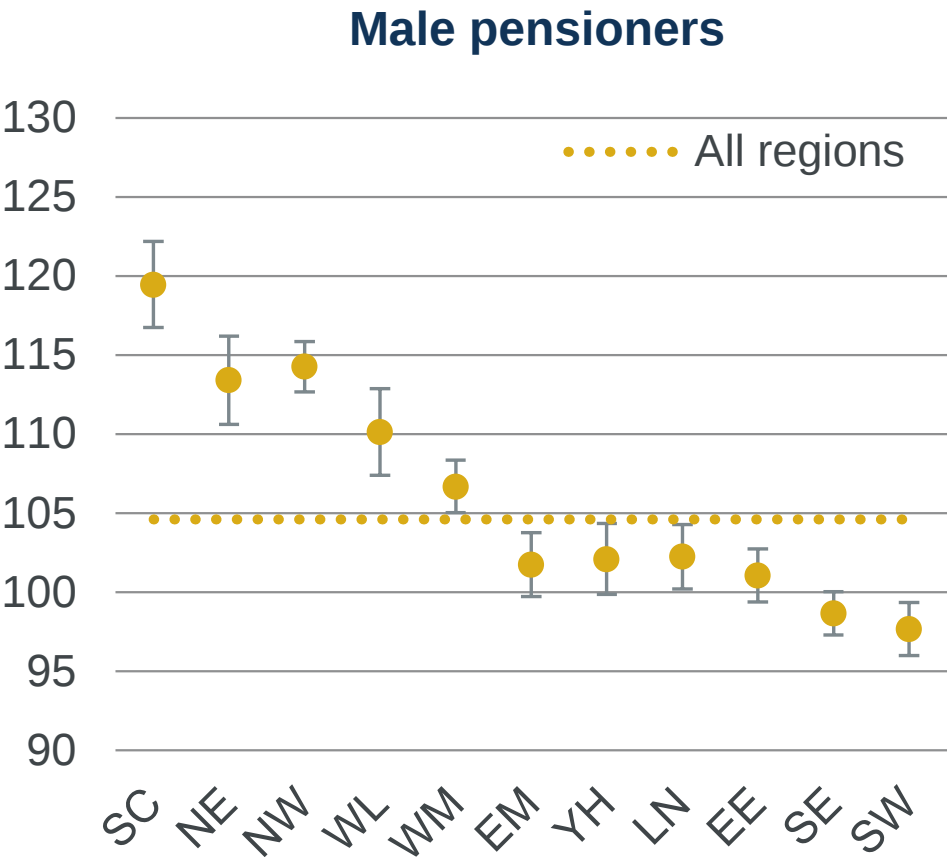
IMD Decile

Chart 3F 100 A/E comparisons against S4 Series table with projection



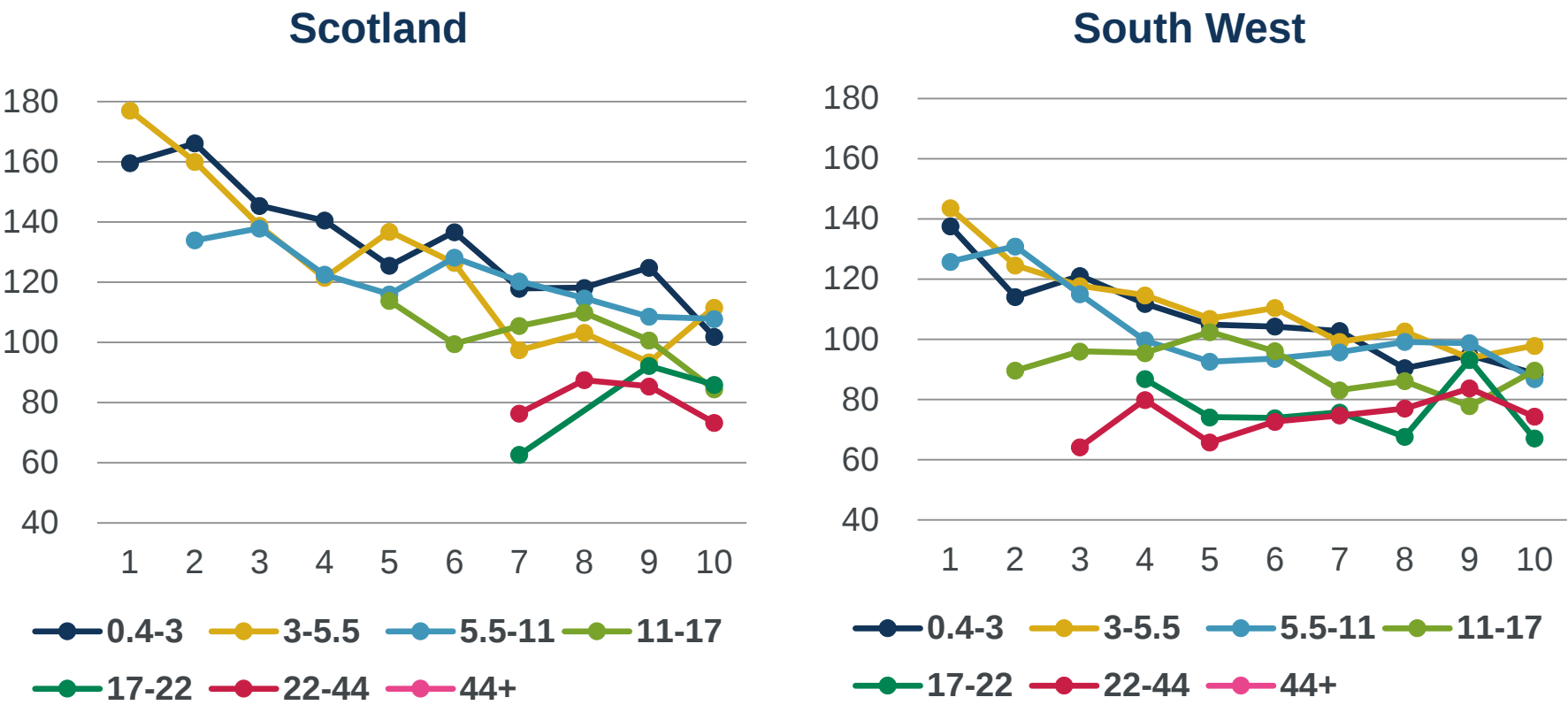
Region

Chart 3H 100 A/E comparisons against S4 Series table with projection



Pension amount, IMD decile, region – male pensioners

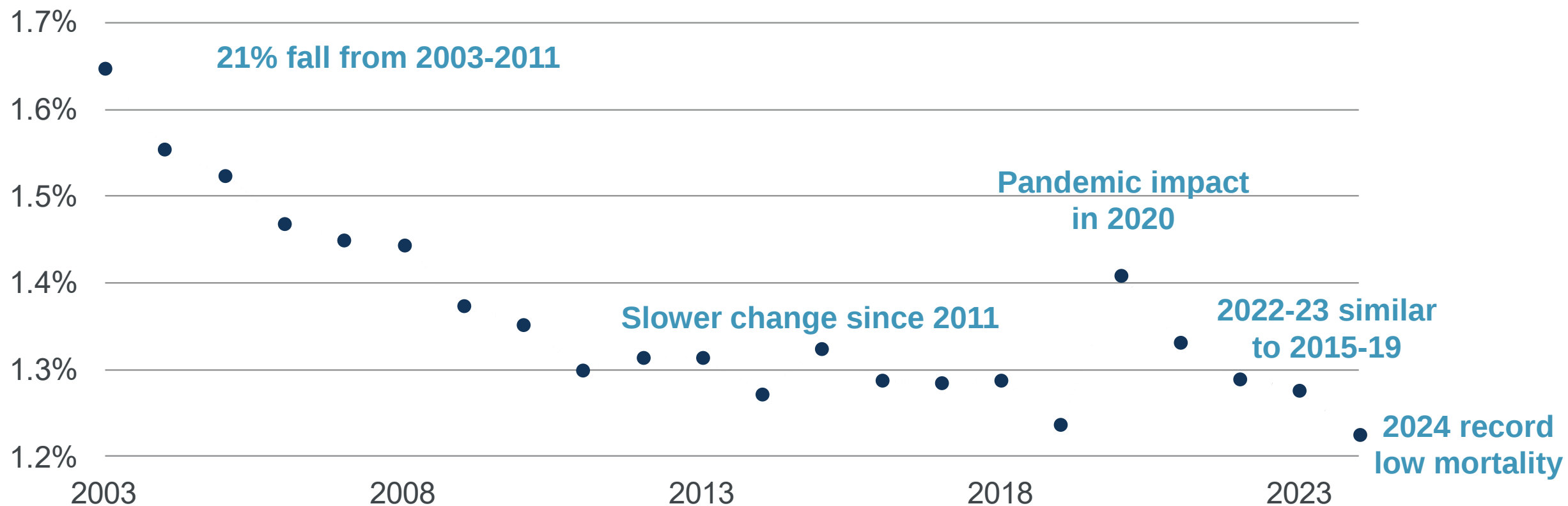
Chart 5A 100 A/E comparisons against S4 Series table with projection by pension amount, IMD decile and region



Recent mortality in the general and DB pensioner population

Historical mortality – England & Wales

Age-standardised mortality rates (ASMRs), males and females aged 20 to 100



Mortality improvements in SAPS dataset

Chart 5Q: Five-year average mortality improvements and confidence intervals, males and females combined

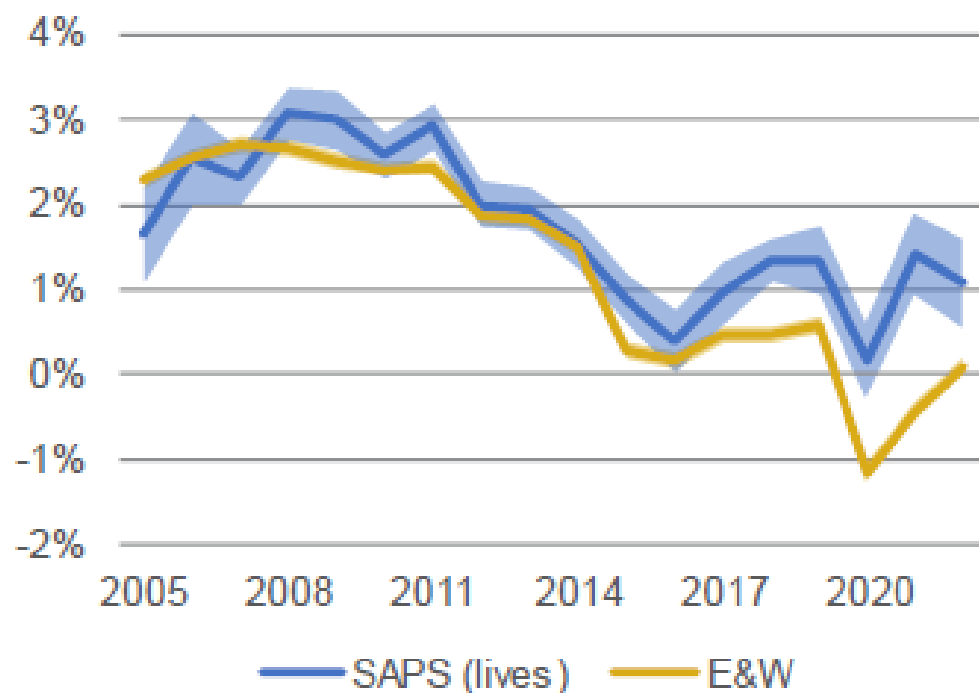
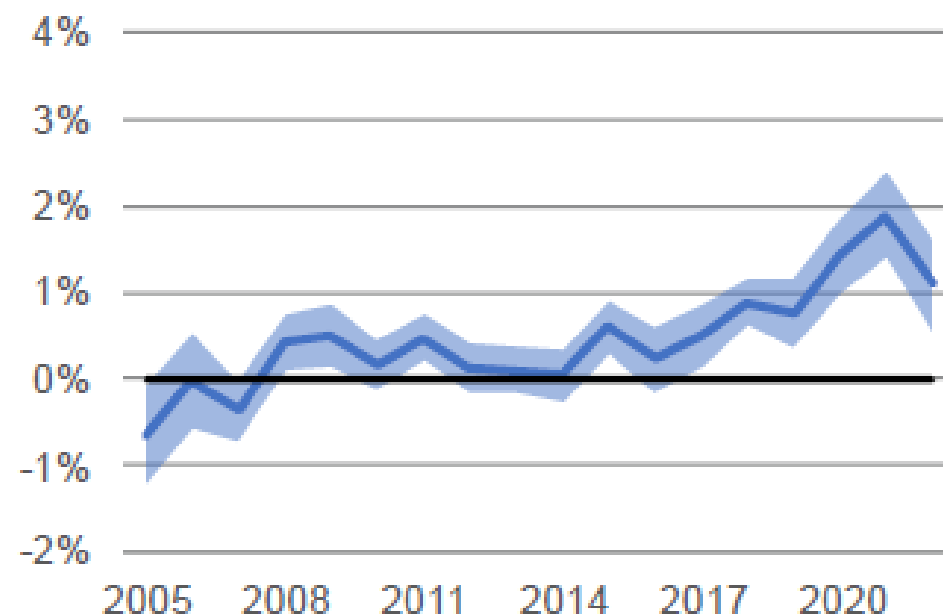


Chart 5R: Difference in five-year average mortality improvements with calculated confidence intervals, males and females combined



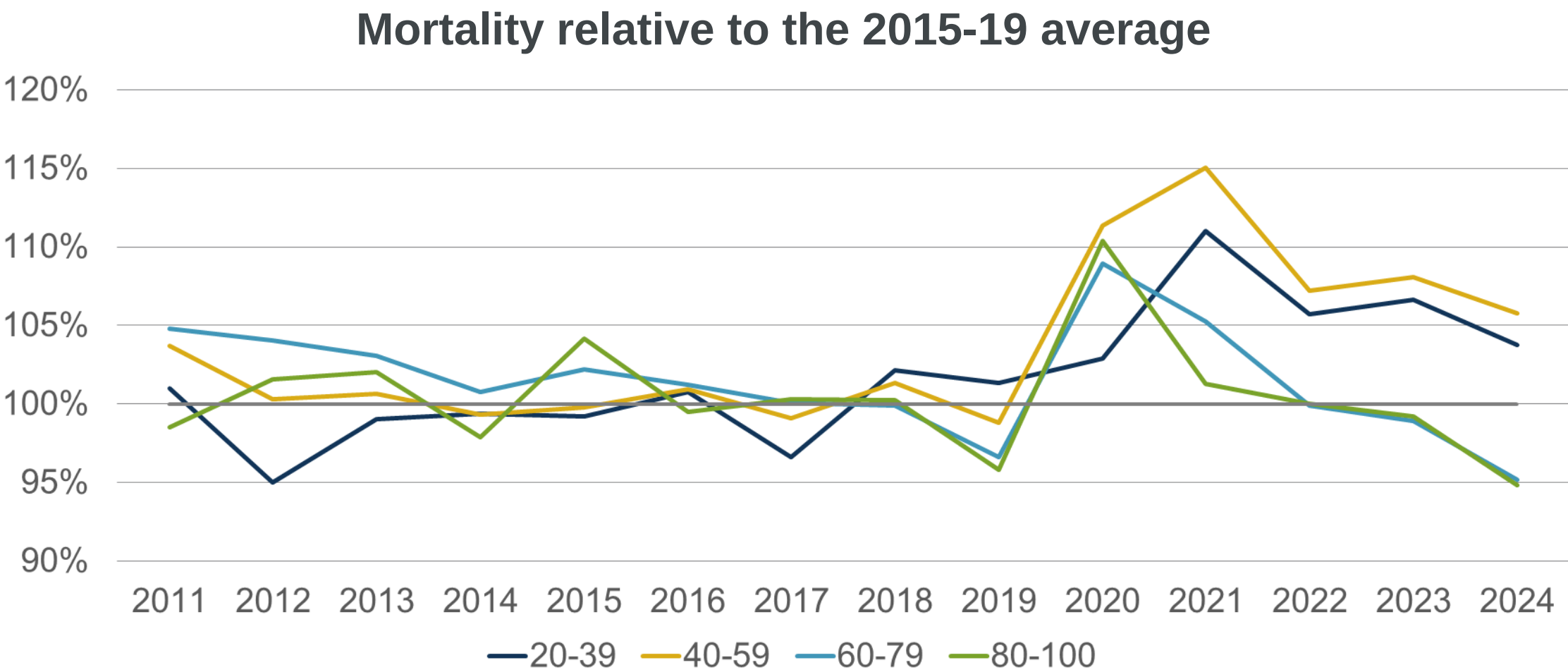
Covers mortality improvements in the period 2000 to 2022 (2023 excluded to reduce impact of late reported deaths).

Review for CMI_2024

CMI_2023 – consultation responses

- Different views on single weight between consultants and insurers
 - All insurers/reinsurers prefer 10% or lower
 - Majority of consultants/others prefer 25% or higher
- Majority found CMI_2023 proposal tolerable, but various concerns
 - Answer relies on MPC judgement rather than driven by data
 - Lack of transparency. What does a weight mean? Non-linearity
 - Weights a fair “stopgap”, but not a long-term solution
- Some interest in a more realistic overlay approach

Differing persistence of pandemic impact by age



Model criteria (no priority order)

More qualitative Subjective assessment	More quantitative Assess using scenarios
Pragmatic	Consistency with pre-pandemic models
Straightforward, common currency	Appropriately responsive
Flexible	Broadly unbiased
Transparent and objective	Fit to historical data

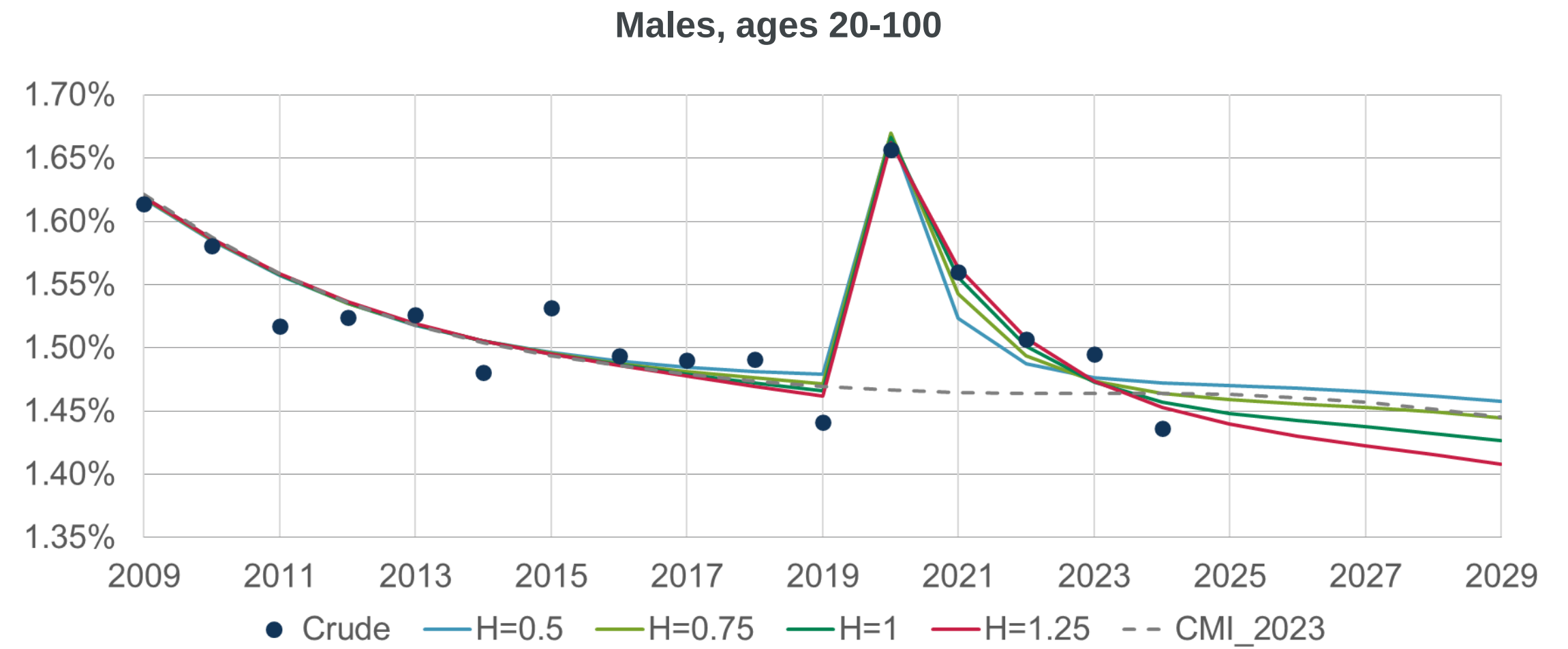
Options considered

- A. Current approach – gradual return to 100% weights
- B. Simpler weights – all 0% or 100%
- C. Current overlay – fit underlying mortality and allow for excess
- D. Enhanced overlay – fit underlying and excess to data
- E. Period smoothing parameter
- F. Counterfactual dataset
- G. Multiple period terms – could be applied to any other option

CMI_2024 proposal

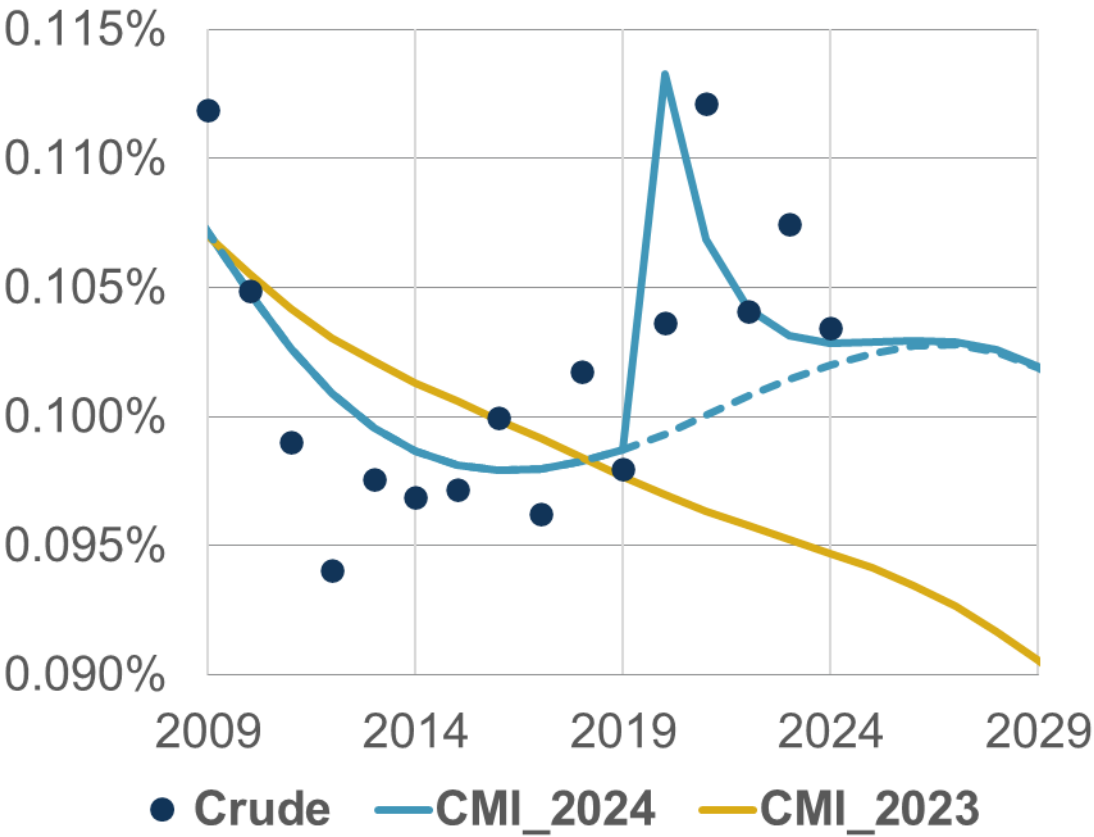
- Fitted overlay (Option D)
- Three period terms (Option G)
- Cohort constraints applied after the APCOI model
- Improvements to the algorithm used to fit the APCOI model
- Webinar on 5 March
- Consultation open until 25 March
- Publish CMI_2024 in Q2 2025. Timing depends on consultation responses

Indicative CMI_2024 results – males

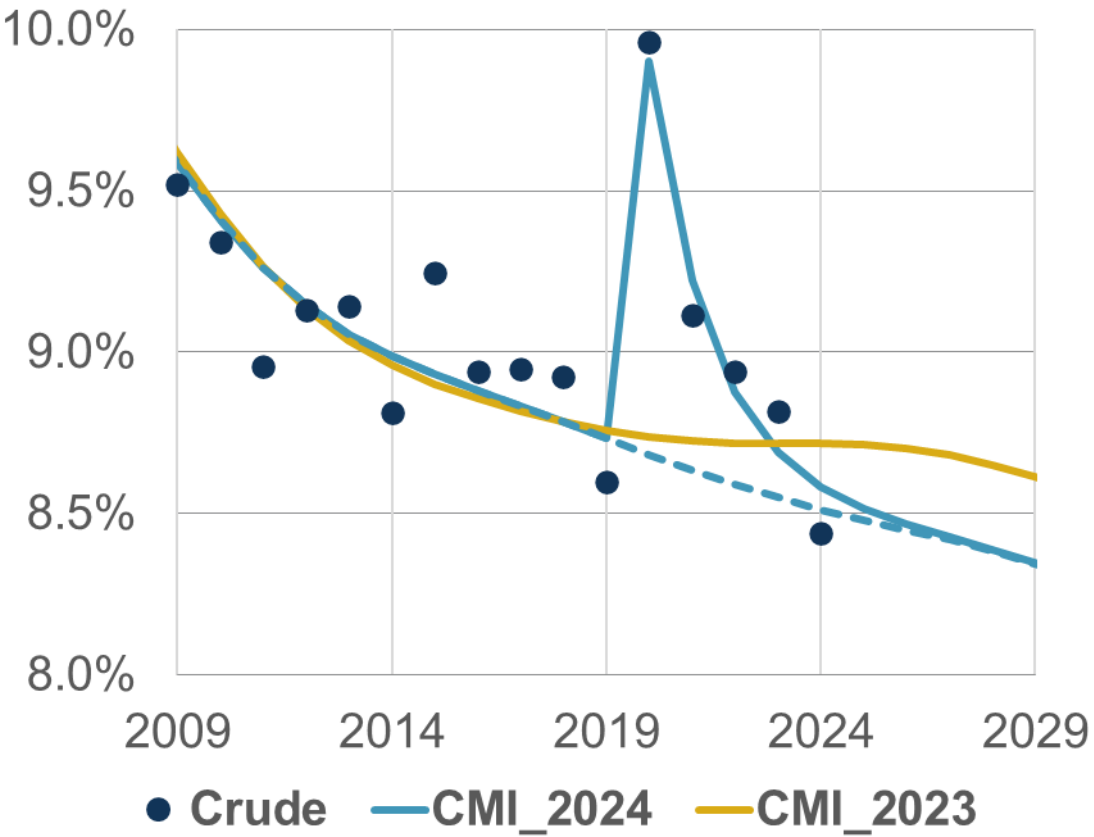


Indicative CMI_2024 results – males

Males, ages 20-44



Males, ages 75-100



Indicative results – life expectancies

- Life expectancies are higher than CMI_2023 at older ages and lower than CMI_2023 at younger ages.
- Variation by age mainly reflects the multiple period terms – higher initial improvements at older ages and lower initial improvements at young ages.

Indicative cohort life expectancies – CMI_2024 relative to CMI_2023

Sex	Age 25	Age 45	Age 65	Age 75	Age 85
Male	-0.52%	-0.67%	+0.46%	+1.41%	+2.28%
Female	-0.31%	-0.51%	-0.10%	+0.64%	+1.29%



Questions



Comments



Continuous Mortality Investigation

Institute and Faculty of Actuaries

Continuous Mortality Investigation Limited
Registered in England & Wales (Company number: 8373631)
Registered Office: 1-3 Staple Inn Hall, High Holborn, London, WC1V 7QJ

Correspondence address: Cheapside House, 138 Cheapside, London, EC2V 6BW, United Kingdom
Email: info@cmilimited.co.uk
Tel: +44 20 7776 3820

Website: www.cmilimited.co.uk (redirects to www.actuaries.org.uk)

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