Continuous Mortality Investigation
Institute and Faculty of Actuaries

SIAS
Staple Inn Actuarial Society

Outlook for mortality improvements at different ages

Discussion hosted by SIAS and the CMI Mortality Projections Committee

7 May 2026
Staple Inn Hall, London

The views expressed in this presentation are those of the presenters and not necessarily those of their employers, the CMI or the Staple Inn Actuarial Society.

Agenda

- **Welcome and introduction**
  - Cobus Daneel (CMI)
- **CMI_2025, recent mortality, and future plans**
  - Cobus Daneel (CMI)
  - Steve Bale (CMI)
- **Outlook for mortality improvements at different ages**
  - Andrew Hunt (Pacific Life Re)
  - Dan Ryan (Just)
- **Discussion**

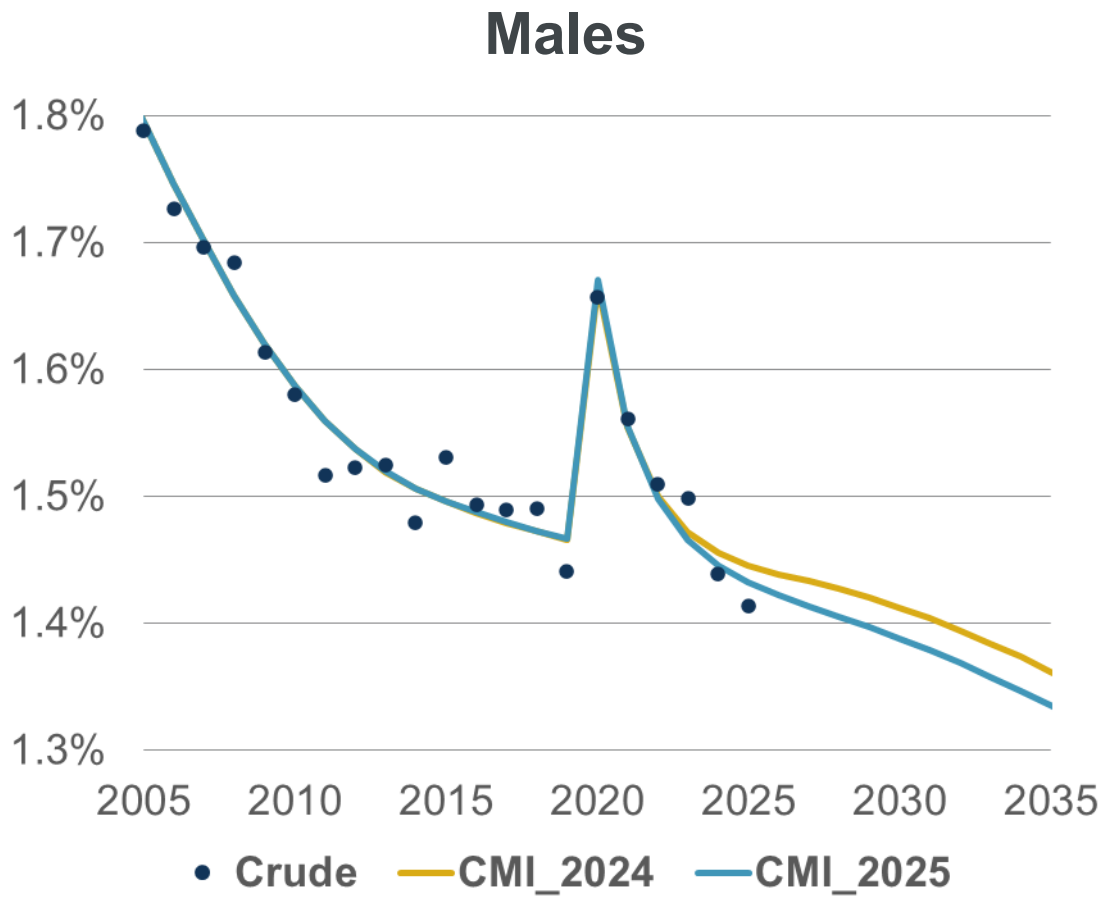
CMI_2025

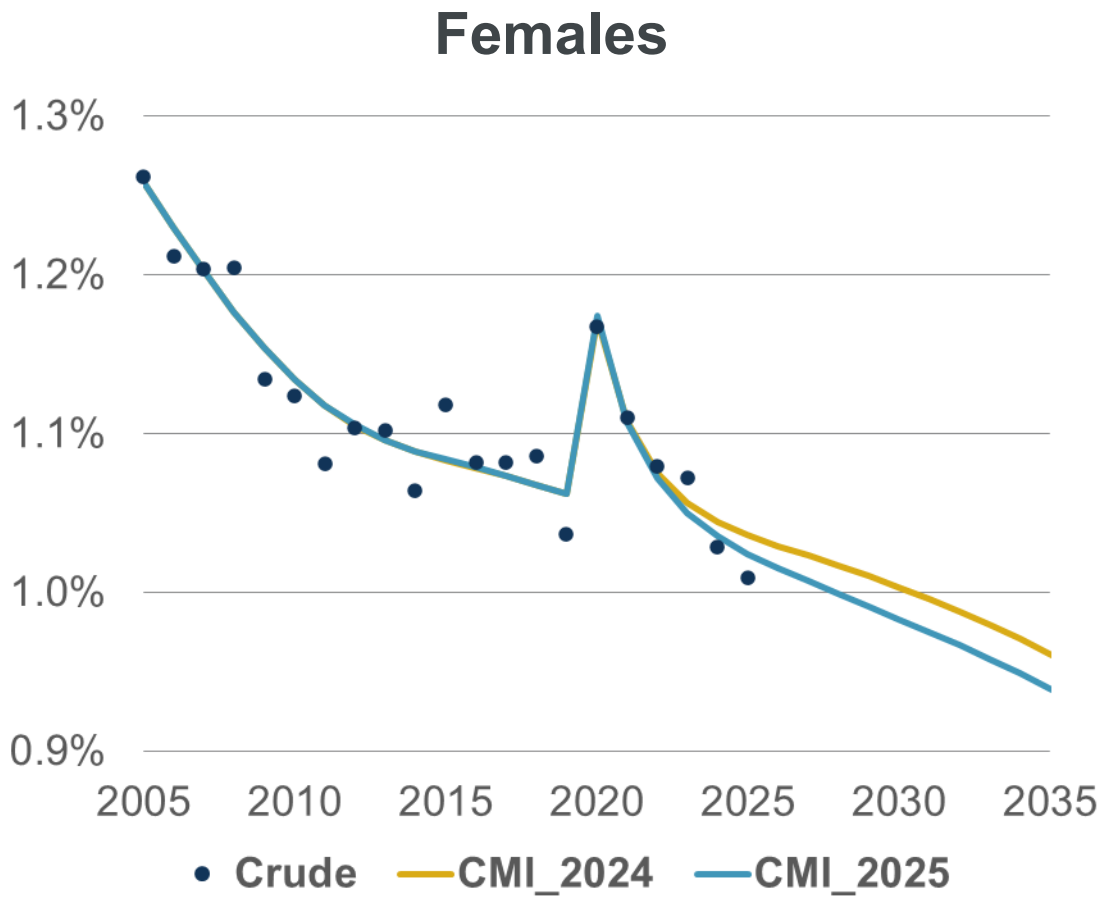
Cobus Daneel
CMI Mortality Projections Committee

CMI_2025 methods

- **CMI_2024 made significant changes**, introducing:
  - An overlay – to reflect the impact of the COVID-19 pandemic
  - Multiple period terms – to better reflect different trends at different ages
- **CMI_2025 was a business-as-usual update:**
  - Calibrated to England & Wales data for 1985-2025
- **We reviewed, but did not change methods for:**
  - Estimating the final-year population
  - The shape of the overlay by age
  - Convergence periods at older ages
  - The impact of changing registration delays

Age-standardised mortality rates (ages 20-100)





Source: CMI Working Paper 211 Charts 4O and 4P (simplified)

Life expectancy increase between CMI_2024 and CMI_2025

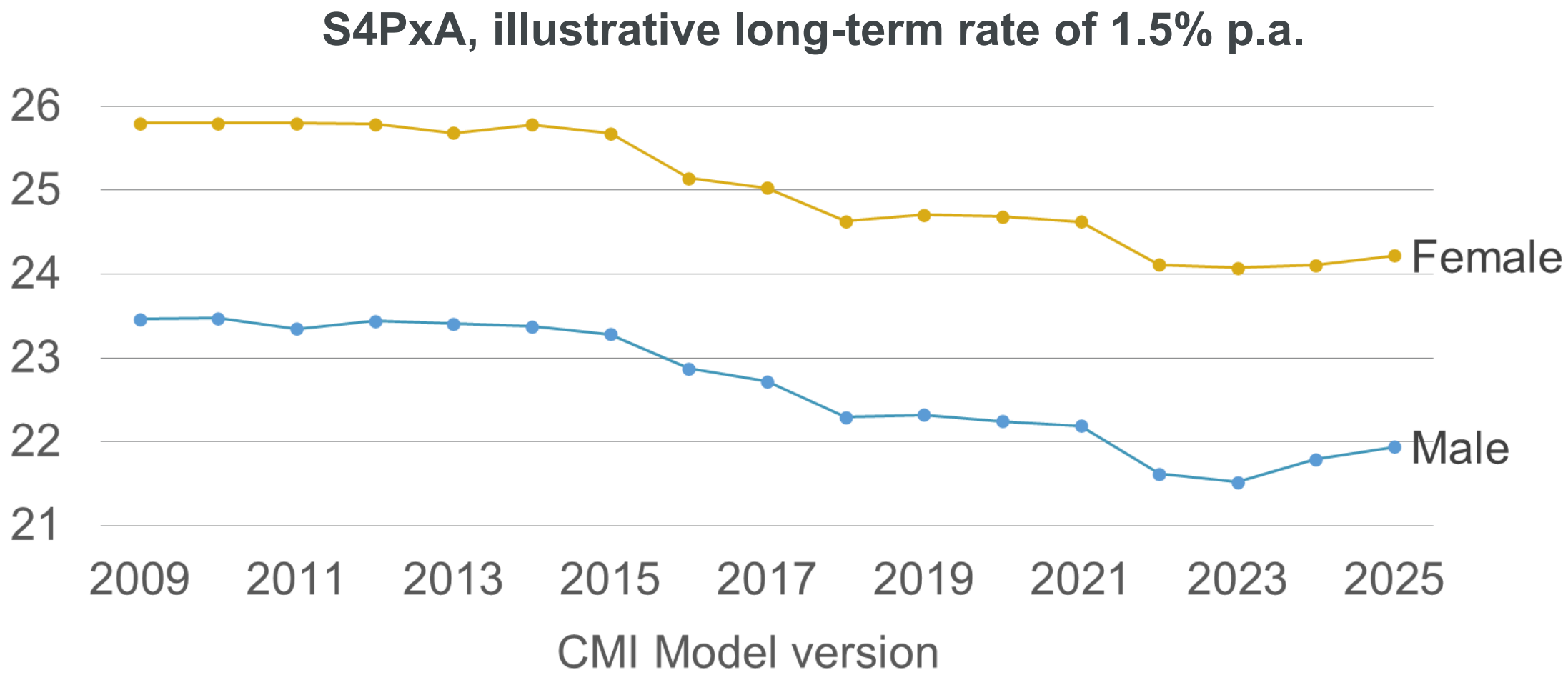
Change in cohort life expectancy at 1 January 2026

S4PxA, illustrative long-term rate of 1.5% p.a.

Sex	25	35	45	55	65	75	85
Male	+0.21%	+0.26%	+0.31%	+0.44%	**+0.68%**	+0.59%	+0.20%
Female	+0.21%	+0.27%	+0.33%	+0.39%	**+0.46%**	+0.53%	+0.29%

Source: Working Paper 211 Tables 5.3 and 5.4 (extract)

Progression of cohort life expectancy at age 65

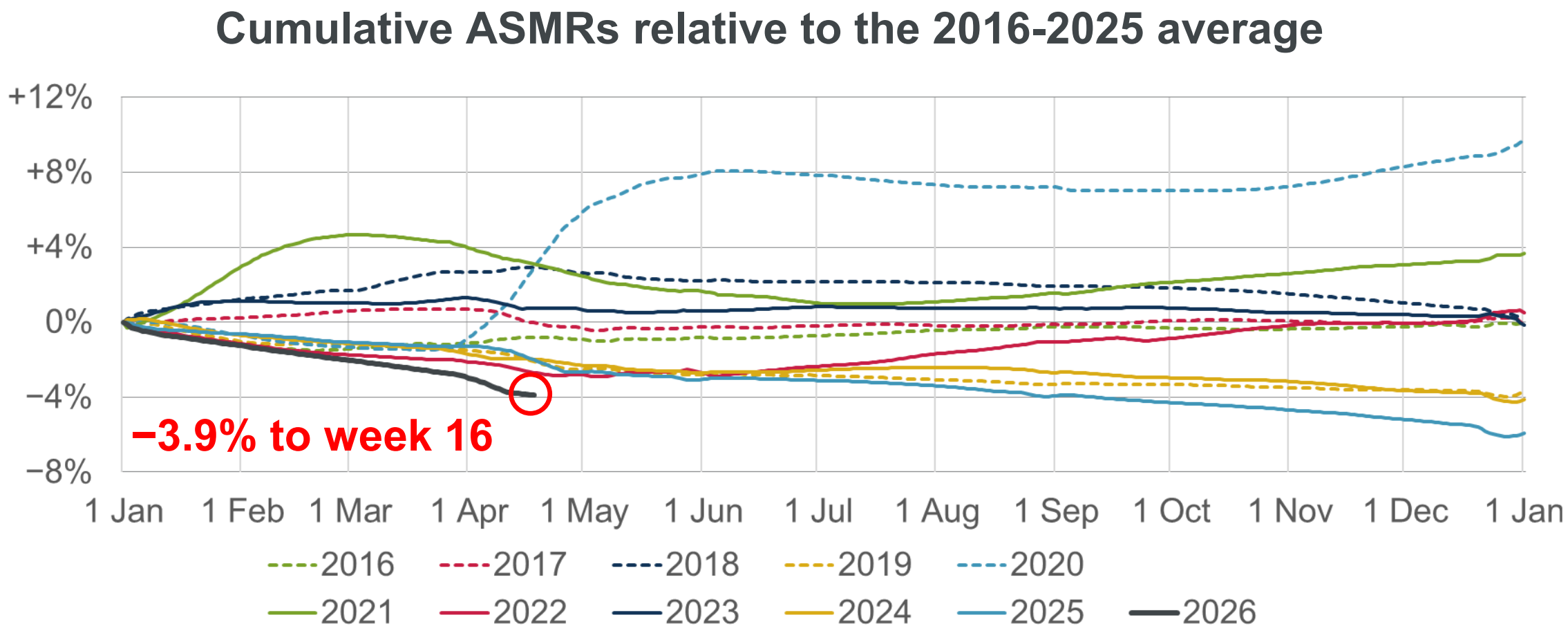


Source: CMI_2025 press release

Recent mortality and future plans

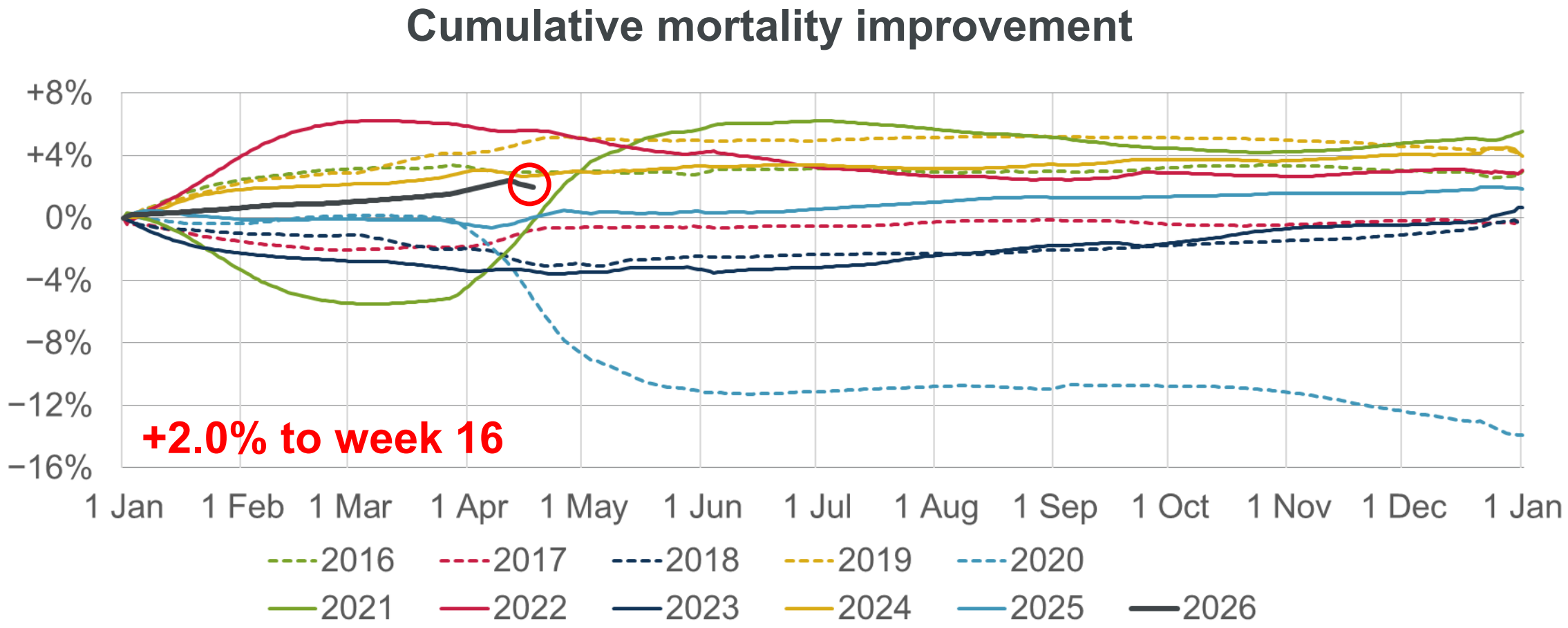
Steve Bale
CMI Mortality Projections Committee

Recent weekly mortality



Source: CMI mortality monitor software, to week 16 of 2026. Unisex, ages 20-100.

Recent weekly mortality



Source: CMI mortality monitor software, to week 16 of 2026. Unisex, ages 20-100.

Implication for business-as-usual (BAU) CMI_2026

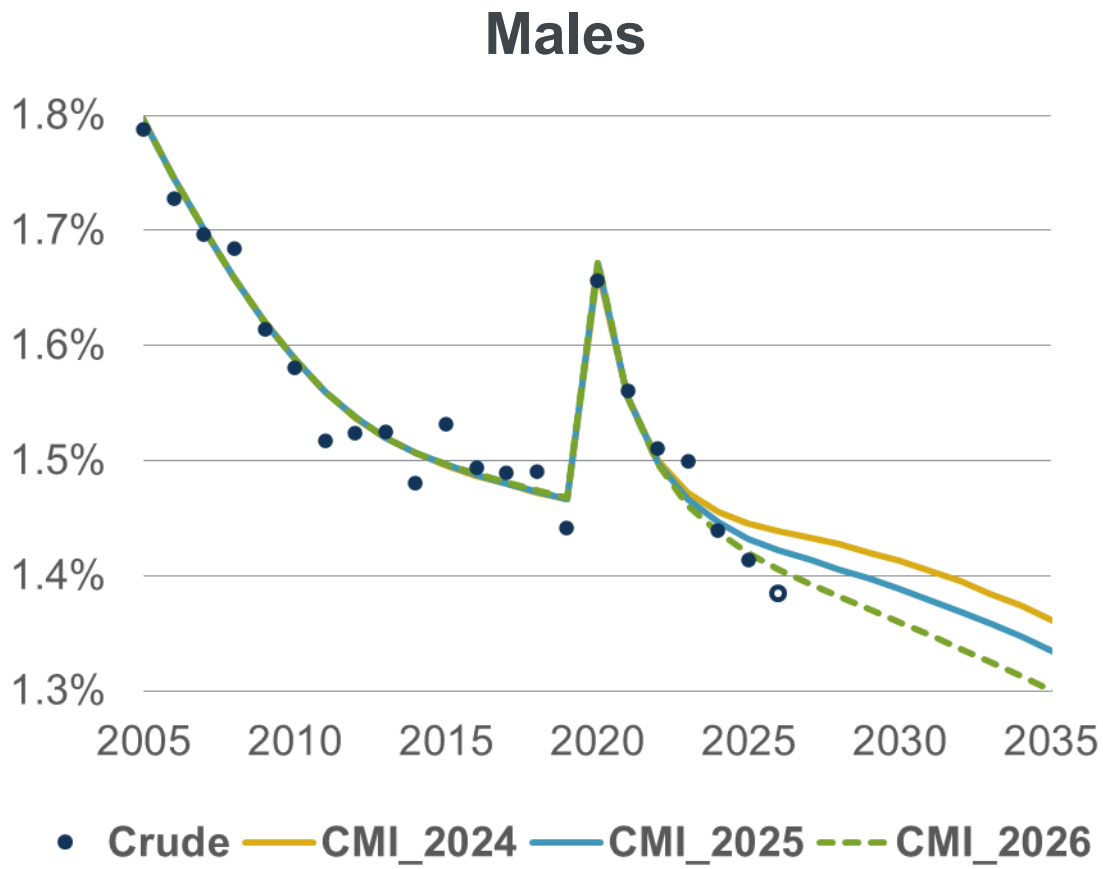
- The mortality improvement for 2026 is highly uncertain at this stage.
- A mortality improvement of 2% for the year would imply an increase in cohort life expectancy at age 65 of around 1% between CMI_2025 and CMI_2026, above the 0.5% model review policy threshold.

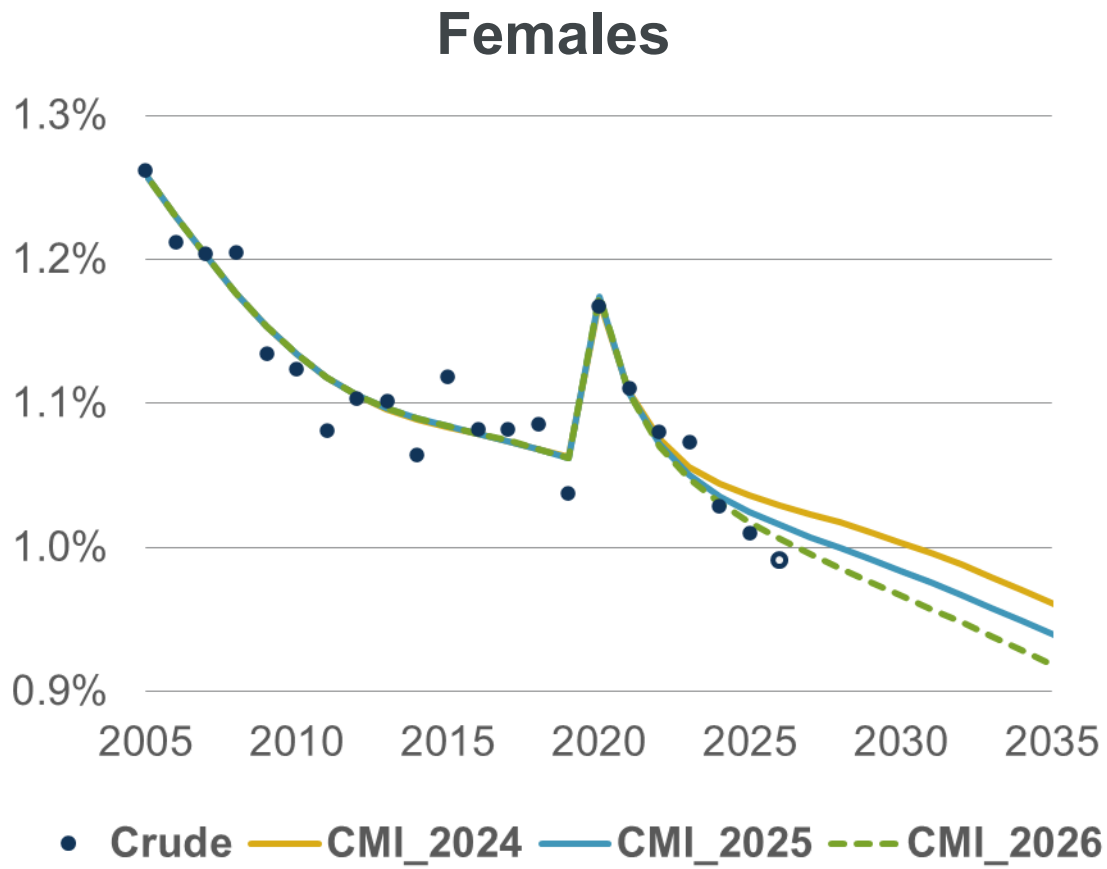
Indicative change in cohort life expectancy between CMI_2025 and BAU CMI_2026

Improvement in 2026	-1%	0%	+1%	+2%	+3%	+4%	+5%
Males 65	-0.3%	+0.2%	+0.6%	**+1.0%**	+1.5%	+1.9%	+2.3%
Females 65	-0.3%	+0.1%	+0.4%	**+0.8%**	+1.2%	+1.6%	+2.0%

Source: CMI Working Paper 211 Tables 7.1 and 7.2 (extract)

ASMRs (ages 20-100) with indicative BAU CMI_2026





Source: CMI Working Paper 211 Charts 4O and 4P (simplified) with illustrative CMI_2026 added

Future publications

- Mortality monitoring continues – monthly summary, detail quarterly
- Sixth survey benchmarking use of the Model by insurers/reinsurers
  - Issued in April, responses by 13 May, results in June
- Interaction between base tables and mortality improvements
- “Annual research” working paper, with various analyses to assist users of the CMI Model – by December 2026
- Aim to publish CMI_2026 in March 2027

Key research areas

- Projection methods
  - CMI_2024 review focussed on calibration to past experience
  - Initial reflections on convergence at high ages included alongside CMI_2025 results in Working Paper 211
- Methods for high-age population estimates
  - CMI method established in Working Paper 106 in 2018
  - Worth reviewing in light of the pandemic and the 2021 census
- Other areas will be agreed when the new committee meets

Mortality Projections Committee members

Continuing	New, from 1 April 2026
Steve Bale (Chair)	Niall Quinn
Mark Cooper	Caroline Roberts
Steven Rimmer	Ed Severs
Neil Robjohns	Roshan Tajapra
Chris Tavener	Huaiyao Yu

Outlook for mortality improvements at different ages

Andrew Hunt
Pacific Life Re

Introduction

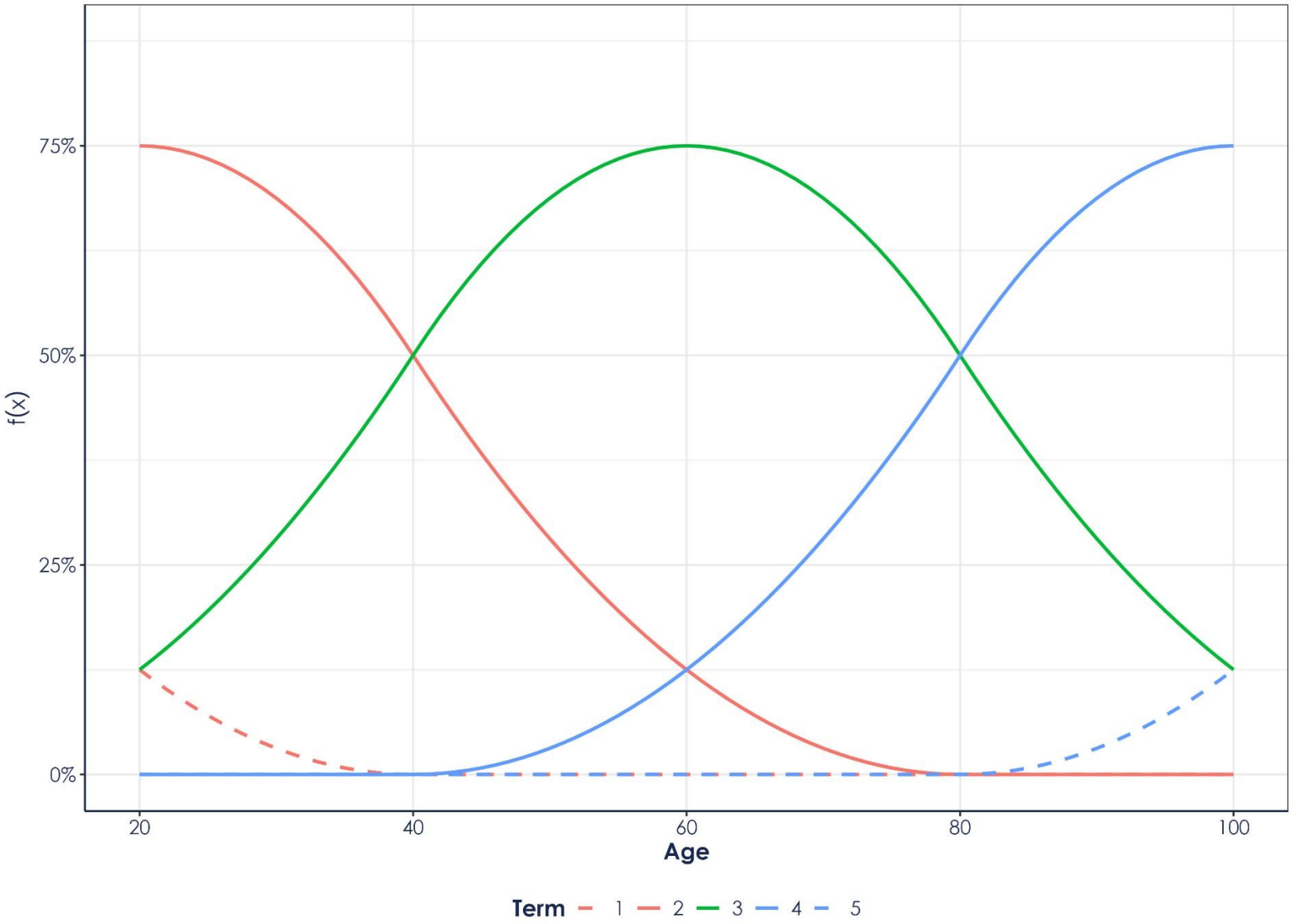
PACIFIC LIFE RE

- Whilst the initial onslaught of COVID-19 broadly affected all ages equally, as we move further away from the pandemic, we see that the impacts on mortality in the post-pandemic era are very different at different ages

- To reflect this, the CMI_2024 model added additional age/period terms, giving more scope for the model to capture different trends in mortality at different ages
- This was part of the biggest overhaul in the structure of the CMI Model since CMI_2016
- Much of the attention last year focused on the overlay terms, how they control for the impact of the pandemic in the historic data and feed through into projections
- However, as we continue to move further from the pandemic, the extra visibility of mortality across the full age range will have longer-lasting impacts on our projections of mortality

New Model Terms

PACIFIC LIFE RE



New Model Terms

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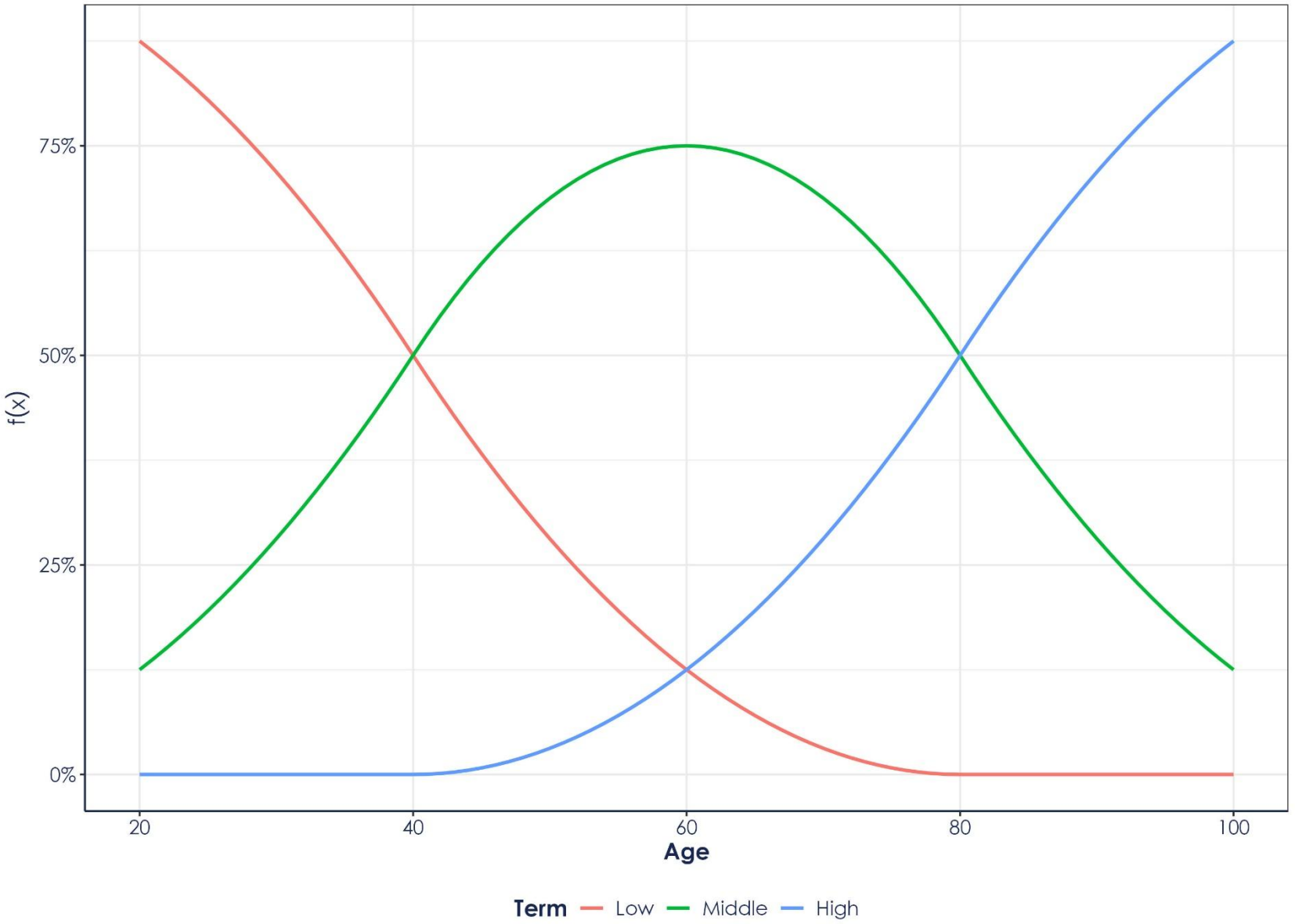

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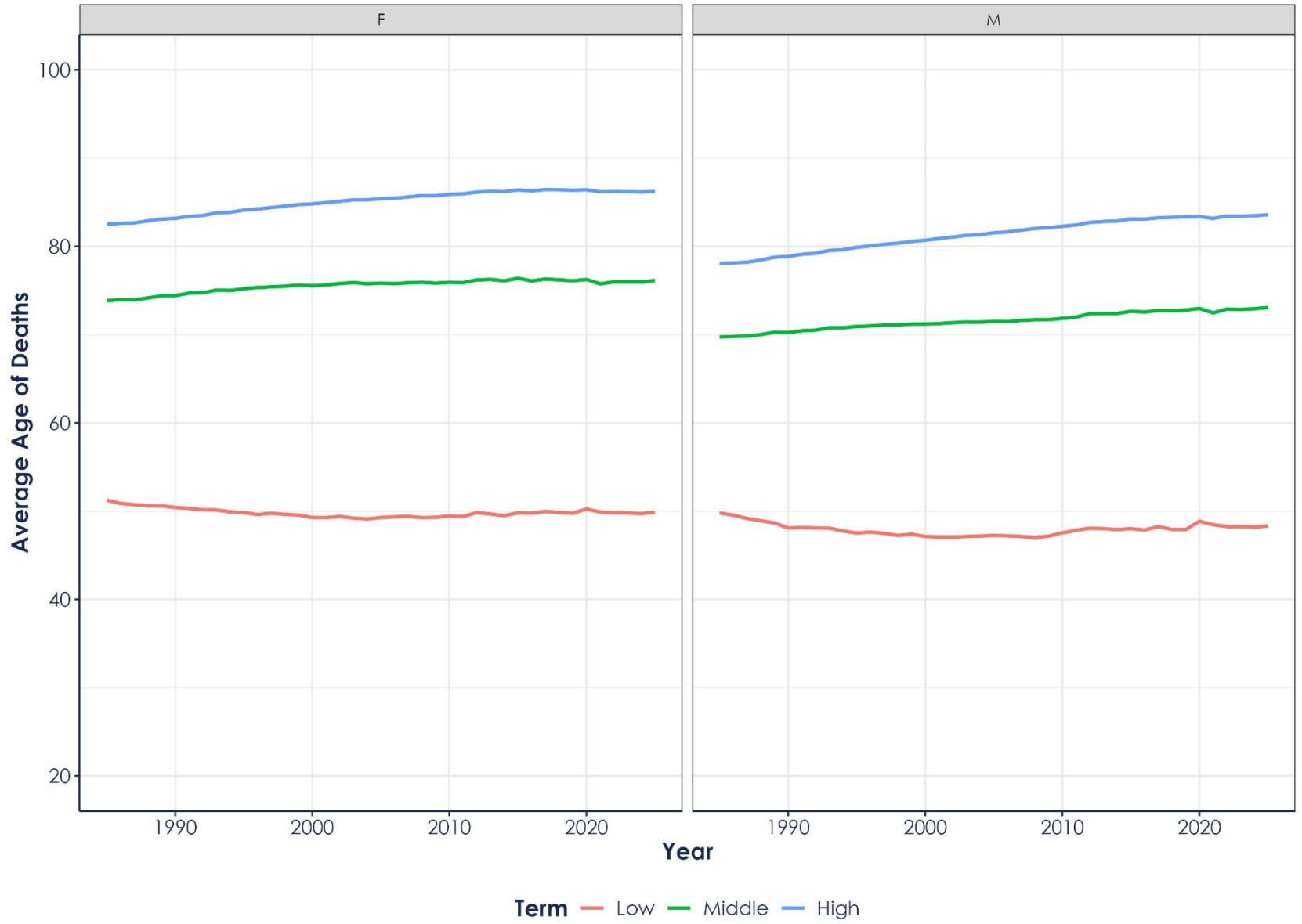

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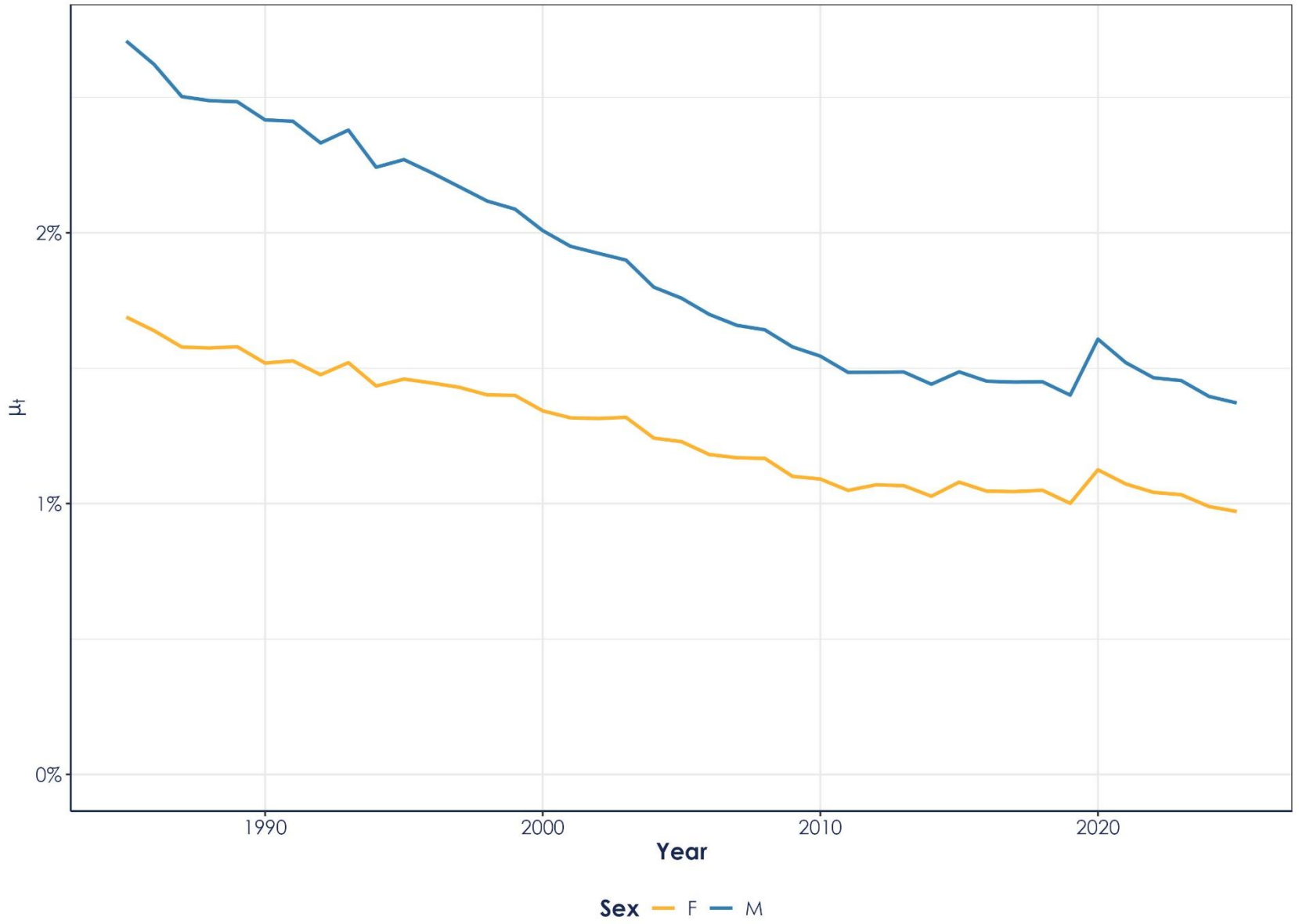

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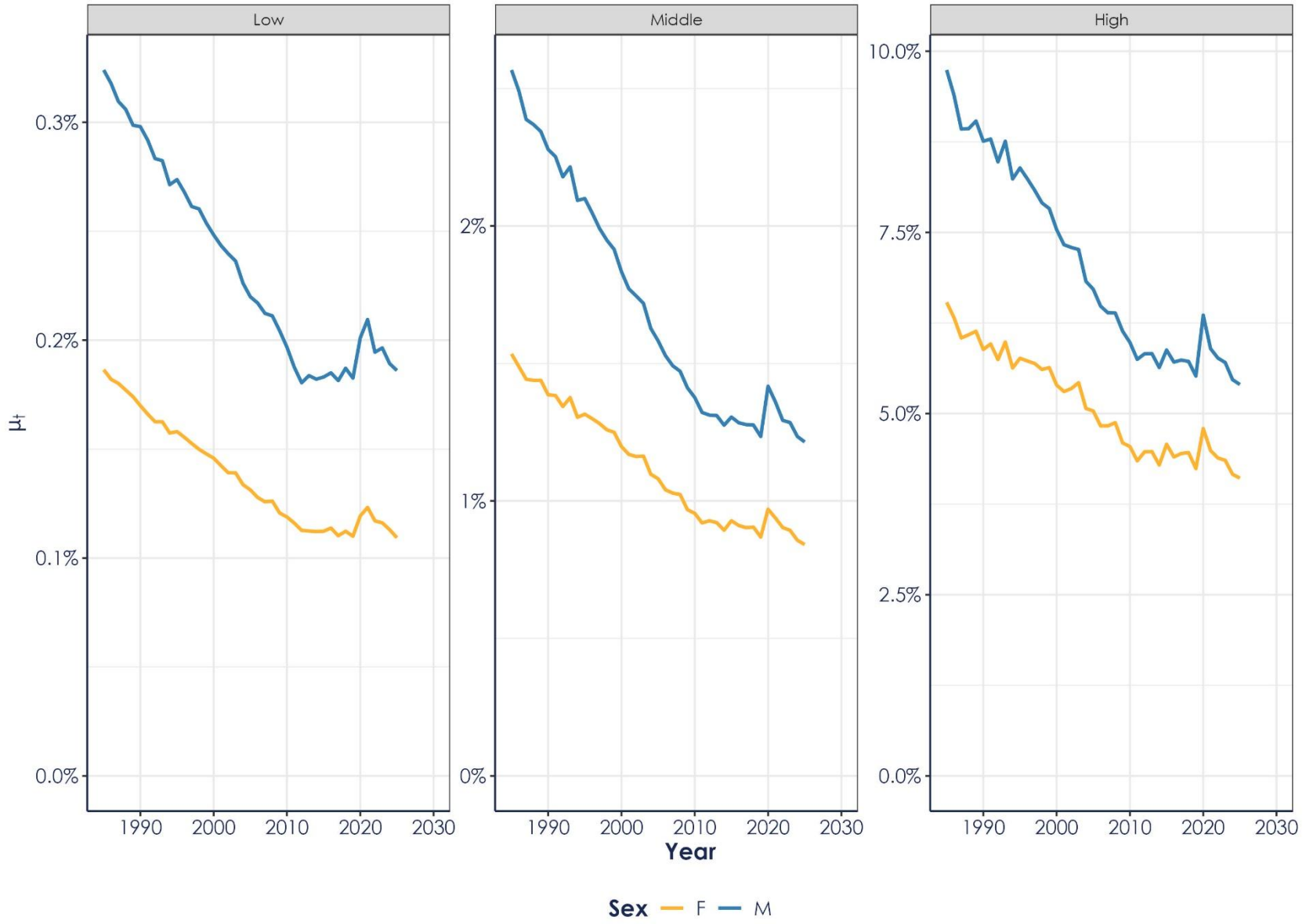

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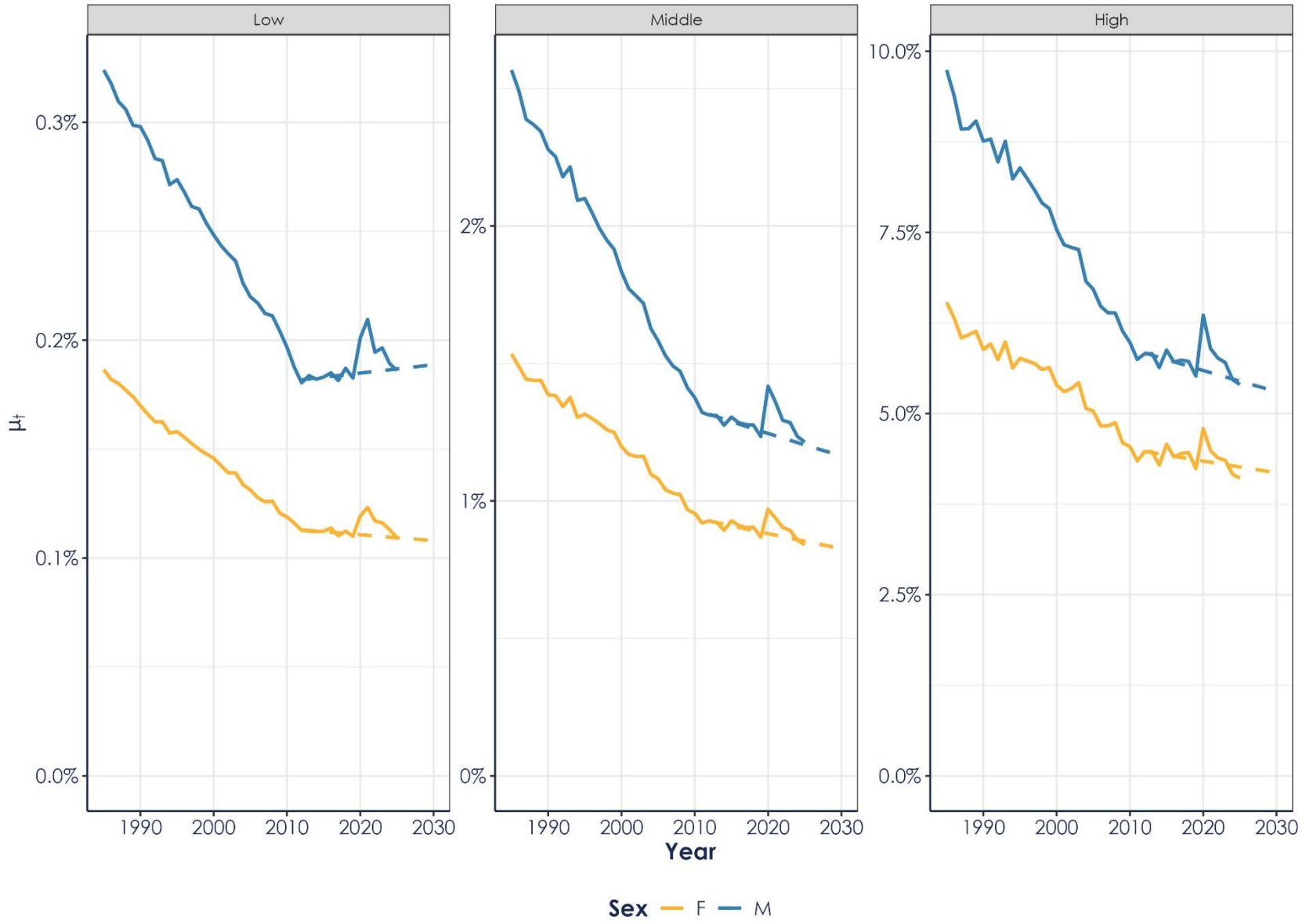
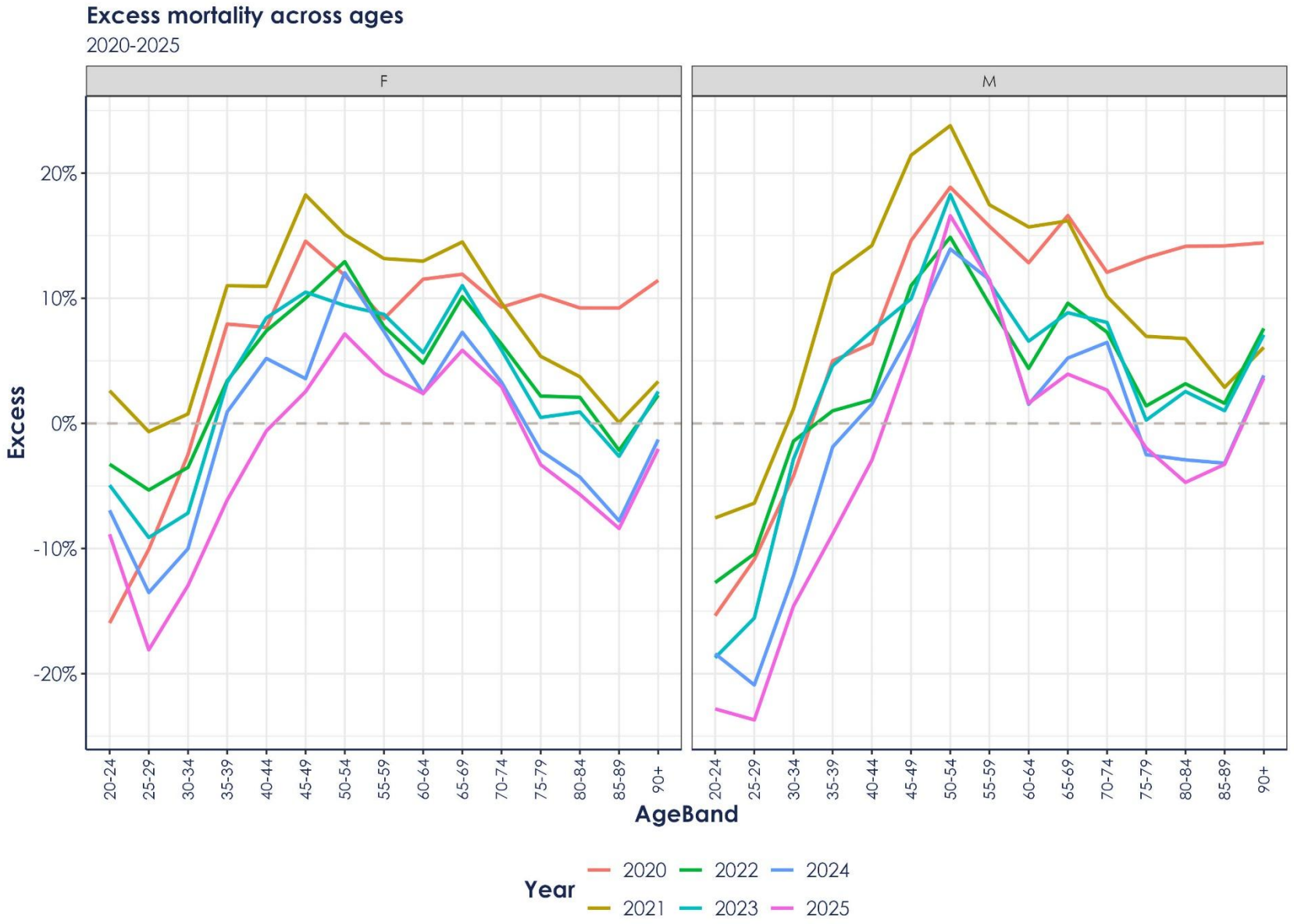


Excess Mortality Across Ages

PACIFIC LIFE RE



Excess Mortality Across Ages

PACIFIC LIFE RE

- To understand what is driving this, we can decompose our prediction by cause of death
  - To do this, we have grouped ICD-10 codes using the leading causes of death used by the ONS
- This decomposed prediction can then be compared with the data to work out excess mortality by cause

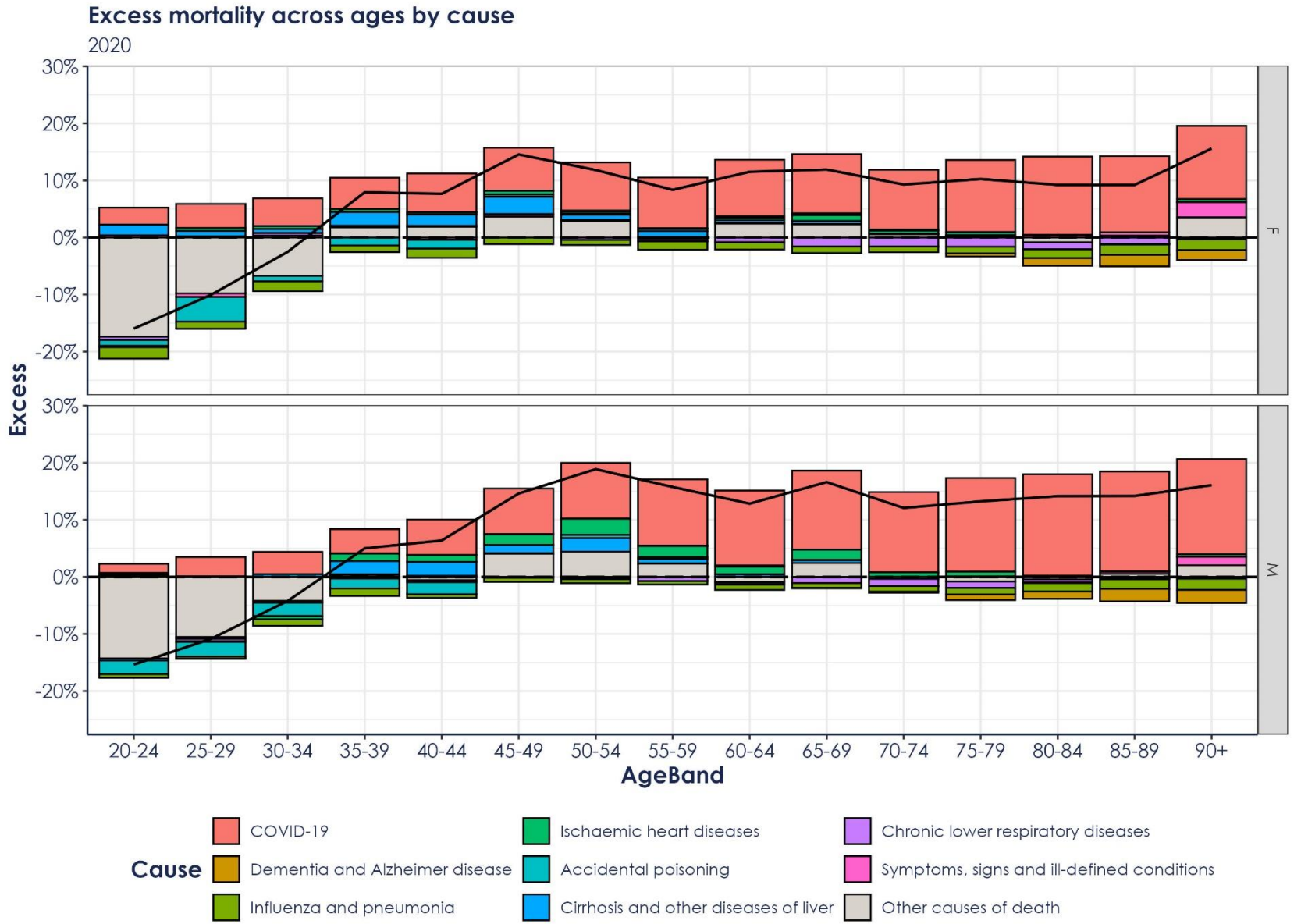
- At older ages (80+), falls in mortality have been largely driven by fewer deaths from dementia and Alzheimer's disease than were expected
  - During the pandemic, this may have been because of displacement due to COVID-19
  - However, the post-pandemic period has seen consistently lighter mortality from dementia than beforehand

- At middle ages (45-65), higher mortality has been caused by higher rates of ischaemic heart disease and cirrhosis of the liver
  - These have fallen gradually following the pandemic
  - Potential explanations are continued disruptions to healthcare, lifestyle changes during the pandemic and lasting impacts of acute COVID-19 infections during the pandemic

- However, large numbers of causes contributing to mortality changes at younger ages – there is no single smoking gun

Excess Mortality Across Ages

PACIFIC LIFE RE



Excess Mortality Across Ages

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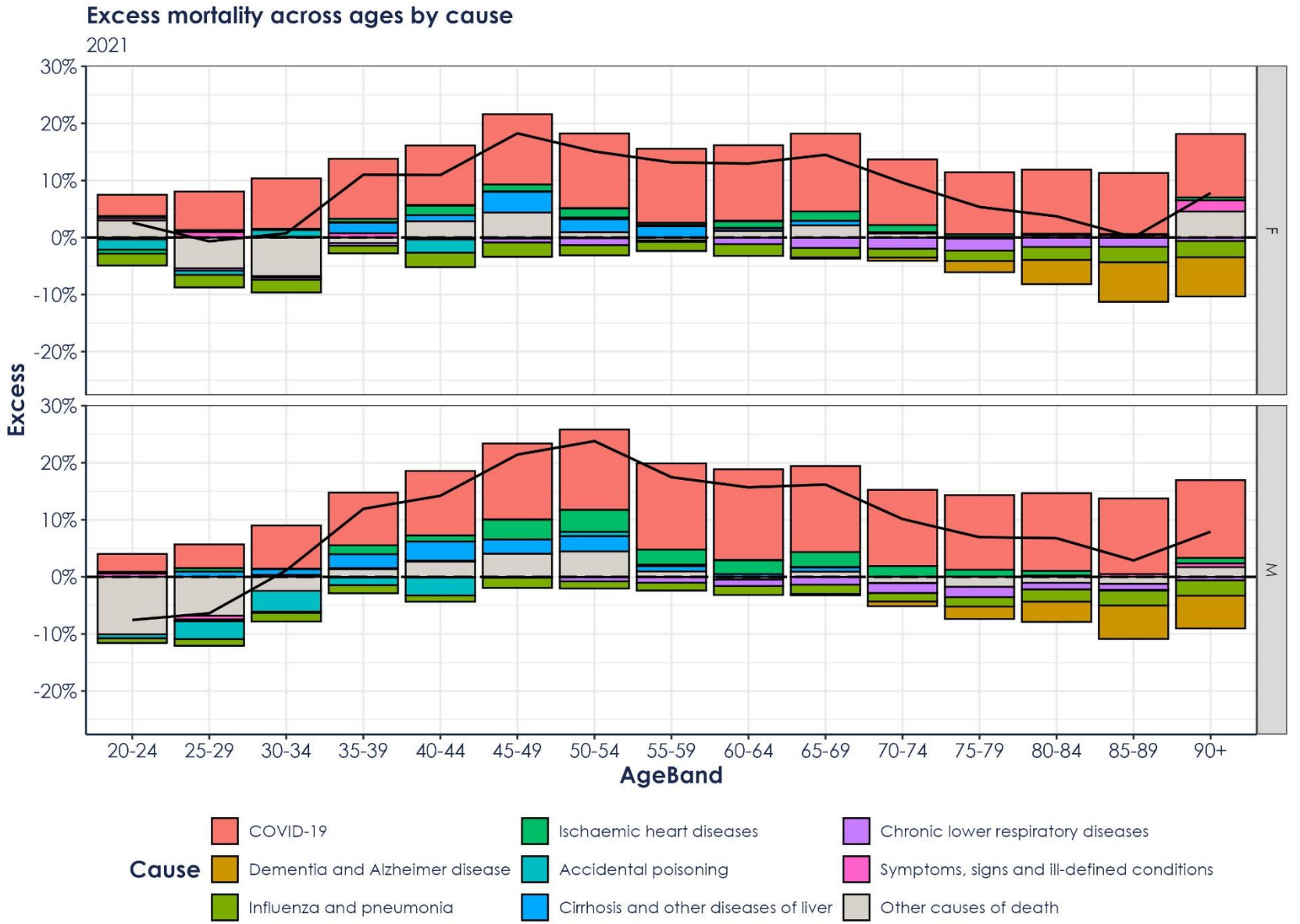

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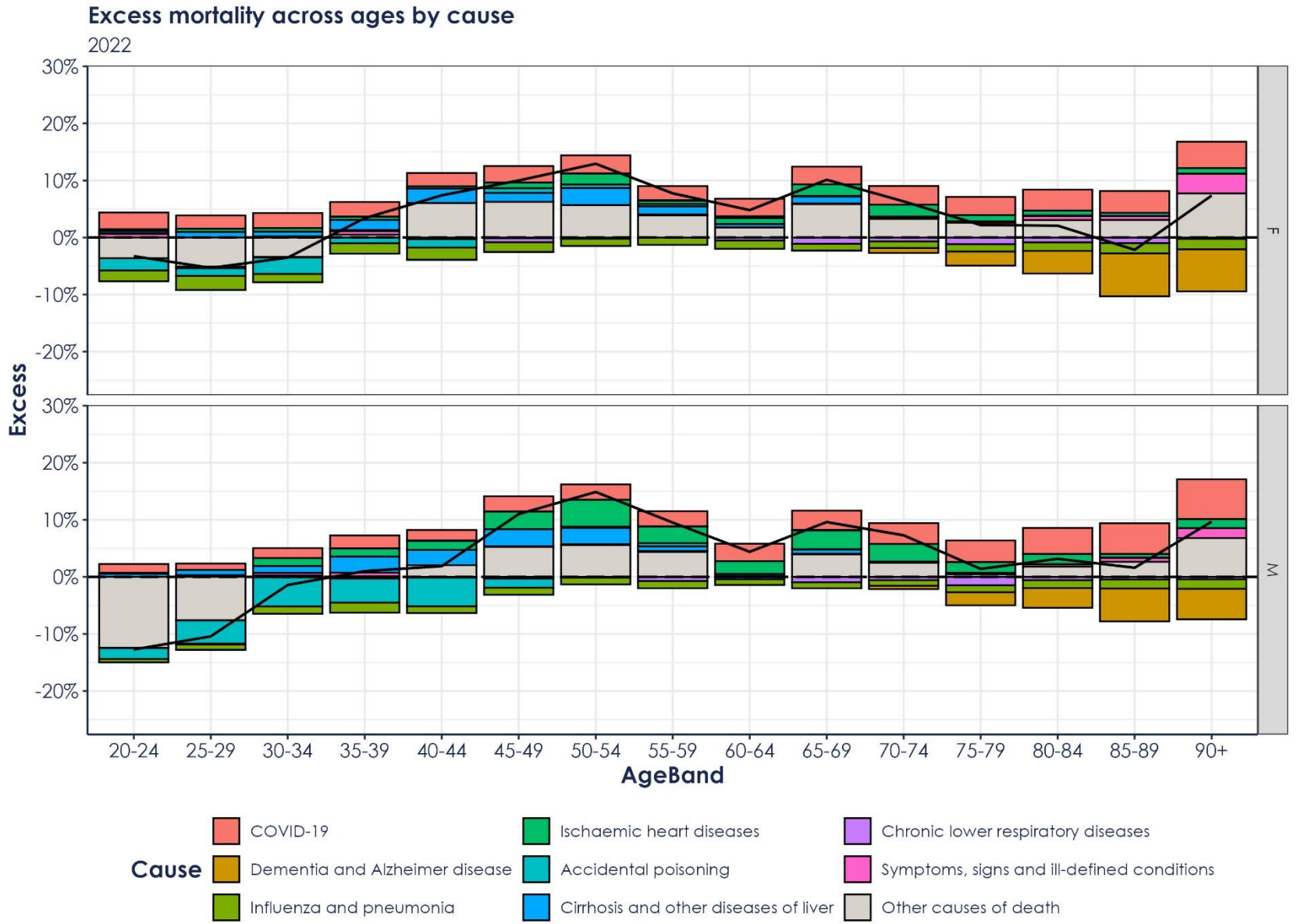

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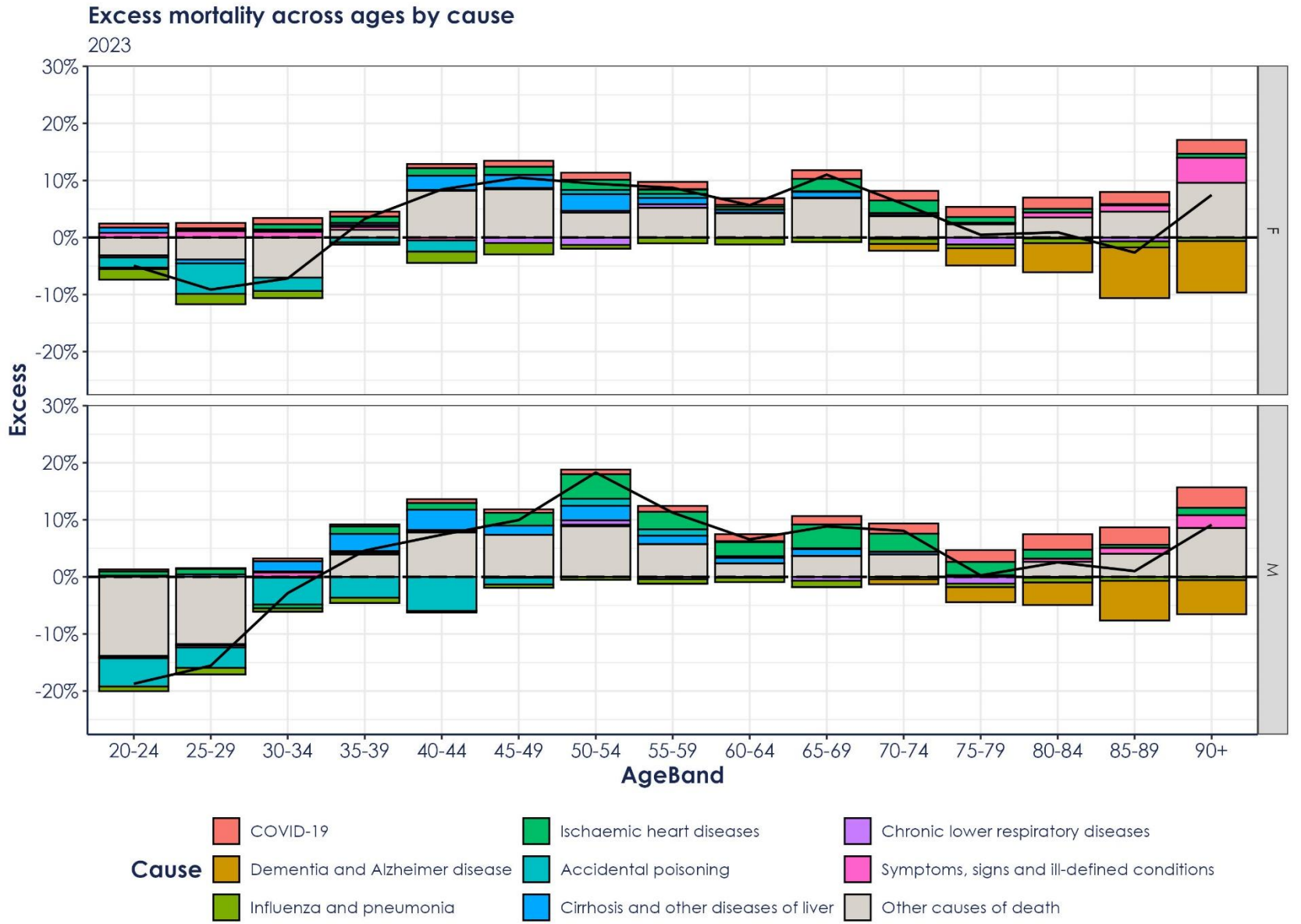

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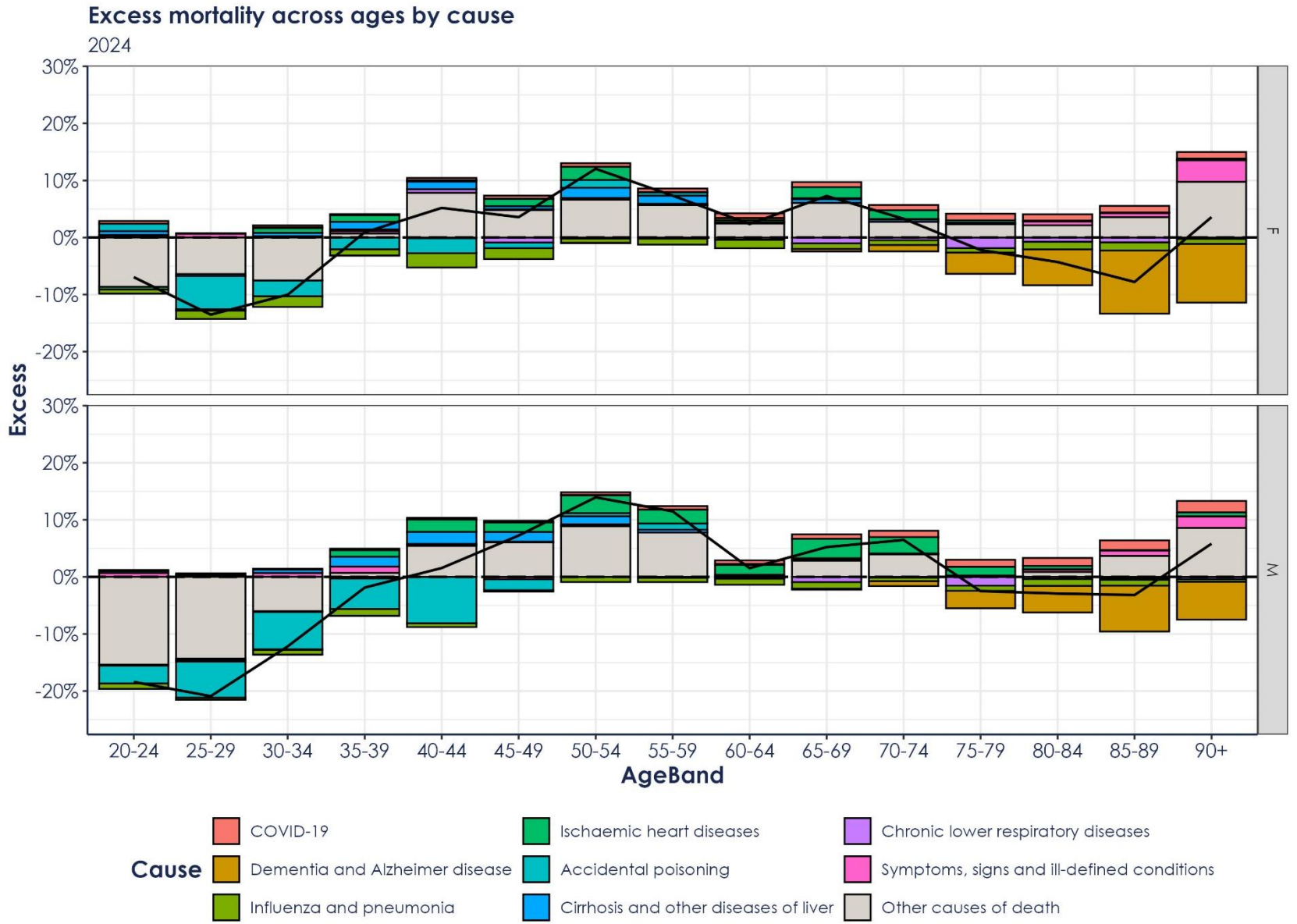


Excess Mortality Across Ages

PACIFIC LIFE RE

Consequences for the CMI Model

- Overlays that are flat across ages with uniform peak mortality in 2020 may not be appropriate at younger ages (see Working Paper 212)
- As we move further from the pandemic and the overlay runs off, the CMI Model will put increasing weight on experience in recent years for projections

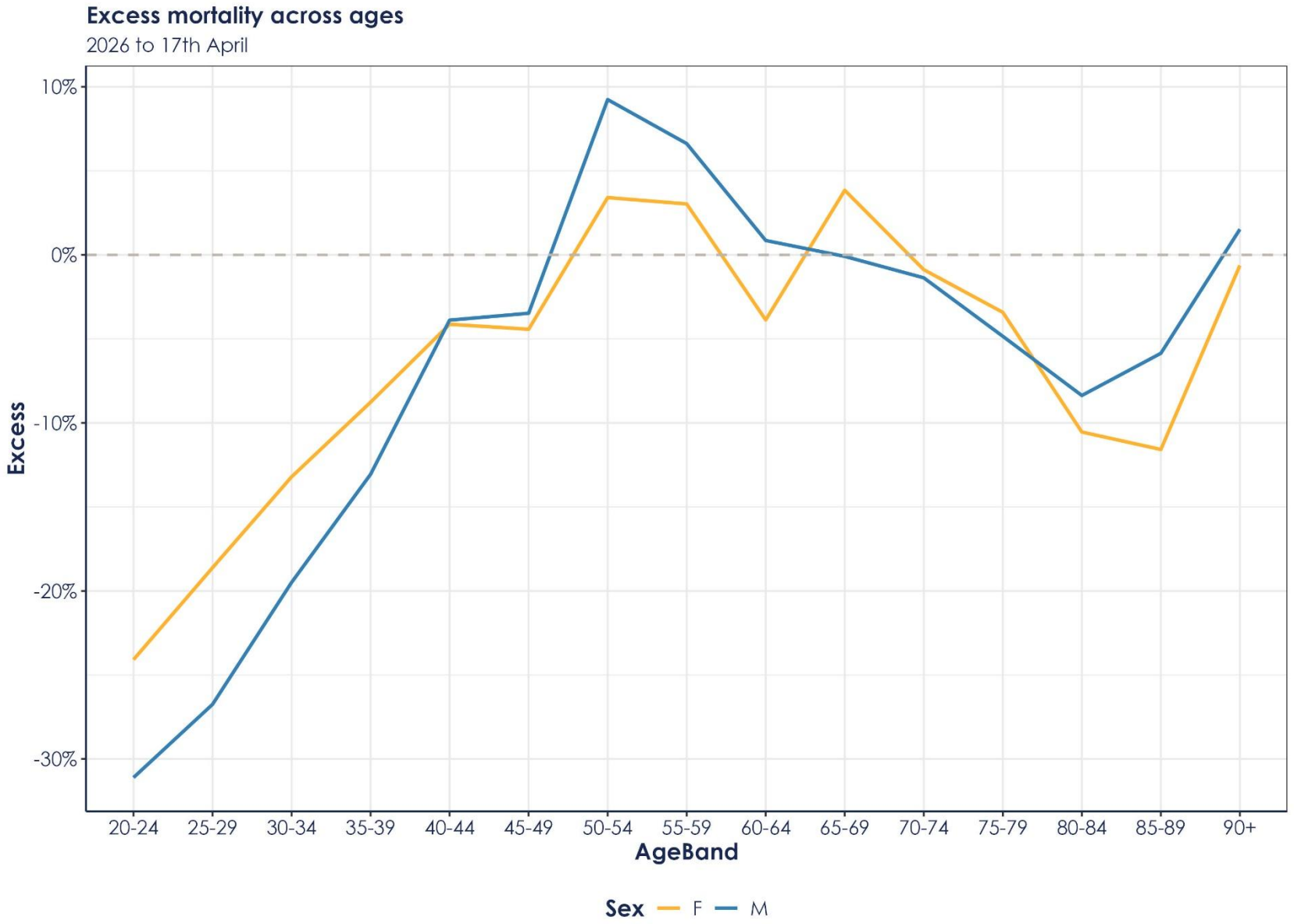
- At older (retired) ages, the changes in mortality appear progressively more durable with each passing year, with reductions in dementia and respiratory mortality expected to continue
- Our view is that this means an acceleration in the improvements at older ages from CMI_2026+

- For middle ages (45-65), the excess mortality from ischaemic heart disease, liver cirrhosis (and other causes) is only gradually wearing off
- Our view is that this will continue, but gradually, and so are forecasting relatively modest improvements at these ages
- However, the widespread adoption of weight-loss drugs means that we are hopeful for an acceleration in improvements towards the end of the decade

- For young adults (20s and 30s), causes of death are radically different – deficit is driven mainly by behavioural causes (accidental poisonings, suicides, road traffic accidents) and various cancers
- Whilst the current low mortality at these ages is welcome, the drivers can change very rapidly and so we are not forecasting anything beyond continued volatility at these ages

Excess Mortality Across Ages - 2026

PACIFIC LIFE RE



Outlook for mortality improvements at different ages

Dan Ryan
Just

WHICH WOULD YOU CHOOSE?

100,000+ miles

1,500 miles

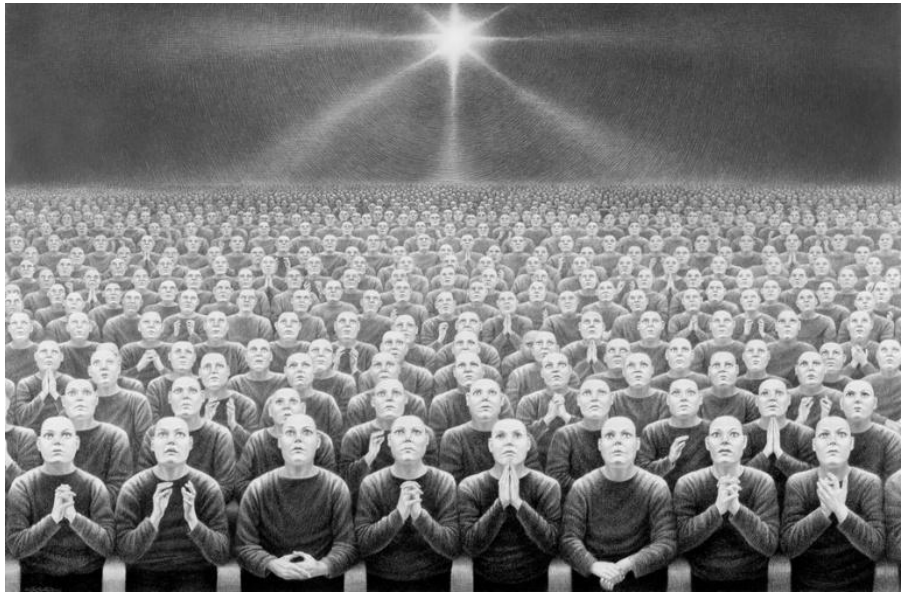
BILL & BEN – A CASE STUDY

William
(b.1918)

Benjamin
(b.1919)

RIGHT PLACE, RIGHT TIME, RIGHT AGE - EVERY ONE OF US IS UTTERLY UNIQUE

- Unique history – location, exposures, behaviours, events
- New drugs are introduced at specific dates for specific groups
- Screening programmes targeted on specific age groups from specific dates
- Ease of access to healthcare is a function of location and age
- NICE guidance focuses on attained age or ethnic group, NOT cohorts
- Importance of cause of death varies by age
- Only intervention so far focused on a cohort – ban on sale of tobacco products for those born 2009+



Source: Brave New World – Bokanovsky Children

ATTEMPTS TO EXPLAIN MORTALITY IMPROVEMENTS FOR THE SILVER COHORT (1952-1961)

Baby Boomer Health Dividend – better childhood nutrition, sanitation and healthcare

Lower lifelong obesity exposure

Benefitting from stenting & thrombolysis

Quitting smoking in large numbers as a result of 1980/90s anti-smoking campaigns

Widespread prescription of statins and anti-hypertensives

Roll-out of NHS Cancer Screening Programmes

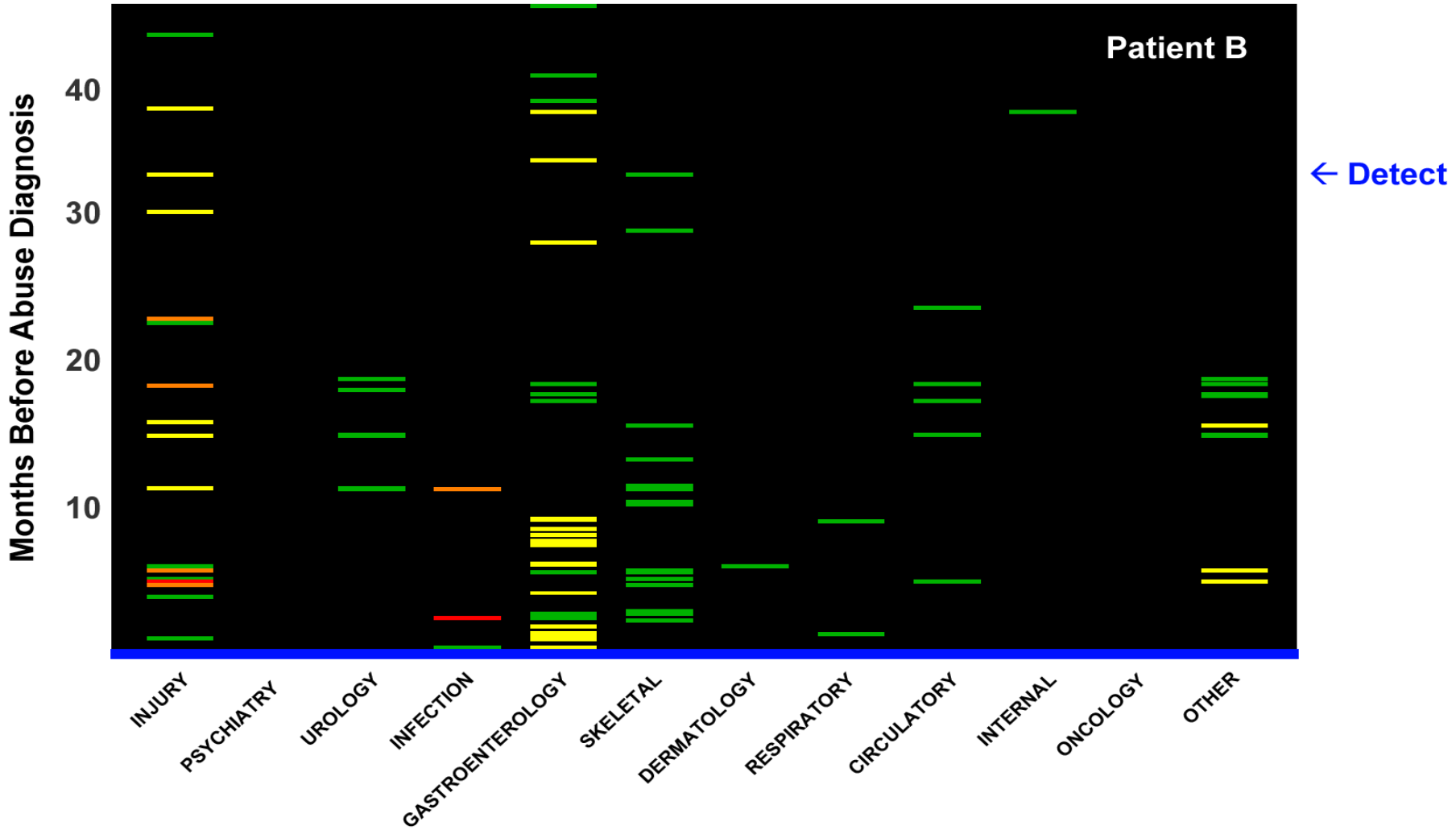
Benefitting from defined benefit pension schemes and rising home ownership

Avoiding industrial pollution

PREDICTING THE FUTURE FROM THE PAST - US HEALTH CLAIMS

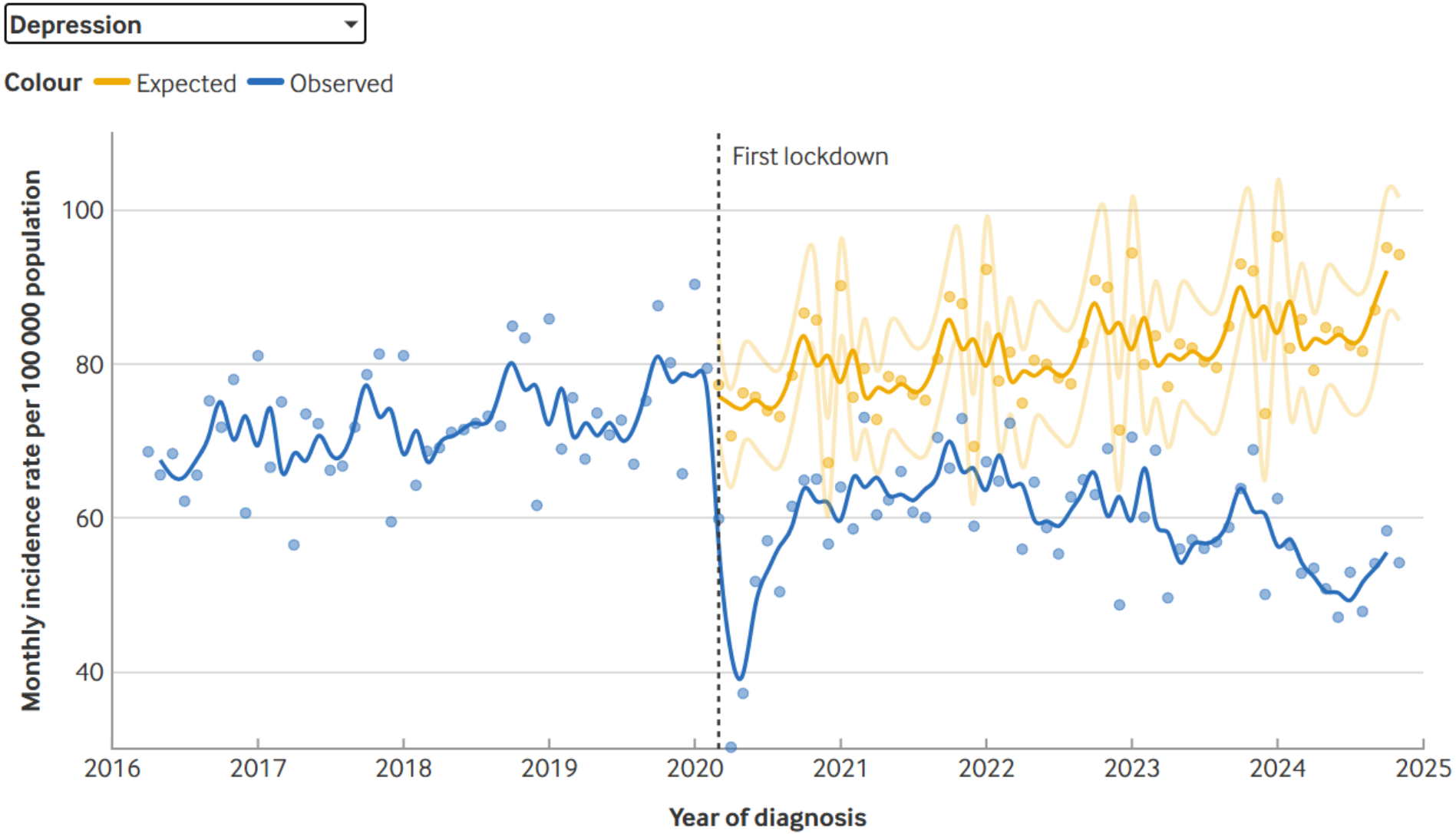
13-Oct-87	13:33:00	3	ABDOMINAL PAIN	53190	GASTRIC ULCER NOS
6-May-88	11:49:27	71	RESPIRATORY DISTRESS	49390	ASTHMA W/O STATUS ASTH
9-Nov-88	18:34:23	40	INJURY - HAND (FINGERS)	81501	FX 1ST METACARP BASE-CL
16-Feb-89	17:54:09	26	EARACHE	3829	OTITIS MEDIA NOS
16-Feb-89	17:54:09	26	EARACHE	3099	ADJUSTMENT REACTION NOS
16-Feb-89	17:54:09	26	EARACHE	5355	GASTRITIS/DUODENITIS NOS
16-Jan-90	17:16:00	40	INJURY - HAND (FINGERS)	92320	CONTUSION OF HAND(S)
28-Feb-90	22:24:00	40	INJURY - HAND (FINGERS)	92320	CONTUSION OF HAND(S)
7-Mar-90	18:13:00	40	INJURY - HAND (FINGERS)	92320	CONTUSION OF HAND(S)
7-Apr-90	14:55:58	93	OTHER	7890	ABDOMINAL PAIN
10-Apr-90	15:53:54	20	DEHYDRATION	7999	UNKN CAUSE MORB/MORT NEC
12-Apr-90	17:22:17	20	DEHYDRATION	2765	HYPOVOLEMIA
27-Apr-90	10:47:39	46	INJURY - HEAD	3469	MIGRAINE NOS
5-Oct-90	12:33:49	3	ABDOMINAL PAIN	5301	ESOPHAGITIS
11-Oct-90	9:16:58	40	INJURY - HAND (FINGERS)	92320	CONTUSION OF HAND(S)
9-Nov-90	19:02:57	37	INGESTION	9899	TOX EFF NONMED SUBST NOS
21-Dec-90	19:27:00	3	ABDOMINAL PAIN	5355	GASTRITIS/DUODENITIS NOS
29-Jan-91	21:39:10	40	INJURY - HAND (FINGERS)	6829	CELLULITIS NOS
1-Feb-91	13:25:11	112	CELLULITIS	6829	CELLULITIS NOS
18-Feb-91	15:50:19	40	INJURY - HAND (FINGERS)	6824	CELLULITIS OF HAND
21-Feb-91	20:51:51	93	OTHER	7890	ABDOMINAL PAIN
21-Feb-91	20:51:51	93	OTHER	0799	VIRAL/CHLAMYD INFECT NOS
2-Apr-91	10:57:49	51	INJURY - KNEE	8362	TEAR MENISCUS NEC-CUR
13-May-91	3:13:56	57	LACERATION	87343	OPEN WOUND OF LIP
7-Jul-91	14:28:34	45	INJURY - EYE	920	CONTUSION FACE/SCALP/NCK
7-Sep-91	17:05:00	79	SUICIDE ATTEMPT	3009	NEUROTIC DISORDER NOS
8-Sep-91	12:24:55	100	FOLLOWUP VISIT/RECHECK	88102	OPEN WOUND OF WRIST
8-Sep-91	12:24:55	100	FOLLOWUP VISIT/RECHECK	V588	AFTERCARE NEC
6-Nov-91	18:48:29	40	INJURY - HAND (FINGERS)	81601	"FX MID/PROX PHAL
7-Nov-91	18:31:50	40	INJURY - HAND (FINGERS)	81500	FX METACARPAL NOS-CLOSED
23-Mar-92	16:28:17	27	EDEMA/SWELLING	7823	EDEMA
23-Jul-92	17:44:00	23	DIARRHEA	0090	INFECTIOUS ENTERITIS NOS
23-Jul-92	17:44:00	23	DIARRHEA	5301	ESOPHAGITIS
9-Aug-92	20:23:07	57	LACERATION	88102	OPEN WOUND OF WRIST
29-Oct-92	19:50:03	23	DIARRHEA	78900	ABDOMINAL PAIN-SITE NOS
29-Oct-92	19:50:03	23	DIARRHEA	53500	ACUTE GASTRITIS S HEMOR
17-Dec-92	17:55:00	57	LACERATION	88102	OPEN WOUND OF WRIST
27-Apr-93	12:58:08	135	DEPRESSION	8840	MULT OPEN WND ARM/S COMP
23-Jun-93	17:16:21	57	LACERATION	88100	OPEN WOUND OF FOREARM
14-Oct-93	14:22:00	31	GI BLEEDING	78900	ABDOMINAL PAIN-SITE NOS
5-Nov-93	18:37:17	3	ABDOMINAL PAIN	78900	ABDOMINAL PAIN-SITE NOS
8-Jun-94	12:51:11	20	DEHYDRATION	5990	URINARY TRACT INF NOS
8-Jun-94	12:51:11	20	DEHYDRATION	9955	CHILD MALTREATMENT SYND

PREDICTING THE FUTURE FROM THE PAST
- HARVARD MEDICAL SCHOOL – PREDICTIVE MEDICINE GROUP



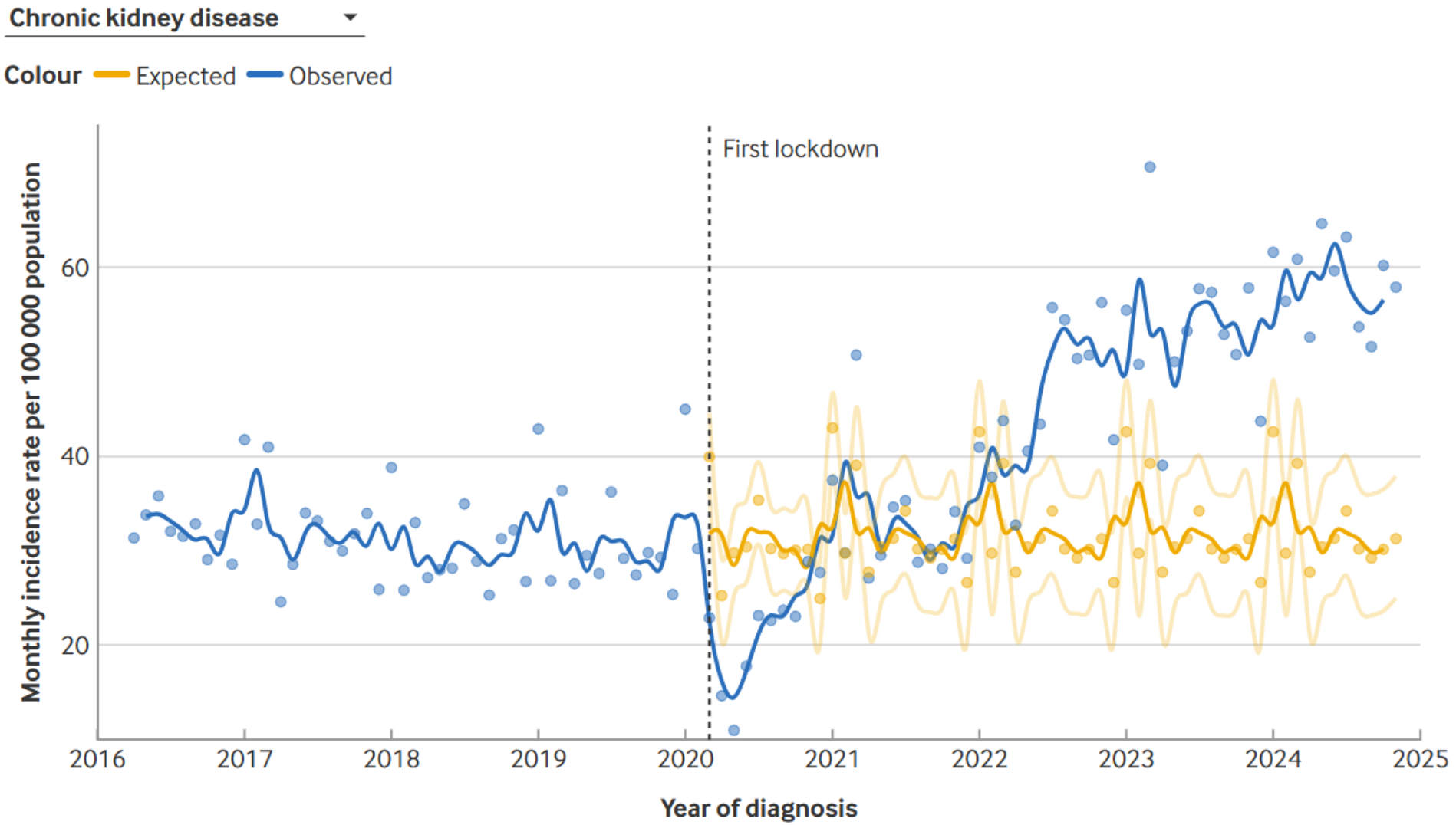
Source: Longitudinal histories as predictors of future diagnoses of domestic abuse

GLIMPSES INTO OUR STATE OF HEALTH (OPENSAFELY)



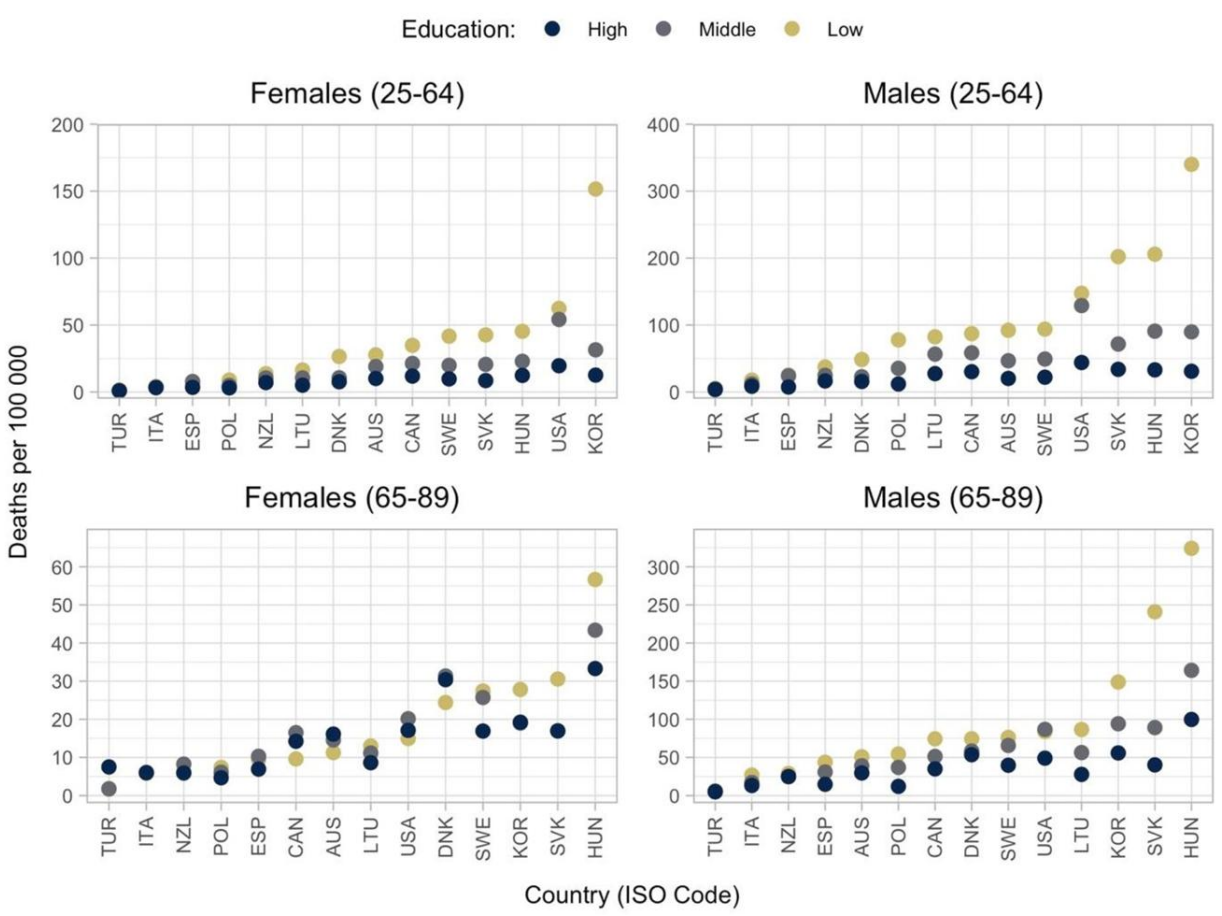
Source: Observed and expected rates of new diagnoses for disease after the onset of the Covid-19 pandemic in England (2026)

GLIMPSES INTO OUR STATE OF HEALTH (OPENSAFELY)

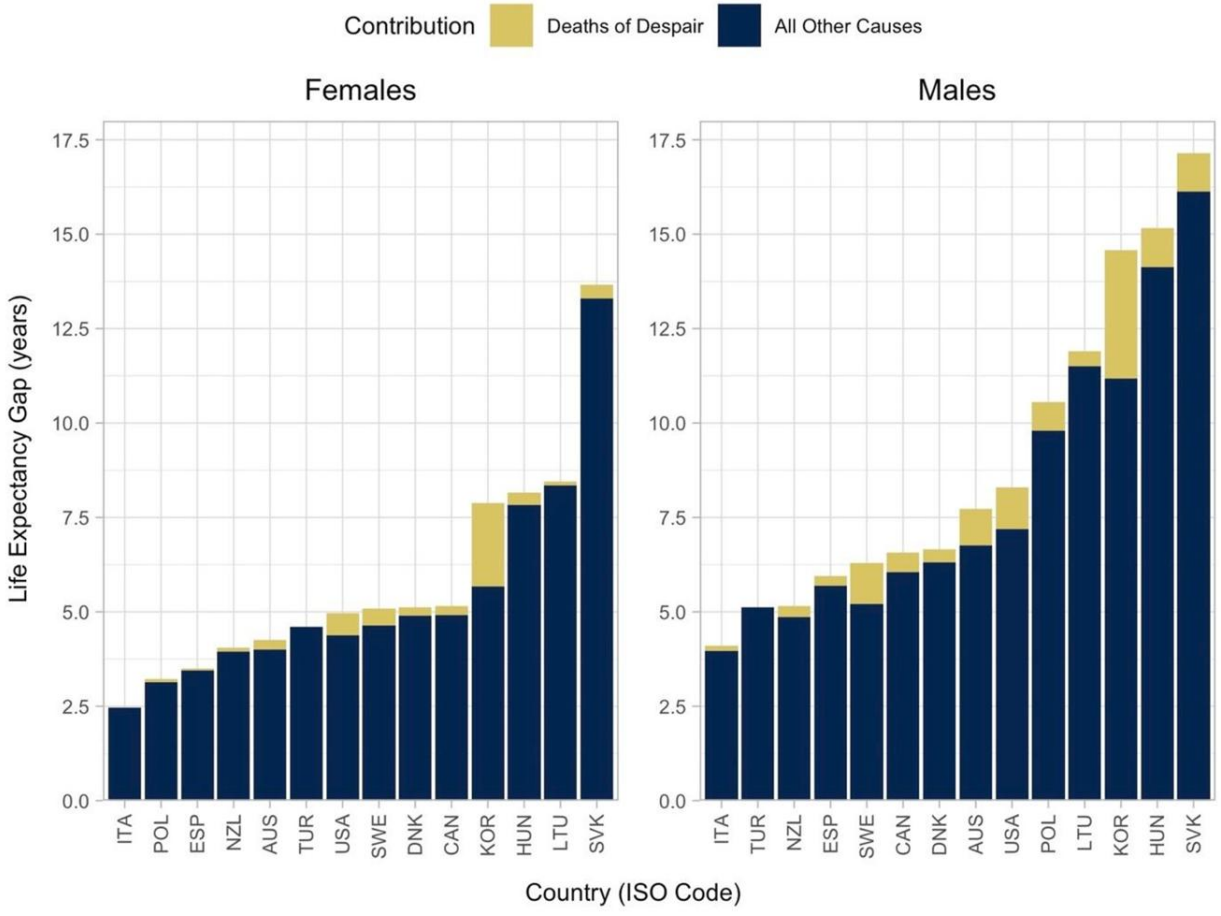


Source: Observed and expected rates of new diagnoses for disease after the onset of the Covid-19 pandemic in England (2026)

DEATHS OF DESPAIR AT YOUNGER AGES, BUT IS THIS PREDICTIVE OF LATER MORTALITY?



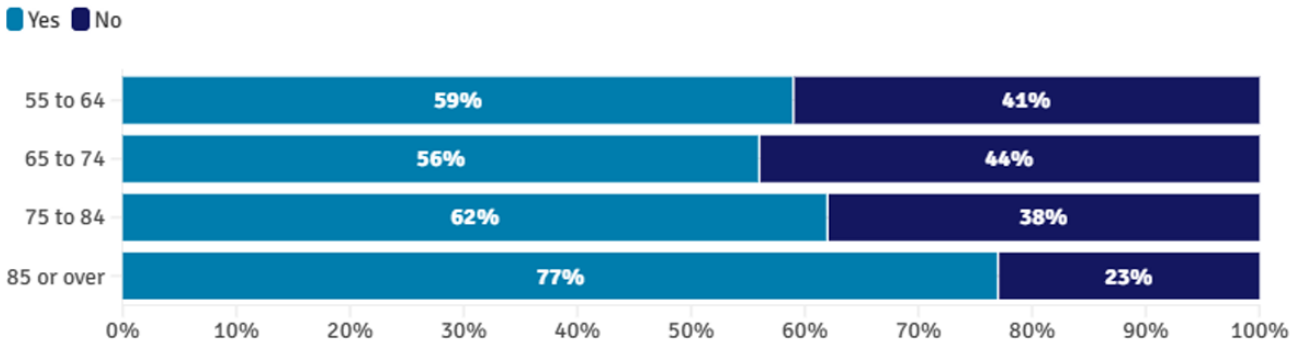
At age 25 between high and low education attainment groups



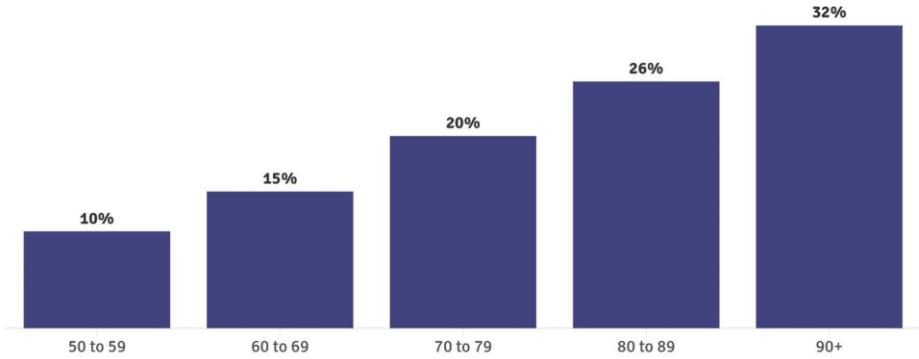
Source: [Educational inequalities in deaths of despair in 14 OECD countries: a cross-sectional observational study]

CHALLENGES OF MULTI-MORBIDITY AT OLDER AGES

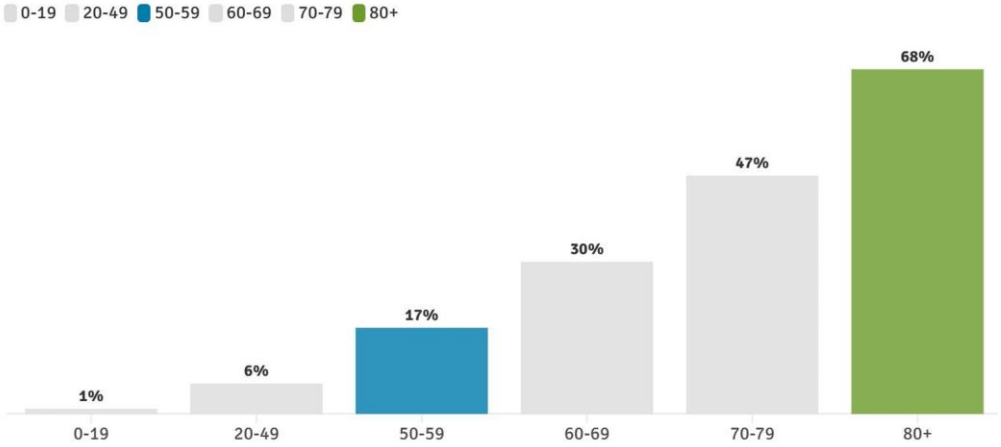
Percentage of people that responded to whether or not their conditions or illnesses reduce their ability to carry out day-to-day activities



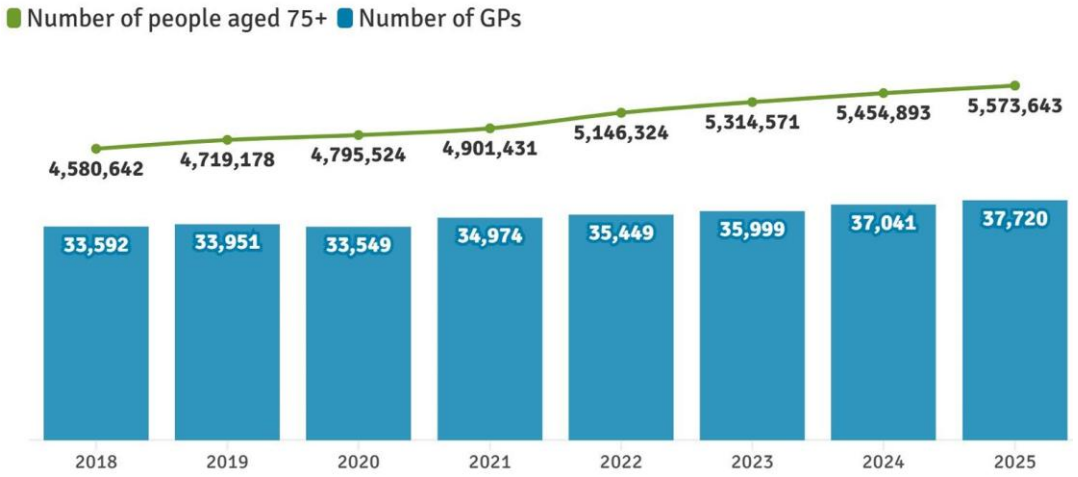
Percentage of people attending emergency admissions waiting for 12 hours or more, by age, March 2025.



Multimorbidity increases significantly with increasing age



Number of full-time equivalent GPs, June 2018 to June 2025, England, against population estimates and projections of over 75's, 2018 to 2025.



Source: [The State of Health and Care of Older People in England 2025]

“PREDICTION IS VERY DIFFICULT, ESPECIALLY IF IT’S ABOUT THE FUTURE” – NIELS BOHR

- Mortality changes are likely to be a result of many different factors spanning public health, individual behaviour, healthcare funding, medical advances and technology changes
- Specific new treatments likely to overpromise and underdeliver – but could be offset by unexpected wins (aspirin, metformin, statins)
- Challenge whether historical mortality improvements –
  - Limit potential for future improvement
  - Unlock and inspire new sources of improvement
  - Just provide the starting point for our investigations of the future by age, sex, social group ….

Discussion

Cobus Daneel
CMI Mortality Projections Committee

The views expressed in this presentation are those of the presenters.

CMI Talk Feedback: Outlook for Mortality Improvements

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Institute and Faculty of Actuaries

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