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# CMI Assurances and Income Protection update

Chris Reynolds, Chair of the CMI Assurances Committee  
Zoe Woodroffe, Chair of the CMI Income Protection Committee

# Agenda

- CMI Centenary and volunteering
- Assurances update
  - Term assurance experience to 2022
  - Considerations post-pandemic
  - Future work
- Income Protection
  - Income protection experience, 2017-2020
  - Future work



# CMI – Benefits of volunteering

- Involvement with a well-respected organisation amongst insurers, reinsurers, consultancies and beyond
- Opportunity to influence and contribute to the work of the CMI at a policy level:
  - Supporting CMI in developing its strategy, so it can continue to deliver valuable outputs to subscribers
  - Contributing to discussions on CMI's risks, governance and financial management, and providing challenge where this is needed
- Provision of excellent professional support and assistance during tenure on the Committee
- Opportunity to further develop effective network of contacts across the industry
- Potential to claim CPD for some activities associated with the role



# CMI Centenary



**Continuous  
Mortality Investigation**

Institute and Faculty of Actuaries

100 years of insight

- 2024 marks CMI's centenary year
- CMI has seen many changes through the years, including:
  - advances in computational techniques
  - changes in structure, such as establishment of CMI Limited
  - new investigations (e.g. SAPS Committee)
  - increasing prominence of mortality improvements
  - monitoring the impact of a global pandemic.
- Things to look out for in the centenary year:
  - Actuary article presenting highlights of our first 100 years
  - Release of “History of CMI” publication



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# 2022 term assurance claims experience, post-pandemic considerations & future work

Chris Reynolds, Chair of the CMI Assurances Committee



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# Term assurance experience to 2022

# Overview

- Working Paper 191 published in June 2024 covering mortality (including terminal illness) and accelerated critical illness experience
- Compares new results for 2022 with:
  - restated results for 2020 and 2021
  - existing results for pre-pandemic (2016-2019)
- New analyses:
  - Claim type for mortality benefits
  - Cause of claim for ACI benefits
  - Experience by nation-specific IMD decile and region



# Mortality – Overall 2022 experience

- Experience marginally lighter than T16 tables (which are based on 2015-2018 data)
- Lives-weighted results generally similar by gender/smoker
- Amounts-weighted results more variable but still similar for non-smokers

2022 experience (100 A/E)

Group	Lives	Amounts
MNS	98	89
MS	96	82
FNS	97	88
FS	100	95
Total	98	88





# Mortality – Differences to previous 2021 results

- Restated 2021 experience was 5% higher than expected (compared to the T16 tables)
- Slightly heavier than in WP176
- Evidence the pandemic not only had a disruptive effect on mortality but also the reporting and processing of claims
- Largest difference is for lives-weighted female non-smoker (100 A/E = 97 in WP176), followed by lives-weighted male non-smoker (100 A/E = 108 in WP176)

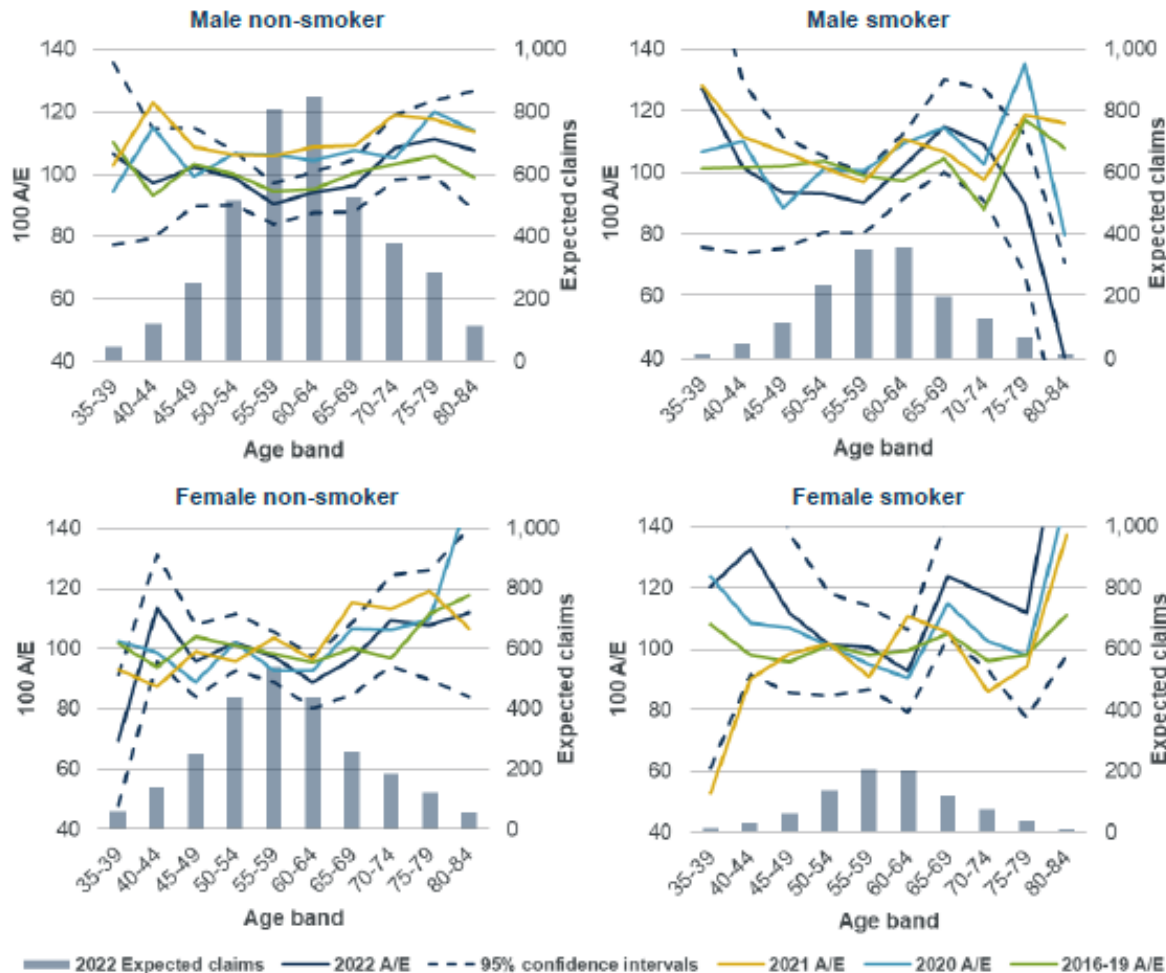
## 2021 lives-weighted experience

Group	WP176	WP191
MNS	108	111
MS	98	100
FNS	97	101
FS	94	94
Total	102	105



# Mortality – Experience by age

Chart 5A: 100 x Actual / Expected values (LH axis) and expected claims (RH axis) by age band, durations 5+ only

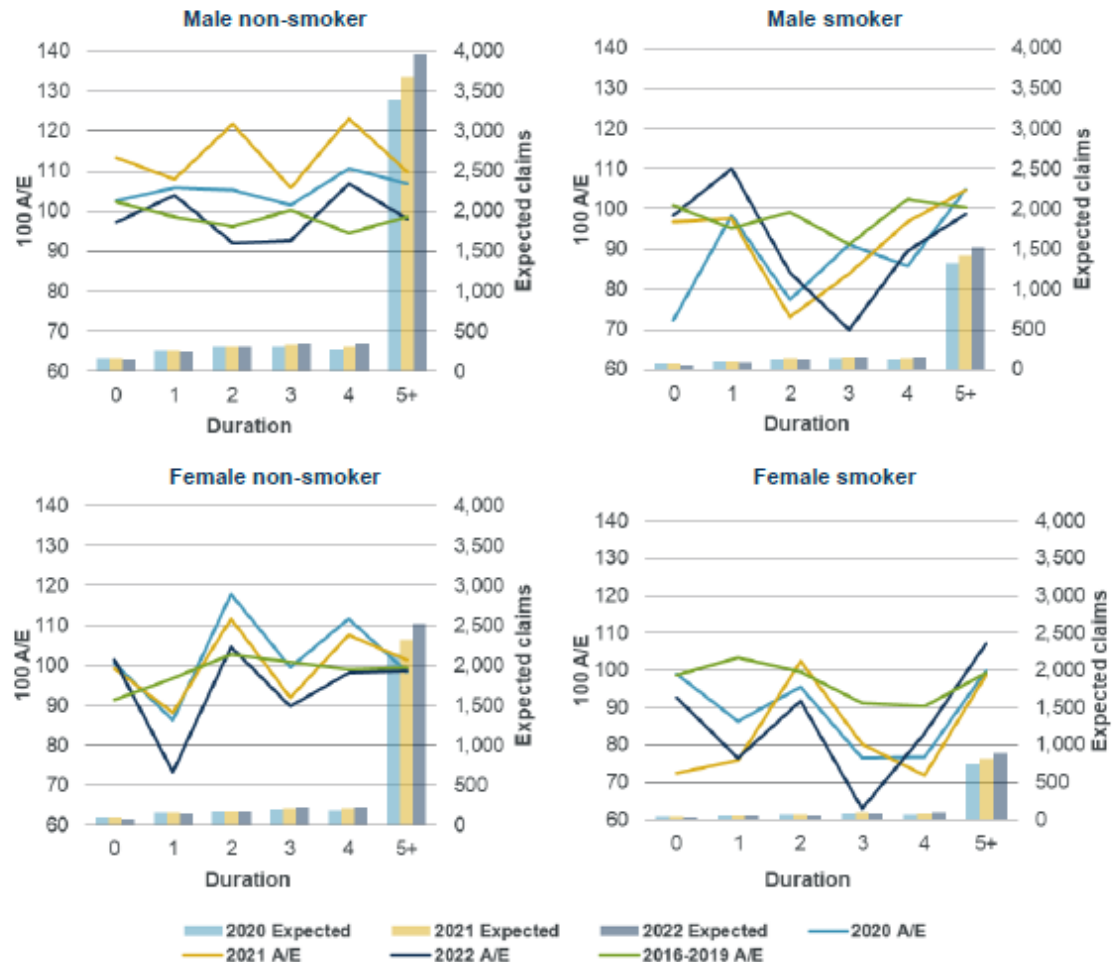


- Male non-smoker: Flat across age bands with heavier experience at older ages – most evident in 2022
- Female non-smoker: Similar to MNS, flat up to ages 60-64 and then becomes increasingly heavier. Trend starts from younger ages in 2021.
- Male smoker: Similar shape across periods. 2022 lighter at younger ages and heavier at older ages.
- Female smoker: More erratic for individual years, 2021 consistently lighter than 2020 (except ages 60-64)



# Mortality – Experience by duration

Chart 5B: 100 x Actual / Expected values (LH axis) and expected claims (RH axis) by duration

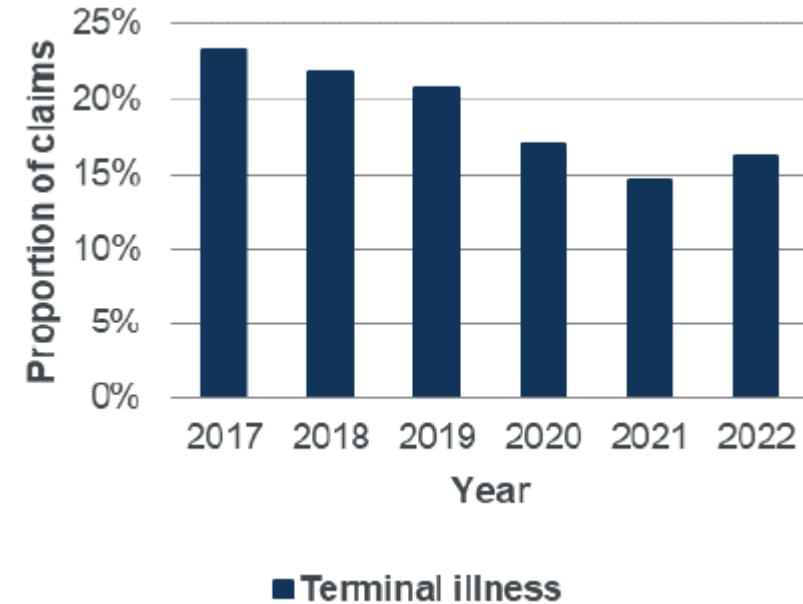


- Male non-smoker: Aligns well with T16 tables
- Female non-smoker: Generally lighter at duration 1 and heavy at duration 2, suggesting differences from T16 allowances
- Female smoker: Lighter at short durations compared to 5+ in 2020-2022. Suggests a longer select period and insufficient select discounts in these years
- Male smoker: Consistently light at short durations in 2020-2022, hinting select discount is too low



# Mortality – Claim type

- Proportion of terminal illness claims (versus death claims)
- Proportion of TI claims decreases between 2017-2021 but then a slight increase in 2022
- Likely the proportion of deaths was higher in 2021 due to the COVID-19 pandemic



# ACI – Overall 2022 experience

- Experience marginally lighter than AC16 tables (which are based on 2015-2018 data)
- Lives-weighted results generally similar by gender/smoker (except male smoker)
- Amounts-weighted results more variable (light for male smoker and heavy for female smoker) but still similar for non-smokers
- No obvious catch-up of the ‘missing’ claims from 2020, when experience was around 10% lighter than expected.

2022 experience (100 A/E)

Group	Lives	Amounts
MNS	98	100
MS	91	88
FNS	100	98
FS	101	108
Total	98	99



# ACI – Differences to previous 2021 results

- Restated 2021 experience close to the expected basis (AC16)
- But considerably heavier than in WP176
- Again, suggesting disruption to typical claims settlement delays beyond what was captured by our late claim adjustments.
- 100 A/E values increase by 8 for males and female non-smokers, and by 3 for female smokers

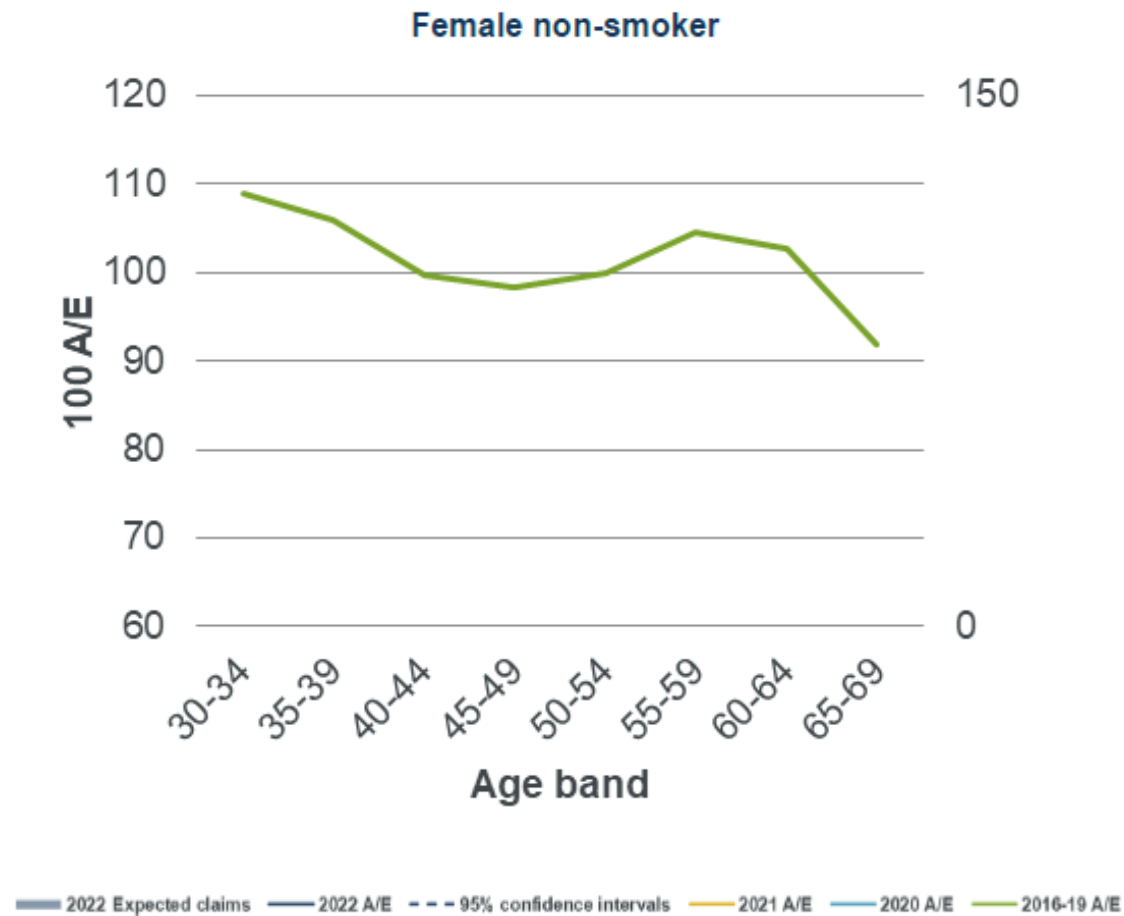
## 2021 lives-weighted experience

Group	WP176	WP191
MNS	90	98
MS	90	98
FNS	93	101
FS	87	90
Total	91	99



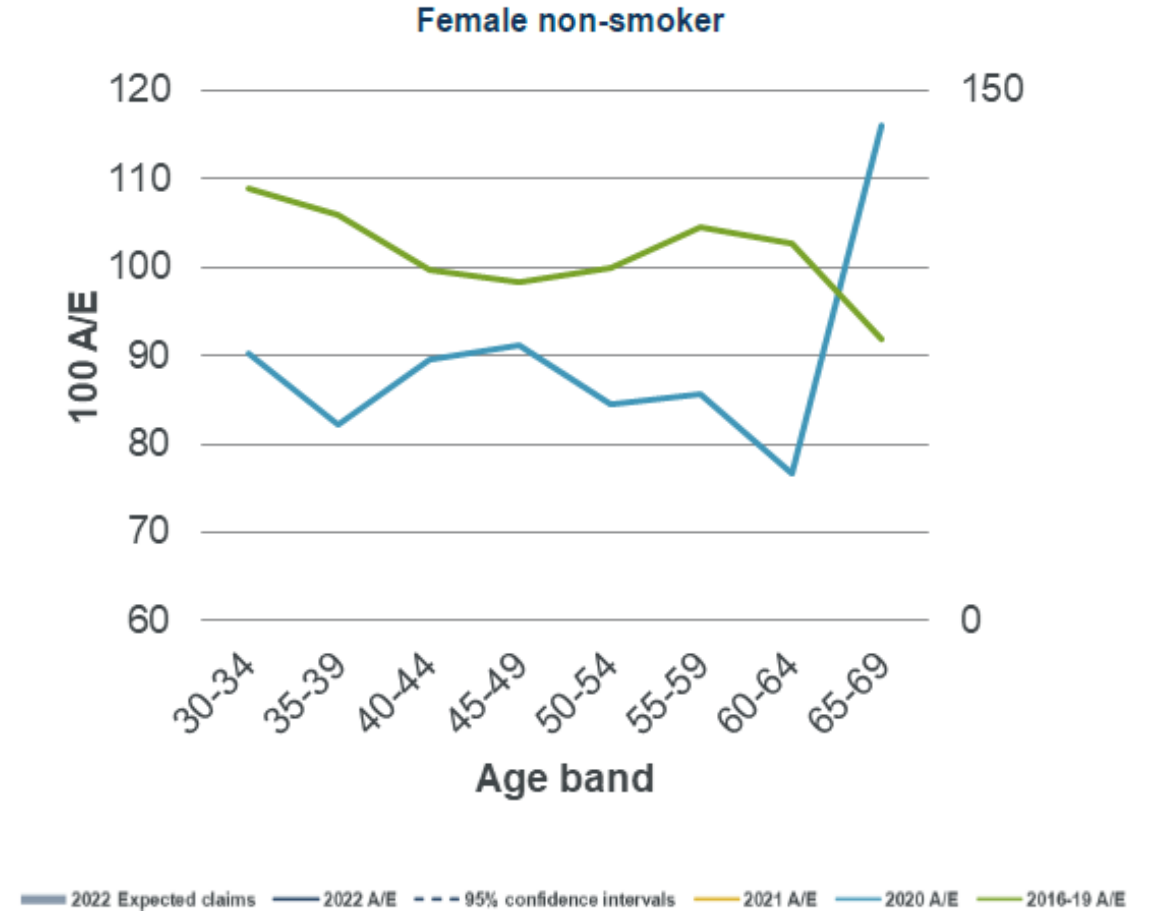
# ACI – Experience by age

- Experience by age is generally in line with the shape of the AC16 tables with one notable exception
- Female non-smokers aged 50-54 around 10% heavier than expected
- AC16 tables feature a non-standard “hump” shape to reflect the commencement of breast cancer screening between ages 47 and 51
- Experience in 2021 & 2022 more extreme at ages 50-54, where expected claim rates plateau in the AC16 tables
- Could be explained by a ‘catch-up’ effect due to screening backlogs from 2020 being cleared



# ACI – Experience by age

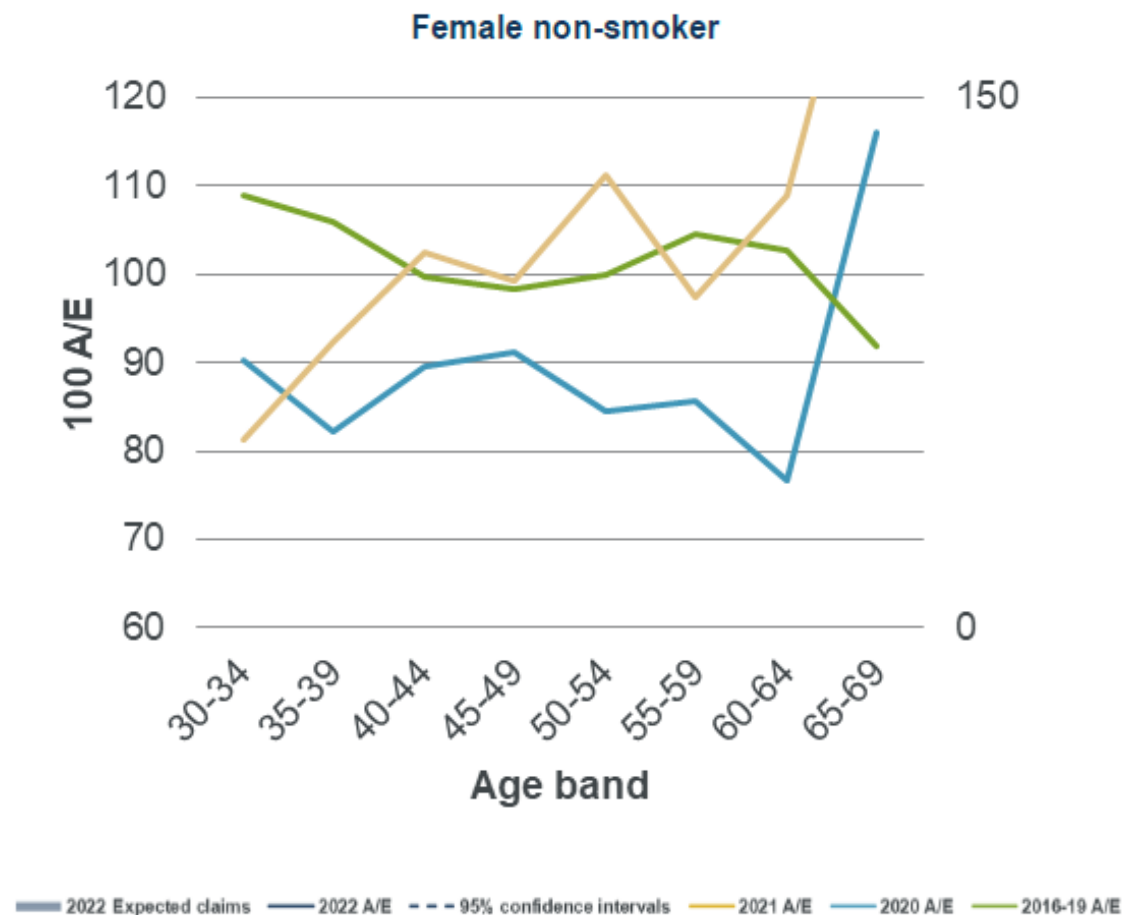
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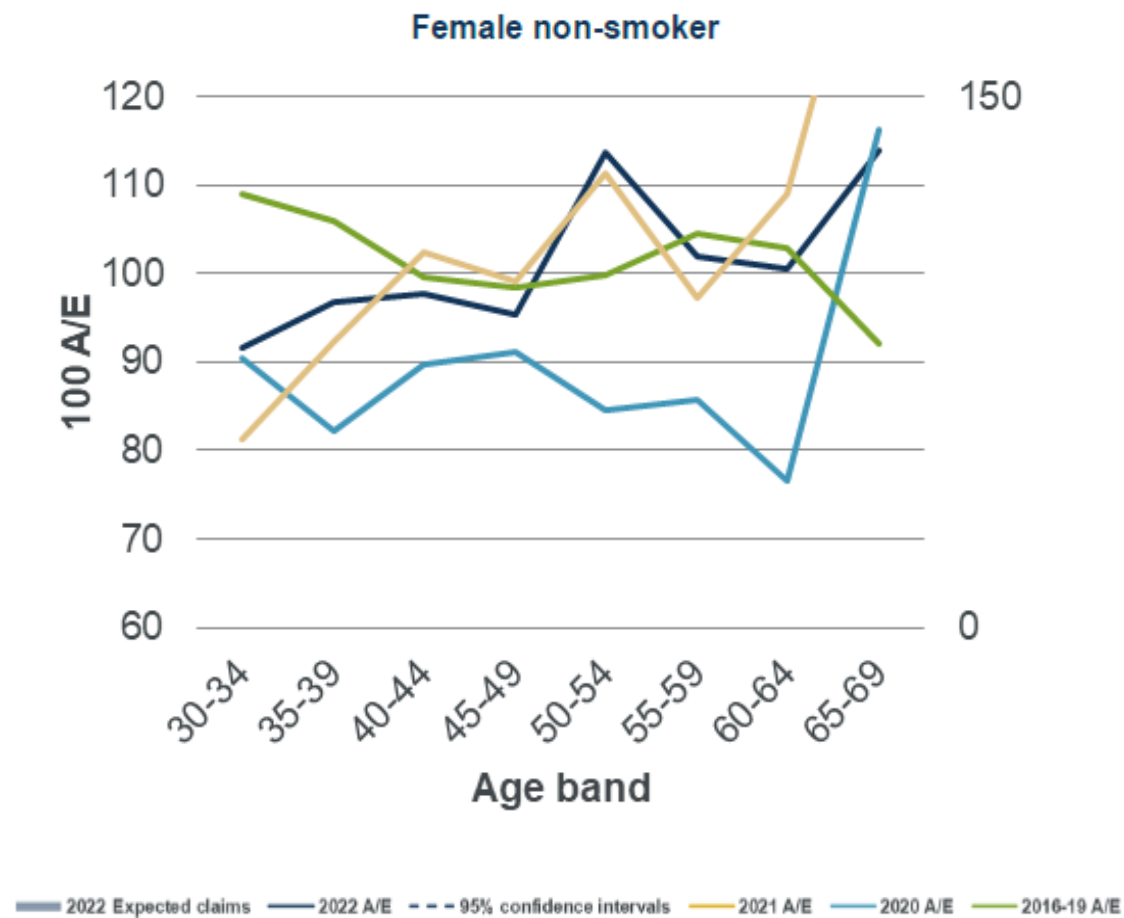
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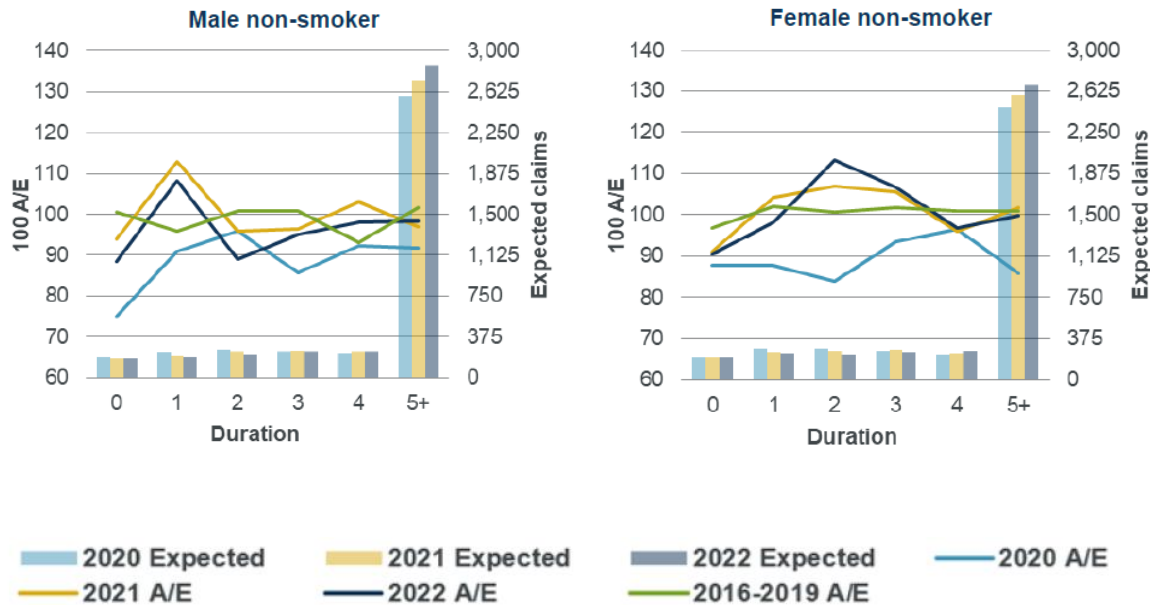


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# ACI – Experience by duration



- Some indication that select discounts do not align well with experience:
  - Male non-smoker: Light at duration 0 but heavy for duration 1 in 2021 & 2022, otherwise fairly flat at other durations
  - Female non-smoker: Light at duration 0 but heavy at durations 2 and 3 in 2021 and 2022 (and duration 1 in 2021 only)
- The smoker subsets have low data volumes and have erratic patterns

# ACI – Cause of claim

- Relatively consistent proportions by calendar year
- Cancer claims lowest in 2020 (except for female non-smokers)
- 2020 spike in male non-smokers deaths hasn't returned to pre-pandemic levels

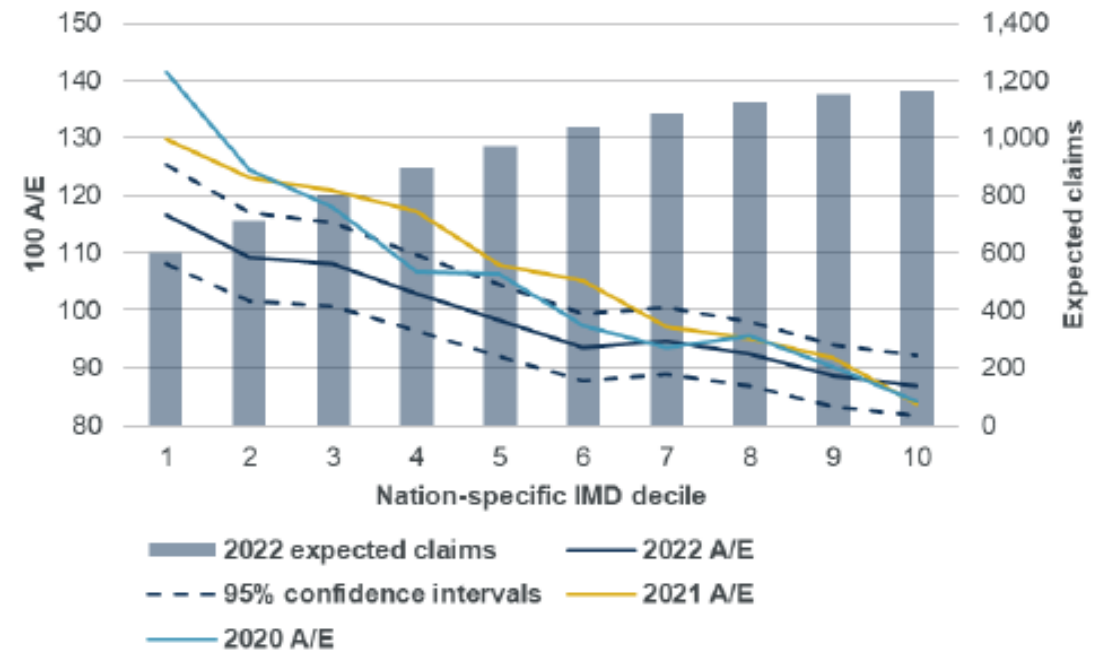
Chart 6F: Proportions of claims by cause



# Mortality – New IMD results

- Additional data from contributors has allowed for new results by nation-specific IMD decile, rather than just UK-wide IMD decile. Results appear very similar for both measures.
- High variation in mortality experience between most- and least-deprived. Flatter in 2022 than in 2020 and 2021

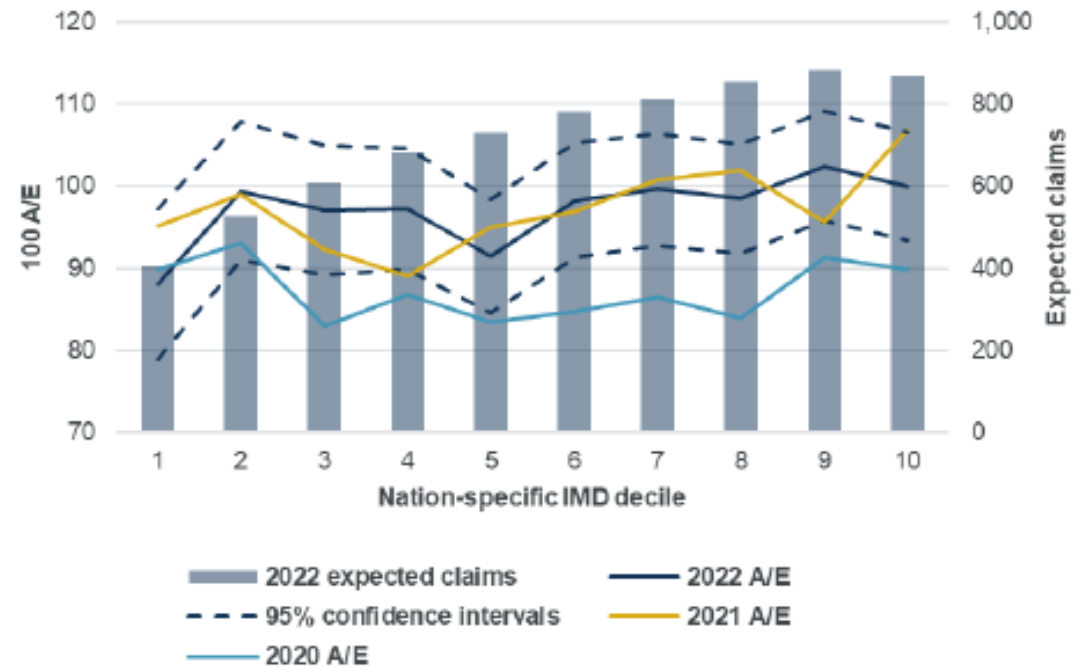
Chart 5D: 100 x Actual / Expected values (LH axis) and expected claims (RH axis) by nation-specific IMD decile



# ACI – New IMD results

- Heavier ACI experience in less-deprived deciles – higher socio-economic groups may benefit from better access to private medical care whilst the lower groups rely on an increasingly stretched NHS

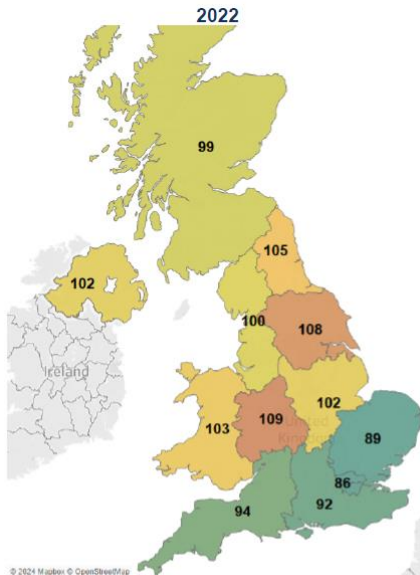
Chart 6D: 100 x Actual / Expected values (LH axis) and expected claims (RH axis) by nation-specific IMD decile



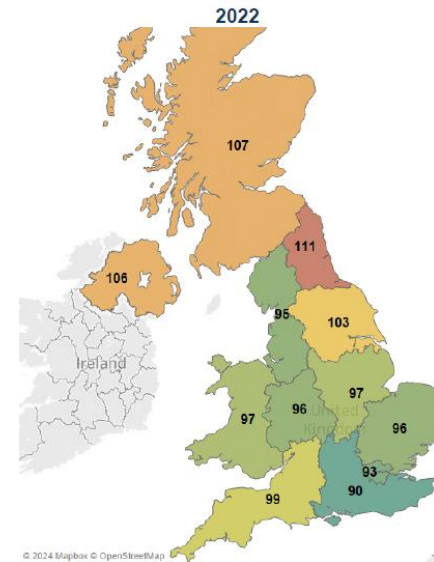
# New region results

- Mortality: Clear north/south divide in all years. Evidence that IMD variations exist within region hence regional effect is in addition to variation by socio-economic group.
- ACI: Regional patterns are less clear, particularly in 2022, however South East & London show consistently lighter experience than the rest of the country – surprising given experience is heavier for higher socio-economic groups we tend to associate with these regions.

Mortality



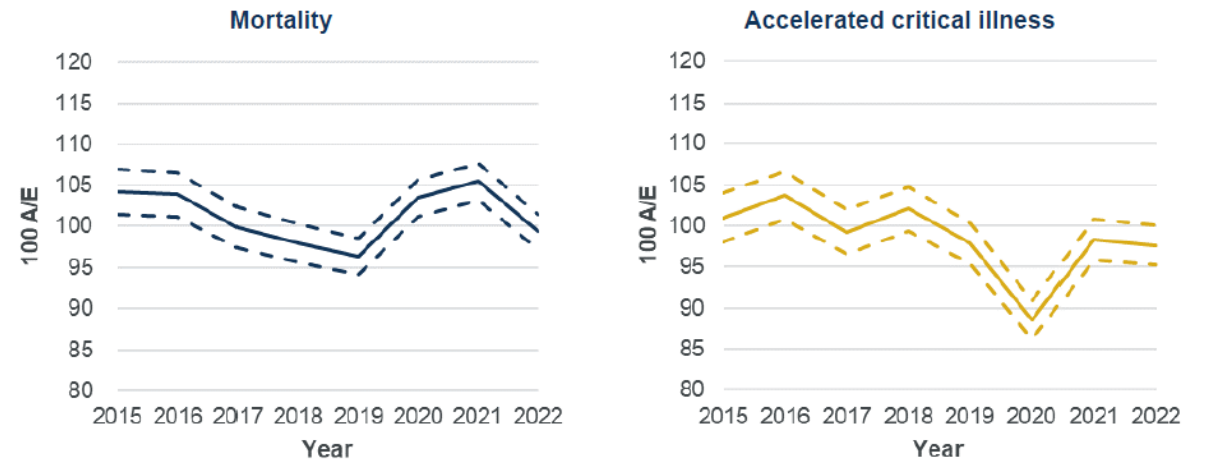
ACI



# Calendar year view

- Mortality experience generally declines with a large upturn in 2020 that persists in 2021. 2022 falls back to 2015-2019 average.
- Accelerated critical illness shows no clear trend from 2015-2018. 2019 has the lightest experience, followed by a steep drop in 2020. Experience in 2021 and 2022 is similar to 2019
- 2021 experience is heavier than noted in WP176, particularly for ACI claims due to the unwinding of allowances for late reporting.

Chart 7A: 100 x Actual/Expected values by calendar year





# Experience by Month

- There is a clear deterioration in mortality experience in the second half of 2022, with December being the highest level of mortality outside the 2 peak COVID-19 waves of April 2020 and January 2021.
- Mortality experience slightly increased to around 100% of the expected basis in late 2021, aligning with an increase in COVID-19 deaths. It stabilised in 2022 but rose again towards year-end, mirroring higher death rates in the general population.
- ACI experience was more erratic in 2021 but seems stable in 2022.

Chart 8D: 100 x Actual / Expected values by month – mortality

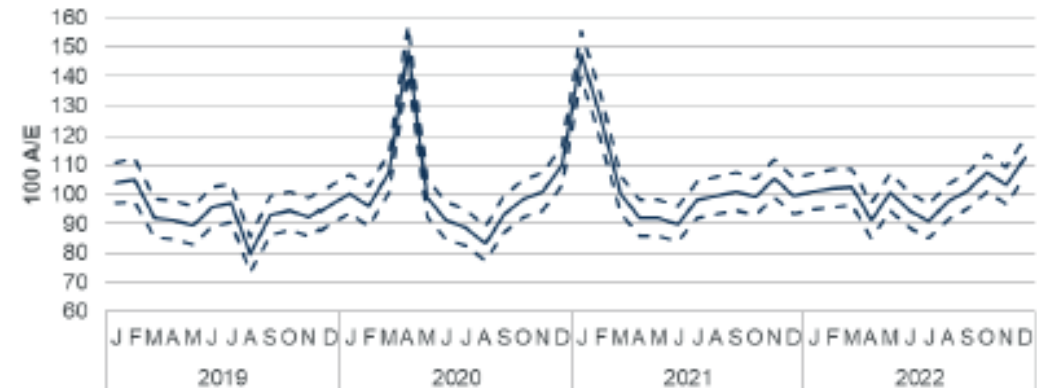
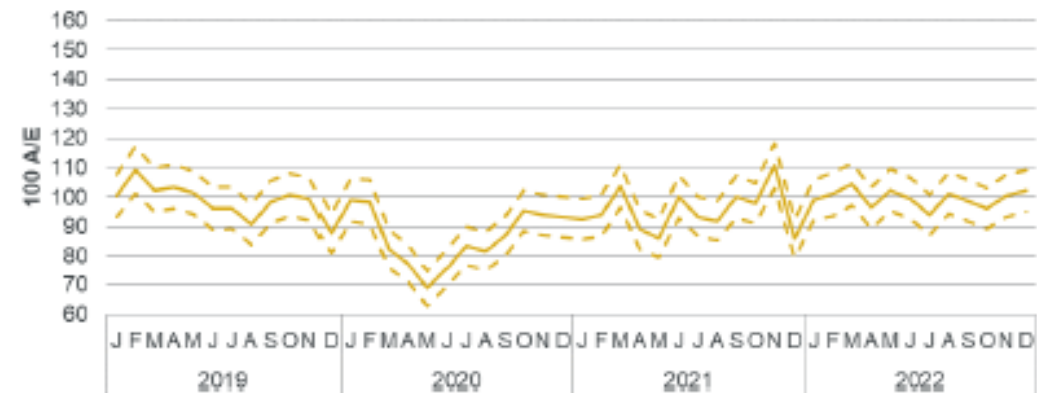


Chart 8E: 100 x Actual / Expected values by month – accelerated critical illness





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# Considerations for post-pandemic



# Overview

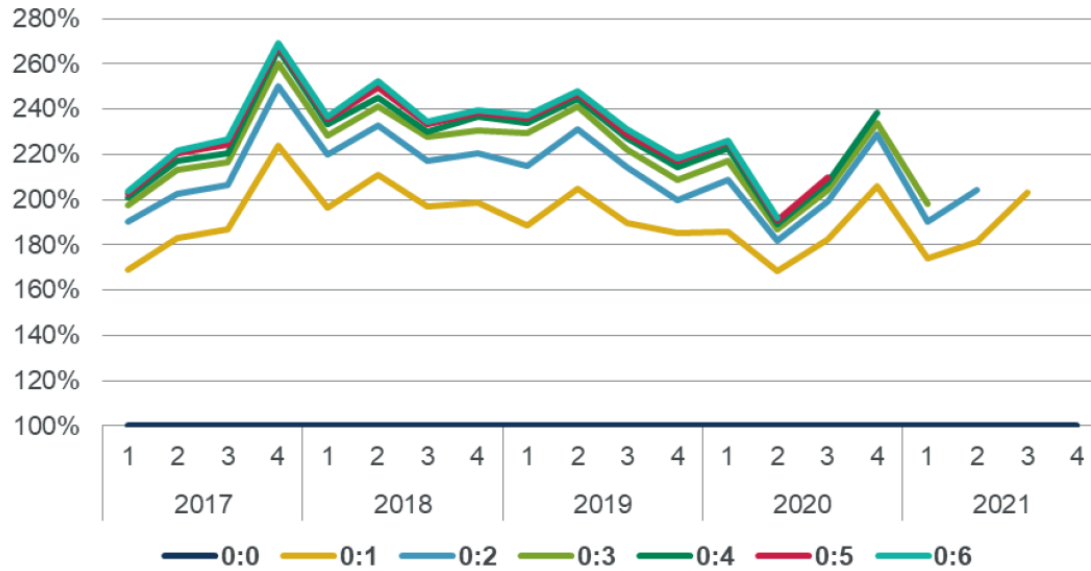
- Working Paper 182 published in January 2024
- Contains analysis of:
  - Impact of the pandemic on term assurance experience and the general population, including by Index of Multiple Deprivation (IMD).
  - Mix of death and terminal illness claims on mortality term assurances.
  - Delays to claims settlement.
  - Experience by a variety of risk factors using both a traditional one-way analysis of Actual / Expected claims and a Generalised Linear Modelling (GLM) analysis



# Claim settlement delays

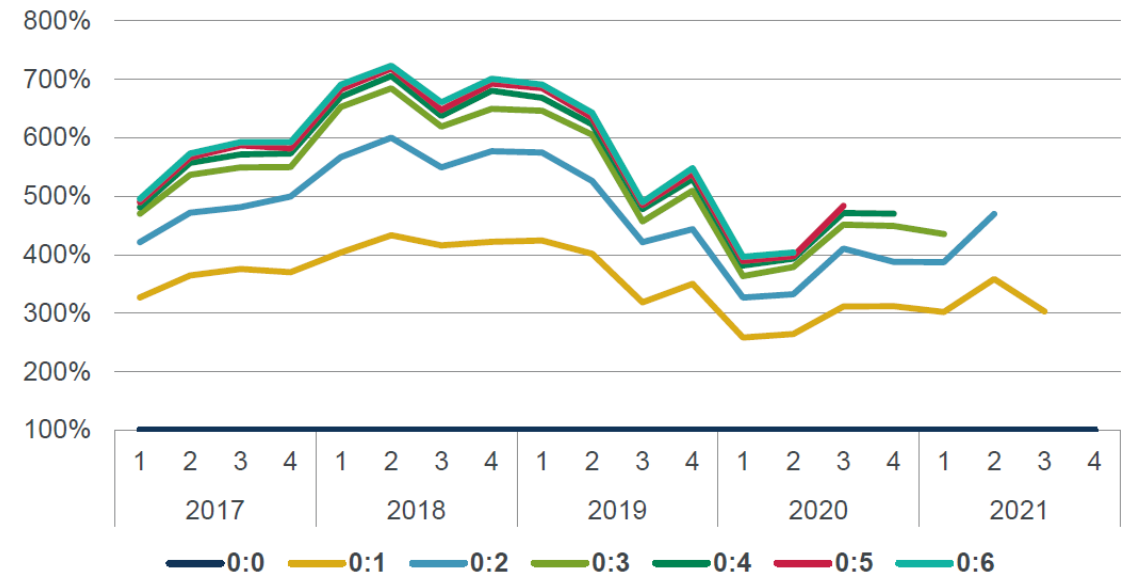
## Mortality

Chart 4B: Cumulative development of incurred claims by quarter (x axis) by number of quarters lag (line) – quarter 0 baseline



## ACI

Chart 4E: Cumulative development of incurred claims by quarter (x axis) by number of quarters lag (line) – quarter 0 baseline



# Considerations for assumption setting

- **Use of post-2019 data** requires judgment on weighting when combined with pre-pandemic data to hold future relevance
  - Excluding the data avoids double counting of the pandemic impacts but ignores valid age pattern changes and other trends
  - Excluding particular years or reducing their weighting can help maintain credibility
- **Base and trend adjustments must be consistent**, so when adjusting post-2020 data it is necessary to remove or split the excess mortality into temporary and permanent effects
  - Driver-based analysis to set these apart before adjusting trends accordingly for future years
  - More data will become available to give visibility on split between temporary and permanent effects, offering more confidence when including or excluding pandemic data
- **Graduated tables** may need adjustments for risk drivers that differ from past or future experience





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# Future work



# Irish term assurance analysis

- Collaboration projection with SAI Demography Committee
- Experience analysis of Irish term assurances for 2015-2021 (2016-2021 for mortality benefits)
- Mortality, accelerated CI and standalone CI benefits
- 5 insurers submitted data for this analysis
- As typical with a UK experience analysis, paper includes results by gender, smoker status, age, duration, sum assured band, product type, commencement year, single/joint life
- Expect this paper to be released by the end of September 2024



# Multivariate analysis review

- To date, we have used relatively simple generalised linear modelling (GLM) to enhance our understanding of the drivers of experience.
- For recent analyses, we have relied on a historic model structure and not investigated whether alternative models might now offer a better fit.
- Currently undertaking scoping exercise to review and update multivariate analysis techniques.
- The aims of the work are to:
  - Explore GLM formulae/ other techniques which may be suitable for understanding drivers of experience.
  - Explore what place multi-variate analyses have in our annual updates of term assurance experience
  - Set foundations to make better informed decisions on aspects of new mortality and morbidity tables such as select periods and risk factors to split/adjust tables by.





# Changes in business practices

- Plan to summarise key changes in the term assurance business practices that may have impacted term assurance experience in the recent years or are likely to affect it going forward
- We will develop comprehensive surveys where we hope to hear back from underwriting and claims teams
- Responses will then be analysed to identify trends which may have impacted or may impact claims experience.
- We aim to publish this paper by January 2025.





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# 2017-2020 individual income protection experience & future work

Zoe Woodroffe, Chair of the CMI Income Protection Committee

# Previous work and delay

- The previous analysis of income protection experience, covering 2011-2016, was presented in Working Paper 124, published in 2019.
- The delay in producing an updated analysis of experience has been caused by the following:
  - Substantial work being undertaken to update the analysis methodology and the systems to process and analyse income protection data.
  - The need to seek data from additional data contributors to increase the market coverage of the analysis.
  - Additional validation of the data processing, and subsequent results, given the introduction of new systems, changes in data format and data being received from new data contributors.
- The first two factors have been valuable in improving the analysis and the final factor has been necessary to ensure the quality of the analysis. The Income Protection Committee would like to thank subscribers for their patience and understanding in waiting for the completion of this updated analysis.





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# Income protection experience, 2017-2020

# Overview

- Working Paper 193 published in September 2024 covering claim inception and termination experience of individual income protection policies, 2017-2020.
- First analysis produced following methodology changes.
- Presents results by calendar year, sex, deferred period, occupation class, and for the first time, smoker status.
- Includes comparisons of pre-pandemic years 2017-2019 to 2020.



# Changes to methodology

- Inceptions:
  - Moved to day count approach rather than census-based approach, removing the need to apply approximations.
  - Greater scrutiny of data: duplicates and other data irregularities are addressed on a case-by-case basis, rather than systematically.
  - IP11 inception rates used to calculate expected inceptions. Adjustments applied to rates to allow for data issues identified in graduation dataset, as discussed in Working Paper 149.
- Terminations:
  - Largely unchanged, as previously used day-count approach.
  - IP11 termination rates used to calculate expected recoveries and deaths.



# Overall claim inception experience

- For males:
  - Experience is generally lighter than that expected under the IP11 basis.
  - Compared to 2017-2019 combined, 2020 has lighter claim inception experience, with the exception of OC1 DP1.

**Males OC1 (100A/E)**

Deferred Period	2017	2018	2019	2020	2017-2019
DP1	61	68	69	76	65
DP4	72	87	80	73	76
DP13	78	78	72	70	76
DP26	104	88	88	70	93
DP52	91	106	66	63	88



# Overall claim inception experience

- For males:
  - Experience is generally lighter than that expected under the IP11 basis.
  - Compared to 2017-2019 combined, 2020 has lighter claim inception experience, with the exception of OC1 DP1.
- For females:
  - Experience is generally lighter than that expected under the IP11 basis, except for DP4.
  - Experience by calendar year is relatively volatile, except for DP13, where the experience becomes lighter over the period.

## Females OC1 (100A/E)

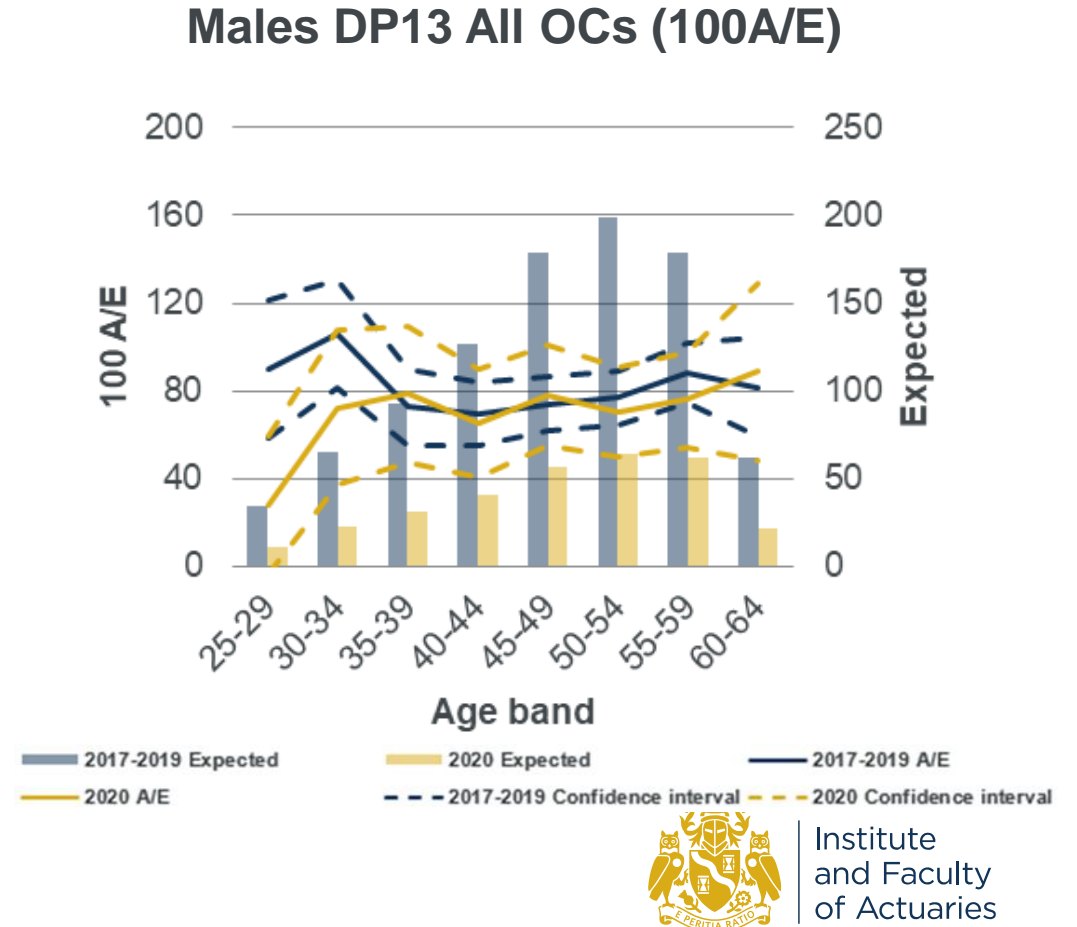
Deferred Period	2017	2018	2019	2020	2017-2019
DP1	99	83	106	142	95
DP4	102	87	111	109	100
DP13	96	73	64	62	77
DP26	96	74	75	77	81
DP52	87	69	80	77	79





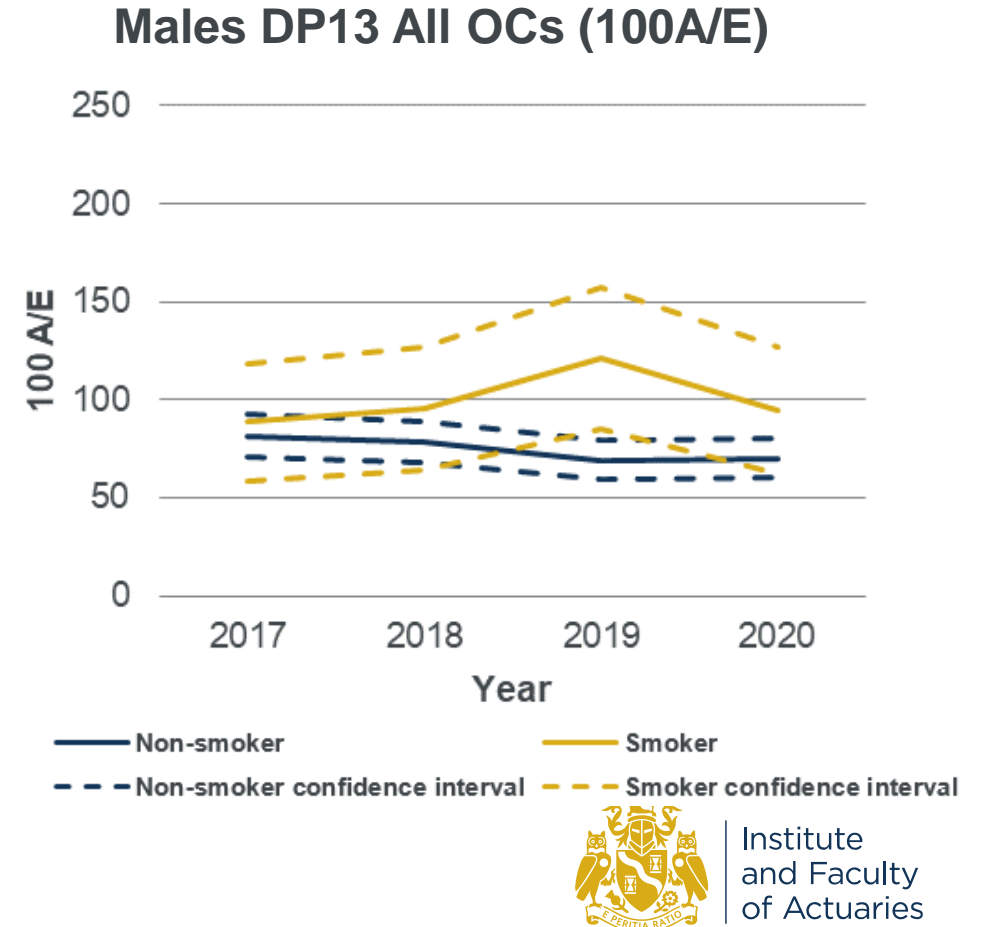
# Claim inception experience by other factors

- For males:
  - By age, the experience is mostly similar in shape to that of IP11.



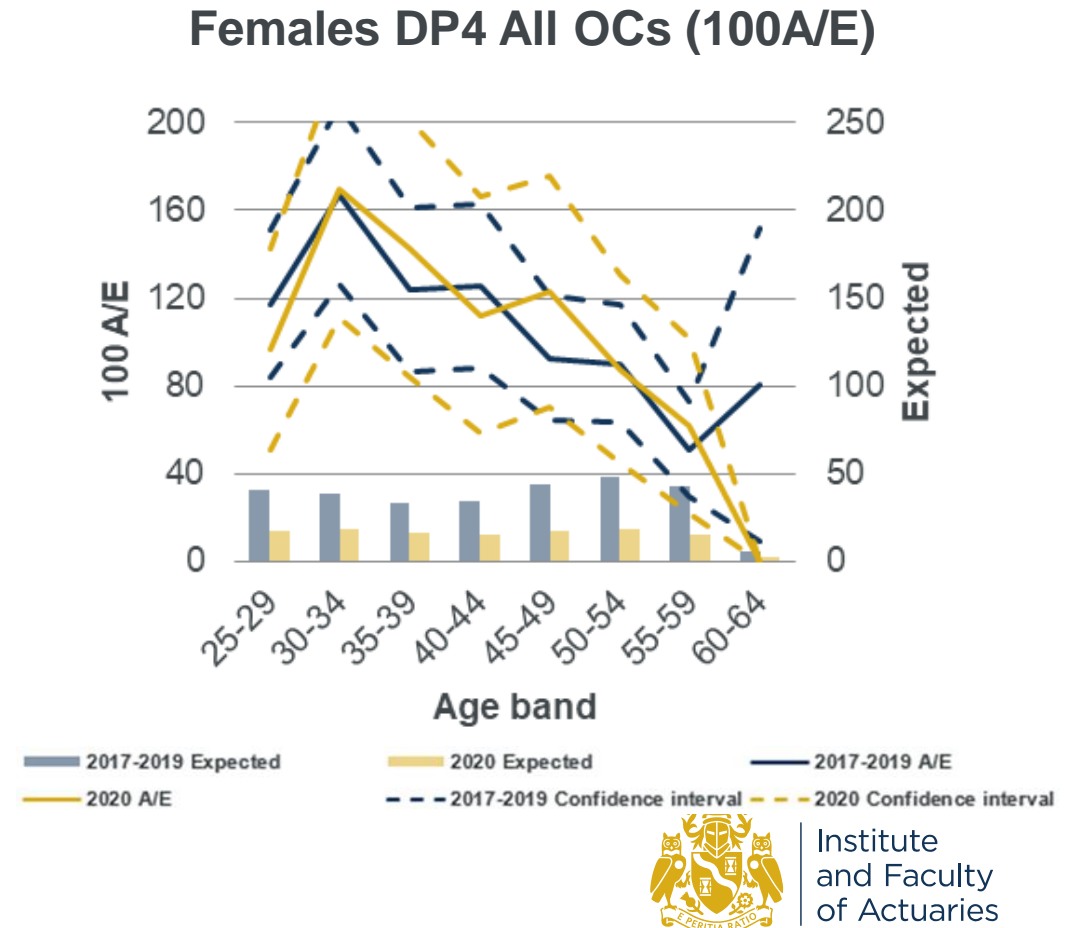
# Claim inception experience by other factors

- For males:
  - By age, the experience is mostly similar in shape to that of IP11.
  - The experience of non-smokers is generally lighter, and less volatile, than that of smokers.



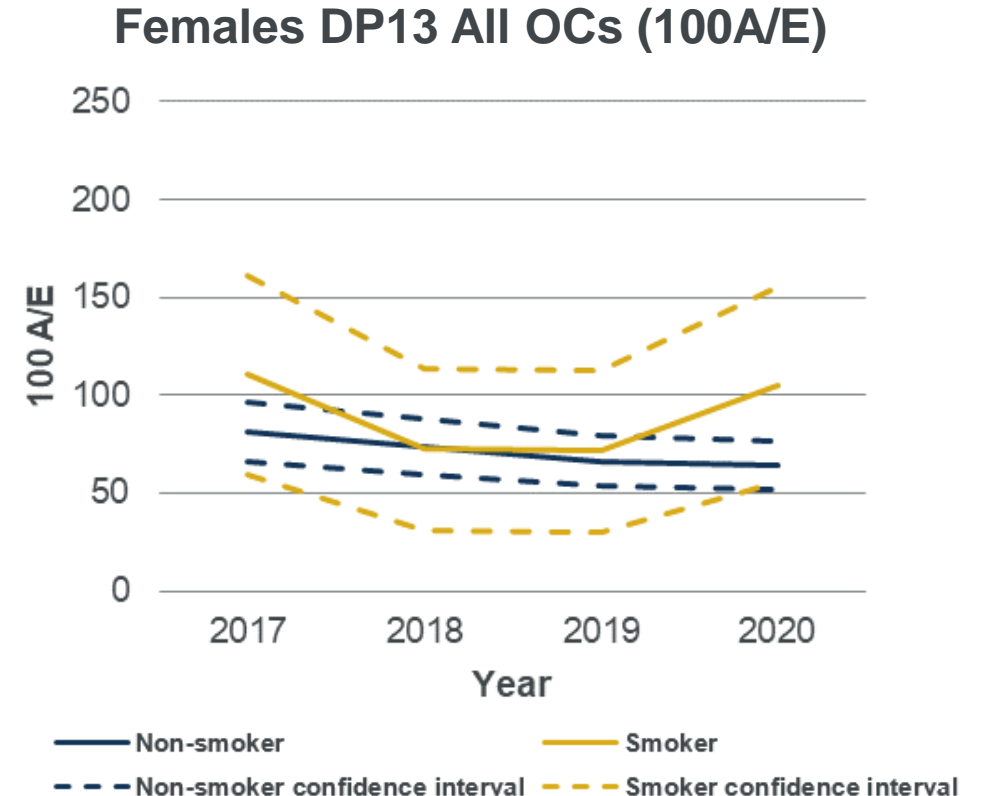
# Claim inception experience by other factors

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  - By age, the experience is mostly similar in shape to that of IP11.
  - The experience of non-smokers is generally lighter, and less volatile, than that of smokers.
- For females:
  - By age, the experience is more volatile than for males. For DP4, DP26 and DP52 the experience tends to be heavier than expected at younger ages and lighter than expected at older ages.



# Claim inception experience by other factors

- For males:
  - By age, the experience is mostly similar in shape to that of IP11.
  - The experience of non-smokers is generally lighter, and less volatile, than that of smokers.
- For females:
  - By age, the experience is more volatile than for males. For DP4, DP26 and DP52 the experience tends to be heavier than expected at younger ages and lighter than expected at older ages.
  - The experience of non-smokers versus smokers is less clear than for males.



# Claimant termination experience

- Claimant recovery:
  - The experience relative to that expected under the IP11 basis is mixed for each deferred period and there is no clear pattern in the experience of 2020 relative to that for 2017-2019 combined.
  - The experience by age-band is broadly similar to IP11, for ages where there are reasonable data volumes.
  - The experience of male non-smokers appears to be higher (i.e. better) than that for male smokers. The data for females is sparser and such a pattern is not evident.
- Claimant mortality:
  - Difficult to draw any firm conclusions from the results, due to low data volumes.





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# Future work



# Future work

- Experience analyses:
  - “All offices” results up to 2022
    - Data collection and processing underway.
    - Target date early 2025
  - “All offices” results up to 2023
    - Data requests sent out
- Expanding range of analysis by exploring additional factors/products:
  - Index of multiple deprivation (IMD)
  - Distribution channel
  - Cause of sickness
  - Benefits with maximum payment periods



# Questions

# Comments

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



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