



England & Wales mortality monitor – end of 2024

Summary

Mortality in the final quarter of 2024 was lower than in any year since 2018.

Mortality, based on death registrations, for 2024 as a whole was 5.1% below the 2014-2023 average and 3.7% below 2023. Mortality in 2024 was similar to mortality in 2019 and lower than in any other year.

Mortality compared to the 2014-2023 average varied substantially by age – mortality for ages 75-84 was 7.7% below the ten-year average but mortality for ages 20-44 was 1.7% above.

Note: Bank holidays mean that results for recent weeks may not be directly comparable to other weeks or years.

Note: Death certification reforms on 9 September 2024 affect results since that date. Our [analysis](#) suggests that weekly figures were only materially affected in the weeks shortly after that date, but the cumulative standardised mortality rate for 2024 may be around 0.25% lower and the mortality improvement for 2024 may be around 0.25% higher than if the reforms had not been implemented.

Background

This is the latest in a series of quarterly updates monitoring mortality in England & Wales. It is based on provisional weekly deaths data published by the Office for National Statistics (ONS) up to 3 January 2025 (i.e. week 1 of 2025) on 15 January 2025. We intend to publish the next quarterly update, for data to the end of Q1 of 2025, in April 2025.

We are also publishing briefer weekly summaries, which include Charts D and E from the quarterly monitor.

All updates are publicly available from the CMI pages of the Institute and Faculty of Actuaries website: <https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation/other-cmi-outputs/mortality-monitor>. The same page has “beta” mortality monitor software, which is available to Authorised Users. This enables users to produce their own ad hoc updates to the results of this report.

Notes

We have used our standard approach in producing this report, basing it on data published by the Office for National Statistics.

Our calculations rely on data for registered deaths, and we are conscious that during the coronavirus pandemic the timing of registration of deaths may have differed from previous years. Consequently, comparisons of mortality between years may not be entirely on a like-for-like basis. Also, results for individual weeks may not be consistent between years due to the timing of public holidays.

All of our analysis in this update is based on Standardised Mortality Rates (SMRs). These adjust the provisional weekly deaths data published by the Office for National Statistics to control for changes in the size and age and gender distribution of the population over time.

Contents

Charts A, B and C show centred averages of weekly SMRs. The annual averages smooth out seasonal variations. The quarterly averages smooth short-term variations but still show seasonal patterns, allowing the identification of, for example, winters with particularly heavy or light mortality.

Chart D shows cumulative standardised mortality (cSMR) for each year, relative to the average for 2014-2023, and Chart E shows cumulative standardised mortality improvements (cSMRI) for each year (i.e. the progression of annual mortality improvements over the course of each year). Charts D2 and E2 show the same information as charts D and E respectively in a different format and may be easier to interpret for those with colour vision deficiency.



Charts A to E show results for males and females combined, for ages 20-100. Charts F and G show variations in the cSMR and cSMRI by gender and age band.

Full details of the methods used are included in [Working Paper 111](#).

The numerical results underlying the charts are provided in an accompanying spreadsheet, together with further results, including SMRs by gender and age band.

Use of this document

Please note that:

- The CMI disclaims any liability from use of or reliance on these calculations, including in relation to financial transactions such as longevity swaps; and
- The CMI does not guarantee that it will continue to publish quarterly updates.

Please also see the reliances and limitations, disclaimer, and copyright notice on the final page of this document.

This document is categorised as a “Research Report” as defined in the Terms and Conditions.

TAS compliance

This paper is intended to translate publicly available demographic information published by the Office for National Statistics and similar bodies into indicative mortality measures to illustrate recent mortality experience primarily in England & Wales. The paper is intended for use by actuaries and other parties interested in detailed mortality statistics and is for information only.

The paper complies with the principles in the Financial Reporting Council’s Technical Actuarial Standard “TAS 100: General Actuarial Standards”. Any person using this paper should exercise judgement over its suitability and relevance for their purpose.

Smoothed mortality at a point in time

Chart A shows quarterly (13-week) and annual (53-week) centred averages of SMR, since weekly deaths data became available. Note that although we have used data from 31 July 1999 to 3 January 2025, the quarterly and annual averages start 6 and 26 weeks later and stop 6 and 26 weeks earlier.

The annual average SMR was fairly flat from 2010 to mid-2018, remaining within the range from 1.25% to 1.36%, but it reached a new low of 1.22% in late 2018 and early 2019. It rose rapidly because of the coronavirus pandemic, reaching 1.49% in September 2020, but has since fallen. The latest value is 1.23%, the lowest value since 2019.

The quarterly average SMR shows that mortality typically peaks near the start of each year. However during the pandemic the quarterly average SMR peaked at 1.80% in week 15 of 2020 and 1.77% in weeks 1 and 2 of 2021. In contrast, the low of 1.09% in week 30-33 of 2020 was the lowest ever seen. The summer low in 2024 of 1.12% is lower than in 2022 and 2023 but higher than in 2020 and 2021.

Chart A: Quarterly and annual centred average SMRs – whole period

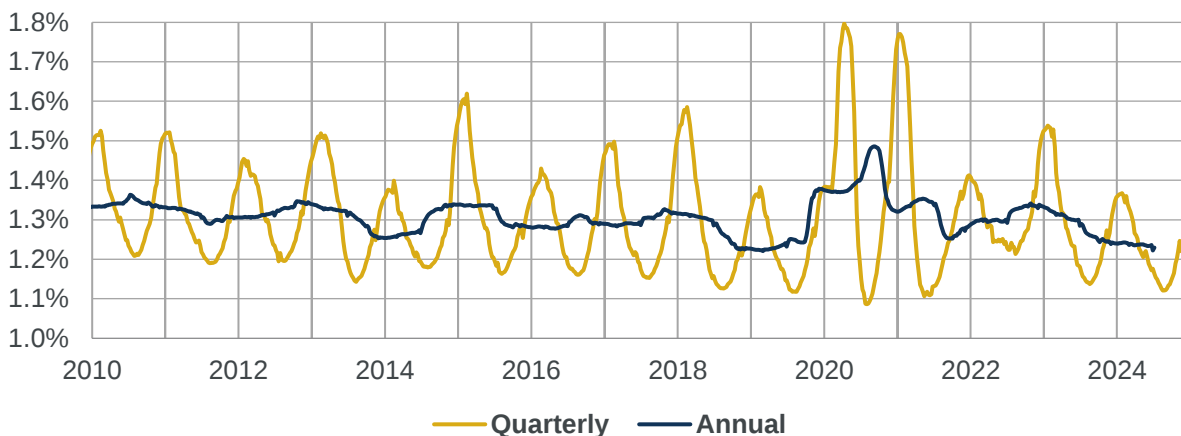


Chart B shows the same information as Chart A, magnified to show the current year and the previous five years more clearly.

Chart B: Quarterly and annual centred average SMRs – current and previous five years

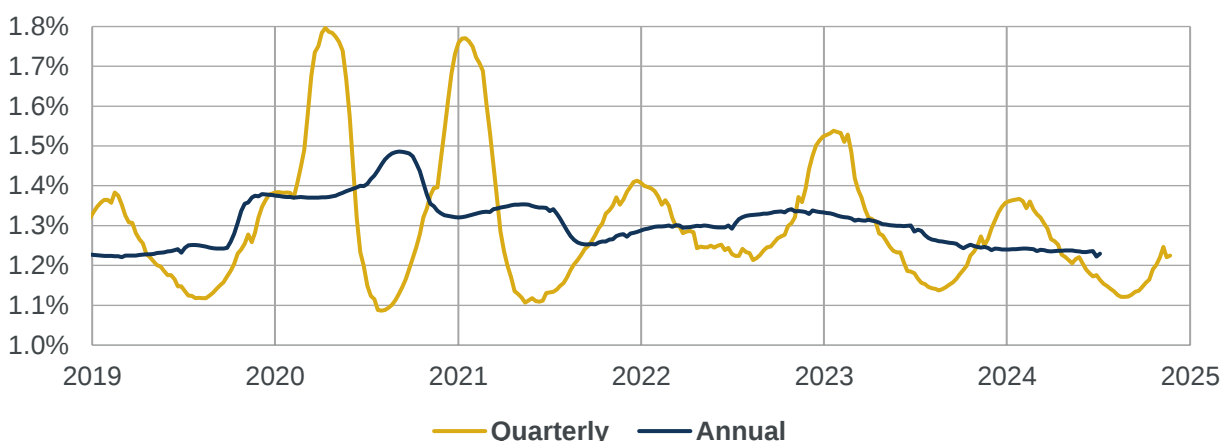
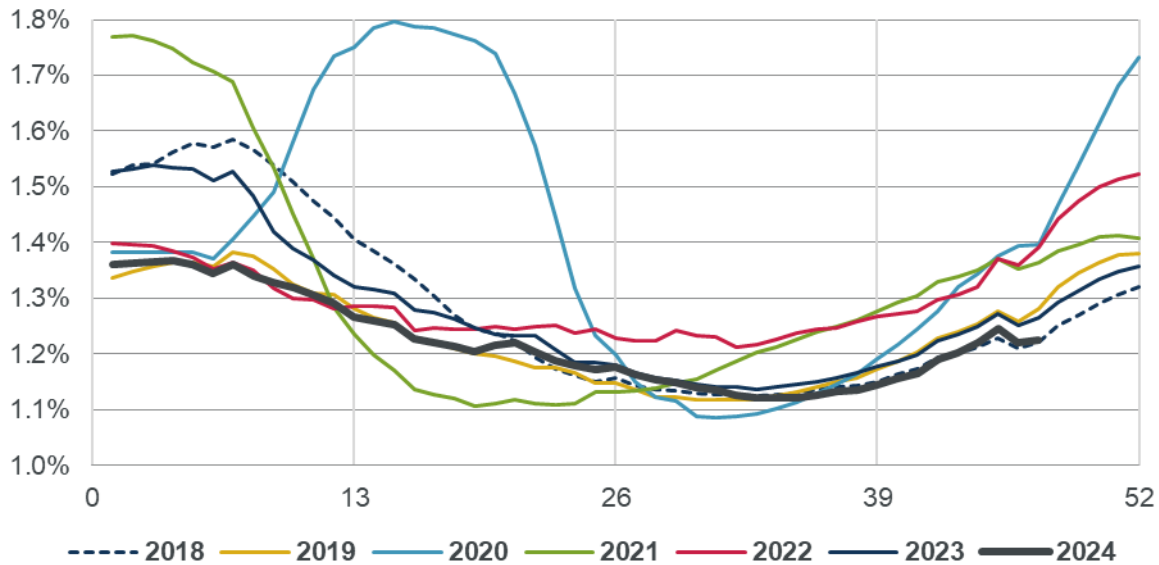


Chart C shows the quarterly average SMRs from Chart B for each year, with values plotted by week number to aid comparison. Although lines are labelled by calendar year, the quarterly averages for weeks towards the start and end of each year will be affected by mortality in earlier and later years respectively. The chart again illustrates the exceptional nature of mortality during the pandemic, with highs in Q2 of 2020 and Q1 of 2021, and lows in Q3 of 2020 and Q2 of 2021. Compared to the corresponding point of prior years, the latest figure is lower than in any other year since 2018.

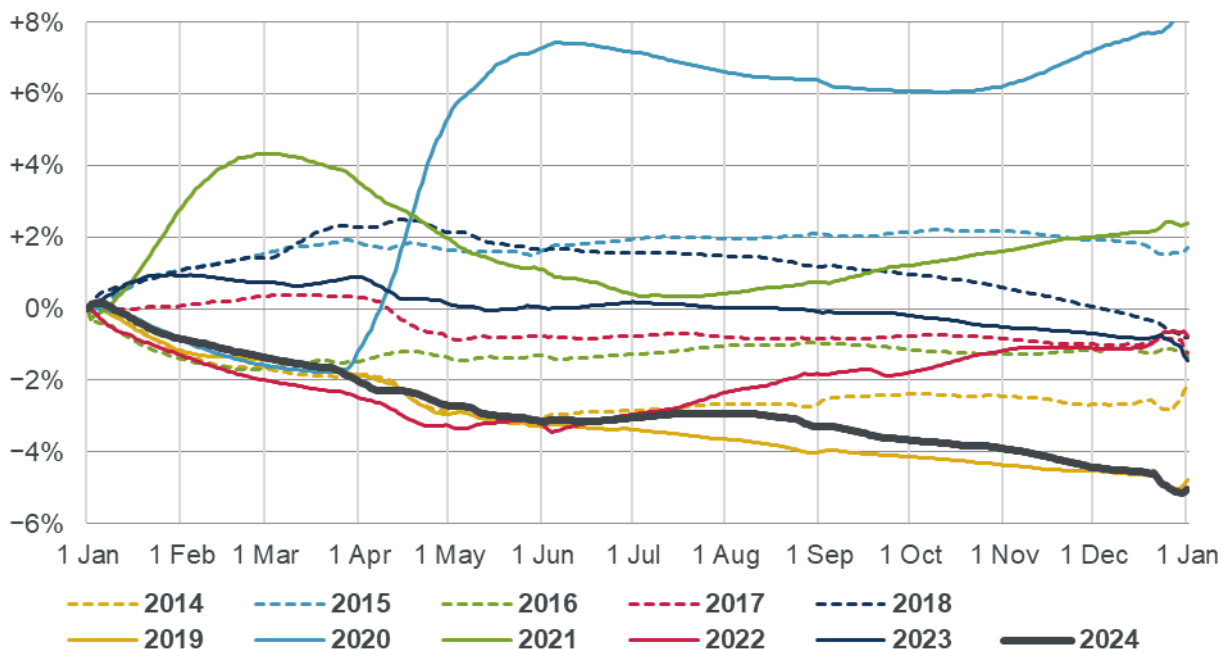
Chart C: Quarterly centred average SMRs, by week number



Cumulative mortality

Chart D shows cumulative standardised mortality rates for 2024 and the previous ten years compared to the 2014-2023 average. The calculation method is described in Section 4.2 of Working Paper 111. Chart D2 (in Appendix 1) shows the same information in a different format and may be easier for those with colour vision deficiency.

Chart D: Cumulative standardised mortality rate (cSMR) compared to the 2014-2023 average



All years have a value of 0% at the start of the year, by definition, as there has been no mortality at that point of the year; the year-end values show how mortality for each year as a whole compares to the 2014-2023 average; and intermediate points show how mortality has developed during the year, relative to the average. If mortality improvements had been constant throughout the period considered then the lines for each year would form a "fan", with the end-year values decreasing steadily from year to year. While we saw a decrease of this sort in the years up to 2011 (not shown), there is no clear pattern to the end-year values for later years, as mortality has

been volatile with low improvements. Mortality for complete calendar years was lowest in 2019 and highest in 2020 (of the years shown).

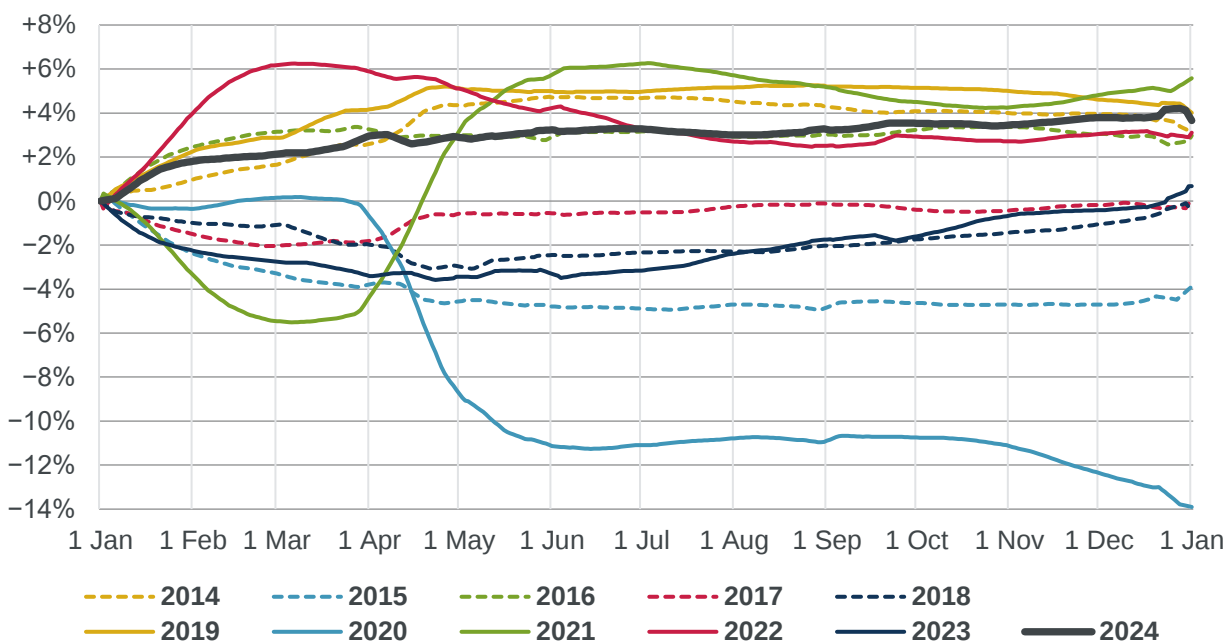
Chart D shows that cumulative standardised mortality to the end of 2024 was 5.1% lower than the ten-year average and similar to mortality in 2019.

Chart E shows the cumulative annual standardised mortality improvement (also described in Section 4.2 of Working Paper 111) for 2024 and for the previous ten years. Chart E2 (in Appendix 1) shows the same information in a different format and may be easier for those with colour vision deficiency.

All years have a value of 0% at the start of the year, by definition, as there has been no mortality at that point of the year; the year-end values show how mortality for each year as a whole compares to the previous year; and intermediate points show how mortality improvements have developed during the year.

Note that Chart E shows mortality improvements, so a higher value represents a higher improvement and lower mortality; whereas in Chart D a higher value represents higher mortality.

Chart E: Cumulative annual standardised mortality improvement (cSMRI)



The cumulative mortality improvement at the end of 2024, relative to 2023, is +3.7%.

Note that:

- The cumulative values at the end of the year in Charts D and E may not necessarily agree precisely with the corresponding values based on annual data. This is because some weeks span two years, requiring us to estimate in which year those deaths were registered.
- Mortality improvements vary by age (as shown later in this report) and the mortality improvements shown in Chart E are sensitive to the age distribution of the chosen standard population.

Implication for future versions of the CMI Model

In previous years we have included a section showing indicative results from the next version of the CMI Model for a range of scenarios for mortality in the current year.

We aim to publish the next version, CMI_2024, in the second quarter of 2025. We have not included any indicative results for that version at this stage as the Mortality Projections Committee is considering what methods and parameters to use.



Variation by gender and age

Charts F and G shows how cSMR and cSMRI have varied by gender and age band. Tables 1 and 2 show the values at the end of 2024.

We note that results by age should currently be treated with particular caution as delays in registrations versus occurrences could have impacted different age ranges to different degrees.

Table 1: Cumulative standardised mortality rate (cSMR) compared to the 2014-2023 average, by gender and age-band, at 31 December 2024

	0-64	65-84	85+	20-100	20-44	45-64	65-74	75-84
Male	-0.1%	-6.3%	-4.8%	-4.9%	+1.2%	-1.0%	-3.4%	-8.0%
Female	-1.4%	-6.3%	-5.4%	-5.3%	+2.5%	-2.7%	-4.4%	-7.3%
Combined	-0.6%	-6.3%	-5.1%	-5.1%	+1.7%	-1.7%	-3.8%	-7.7%

Table 2: Cumulative annual standardised mortality improvement (cSMRI), by gender and age-band, at 31 December 2024

	0-64	65-84	85+	20-100	20-44	45-64	65-74	75-84
Male	+3.3%	+3.8%	+3.6%	+3.6%	+3.7%	+3.3%	+2.9%	+4.3%
Female	+2.1%	+3.9%	+3.9%	+3.7%	+1.5%	+2.6%	+3.4%	+4.2%
Combined	+2.8%	+3.8%	+3.7%	+3.7%	+2.9%	+3.0%	+3.1%	+4.3%

Mortality rose during 2020 and 2021 due to the coronavirus pandemic:

- For over-65s and above, mortality was higher in 2020 than in 2021.
- For under-65s, mortality was higher in 2021 than in 2020.

In 2022 and 2023, cumulative mortality rates:

- fell below the 2014-2023 average for over-65s; but
- remained above the 2014-2023 average for under-65s.

In 2024:

- Mortality was below the 2014-2023 average for all groups shown except males and females aged 20-44.
- Mortality was particularly low for males and females aged 75-84. Compared to the 2014-2023 average, mortality for males was 8.0 below and mortality for females was 7.3% below
- Mortality improvements were positive for all age groups for both sexes, varying from +1.5% for females aged 20-44 to +4.3% for males aged 75-84.



Chart F: Cumulative standardised mortality rate (cSMR) compared to the 2014-2023 average, by gender and age-band

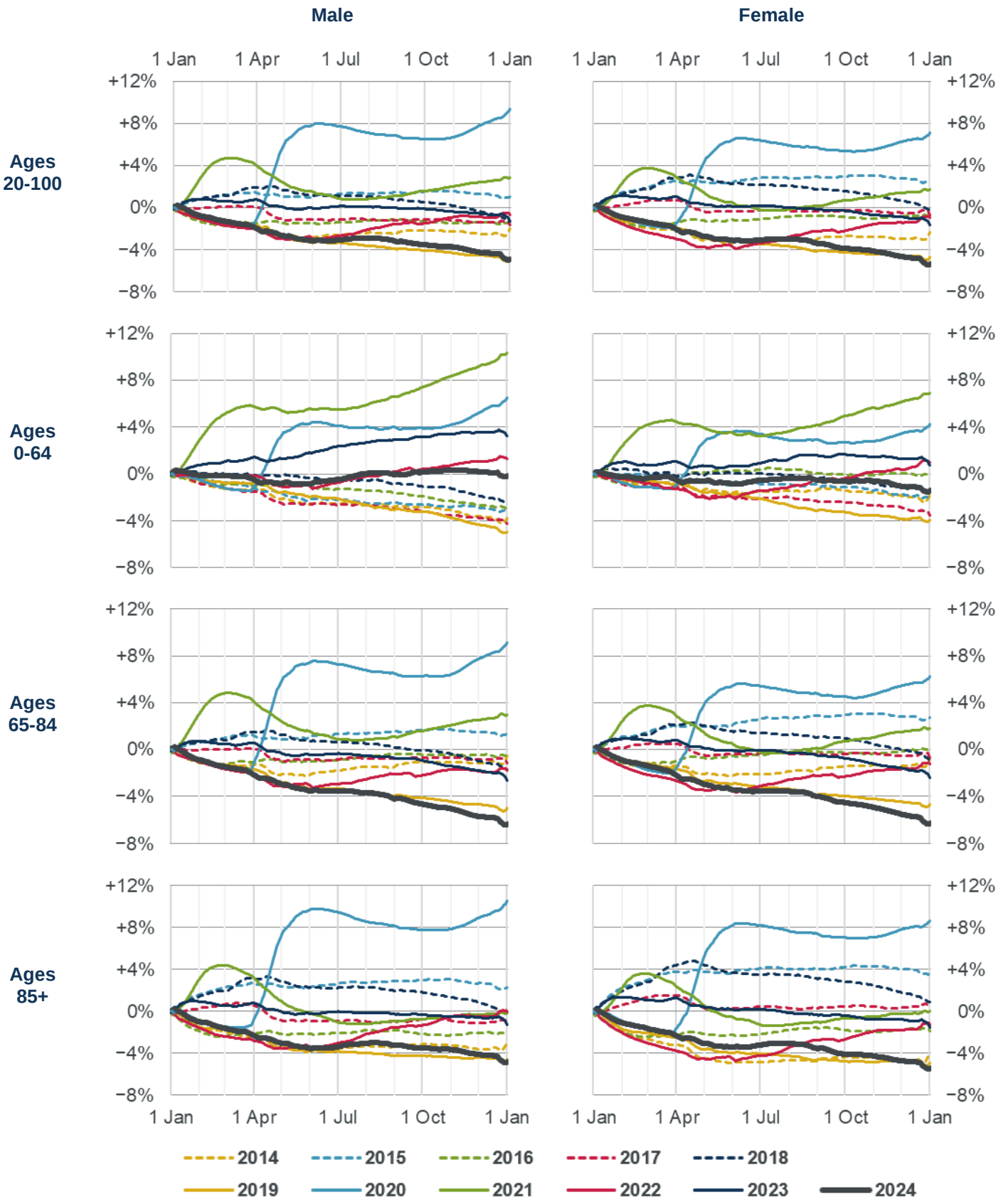




Chart F (cont): Cumulative standardised mortality rate (cSMR) compared to the 2014-2023 average, by gender and age-band

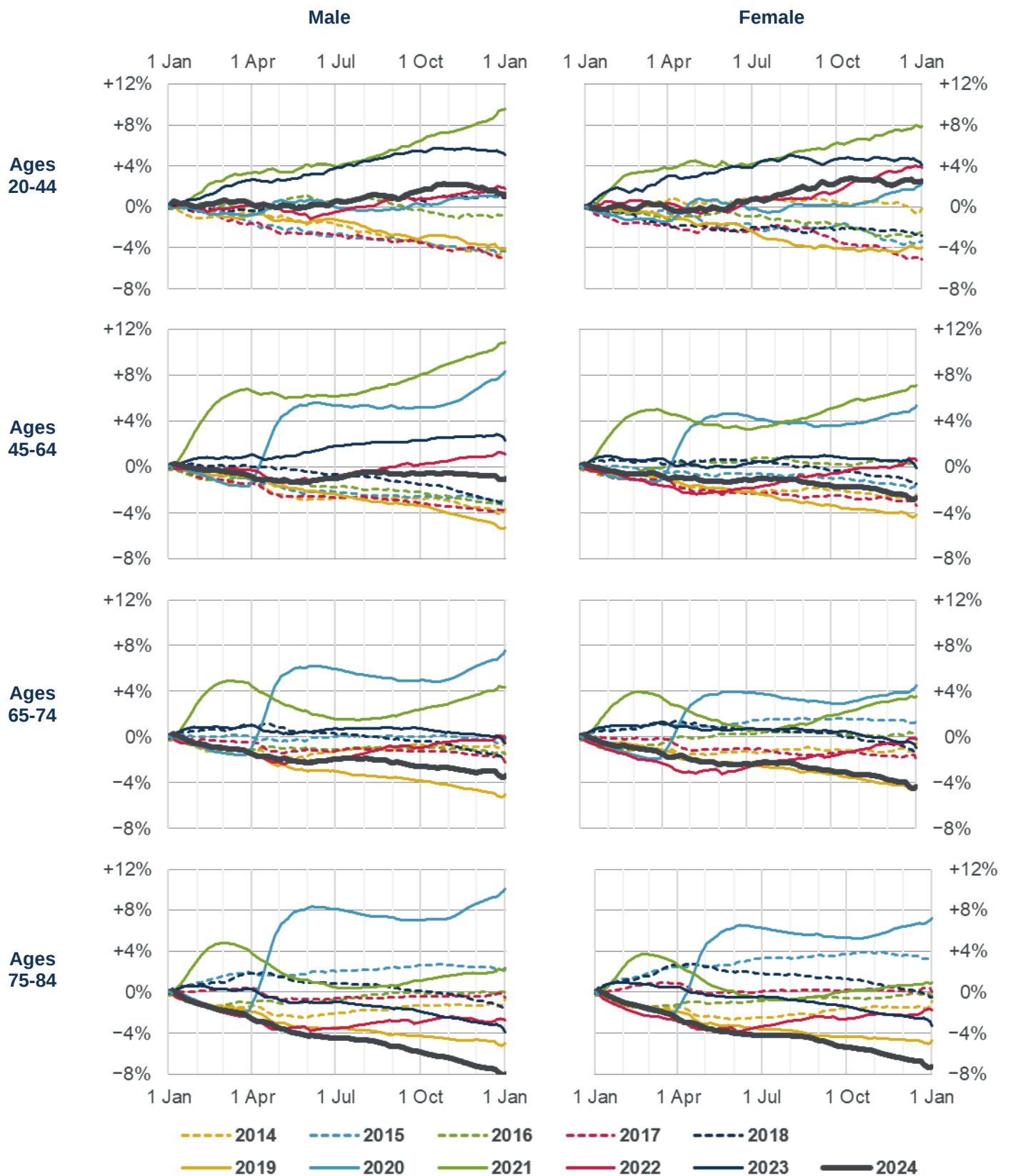




Chart G: Cumulative annual standardised mortality improvement (cSMRI), by gender and age band

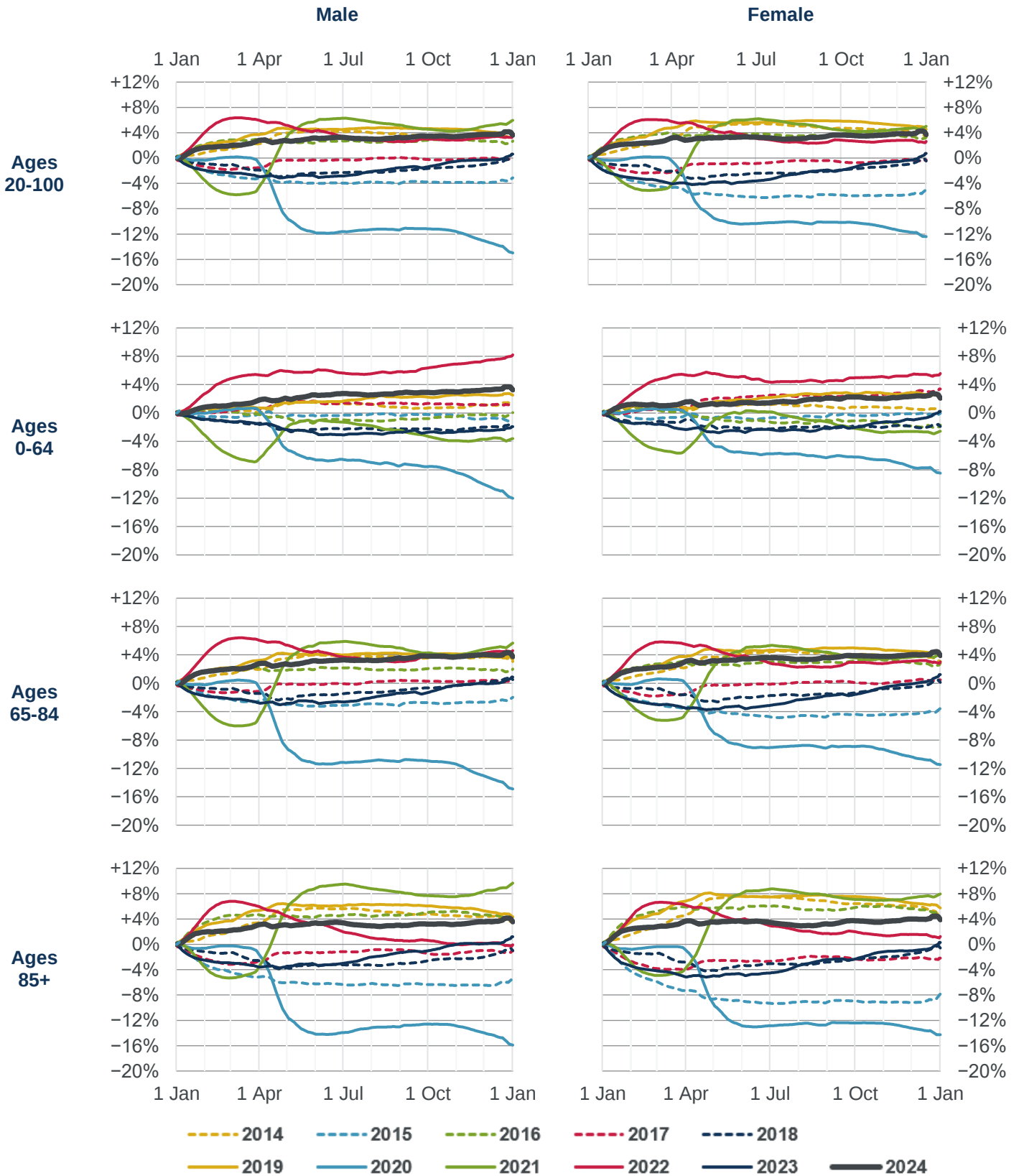
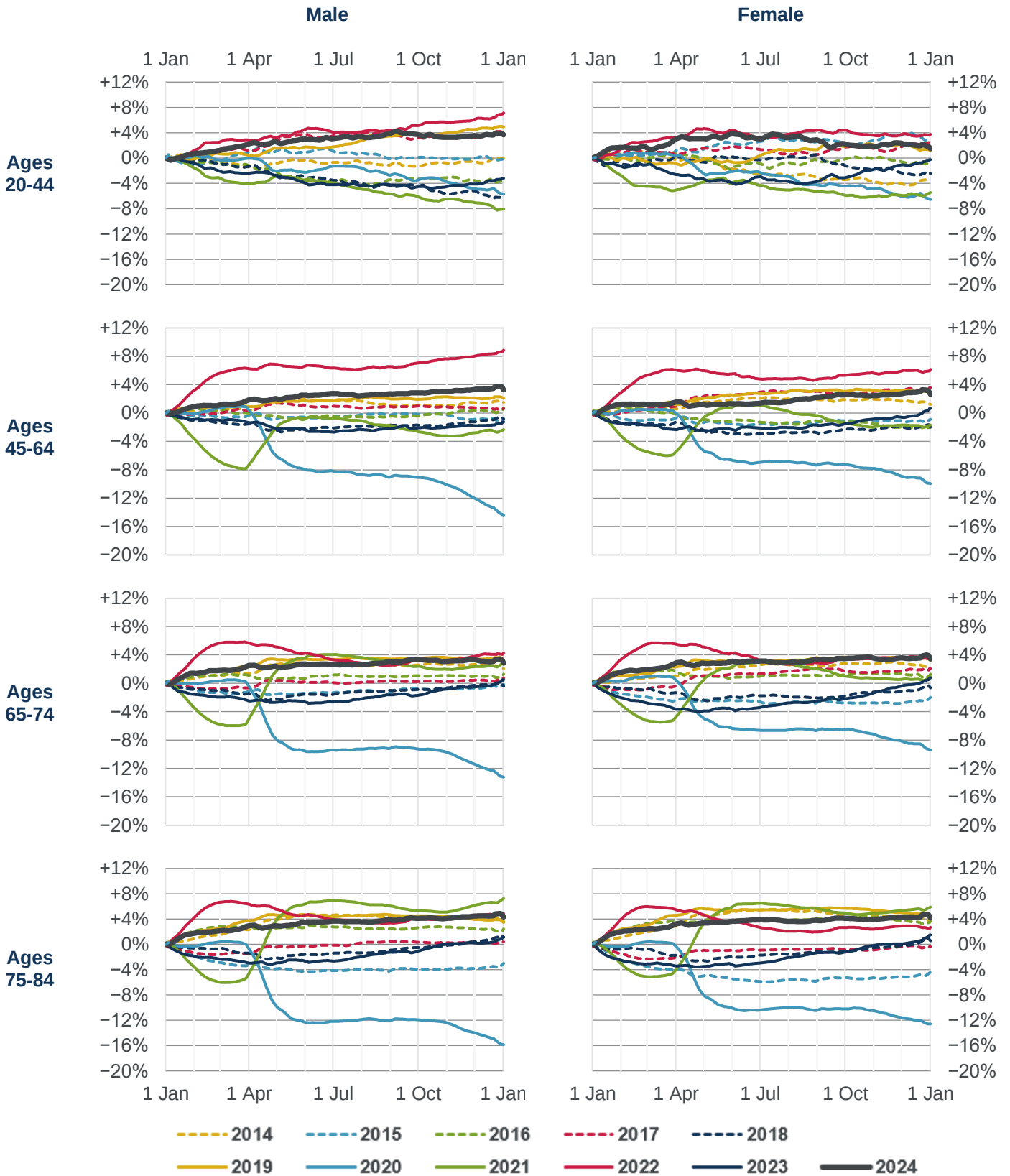




Chart G (cont): Cumulative annual standardised mortality improvement (cSMRI), by gender and age band





Appendix 1 – Accessible versions of charts D and E

Chart D2: Cumulative standardised mortality rate (cSMR) compared to the 2014-2023 average, showing 2014-2024 and highlighting individual years

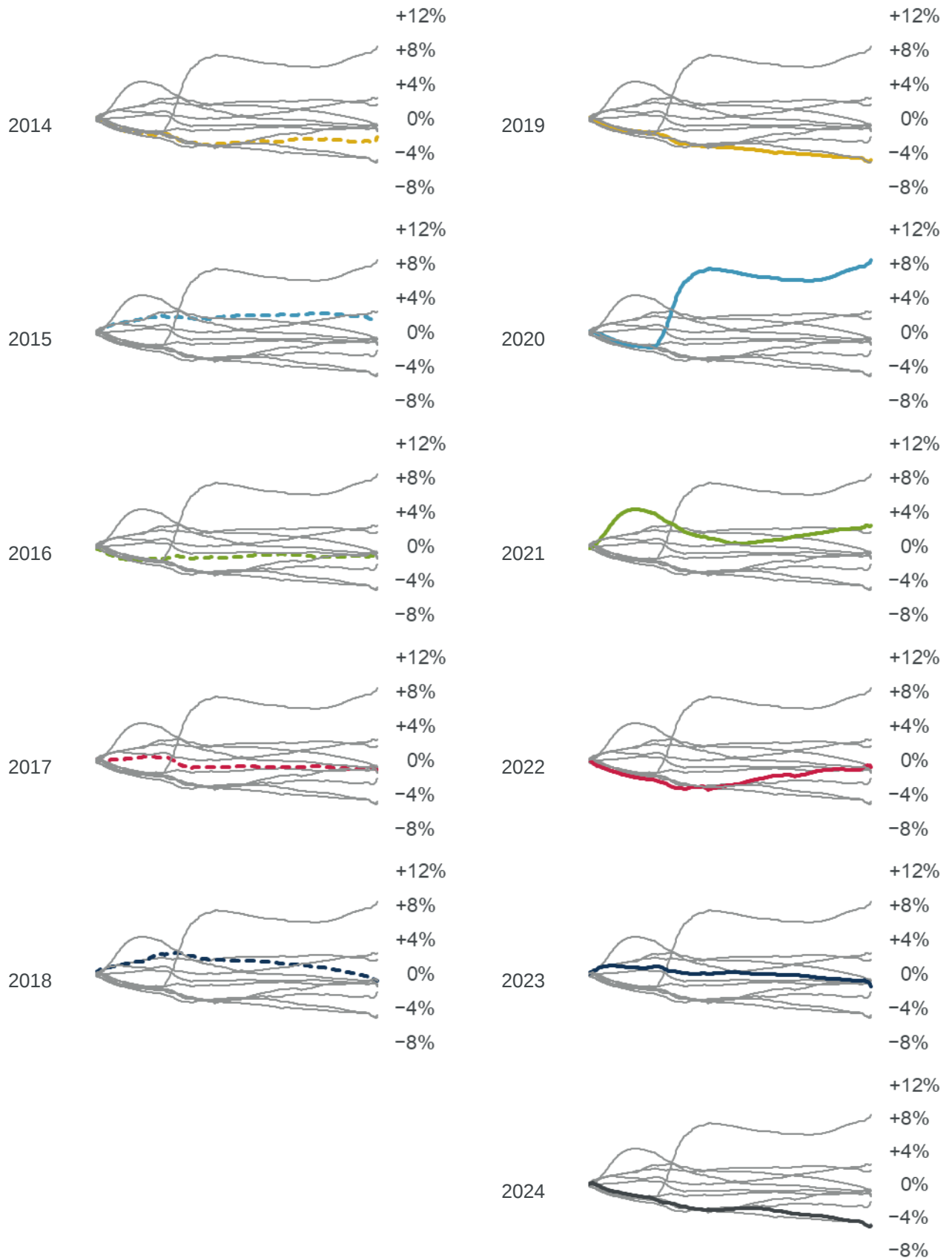
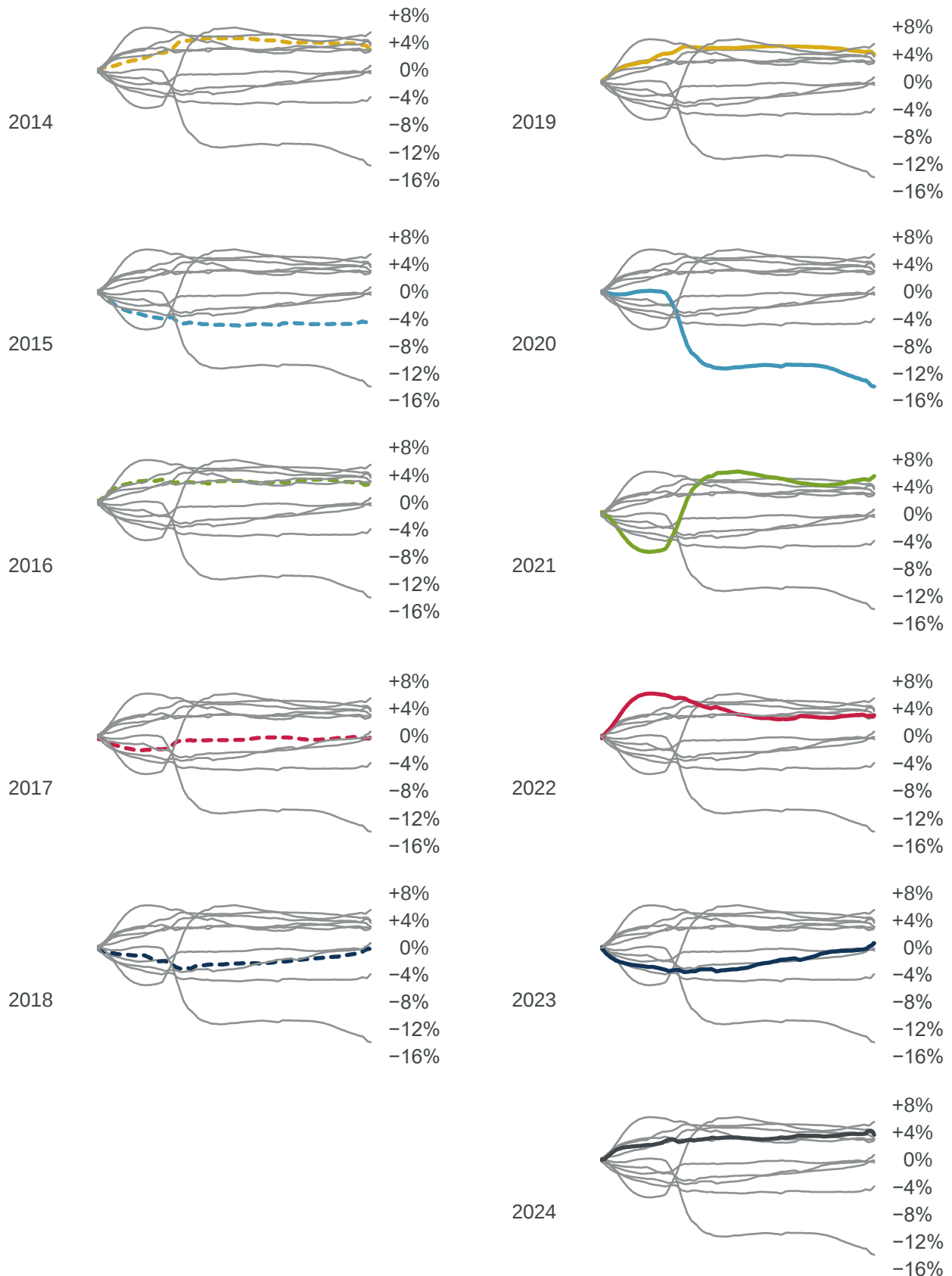




Chart E2: Cumulative annual standardised mortality improvement (cSMRI) for 2014-2024, highlighting individual years





Reliances and limitations

The purpose of the mortality monitor is to provide regular updates on standardised mortality in England & Wales, adjusting ONS data to allowing for changes in the size and age of the population. This can be used to inform a view on the outcome of the next version of the CMI Model, in the absence of any change in method.

The CMI aims to produce high-quality outputs and takes considerable care to ensure that the mortality monitor and the accompanying spreadsheet of results are accurate. However:

- We cannot guarantee their accuracy (see the Disclaimer).
- There is a reliance on the underlying data, published by the ONS and described as provisional.
- We have also applied judgement and assumptions in deciding on the calculation methods and the presentation of results.
- Anyone using the results of the mortality monitor should ensure that it is appropriate for their particular use and note that care is needed when estimating full year experience from partial year experience. This is particularly true during the coronavirus pandemic.
- Population estimates for the latest years reflect our own estimates and are less certain than published ONS figures for earlier years.

Disclaimer: This document has been prepared by and/or on behalf of Continuous Mortality Investigation Limited (CMI). The CMI does not accept any responsibility and/or liability whatsoever for the content or use of this document. Whilst care has been taken during the development of the document, CMI does not (i) warrant its accuracy; or (ii) guarantee any outcome or result from the application of this document or of any of CMI's work (whether contained in or arising from the application of this document or otherwise). You assume sole responsibility for your use of this document, and for any and all conclusions drawn from its use. CMI hereby excludes all warranties, representations, conditions and all other terms of any kind whatsoever implied by statute or common law in relation to this document, to the fullest extent permitted by applicable law. If you are in any doubt as to using anything produced by CMI, please seek independent advice.

Copyright: You may reproduce the contents of this document free of charge in any format or medium provided it is:

1. reproduced accurately and is unaltered;
2. not used in a misleading context; and
3. correctly referenced and includes both CMI's disclaimer notice set out above and CMI's copyright notice, as follows:

© Continuous Mortality Investigation Limited.

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

Correspondence address: Two London Wall Place, 123 London Wall, London, EC2Y 5AU
Email: info@cmilimited.co.uk
Tel: 020 7776 3820

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

Continuous Mortality Investigation Limited is wholly owned by the Institute and Faculty of Actuaries.