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Invited Review

Influenza: cause or excuse? An analysis of flu's influence on worsening mortality trends in England and Wales, 2010–19

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Background: England and Wales experienced a stagnation of previously improving life expectancy during the 2010s. Public bodies cited influenza as an important cause.

Sources of data: We used data from the Office for National Statistics to examine mortality attributed directly to influenza and to all influenza-like diseases for the total population of England and Wales 2010–19. Several combinations of ICD-10 codes were used to address the possibility of under-counting influenza deaths.

Areas of agreement: Deaths from influenza and influenza-like diseases declined between 2010 and 2019, while earlier improvements in mortality from all causes of death were stalling and, with some causes, worsening. Our findings support existing research showing that influenza is not an important cause of the stalling of mortality rates 2010–19.

Areas of controversy: Influenza was accepted by many as an important cause of stalling life expectancy for much of the 2010s, while few in public office have accepted austerity as a key factor in the changes seen during that time.

Growing points: This adds to the mounting evidence that austerity damaged health prior to COVID-19 and left the population more vulnerable when it arrived.

Areas for developing timely research: Future research should explore why so many in public office were quick to attribute the change in trends in overall mortality in the UK in this period to influenza, and why many continue to do so through to 2023 and to deny the key role of austerity in harming population health.

Key words: mortality, influenza, life expectancy, austerity

Introduction

The problem: long-term improvements in mortality stopped in the UK in the 2010s

All social groups in England and Wales experienced a long period of increasing life expectancy until the second decade of the 21st century,[1–3] a trend mirrored within Scotland and Northern Ireland, albeit not as favourably in recent decades. Life expectancy, the most widely used summary measure of a population's mortality experience, shocked observers when its long upward trend slowed markedly shortly after 2010 (Fig. 1). Period life expectancy at birth, the most common version, is the average number of years a person born in a given year could expect to live based on the mortality rates of people dying in that year—it is not a prediction of how long they will live, which is unknowable as it is in the future. Mortality rates and life expectancy go hand in hand: if mortality rates increase, life expectancy improvements will reverse. Recent gains in life expectancy even reversed in some groups, such as those living in poorer areas.[4,5] This slowdown was also witnessed throughout the rest of the UK. Although we focus on England and Wales, some other European countries also saw slowing life expectancy improvements. However, the situation in the UK was more severe and prolonged than elsewhere in Europe, similar to what was observed in the USA.[2,6,7] For comparison, between 2010 and 2021, UK life expectancy at birth increased by 0.5 and 0.3 years for women and men, respectively. In contrast, the corresponding figures in Sweden were 1.4 and 1.6 years; in France, they were 0.8 and 1.4 years; and in Germany, one of the poorest performers in continental Europe, they were 0.6 and 0.7 years.[8]

Life expectancy tends to fluctuate yearly, especially in countries with small populations where the impact of relatively few deaths can be significant. In contrast, a non-trivial change in a large country like the UK usually has an identifiable cause. For instance, life expectancy in England and Wales fell by 0.45 years between 1950 and 1951 and 0.37 years between 1967 and 1968. These decreases coincided with what was considered an influenza epidemic and a confirmed influenza pandemic, respectively.[9] While there is ongoing debate about the exact causes of the high death toll in 1950/51, which was much higher than in other countries, the impact of the 1968 influenza pandemic is uncontested. The underlying upward trend in life expectancy has been attributed to reduced risk factors, especially for smoking-related cancers and cardiovascular diseases. This decrease in risk reflects improved living conditions and, particularly since the 1960s, advancements in the effectiveness and coverage of healthcare (The wider range of factors that may explain most of the overall trends in life expectancy are beyond the scope of this paper.).[10,11] While there is some debate about the detailed explanation of these improvements,[12] health overall in the UK was improving. There was a widespread, albeit implicit, assumption that this would continue. However, something changed in 2012. Unlike the previous years mentioned, this was not a one-off decline but a shift in the longer-term trend.

What is already known about the changes in mortality?

Public health experts began raising alarms in the mid-2010s.[13] Two separate analyses using 3-year

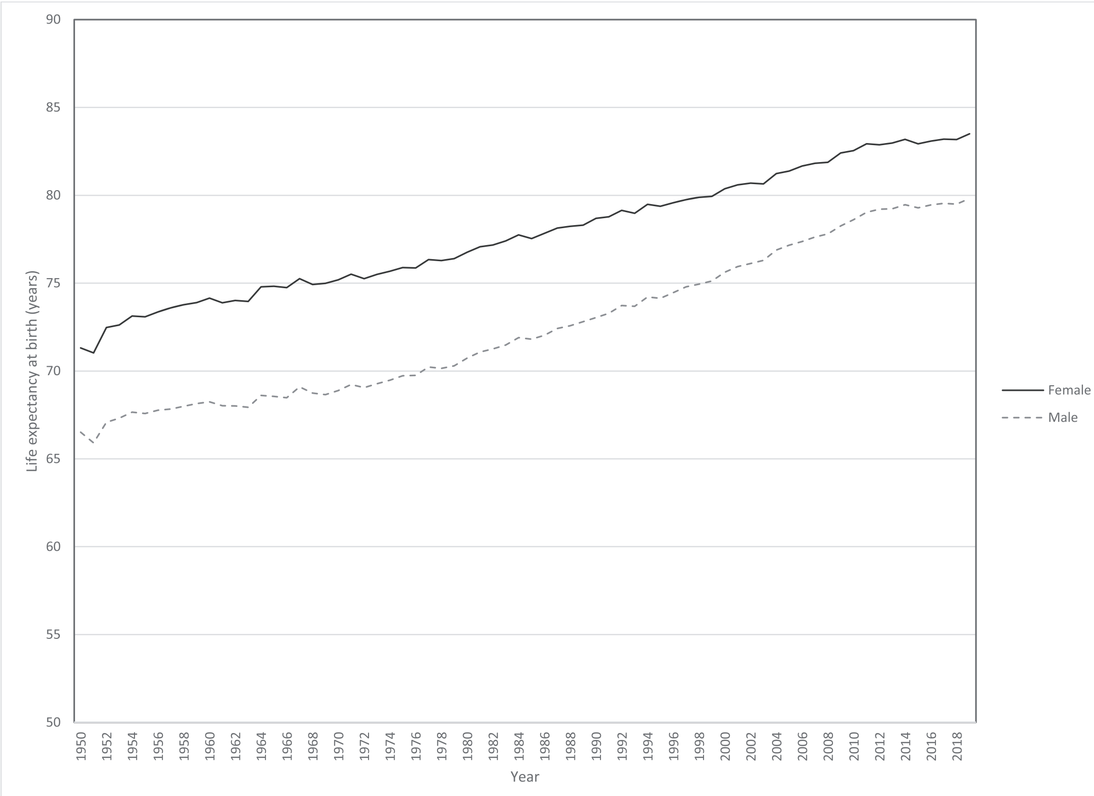

Fig. 1 Life expectancy at birth by sex, England and Wales, 1950–2019. Source: Human Mortality Database, 2022. Note: The axis does not start at 0.

and annual life expectancy data from the Office for National Statistics (ONS) revealed a drop in life expectancy for females aged over 85 years. Specifically, from 2012–14 to 2013–15, there was a decrease of 0.04 years (based on 3-year data),[3] and from 2014 to 2018, there was a decline of 0.03 years for women in England (based on annual data).[14] Initial concern arose from the observation that more older women were dying in the UK in 2012 than in previous years, after accounting for changes in the size of the population at risk.[13] This excess mortality was initially attributed to an 'unusually prolonged influenza season in England [in 2012-2013]' by Public Health England (PHE), now part of the UK Health Security Agency (UKHSA).[15,16] One study published in 2016 used a geographical analysis to link worsening old age mortality between 2007 and 2013 to austerity, but it received little attention.[17] It was not until the significant year-on-year increase in mortality between 2014 and 2015, described by ONS as the greatest increase since the onset of the influenza pandemic of 1968,[18] that a broader circle of researchers began to take note.[19]

At first, the increase in deaths between 2014 and 2015 was seen by many as a one-off blip, including by the Department of Health.[20,21] We explore these responses in more detail in the discussion. Provisional analysis by ONS revealed that most of the increase in 2015 occurred at the beginning of the year, coinciding, as the authorities at the time emphasized, with 'peak in flu activity for the 2014/15 season'.[18] The view then was that what was being seen could be attributed mainly to a particularly bad influenza season, detailed in publications by both the ONS and PHE, who wrote that the circulating strain—influenza A(H3N2) subtype—was 'known to predominantly affect older people'.[1,15,18,22,23] PHE also pointed to an ageing population with higher levels of multi-morbidity and suggested that, even if many deaths in older people were not directly attributed to influenza, it was a factor contributing to their earlier deaths, thus contributing to the overall slowdown in improvements in life expectancy. However, it should be noted that deaths in older populations contribute less to overall life expectancy than those in younger populations. A senior official at PHE said, 'A range of factors can push up the number of deaths in older people in a particular year. An outbreak of influenza can have a big impact, especially on those who are most vulnerable or experiencing other illnesses, such as dementia... An increase in deaths will generally lead to a decrease in life expectancy that year, but we have seen these annual fluctuations before and the overall trend has remained positive'.[23] The title of another paper, analysing this increase, included the phrase 'influenza the likely culprit'.[24] An official from the ONS said 'A major cause behind the rise was the influenza virus, with estimates showing that the influenza vaccine was not as effective this winter compared to previous years'.[25,26] This explanation was contested by some others, including the three authors of this paper, who questioned whether deaths directly or indirectly due to influenza at that time could account for more than a small fraction of the observed increase in overall deaths.[27] The chief executive of a charity representing older people said 'Even discounting the impact of the flu, the figures are still far higher than in the previous year'.[28] Unfortunately, none of the concerns raised gained traction with those in authority, including the government and most of the leading think tanks close to the government.[29]

Advocates for the major role of influenza could highlight its contribution, along with other respiratory diseases, to the declines in life expectancy in several European countries in 2014/15.[1,30,31] However, the following year (2015/16), the UK and USA were the only countries not to see substantial gains in life expectancy in an analysis of 18 high-income countries, suggesting that other factors were at play.[6] Others contended that what transpired in England and Wales could be anticipated, given the unusually rapid improvements in the first decade of the 21st century. In other words, the rate of progress was returning to 'normal' after exceptional acceleration due, in part, to reductions in cardiovascular disease mortality.[32–34] However, a review of a longer time series found that while the first decade of the 21st century was unusual, the slowdown in the second decade saw rates of improvement fall below previous levels, with some rates turning negative.[35]

In summary, by the latter part of the 2010s, it became clear that the 'spike' in deaths in 2014–15 was part of a longer-lasting stagnation and, for certain groups, marked a reversal in mortality trend improvements.[36,37] Over time, the argument that austerity measures have had a detrimental effect on health has gained traction.[2,4,5,35,38–44] This includes research that has shown how the increase in excess mortality at local authority level correlates with the impact of welfare reforms (cuts), but not deprivation (poverty)[43], and an association between reductions in funding allocations by central government and adverse changes in life expectancy,[5] also noting that the reductions were greatest in the most deprived areas.

What is unknown or contested?

Despite the wealth of evidence linking austerity to worsening health outcomes, some seek to explain the observed effects as largely, or almost entirely, due to influenza—an increasing body of research has challenged this particular viewpoint.[40,41,45–47] This includes decomposition analyses that show influenza per se did not contribute significantly to the deteriorating trends in life expectancy. Yet, influenza continues to be invoked to explain why the UK fares so poorly compared to neighbouring countries.[1,37,48,49] A PHE review of mortality trends in England presented age-standardized mortality rates and decomposition analyses of selected causes of death from 2001 to 2016 for both sexes, showing large and relatively continuous improvements in mortality rates from influenza and pneumonia.[1] Despite this contrary evidence, the report stated that 'there is a considerable body of evidence, both for England and across Europe, besides what is reported here, which provides evidence that respiratory diseases, including influenza, are leading contributors to levels of excess mortality in recent winters'. To date, this appears to remain the official view. Ramsay et al. performed decomposition analyses in Scotland using data up to 2017. While they noted an increase in deaths due to influenza and respiratory causes in the most recent years, they also demonstrated that this increase made only a small contribution to the stalling of life expectancy improvements.[45] Furthermore, their analyses showed that mortality had worsened across various age groups and causes of death, leading them to conclude that it is unlikely one 'single factor' could explain the change in trends.[45] Even if influenza was responsible for the observed changes, the question remains as to why the UK seems to experience higher mortality levels during epidemics than other countries. The COVID pandemic may provide insights, including the exclusive focus on influenza in preparedness exercises.[50,51] Given a novel virus in a population not previously exposed, the immediate cause among those so affected was the SARS-CoV-2 virus, poverty and service provision played an important role in mortality risk.[52]

What this paper adds

This paper aims to contribute to the existing body of evidence for England and Wales by (a) adopting a broader perspective on influenza-related deaths and (b) extending the time series up to 2019, before the onset of the COVID-19 pandemic in 2020. Finally, it seeks to understand why influenza was widely accepted as the primary cause of the observed changes and why there was, to a large extent and remains to be, an official denial of the role of austerity.

Methods

We use publicly available ONS cause of death (by ICD-10 code) data and mid-year population estimates to describe patterns of age/sex standardized death rates from 'influenza' between 2001 and 2019 for England and Wales treated as a single geographical area. The ICD-10 codes for influenza alone are insufficient to ascertain the true number of influenza deaths, given that not everyone with influenza will be tested and it may be a contributory factor to a death from other causes. Consequently, we follow conventional practice in combining the codes for influenza (J09–J11) and pneumonia (J12–J18).[53,54] Second, we use a bespoke dataset, i.e. a user-requested dataset from the ONS (The dataset includes numbers of deaths due to and involving influenza or pneumonia by 5-year age group for England and Wales, 2001–21.), which includes both deaths *due to* and *involving* influenza and pneumonia (The ONS describes this difference as: 'We use the term "due to" a cause of death (e.g. influenza) when referring only to deaths with that underlying (main) cause of death. We use the term "involving" when referring to all deaths that had the cause mentioned anywhere on the death certificate, whether as an underlying cause or contributory factor' (ONS, 2022).).[55] Third, we include additional analyses to broaden the classification to include other codes that might capture influenza deaths. These are shown in Table 1, henceforth referred to as 'influenza and influenza-like disease'. Finally, to account for the changing population composition, we calculated age-standardized mortality rates and ratios using the European standard population.[56]

Data availability

No new data were generated or requested as part of this manuscript. All data analysed are publicly available from the ONS at the given references.

Results

Mortality from influenza (ICD-10 codes J09-J11 inclusive)

Figure 2 shows the age-standardized mortality rate (ASMR) per 1000 people per year where influenza is directly coded as the underlying cause of death (ICD-10 codes J09-J11). This shows that influenza deaths were low until 2017, rose in 2018 and

Table 1 ICD-10 codes used for a broader analysis of 'influenza and influenza-like disease'

Code	Description
J09–J18	Influenza and pneumonia
J40	Bronchitis, not specified as acute or chronic
J41	Simple and mucopurulent chronic bronchitis
J42	Unspecified chronic bronchitis
J44	Other chronic obstructive pulmonary disease
J47	Bronchiectasis

remained higher than in 2019. This relatively high level of mortality from influenza coincides with the lowest all-cause age–sex-adjusted mortality in England and Wales on record (see Fig. A and Table B in the supplementary material for additional information).[57]

Mortality from influenza and pneumonia (ICD-10 codes J09–J18 inclusive)

Next, we present mortality from influenza and pneumonia, where either term was listed as the main *or* contributory cause of death (The ONS describes this difference as: 'We use the term "due to" a cause of death (e.g. influenza) when referring only to deaths with that underlying (main) cause of death. We use the term "involving" when referring to all deaths that had the cause mentioned anywhere on the death certificate, whether as an underlying cause or contributory factor' (ONS, 2022).). These bespoke data were not available disaggregated by sex. Figure 3 shows deaths per 1000 population (calculated using the mid-year population estimates by single year of age for England and Wales) from 2001 to 2019. It demonstrates a sustained downward trend, most obviously in the oldest age groups. Although the largest fall is for the oldest groups, when the graph is drawn on a log scale, in which equal vertical distances between lines represent equal percentage changes (see Fig. F in the supplementary material), this fall was similar in relative terms across all age groups. Figure 3 also demonstrates that 2019 saw the lowest number of deaths involving and due to pneumonia and influenza for those aged 70 and over. Conversely, this corresponds with a period of higher mortality in quarter 4 of 2019 in England compared to the previous five years for men and for all years except 2017 for women (see Table C and D and Figs G and H in the supplementary material and the work of Li et al. on the likely rise of influenza in late 2019 and early 2020 in the UK).[58]

Mortality from influenza and influenza-like disease (ICD-10 codes)

To further compensate for undercounting of influenza deaths, we present the data on trends in mortality rates from influenza and influenza-like disease using all the ICD-10 codes listed in Table 1, from 2001 to 2019 by age group and sex (Fig. 4). There was a spike in deaths in 2015 in both sexes in age groups 80–84 and 85+. However, this can be seen as causing only a small perturbation in overall influenza declines over this period in older age groups, among whom overall mortality was stagnating or worsening. At younger ages, the rate of decline either plateaued or transiently reversed. Still, the rates were so low that the small perturbation is unlikely to have had any significant effect on overall trends. Figure 4 also shows that the 2018 and 2019 increases in deaths directly attributed to influenza (Fig. 2) were not part of a wider increase in deaths from all influenza-like diseases (see Figs B to E in the online supplementary material for the longer-term trends).

Age-standardized mortality rates for influenza and influenza-like disease

Figure 5 combines the age-specific data in a summary age-standardized mortality rate, presenting trends in males and females from all influenza and

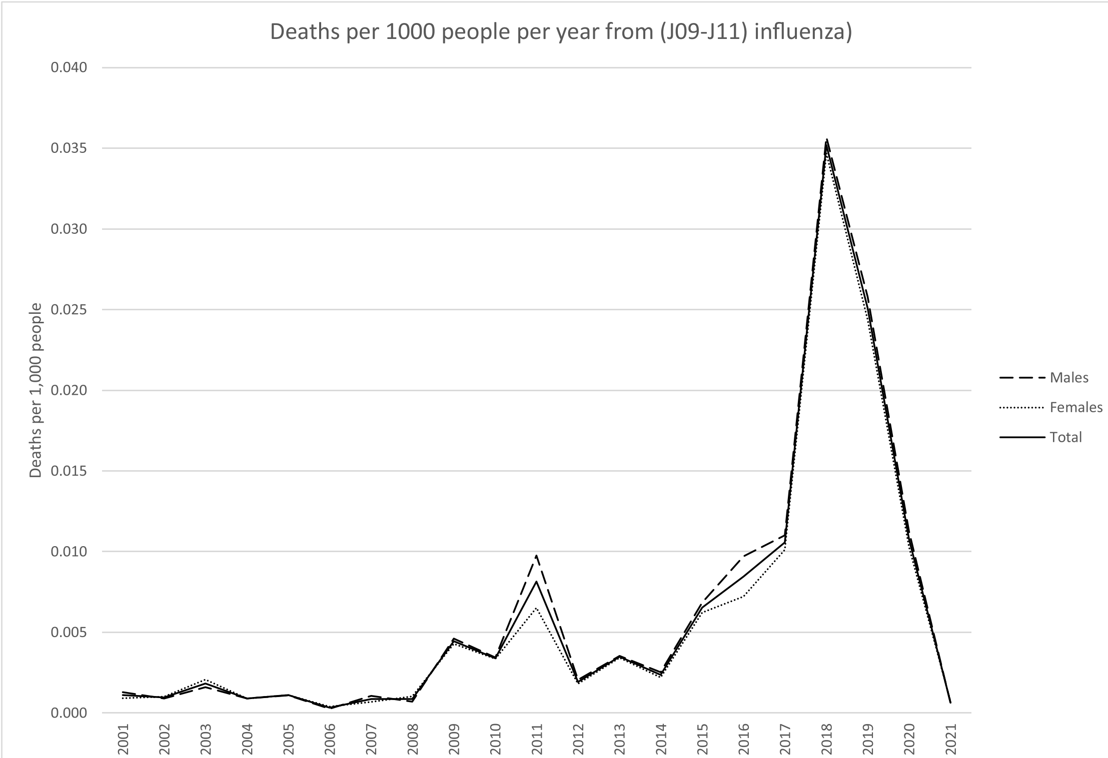

Fig. 2 Mortality from influenza (J09, J10, J11) per 1000 people, 2010–21, in England and Wales, directly standardized to the 2013 standard European population.

influenza-like disease. The increase observed in 2015 represents an increase of 12 deaths per 100 000 men and 11 per 100 000 women. Figure 2 reveals that <0.5 deaths per 100 000 deaths were directly attributable to influenza in most years between 2001 and 2021. In 2018 and 2019, it was slightly higher than 2 deaths per 100 000 people per year. A further important observation is that there were 79 male deaths and 60 female deaths per 100 000 in 2021 when almost no influenza virus was circulating in England and Wales. This helps to confirm what many people working in this area have long known: that the large majority of deaths falling within this broader category are not, in fact, due to influenza.[59]

Discussion

Areas of agreement

We demonstrate an overall decline (an improvement) in mortality in older age groups from influenza in both sexes from 2001 to 2019 in England and Wales, in contrast with the concurrent stalling of improvements and worsening of all-cause mortality. This is consistent with existing research critically appraised in McCartney et al.'s 2022 report, which concluded that 'influenza is unlikely to have been an important cause of the stalled trends in mortality improvements'.[40] McCartney et al. cited existing decomposition analyses showing that influenza and pneumonia made minimal and/or positive contributions,[1,45,47] that the stalling impacted all ages (not just older groups as would be expected with influenza mortality)[1,45] and that there was no increase in GP consultations for influenza-like illness or hospital admissions due to influenza.[1,60] Analyses up to 2017–18 reported that, while variation over time in influenza did contribute to annual fluctuations in mortality, its impact and that of other respiratory infections during the period in question was no greater than in

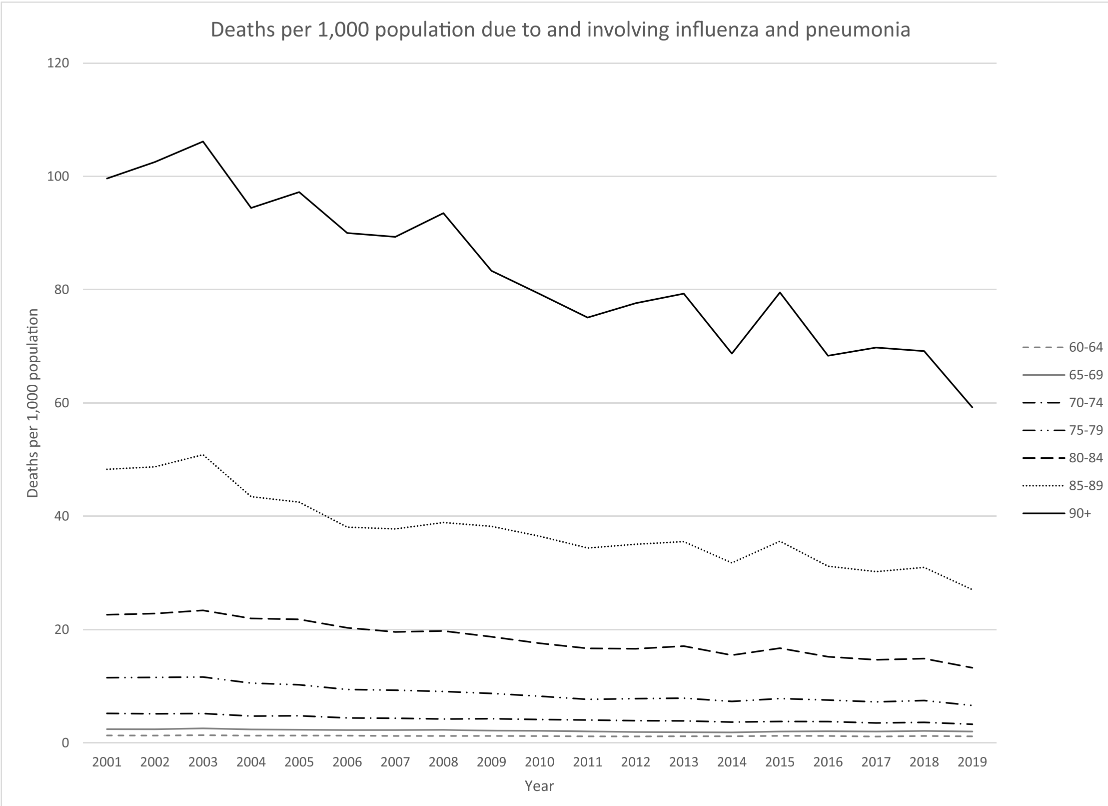

Fig. 3 Deaths per 1000 population due to and involving pneumonia and influenza by 5-year age group, England and Wales, 2001–19. Source: ONS, 2022.[55]

previous periods and should not impact longer-term trends.[27]

Strengths and weaknesses of the study

This study reports new analysis of the most recent data and we go beyond existing evidence, countering the claim that influenza played a significant role in the stagnating trends in mortality seen in England and Wales in the second decade of the 21st century. It is known that narrow codes—i.e. J09–J11 only—will undercount influenza deaths. Figure 2 highlights that when a new strain of influenza appears and is detected by analysis of viruses in hospitals, that is then reflected in the increased use of particular ICD-10 codes resulting from the change in notifications on death certificates. For example, in the UK in 2009, the code J09 was first used to code deaths when a new strain of influenza—H1N1—was detected (H1N1 caused the so-called swine influenza pandemic, which the World Health Organization (WHO) defined as taking place between June 2009 and August 2010, after which it became endemic and was given its own ICD10 code, J09, which had not been used in the UK before that date.). Although the number of deaths was extremely low, it might account for the slight reported overall rise in 2009 and 2012 because of improved virological surveillance and thus better identification of cases and because more testing was being done in the light of knowing about the new strain.

We extend beyond existing analyses focusing on deaths due to influenza and pneumonia to include those involving related diseases. The limitations

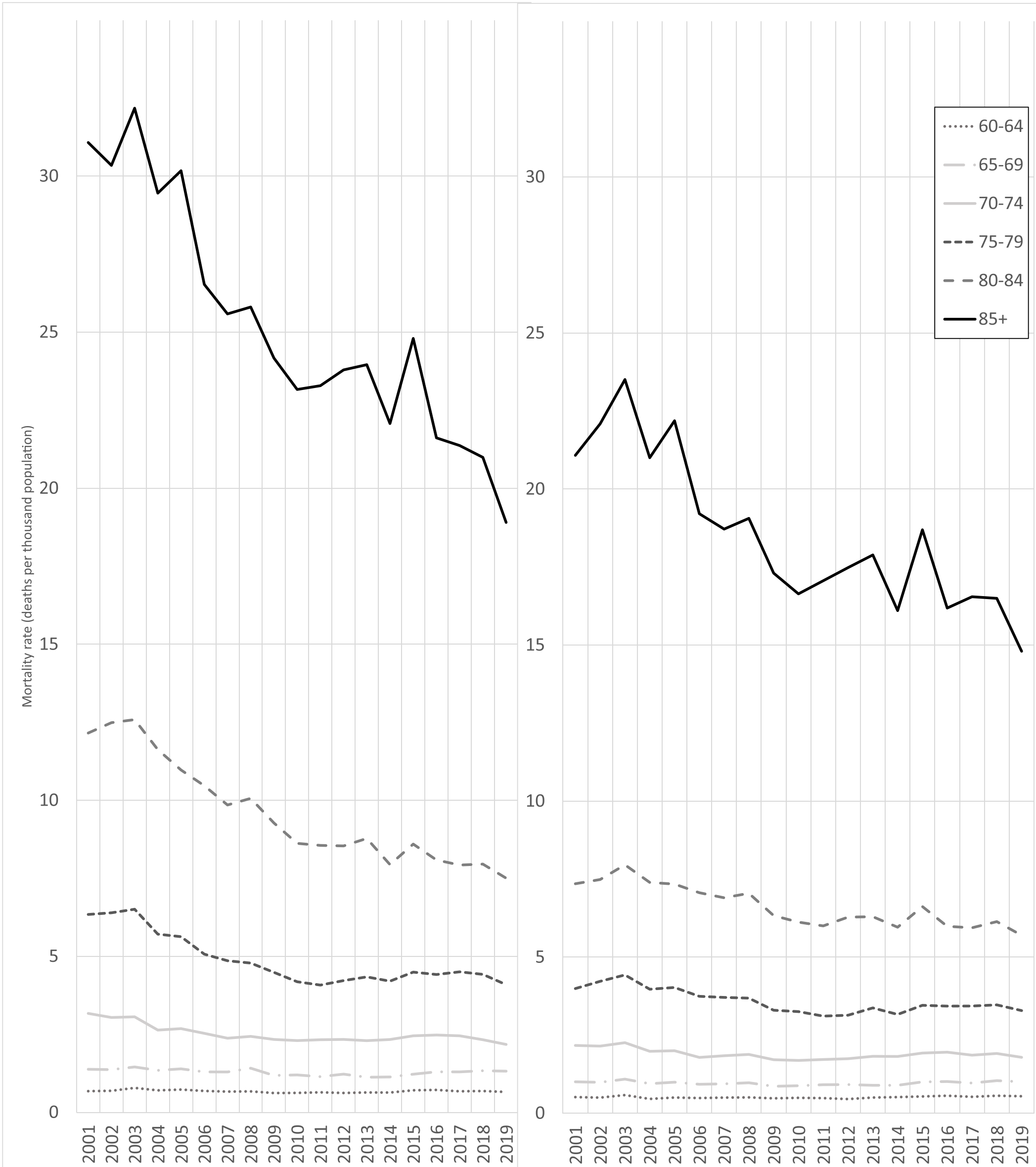

Fig. 4 Mortality rate (deaths per 1000 population) from influenza and influenza-like disease 2001–19 by age group for males (left) and females (right), England and Wales

lie within the challenges of assessing influenza deaths, which are well established. Underreporting of deaths from influenza is widely acknowledged, yet overreporting is not,[1,40] and an important limitation is that, despite the mitigations outlined in the results and methods section of this paper, some deaths involving influenza might still have been missed while others that should not have been included may have been. Including pneumonia could overestimate influenza deaths. Pneumonia is a far more common recorded cause of death than influenza,[55] and most deaths from pneumonia are not caused by or involve

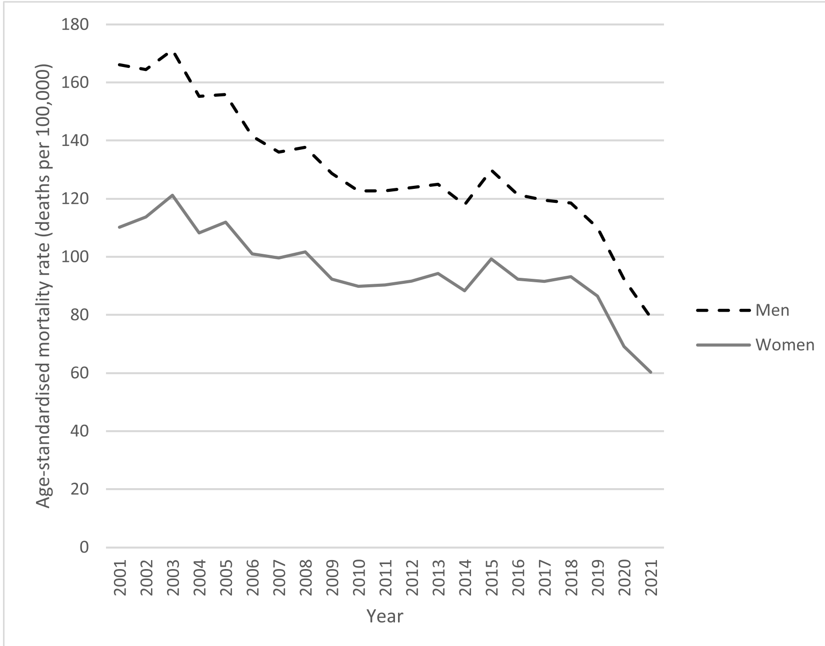

Fig. 5 Age-standardized mortality rate, deaths per 100 000 population, for influenza-like disease, males and females in England and Wales 2001–21. Note: deaths due to the spread of Sar-CoV2 are not included.

influenza. Furthermore, many other commonly circulating respiratory viruses will contribute to these figures.

A further limitation is that deaths from other diseases, particularly cardiovascular disease and dementia, both of which increased during the period in question, could have been expedited by a person also suffering from a respiratory infection, including, but not limited to, influenza, and these would also not have been captured.[40,61] The link between acute respiratory infection and cardiovascular disease mortality has long been established,[61–64] with an increasing understanding of the causal pathways involved.[65] However, there is no clear evidence that specifically implicates influenza as the most often involved infectious agent.[12] Similarly, while influenza is not known to cause dementia, individuals living with dementia are more susceptible to poor outcomes from respiratory infections. Yet, the extent to which a respiratory infection might provoke deaths from cardiovascular disease or dementia/Alzheimer's disease remains unknown. Conversely, a small study conducted in two teaching hospitals in New York City, USA, retrospectively reviewed all deaths with pneumonia or influenza as the cause of death and found that more than one-third were, in fact, due to heart disease or dementia/Alzheimer's disease.[66]

Areas of controversy

Our review of the data up to 2019 is consistent with existing evidence that influenza was not the primary, or even an important, explanation for the stalling life expectancy in England and Wales from 2012 onwards. This leads to the critical question: why were so many experts across government, public health bodies and think tanks so quick to accept influenza as the leading cause of the changes in mortality and so slow to change their minds when confronted with information to the contrary? We surmise that there are, at least, three possible explanations: first, a longstanding tendency to use influenza as, in effect, a default explanation when deaths increase; second, a reluctance to engage with the political choices that lead to poor health; and third, the active promotion of competing narratives.

Influenza as a default explanation when deaths increase

Why did many experts accept influenza as the cause of worsening mortality? Historically, there is a precedent for misattributing a substantial rise in deaths to influenza. Ascribing excess mortality, especially at older ages, to influenza was commonplace after 1889.[12] After an influential working paper was published by Serfling in 1963,[67] this tendency became systematized, and influenza began to be blamed for most excess deaths each winter. Attempts to assess the 'virulence' of different circulating strains of influenza and their impacts on the population were, and often still are, based on overall rises in winter mortality.[68,69] Over time, the identification and increased understanding of many more viruses has shown that many are implicated in respiratory disease—not just influenza.

There were influenza pandemics in 1918/19, 1957, 1968 and 1977 and smaller ones (There was probably at least one pandemic between 1919 and 1957, but our means of detecting the influenza virus were in their infancy then, with the virus only having been identified in the 1930s.).[70] In between the pandemic years, there was a tendency to ascribe excess winter deaths to influenza. One example is London in 1952 when influenza was initially blamed for a large rise in mortality. While this is understandable given there was what was thought to have been an influenza epidemic in 1951,[71] but with the benefit of hindsight, as far as we can currently ascertain, the 1952 rise in mortality in London was caused mainly by what has been called the 'great smog'.[72,73]

The argument linking recent mortality patterns to influenza draws extensively on two data sources, EUROMOMO and FLUMOMO.[30,74] These report weekly trends in excess mortality across selected European countries. However, both measures have important limitations. EUROMOMO presents the Z scores for data on all-cause excess deaths scaled by their standard deviations. If the natural variability of death rates is lower in one country than another, then this could exaggerate excess mortality compared to what would be seen using P scores, as is done by the Financial Times, so, strictly speaking, the measures are not comparable across countries.[75] FLUMOMO considers any deviation from baseline to be due to influenza or extreme temperatures, but it has been argued that it excludes other important variables.[76]

The tendency to ascribe excess winter deaths to influenza is not helpful. It diverts attention away from the danger of actual pandemics of new strains or the return of an older strain to a young population without immunity. It also diverts attention from other respiratory diseases—had modern medical techniques not existed in 2020, it is possible that the COVID-19 pandemic would have been called an influenza pandemic.

Insufficient caution is applied in attributing deaths to influenza without microbiological evidence to support it. It is noteworthy that the UK surveillance system did not detect any significant changes in influenza between 2010 and 2022 (See Figure 22 available at: https://www.gov.uk/government/statistics/annual-flu-reports/surveillance-of-influenza-and-other-seasonal-respiratory-viruses-in-winter-2021-to-2022#microbiological-surveillance (accessed 19 June 2023)).[77] Given the evolving nature of respiratory viruses and the crumbling of an under-funded, over-worked health service, this will become increasingly important in both planning and decision-making, mainly come winter 2023/24 and the winters that follow in the UK with its severely depleted public health and care services, and officials still all too willing to blame 'the flu'.

A reluctance to engage with political choices that lead to poor health

Writing in 2023, there remains a need for acceptance of the negative impacts of austerity. This study contributes to the existing evidence by refuting claims that influenza is one of the main causes of the deterioration.[27,40,45,47] On their own, the observed changes in cause-specific mortality that we have described do not allow us to invoke austerity as playing a role, but nor do they allow us to exclude it—that requires other evidence.[78–81] It is, however, intuitive that anyone already living in deprived circumstances will be at greater risk from health and social care cuts, as laid bare by the COVID-19 pandemic,[52] and this would also likely be the case if an actual influenza pandemic or epidemic took hold and then rapidly spread across the country. As the health services already cannot cope in most winters, an influenza pandemic could be devastating. This is especially the case given an ageing and increasingly impoverished population suffering from the effects of cost-of-living crises, including not being able to heat many homes. Misattributing rising mortality to influenza could have unforeseen detrimental effects in the event of an actual influenza pandemic.

It is difficult to justify the almost total rejection by Conservative politicians of the idea that austerity played a role. Yet this is what has happened. In 2017, in response to our publications examining potential causes for the 2014–15 rise in mortality, including influenza, and calling for urgent investigation into the link between health and social care cuts,[19,20] a Department of Health spokesperson said 'This report is a triumph of personal bias over research – for two reasons. Every year there is significant variation in reported excess deaths, and in the year following this study they fell by nearly 20,000, undermining any link between pressure on the NHS and the number of deaths. Moreover, to blame an increase in a single year on "cuts" to the NHS budget is arithmetically impossible given that budget rose by almost £15bn between 2009-10 and 2014-15'.[21] That publication was met with criticism and scepticism by others, perhaps appropriately given the focus on one year-on-year change.[82–84] However, there was a growing realization that what had just occurred was more serious than first realized and represented the early stage of a reversal of the previous long-term improvements.[85] Nevertheless, the architects of austerity (including the current Conservative government) still do not appear to accept that it had any adverse health impact.[86]

In 2022, Walsh et al. published research linking 'over 330,000 excess deaths in Great Britain' to austerity.[87,88] This was debated in the House of Lords in early 2023, with the then parliamentary under-secretary of state at the Department of Health and Social Care, Lord Bethell. While Lord Bethell did acknowledge that the rate of improvement of life expectancy had stalled, when asked '... [if the government] accepted that austerity policies since 2010 was a significant cause. This argument was rejected by Lord Bethell'.[89] The debate went on: 'Lord Kirkhope of Harrogate (Conservative) asked the government what it thought the explanation was for this change, querying whether it might be the result of a change in the methodology used to assess life expectancy or a result of changing social habits among the population. Lord Bethell said the reasons for the change were complex and that he could not give an answer that addressed every element of this problem. However, he said behaviour was a factor, noting the high levels of obesity in the UK'.[89] One study that has looked at this in detail finds that, at most, 20% (male) and 35% (female) of the stalling mortality between 2017 and 2019 could be attributed to obesity, and these figures are likely overestimates.[78] Moreover, evidence links austerity, specifically cuts to early childhood services, to increased childhood obesity in England.[90] This denialism of the effects of cutting public health and social care services can also be seen in how the advocates of austerity have refused to accept that it played a role in the UK's poor response to the COVID pandemic despite the extensive evidence to the contrary.[91]

A frequent rebuttal to research linking austerity to worsening health outcomes is an epidemiological one—asserting that observational longitudinal data cannot provide evidence of causality. This argument was used in published criticisms of a 2017 paper linking health and social care cuts with 120 000 excess deaths.[92,93] While this point has merit, the criticism is weakened by study after study reporting the same findings despite using different data and approaches and by how many of the studies invoking austerity are very robust, employing panel regression methods to account for time-invariant confounding, series of sensitivity analyses and checking for possible confounding by using different measures of austerity.[2,38,39] The evidence invoking influenza is also observational, but that has not prevented it from being used. This suggests that different evidence thresholds are being applied to other hypotheses, suggesting that personal, ideological or institutional biases towards 'safer' and 'depoliticized' explanations may play a role. We have also shown previously how the argument invoking austerity meets Bradford–Hill's criteria for causality.[94] This begs the greater question: at what point does the evidence for the cuts have led to shorter lives become overwhelming?

Many public bodies still refuse to accept the negative impacts of the cuts on health. Influenza, then, may perhaps be considered a convenient and well-tested excuse for an increase in deaths. A concentration on influenza as a possible cause for worsening mortality provides an off-the-shelf excuse for governments wishing to divert attention from things they can more directly control.

Active promotion of competing narrative

We have shown how faced with clear evidence of worsening health linked to austerity, politicians and others were promoting a competing narrative that emphasized a mixture of artefact and influenza. This was largely successful, and, until relatively late in the day, there was little serious discussion about the austerity causing earlier deaths issue in policy circles. How did this narrative take hold?

Narratives are powerful storytelling tools that shape how policymakers and the public perceive and understand certain issues. They are established and maintained in several ways. The first is the framing chosen for the issue.[95] In this case, it was a frame that included artefact and influenza and which excluded austerity. Other examples in public health include how problems arising from consumption of harmful substances, like tobacco[96] or gambling,[97] are framed by their producers as a matter of individual responsibility so as to exclude measures such as restrictions on marketing or availability from the policy discourse. The second is the media. With a few exceptions, the British print media is unsympathetic to anything that would increase the state's role (pejoratively referred to as the 'nanny state')[98] or the taxes paid by its readers. The third is the role of advocacy groups and interest organizations. Although their activities usually take place in the shadows (a rare exception was the attention they attracted as advocates of the short-lived and catastrophic policies of Prime Minister Liz Truss in 2022), their influence is substantial. A cluster of well-connected organizations, co-located at 55 Tufton Street, London and a few nearby addresses,[99] have mounted sustained attacks on critics of austerity, even though these critics include Nobel laureates and United Nations Special Rapporteurs.[100] Importantly, there was no strong countervailing narrative from the leading health thinktanks. This is unsurprising as they had been unwilling to take a firm stance over the introduction of the 2012 NHS 'reforms' in England, now widely accepted as having been misguided, even by the then Prime Minister, David Cameron, in his memoirs.[101] However, such public bodies and some academics face a difficult balancing act. They may depend on access to ministers, access that can easily be cut off should they be seen to be critical. They may depend on government funding, sponsorship or approval to do their work. As a 1993 paper noted, 'Think tanks face tactical dilemmas when pressing their views on Britain's comparatively closed system of government, in particular their choice between insider and outsider forms of persuasion; the tension between proximity to ministers and intellectual autonomy; and their advantages to politicians as deniable sources that can float new ideas, which can be counter-balanced by politicians' fluctuating appetite for radical ideas'.[102] Future research could usefully explore the role that these factors played in promoting influenza in the face of growing evidence that challenged it.

Unanswered questions and future research

Influenza did not cause the stalling and worsening mortality trends in England and Wales from 2012 onwards, which continue to the present day. Given the evidence of the greatest impact of austerity on those living in deprived areas,[4,5] a next step will be to examine these trends by deprivation decile. Future research may also explore why so many people in such high positions of authority were so quick to attribute the change in overall mortality trends to influenza and were slow to correct this later and why, to this day, the negative impacts of austerity on health, not least on pandemic preparedness, are not accepted by its architects, nor by so many of those who have followed them,[86] and why so many people in England and Wales have stood by and watched this failure of government and public health unfold.[103]

Supplementary material

Supplementary material is available at *British Medical Bulletin Journal* online.

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Author contributions

Lucinda Hiam (Conceptualization, Investigation, Project administration, Writing– original draft, Writing– review & editing), Martin McKee (Conceptualization, Investigation, Methodology, Supervision, Writing– review & editing), Danny Dorling (Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Supervision, Validation, Visualization, Writing– review & editing)

Conflict of interest statement

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Supplementary material: Additional data on all-cause and flu mortality trends in England and Wales

Crude number of deaths (all causes) and age-standardised mortality rates over time

Figure A shows the total number of deaths (crude – absolute – the simple count, in grey) and the age-standardised mortality rate (blue line) for England and Wales, 1950 to 2019. It has been drawn using ONS data. The crude number of deaths per year had been steadily falling since the mid-70s, but rose in 2012.[1] The age-standardised mortality rate (ASMR), shows the annual rate of deaths adjusted so as not to be influenced by the ageing population, and reveals that mortality by this better measure also increased in 2012 and improvements stalled thereafter, being higher in 2015, 2016, 2017 and 2018 than in 2014. The lowest ASMR recorded was in 2019.

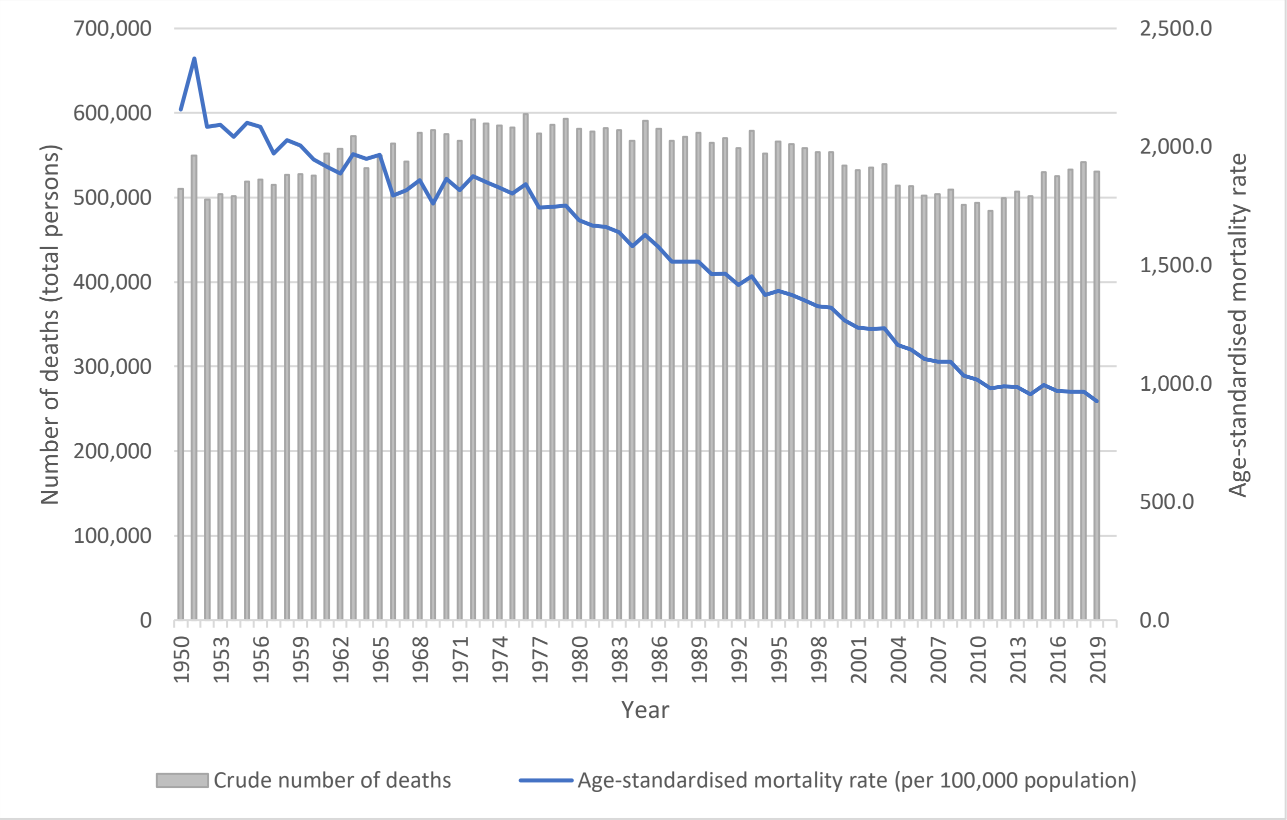

Figure A: Number of deaths and age-standardised mortality rates for total population, England and Wales, 1950 to 2019. Source: ONS 2021[1]

Influenza deaths and age-standardised mortality rates from influenza over time

International classification of diseases (ICD) coding changes over time. Figures B to E, below, show deaths directly coded as influenza, rather than the broader definition of influenza-like deaths, using the codes in Table A.

Table A: ICD codes for influenza 1901-2022 (narrow definition)

Year	ICD version	Code	Description
1901-1910	1	120	Influenza
1911-1920	2	10	
1921-1930	3	11	
1931-1939	4	11	
1940-1949	5	33	
1950-1957	6	480-483	
1958-1967	7	480-483	
1968-1978	8	470-474	
1979-2000	9	487	
2001-2022	10	J09-J11	

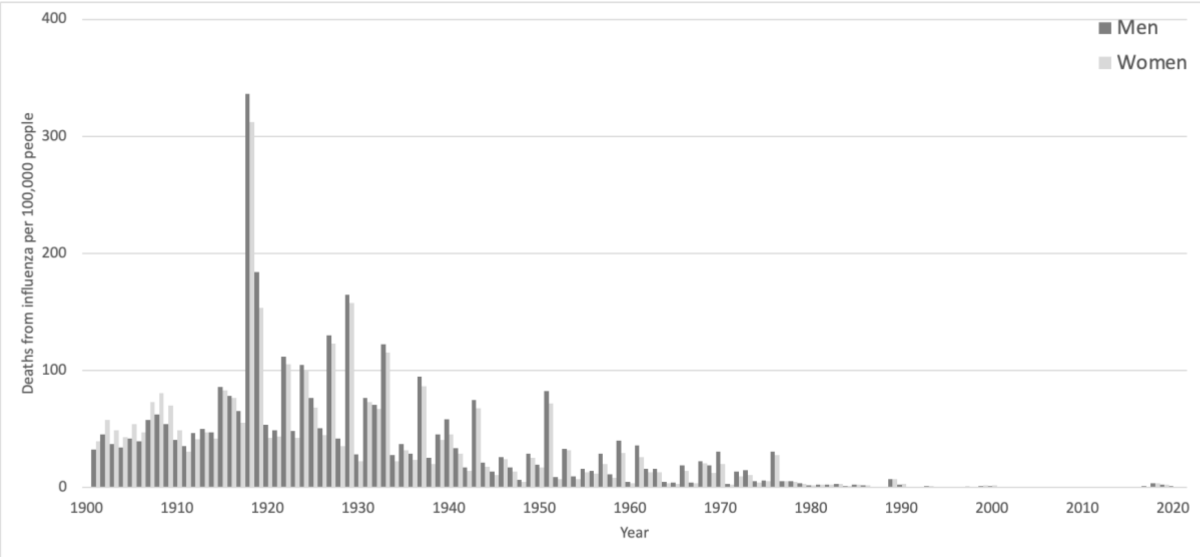

Figure B: Influenza deaths (narrow definition) age-standardised mortality rates for men and women. Source: Source: ONS 20th and 21st century mortality files and Human Mortality Database denominators, calculation by authors, and standardized to the 2013 European population.

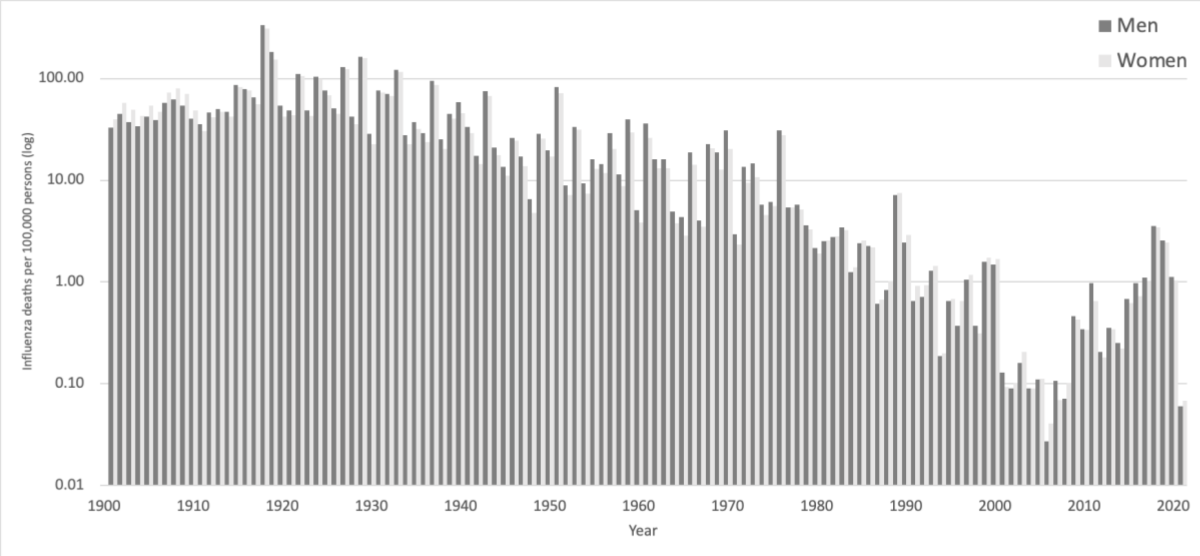

Figure C: Age-standardised mortality rates for deaths from influenza (narrow definition) per 100,000 persons, log scale. Source: As for Figure B

Figure C illustrates that while rates of influenza were increasing between 2007 and 2019, at most, the disease resulted in only 1 extra death per 100,000 people when the rates have been age-sex standardized, and thus influenza in these years could not make a significant contribution to overall mortality trends. Furthermore, as Figure 3 in the main paper illustrates, mortality from flu-like diseases defined more widely, which may have included undiagnosed influenza, was falling over this period.

Table B shows the crude rates of deaths from influenza directly (J09-J11) from 2010 to 2021.

Table B: Mortality from influenza (J09, J10, J11) per 100,000 people, 2010-2021, in England and Wales (not age standardized)

Year	Males	Females	Total
2010	32.3	32.3	32.3
2011	90.2	62.3	76.0
2012	14.8	14.7	14.7
2013	27.2	29.5	28.4
2014	21.3	20.0	20.6
2015	45.7	52.7	49.3
2016	81.2	66.9	74.0

2017	72.2	84.0	78.2
2018	247.3	294.5	271.2
2019	197.6	214.8	206.3
2020	81.7	90.3	86.0
2021	5.4	6.3	5.9

Note that the crude rates in Table B are not age standardized. They vary so much between years, and the age distribution of the population changed so slowly in these years, that such standardization does not alter them greatly apart from their magnitude (see Table 2 in the main paper where the age standardized rates are shown). In the past these rates have been published per million and without age standardisation (see Table 5 in Langford 2002, and Andrewes 1942).[2,3]

The two older publications produce a series of deaths per million which can now be extended to 2021, as shown in Figure D.

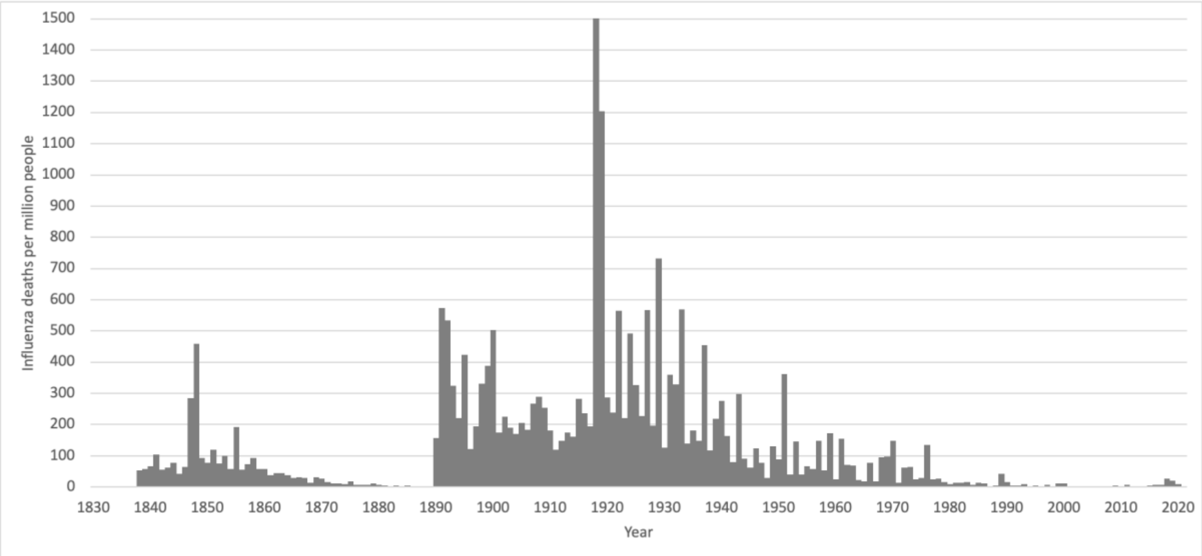

Figure D: Influenza deaths mortality rates per million for both sexes combined, England and Wales, 1838-2021. Source: As for Figure B with additional data from Langford 2002 and Andrewes 1942.

The longer-term trend in deaths solely attributed to influenza is clearer when plotted on a log scale (Figure E). Part of the fall in recent years (in the years since the 1950s) will be as more deaths are attributed to bronchitis and pneumonia, with no mention of influenza, but it is nevertheless interesting to see how similar the fall from 1838 to 1889 was as compared to that seen in more recent times. Drawn on a log scale in Figure E there appears to be a long term pattern to the supposed influenza mortality rate – the basic rate at which people die from what their clinicians have through of as influenza over this very long period.

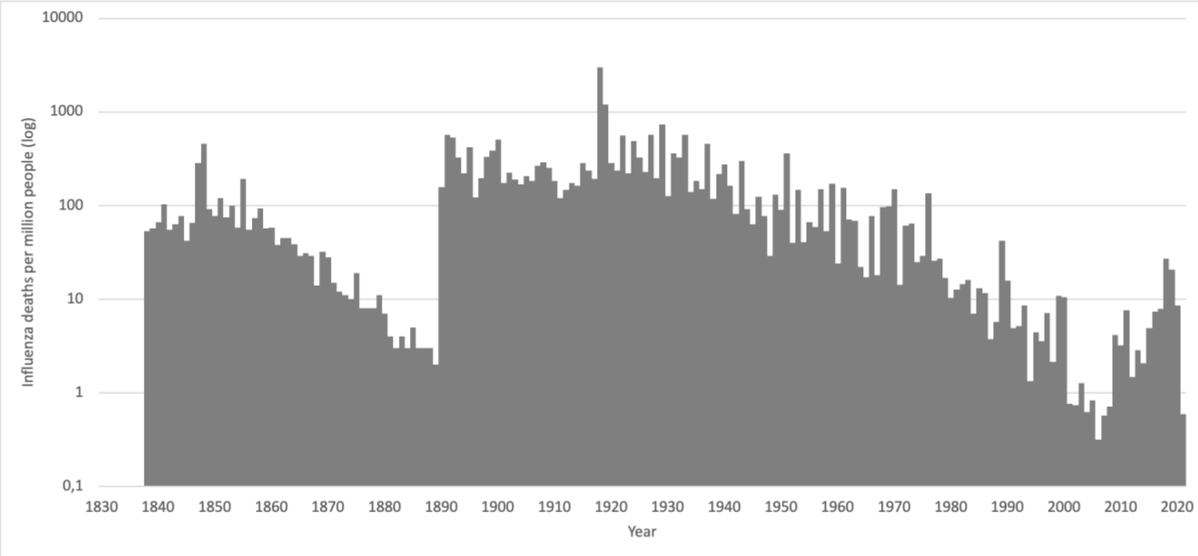

Figure E: Influenza deaths mortality rates per million for both sexes combined, England and Wales, 1838-2021. Source: As for Figure B with additional data from Langford 2002 and Andrewes 1942. Source: As for Figure B with additional data from Langford 2002 and Andrewes 1942.

Figure E shows again that the number of deaths attributed to influenza became too low in the period since 2010 to account for any non-trivial component of the overall rise in mortality in those years, and that this was a part of a long term downwards shift in the relative importance of influenza and what was thought to be a death associated with influenza across this time period in England and Wales. When not standardized by age, the rise is still only an extra 10 deaths per million, or 1 death per 100,000 people per year in 2018 and 2019.

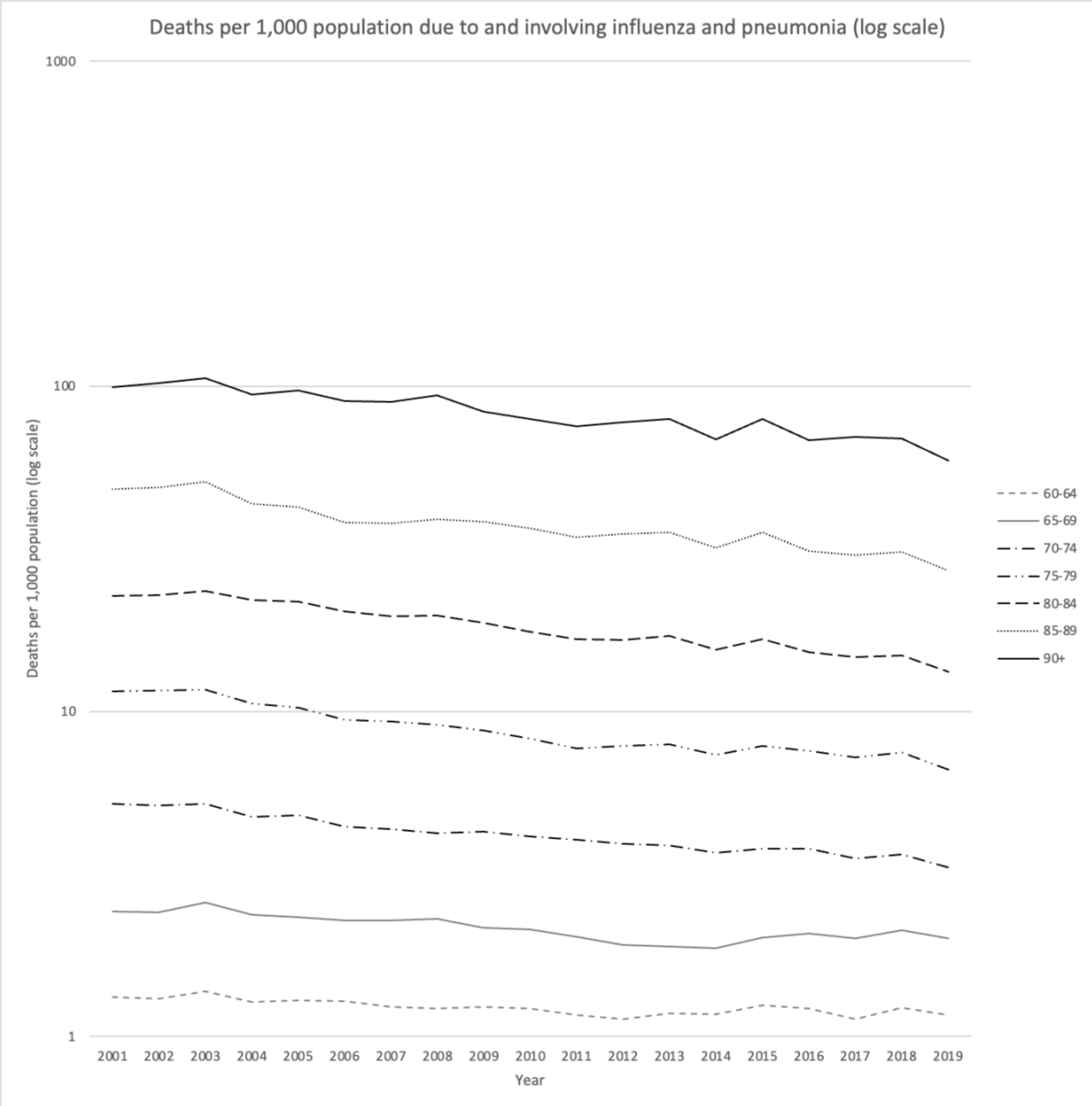

Figure F: Deaths per 1,000 population due to and involving pneumonia and influenza by 5-year age group, log scale, England and Wales, 2001-2019. Source: ONS, 2022

Figure F, which uses a log scale, shows how mortality due to and involving pneumonia and influenza declined overall between the years 2003 and 2019, with a very small temporary rise recorded for older people in 2015, but a flat-lining after 2014 for those aged 65-69. It is possible that the rise in 2015 was as much due to more mortality due to colder weather in January and February 2015 and the health services were extreme stretched at this time. However, the key message from this figure is that influenza cannot have contributed to the stalling and in some cases falling of life expectancy after 2014. It was simply too rare a cause of death – no matter how widely defined.

Excess mortality rates from all causes in England, 2019

Finally, Tables C and D below give the excess mortality rates for men and women respectively in Quarter 4 (Q4) 2019 as compared to Q4 in each of the previous five years by five-year age groups over age 70. These data are also taken from the ONS records.[4] Note these data are for England only at this point. These two tables C and D show that Q4 2019 was an unusual time, with higher mortality rates across all age groups as compared to the previous 5 years for men, and for all age groups and years except 2017 for women. Figures G and H illustrate those two tables graphically. It is noteworthy than in 2019 influenza-like deaths for both sexes in older age groups were at their lowest in the 21st century (Figure 3 in the main paper). Why did mortality rise in Q4 2019 for older men and women in England as compared to the same period in each of the last four years? Perhaps there finally was a little more influenza being prevalent as compared to 2014, 2015, 2016, 2017, or 2018? And maybe something else was in the air – a little earlier than was thought to have been the case? It is worth future researchers looking closely at this time period and the last few months of 2019 in countries across Europe for men and women of older ages and how they did in comparison to the final few months of the previous four years.

Table C: Excess all-cause mortality in Q4 2019, in England: Men, as compared to Q4 in each previous year. Source: Reference table A: Number of deaths by fiver-year age group and sex, England, Registered in Quarter 4 (October to December) 2014 to 2019, ONS 2020.[4]

Age	Q4 2014	Q4 2015	Q4 2016	Q4 2017	Q4 2018
70-74	17%	15%	10%	3%	2%
75-79	6%	9%	9%	7%	10%
80-84	5%	8%	7%	4%	8%
85-89	10%	13%	7%	5%	10%
90 +	18%	19%	11%	8%	13%

Table D: Excess all-cause mortality in Q4 2019, in England: Women, as compared to Q4 in each previous year. Source: As for Table C.

Age	Q4 2014	Q4 2015	Q4 2016	Q4 2017	Q4 2018
70-74	14%	15%	7%	5%	4%
75-79	4%	8%	6%	6%	10%
80-84	1%	5%	4%	4%	9%
85-89	0%	4%	0%	-1%	7%
90 +	4%	10%	7%	5%	12%

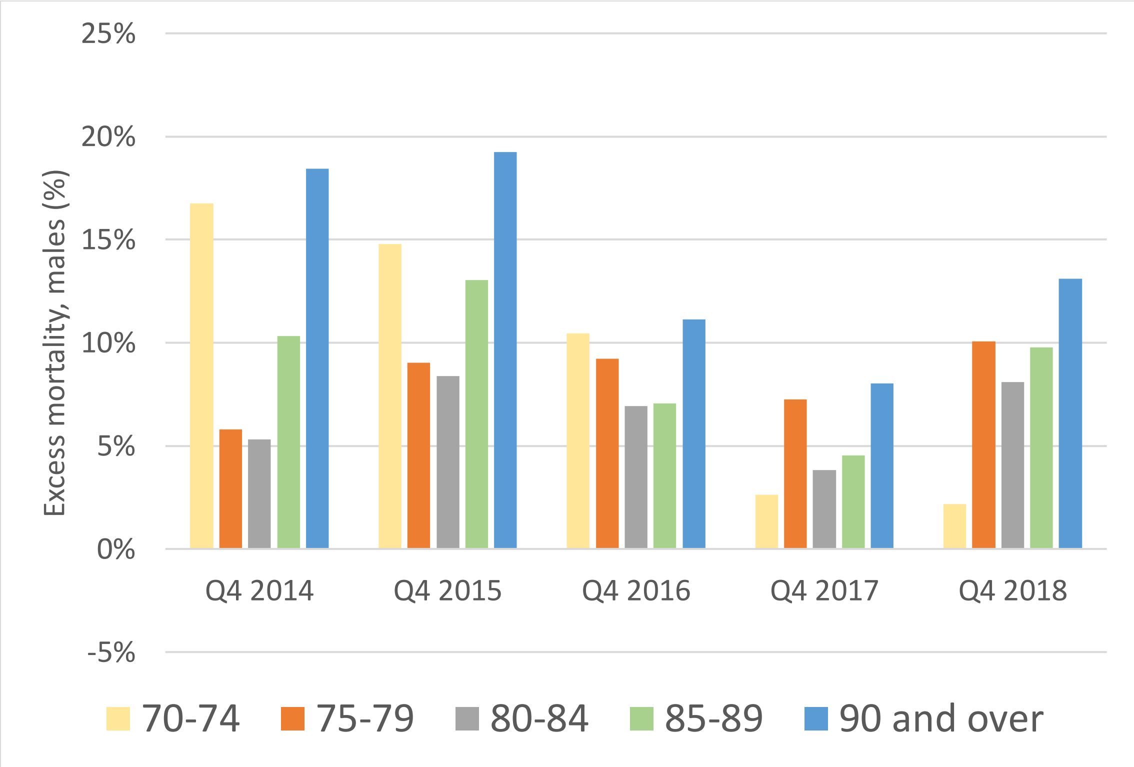

Figure F: Excess mortality for males in England by age in Q4 2019 as compared to each previous Q4, 2014-2019. Source: ONS

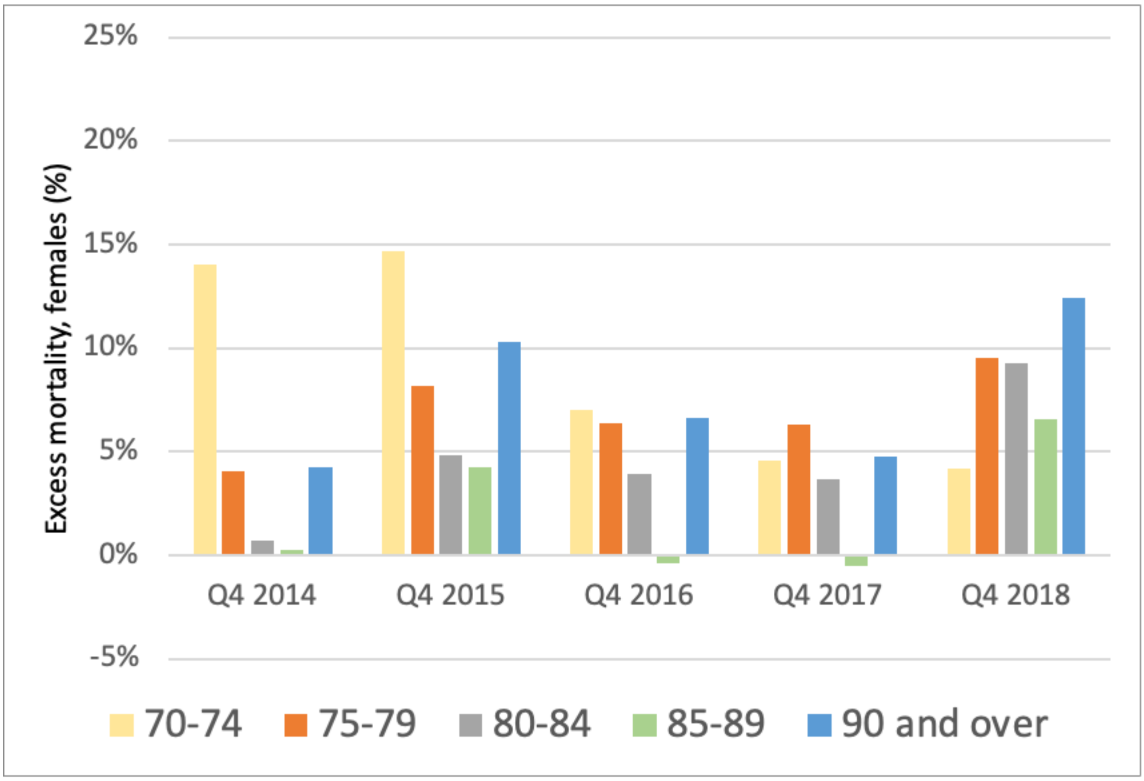

Figure G: Excess mortality for females in England by age in Q4 2019 as compared to each previous Q4, 2014-2019. Source: ONS

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