

## 4.3 Ageing Population and Affordability

### Hotspot Description

The risk that actuaries fail to allow appropriately for changing costs of mortality, morbidity, and certain support systems (e.g. disability and long-term care) due to future experience deviating from projections.

### Current Influences

There is uncertainty concerning the long-term mortality trend, especially post-COVID-19. In addition, as people live longer they are not necessarily in good health, and therefore population ageing leads to increased healthcare costs. Modelling future costs based on projected past statistics leads to uncertain results.

Mental health issues are now more-openly discussed, affording the opportunity for earlier treatment.

The trend from DB to DC pension schemes also means that more people will be responsible for managing their retirement savings throughout old age, and at a time where they may be subject to cognitive decline. The risks of consumers making poor decisions and running out of money in retirement is therefore increasing.

### Key developments and JFAR member regulators' actions during 2020/21

#### Population Mortality

The Continuous Mortality Investigation (CMI) released CMI\_2020 in March 2021, covering

population mortality data up to 31 December 2020. Naturally the COVID-19 pandemic had a significant effect on mortality rates in 2020. In fact, *"standardised mortality rates in England & Wales were on average 12% higher in 2020 than in 2019 as a consequence of the COVID-19 pandemic."*<sup>81</sup>

Ignoring the COVID-19 pandemic, mortality improvements remained positive, but lower than in the recent past: *"Average mortality improvements were above 2% a year for most of 2000-2011, but fell to around 0.5% a year for periods ending in 2015-2019."*<sup>82</sup> As noted:

*"Most actuaries expected some slowdown in mortality improvements as some of the factors that led to the previous high improvements could not persist. In particular, a large part of the high mortality improvements in the decades before 2011 came from reductions in deaths from circulatory diseases, such as heart attack and stroke. As the proportion of deaths from circulatory diseases fell, subsequent reductions could not contribute as much to overall mortality improvements. A higher proportion of deaths are now caused by cancer and dementia, which have shown lower mortality improvements."*<sup>83</sup>

<sup>81</sup> <https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation/cmi-working-papers/mortality-projections/cmi-working-paper-147/mortality-improvements-and-cmi2020-frequently-asked-questions-faqs>

<sup>82</sup> Ibid

<sup>83</sup> Ibid

### Annuitant Mortality

The Continuous Mortality Investigation (CMI) released the latest “16” Series pension annuity in payment mortality tables in December 2020, covering annuity in payment mortality data from 2016 to 2019.

There are (on average) significant socio-demographic differences between annuitants and the general population, the former having lower mortality and higher expected mortality improvements.

### Population Changes

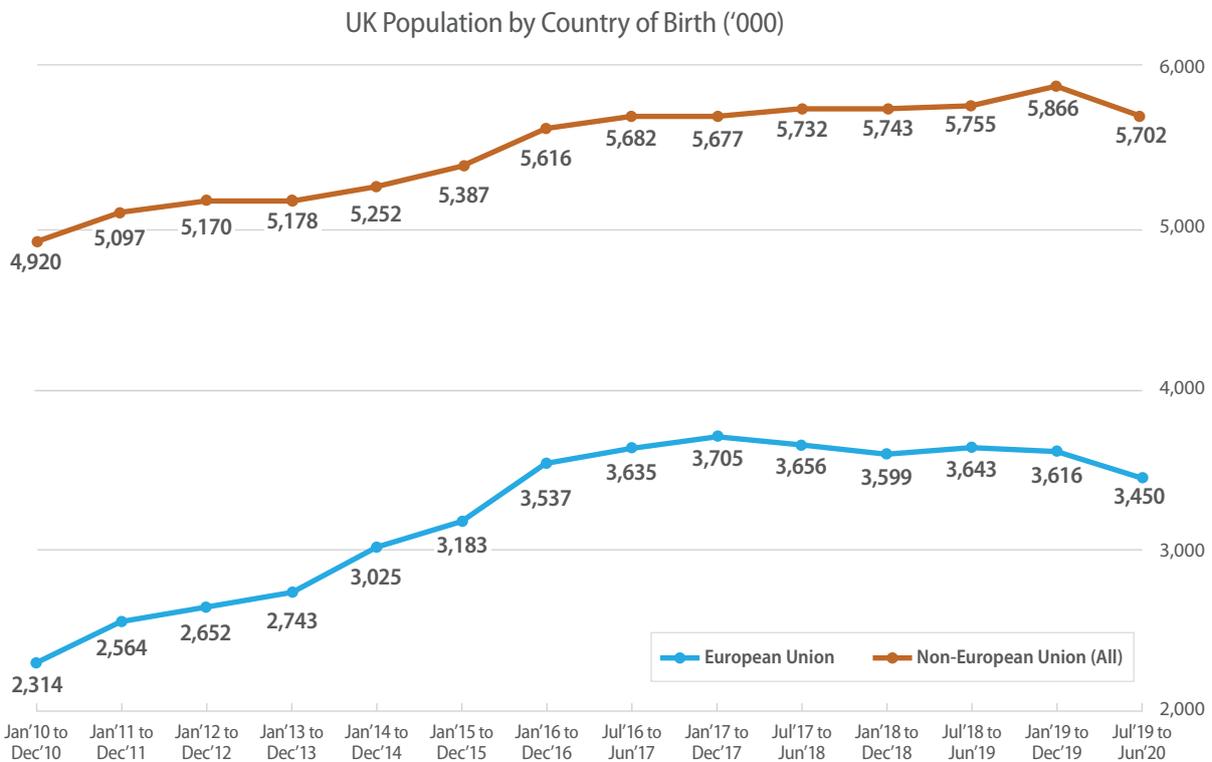
The effects of EU Exit (at relatively lower ages) and the COVID-19 pandemic (at relatively higher ages) has led to a slowdown in UK population growth. The UK population born in the EU is now 7% below the peak. The non-EU born UK population has also fallen.<sup>84</sup>

### COVID-19 Mortality

Most COVID-19 deaths in the UK occurred in older age groups: in the period from mid-March 2020 to mid-March 2021 some 98% of England & Wales COVID-19 deaths occurred in the 50+ age group, and some 89% of England & Wales COVID-19 deaths<sup>85</sup> occurred in the 65+ age group.

The COVID-19 mortality effect on older age groups can clearly be seen below. During each peak some 40% to 45% of deaths in the 65+ age group were COVID-19 related.<sup>86</sup> Throughout the COVID-19 pandemic older age groups have disproportionately suffered higher mortality (both relative and absolute).

Seasonal variations in mortality are expected (generally higher in Winter, lower in Summer). UK government responses (especially ‘lockdowns’) can have quite a profound effect

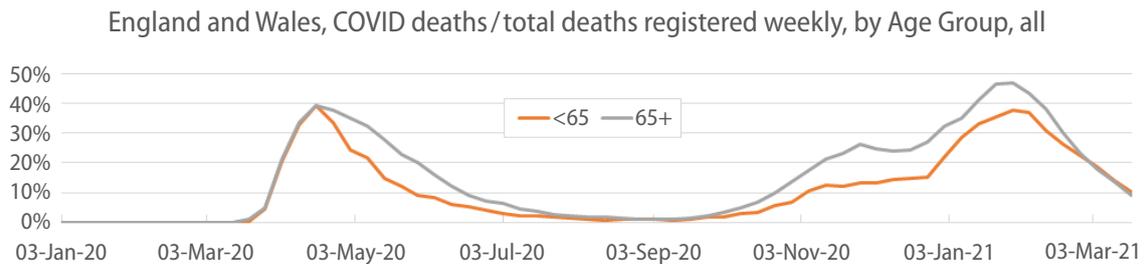


Source: ONS, Population of the UK by country of birth and nationality, Table 1.1

<sup>84</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/datasets/populationoftheunitedkingdombycountryofbirthandnationality> [Table 1.1]

<sup>85</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/weeklyprovisionalfiguresondeathsregisteredinenglandandwales> [COVID-19 - Weekly registrations]

<sup>86</sup> Ibid



Source: ONS, Deaths registered weekly in England and Wales, provisional, COVID-19 - Weekly registrations

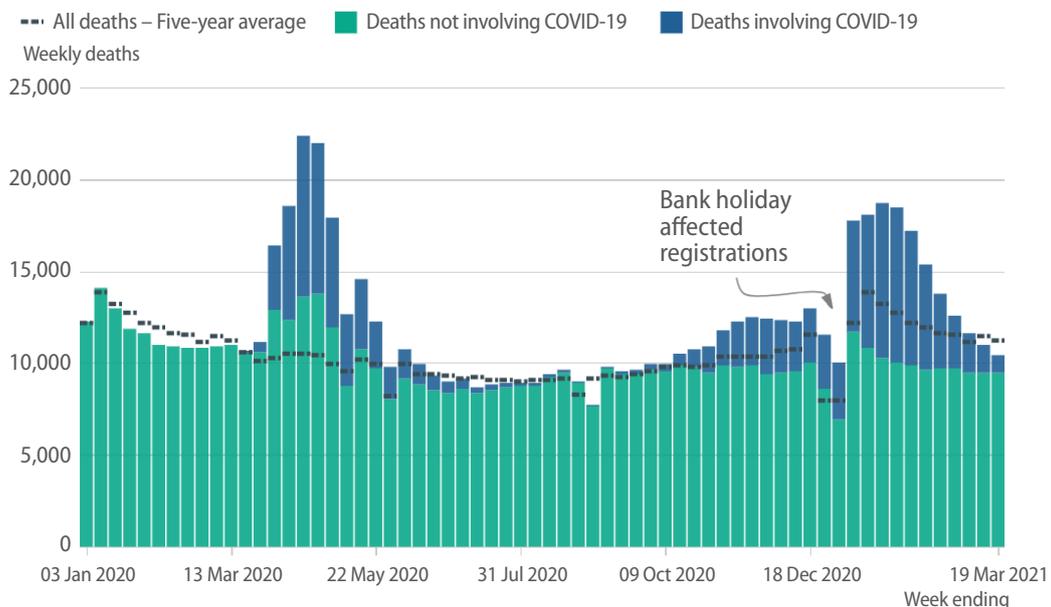
on non-COVID-19 related deaths<sup>87</sup> and this can easily be seen from October 2020 to March 2021 (below).

An alternative measure of the overall impact of the COVID-19 pandemic measures excess deaths (from a normal year e.g. five-year average) only. In this way some positive effects (e.g. less motor vehicle accidents due to the lockdown) and some negative effects (e.g. cancer patients who experience higher mortality as their treatment is delayed) are also captured.

### Future mortality trends

Looking ahead, there are drivers of change that may suggest mortality changes might possibly be adverse. For example, increasing obesity<sup>88</sup> levels (including in childhood), increasing concern over sleep deprivation with proven links to Alzheimer's,<sup>89</sup> heart attacks and strokes,<sup>90</sup> worries over antibiotic resistance,<sup>91</sup> and the spread of opioid addiction.<sup>92</sup> In addition, COVID-19 effects including Long COVID and COVID-19-related mental health issues may also be important. The growing

Number of deaths in England and Wales registered by week, 28 December 2019 to 19 March 2021



Source: ONS, Coronavirus (COVID-19) roundup

<sup>87</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronaviruscovid19roundup/2020-03-26>

<sup>88</sup> <https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-obesity-physical-activity-and-diet/england-2020>

<sup>89</sup> <https://www.nih.gov/news-events/nih-research-matters/sleep-deprivation-increases-alzheimers-protein>

<sup>90</sup> <https://www.nhs.uk/live-well/sleep-and-tiredness/why-lack-of-sleep-is-bad-for-your-health/>

<sup>91</sup> <https://www.antibioticresearch.org.uk/about-antibiotic-resistance/>

<sup>92</sup> <https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2019-to-2020>

frequency of zoonotic<sup>93</sup> diseases is discussed more-extensively in Systemic Risk (Section 4.2, Page 15) and is linked to deforestation and biodiversity loss. Zoonotic diseases (especially in the form of pandemic) could have a significant effect on future mortality trends. The disruption wrought on the National Health Service (NHS) by the COVID-19 pandemic may also have a longer-term impact on the success of the NHS in treating non-COVID-19 illnesses.

In contrast, advances in medical technology in relation to:

- better preparing for future pandemics (including having “vaccines and therapeutics available at scale within 100 days”<sup>94</sup>);
- medical procedures;
- artificial organ transplants;
- the use of Artificial Intelligence and Machine Learning in medicine, although not without drawbacks;<sup>95</sup>
- the use of genetic data to personalise medicine; and
- the increasing use of health-tech<sup>96</sup> to support healthy lifestyle choices may reverse the recent trends.

Technological advances can also result in improved health through:

- improved monitoring and management of disease; and
- earlier and more accurate diagnosis (although the management of the significantly higher levels of personal data used to underpin these advances can create a data privacy risk that needs to be managed).

Another technological development affecting mortality is the introduction of e-cigarettes to replace traditional tobacco-based cigarettes. While the risk of e-cigarettes is claimed to be significantly lower than tobacco cigarettes,<sup>97</sup> their effect on long-term health is still unknown and recent studies in the US have raised concerns about links to lung disease. It is still not known whether e-cigarettes may attract people who have previously not smoked and therefore may have an adverse impact on future longevity.

### COVID-19 Morbidity: ‘Long COVID’

‘Long COVID’<sup>98</sup> refers to lingering health effects long after a COVID-19 infection has subsided. “About one in five people have symptoms of Long COVID five weeks after an initial infection and one in seven after 12 weeks, an Office of National Statistics (ONS) survey suggests. It estimates that 1.1 million people were affected<sup>99</sup> in the UK in the four weeks from 6 February [2021].” “There is no universally agreed definition of Long COVID, but it covers a broad range of symptoms such as fatigue, muscle pain, and difficulty concentrating.”<sup>100</sup>

Of particular concern are reports of hearing loss, tinnitus, and vertigo,<sup>101</sup> symptoms of Long COVID that typically develop in the weeks following a COVID-19 infection.

### Mental Health

The COVID-19 pandemic has caused elevated levels of mental health issues<sup>102</sup> related to fear, worry, stress, job loss, impact on physical health, and feelings of isolation. The immediate and longer-term impacts on mortality and morbidity of COVID-19-related mental health issues are still largely unknown.

<sup>93</sup> <https://en.wikipedia.org/wiki/Zoonosis>

<sup>94</sup> <https://www.ft.com/content/69050b94-0bf0-46b4-9695-3376347214fc>

<sup>95</sup> <https://www.cam.ac.uk/research/news/machine-learning-models-for-diagnosing-covid-19-are-not-yet-suitable-for-clinical-use>

<sup>96</sup> <https://medicalfuturist.com/>

<sup>97</sup> <https://www.nhs.uk/live-well/quit-smoking/using-e-cigarettes-to-stop-smoking/>

<sup>98</sup> <https://www.nhs.uk/conditions/coronavirus-covid-19/long-term-effects-of-coronavirus-long-covid/>

<sup>99</sup> <https://www.bbc.co.uk/news/health-56601911>

<sup>100</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/1april2021>

<sup>101</sup> <https://www.healthyhearing.com/report/53127-Coronavirus-hearing-loss-tinnitus-covid>

<sup>102</sup> <https://www.who.int/teams/mental-health-and-substance-use/covid-19>

An unexpected by-product, however, has been much-greater openness to discussing mental health issues, and greater acceptance of one's own mental health issues as well as the mental health issues of others. Employers have generally responded rapidly.<sup>103</sup> It is possible that the longer-term impacts on mortality and morbidity of mental health issues (both COVID-19-related, and otherwise) will ultimately be positive, with greater-acceptance and earlier-intervention.<sup>104</sup> However, this may lead to a corresponding demand for services at a scale that is not currently capable of being provided.

### The gap between life expectancy and healthy life expectancy

Even though life expectancy is expected to continue to increase, healthy life expectancy is not keeping pace<sup>105</sup> with the overall increase to life expectancy. In addition, there are significant regional variations in the UK ("*Richmond-upon-Thames had the highest male healthy life expectancy at birth in the UK of 71.9 years, 18.6 years longer than males in Blackpool where it was only 53.3 years.*"), largely linked to significant socio-demographic differences.

What this means is that both men and women are spending more years in later life in poor health.<sup>106</sup> The Global Burden of Disease<sup>107</sup> (GBD) estimates that in 2017 the most common causes of morbidity were musculoskeletal disorders, mental disorders and neurological disorders and these accounted for 47% of the ill health in the population. This has implications for the future cost of healthcare insurance. If life expectancy continues to increase faster than healthy life expectancy there is a risk of a gearing effect on the cost of healthcare and of strain on National Health Service (NHS) finances.<sup>108</sup> If actuaries do not sufficiently anticipate this gearing effect,

they may understate future cost increases. Similarly, cost projections for the NHS need to anticipate this gearing.

### Pensions before and during retirement

Under the Pensions Act 2008 every employer in the UK must put certain staff into a workplace pension scheme and contribute towards it<sup>109</sup> and the 'pension freedoms' introduced in 2015 have allowed those reaching retirement to have greater flexibility in how they choose to receive their retirement proceeds.<sup>110</sup> Annuity purchases have fallen, and more retirees are choosing to access their retirement proceeds through a drawdown facility. In effect this means that more retirees are having to take a view on their future longevity and to manage the process of choosing a suitable future time to annuitise (if at all). Given the complex interaction between investment returns and mortality increases with age, actuarial analysis is needed to help retirees optimise their choices.

Similarly, before retirement, people are more likely to need to consider this complex dynamic and the Pensions and Lifetime Savings Association<sup>111</sup> (PLSA) has issued suggested income levels required to support various target standards of living in retirement. In a complementary piece of work the IFOA<sup>112</sup> has produced some 'rules of thumb' for how much needs to be saved to achieve those levels of income in retirement.

### Stresses in Defined Benefit pension schemes

Stresses in Defined Benefit pension schemes are not new. Generous benefits promised (sometimes decades ago), and the now-realised costs associated with these, have caused

<sup>103</sup> <https://www.cipd.co.uk/knowledge/culture/well-being/supporting-mental-health-workplace-return#gref>

<sup>104</sup> <https://www.nhs.uk/mental-health/nhs-voluntary-charity-services/charity-and-voluntary-services/get-help-from-mental-health-helplines/>

<sup>105</sup> <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/bulletins/healthstatelifeexpectanciesuk/2016to2018>

<sup>106</sup> <https://publichealthengland.exposure.co/health-profile-for-england-2019>

<sup>107</sup> <http://www.healthdata.org/gbd/2019>

<sup>108</sup> For example, if life expectancy is 80 years and healthy life expectancy is 76 years, people are expected to live for 4 years in poor health. If LE increases by 4 years but HLE increases by only 2 years, then people are expected to live for 6 years in poor health. This represents a 50% increase to the number of years in poor health with a corresponding increase to cost.

<sup>109</sup> <https://www.thepensionsregulator.gov.uk/en/employers>

<sup>110</sup> <https://www.fca.org.uk/data/retirement-income-market-data> [Table 1]

<sup>111</sup> <https://www.plsa.co.uk/Policy-and-Research/Document-library/Hitting-The-Target-A-Vision-for-Retirement-Income>

<sup>112</sup> <https://www.actuaries.org.uk/news-and-insights/media-centre/media-releases-and-statements/uk-savers-must-set-aside-quarter-earnings-good-retirement>

sponsoring employers to seek ways to scale back costs by closing pension schemes to new pension scheme members, by closing pension schemes for future service for all pension scheme members, by down-sizing benefits,<sup>113</sup> and by investigating newer more-innovative structures involving some level of employer-employee risk-sharing (e.g. via Collective Defined Contribution<sup>114</sup> (CDC) schemes, or 'collective money purchase schemes').

In closed DB pension schemes the impact of ageing changes the dynamics of funding and investment. TPR has alerted pension schemes' trustees and actuaries to this for several years through TPR's successive Annual Funding Statements. In 2020 TPR consulted on factoring scheme maturity explicitly into funding and investment strategies in TPR's new DB Funding Code, which is under development.

### Impact on affordability

The issues outlined above will all have an impact on how individuals are able to adequately fund what is likely to be a longer lifetime, with some of the later stages spent in poorer health. Actuaries play a central role in some of these considerations.

### Actuarial considerations

Actuaries should ensure that mortality assumptions to reflect emerging trends are appropriate for the portfolio that they are valuing as well as reflecting projected changes, based on general population or otherwise.

The issues around improving/uncertain mortality could lead to wider opportunities for the actuarial profession in terms of helping to advise and educate consumers. Wider efforts could involve designing products to address the various issues. These could be products to fund long-term care costs,<sup>115</sup> draw-down products in retirement, or equity-release products.

### Ageing Population Issues

Apart from the impact of mortality, there will be issues arising from providing care to those in later life. As life expectancy increases, the time spent in poor health will also increase. This will place growing burdens on the state and individuals to fund the cost of providing medical support and ongoing care to those who need it. At a macro level, the actuarial profession can provide input to the wider policy debate on how to fund increasing care costs. At a micro level, the profession would also be expected to be involved in developing appropriate 'third age' products<sup>116</sup> that allow individuals to supplement any care they may be entitled to from the state.

### Triple Lock

*"The triple lock<sup>117</sup> is a government commitment, over and above the statutory requirement, to uprate the basic and new State Pension by the highest of earnings, prices or 2.5%. Its introduction was announced by the Coalition Government in its first Budget after the 2010 election."*

The triple lock is a particularly valuable commitment for lower-income older age groups, who not only rely on the State Pension but are keen to ensure future increases in the State Pension keep pace with rises in costs of living. These lower-income older age groups may have little, if any, financial buffer against the vicissitudes of life. Many of these lower-income older age groups will have mortality and morbidity outcomes directly connected to their income levels.

However, the triple lock is an expensive commitment, especially in a time of exceptionally strained public finances and a growing roster of State Pension recipients.<sup>118</sup>

<sup>113</sup> <https://www.pensionsage.com/pa/UUK-launches-consultation-on-proposed-alternative-route-to-USS-valuation-amid-ongoing-tensions.php>

<sup>114</sup> <https://publications.parliament.uk/pa/cm5801/cmpublic/PensionSchemes/memo/PSB06.pdf>

<sup>115</sup> <https://www.wearejust.co.uk/your-money/planning-for-care/costs-of-care/>

<sup>116</sup> <https://www.ukri.org/our-work/our-main-funds/industrial-strategy-challenge-fund/ageing-society/healthy-ageing-challenge/>

<sup>117</sup> <https://commonslibrary.parliament.uk/research-briefings/cbp-7812/>

<sup>118</sup> <https://www.pensionspolicyinstitute.org.uk/sponsor-research/pension-facts/table-1/>

## Climate Change

Climate change is discussed more-extensively in Climate-Related Risk (including Biodiversity) (Section 4.1, Page 8), but this topic merits a brief discussion from a mortality and morbidity point-of-view.

The effects of climate change on mortality and morbidity are still largely unknown. Wider variations in temperature extremes, increased rainfall and flooding, more droughts / dry spells, and impacts on crop success and food availability (and the price of same) could all impact mortality and morbidity.

Particularly for life insurers this may result in more-extreme events resulting in greater profit & loss variability, and feed into decisions on reinsurance strategy.