

What can the UK learn from the impact of migrant populations on national life expectancy?

Lucinda Hiam¹, Claire X. Zhang², Rachel Burns², Frances Darlington-Pollock³, Matthew Wallace⁴, Martin McKee⁵

¹School of Geography and the Environment, University of Oxford, OX1 3QY, UK

²Institute of Health Informatics, University College London, NW1 2DA, UK

³Department of Geography and Planning, University of Liverpool, L69 3GP, UK

⁴Demography Unit, Sociology Department, Stockholm University, 106 91 Stockholm, UK

⁵Department of Health Services Research and Policy, London School of Hygiene and Tropical Medicine, WC1H 9SH, UK

Address correspondence to Lucinda Hiam, E-mail: lucinda.hiam@kellogg.ox.ac.uk

ABSTRACT

Improvements in life expectancy at birth in the UK had stalled prior to 2020 and have fallen during the COVID-19 pandemic. The stagnation took place at a time of relatively high net migration, yet we know that migrants to Australia, the USA and some Nordic countries have positively impacted national life expectancy trends, outperforming native-born populations in terms of life expectancy. It is important to ascertain whether migrants have contributed positively to life expectancy in the UK, concealing worsening trends in the UK-born population, or whether relying on national life expectancy calculations alone may have masked excess mortality in migrant populations. We need a better understanding of the role and contribution of migrant populations to national life expectancy trends in the UK.

Keywords migration, public health

Introduction

Life expectancy at birth* is one of the most widely used indicators of the health of a population.¹ In the past decade, previous improvements in life expectancy in the UK have stalled and, for some groups, such as women in the most deprived deciles,² fallen.³ The situation has worsened during the coronavirus disease 2019 (COVID-19) pandemic, with life expectancy in England falling by 1.3 and 0.9 years in 2020 for males and females, respectively.⁴

Interpreting changes in a summary measure such as life expectancy is complex. In part, any changes represent the net effect of rises and falls in deaths from different causes at different ages, reflecting both period effects and cohort effects, the latter with origins perhaps decades earlier.¹ We now have some potential explanations for trends before 2020, including the impact of austerity measures imposed since 2010 that have disproportionately affected older people,⁵ interruption

of long-term declines in cardiovascular disease mortality^{6,7} and since 2020 the significant direct and indirect effects of the pandemic, the magnitude of which may not be known for some time. However, life expectancy may also be affected by changes in the composition of the population, for example when the health of those who migrate into and out of a country differs. Indeed, research in other high-income countries (HICs) has shown that migrants, with lower mortality rates, have positively impacted reported life expectancy.^{8–11} Although this issue has received less attention, it is important that those formulating policy to improve population health understand how migration might impact measures used to track progress in health attainment.

The impact of migration on life expectancy is especially relevant to the UK, which has experienced relatively high levels of migration, in both directions, in recent years. Almost

Lucinda Hiam, DPhil student

Claire X. Zhang, Honorary Researcher

Rachel Burns, Research Fellow

Frances Darlington-Pollock, Lecturer in Population Geography

Matthew Wallace, Researcher and Docent in Demography

Martin McKee, Professor of European Public Health

* Here, we are referring to *period* life expectancy rather than *cohort* life expectancy. Period life expectancy is the number of years a newborn might be expected to live, on average, assuming the current death rates do not change. It does not consider future changes in mortality rates. Period life expectancies are used to compare trends over time, and the UK and other national life tables are period life tables for this reason.

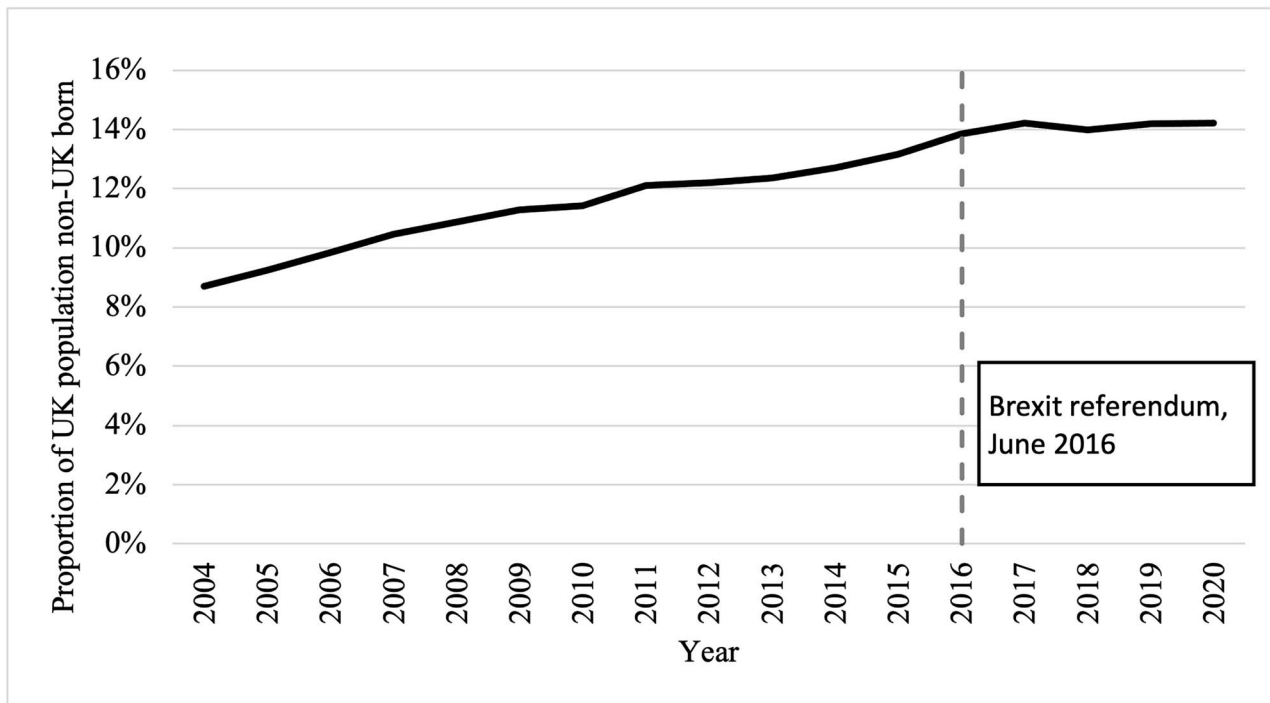


Fig. 1 Proportion of non-UK born population resident in the UK, 2004 to 2020. Authors' calculations based on estimates of non-UK born population in thousands resident in the UK and UK population mid-year estimates. Source: Office for National Statistics.

14% of the total UK population are migrants,¹² defined as any person born outside of and residing within the UK. However, a combination of Brexit and the impact of the pandemic has meant that migration patterns are changing. In these new circumstances, it is important to understand how migration has impacted on life expectancy in the past and how it might do so in the future.

Trends in migration in the UK

The UK's decision to leave the European Union (EU) in 2016 was, in part, driven by a desire to reduce immigration.¹³ Loss of free movement meant EU citizens lost the right to move to the UK and also made it more difficult for older Britons to retire to the Mediterranean. Subsequently, travel restrictions imposed during the COVID-19 pandemic brought movement into and out of the UK to a virtual halt.¹⁴ Figure 1 shows how the increase in the percentage of the resident UK population born outside of the UK has stalled since 2016.

How might migration impact measurement of a nation's health?

Before reviewing what is known, we should become familiar with terminology used in the area of migrant health (Table 1). Those who migrate tend to do so at young ages, and evidence

suggests that they are often not just healthier than those they leave behind, the 'healthy migrant effect',¹⁵ but also healthier than the native-born population in their country of destination, particularly those coming from regions such as North Africa, Asia and Southern Europe.¹⁶ However, any such advantage tends to dissipate over time, with data from France and Scotland pointing to a phenomenon of 'levelling down',^{17,18} as the accumulated disadvantage many migrants experience means that they often experience declining health over time compared with when they arrived in the country.¹⁹

Indeed, migrants may be more likely to live in more deprived areas, inner cities and in unsuitable, temporary housing.²⁰ Many may also be unemployed, underemployed or precariously employed with limited opportunities for upward social mobility. The situation is less clear for forced migrants (e.g. asylum seekers and refugees), in part because of data limitations.^{16,21}

However, while forced migrants are significant in number globally,²² in the UK they are few, contrary to the perception conveyed by the media and certain politicians. Indeed, in 2019, asylum seekers comprised only 6% of all migrants to the UK,²³ and 0.6% of the UK population.²⁴

A further complication is 'salmon bias', where migrants return to their country of birth when faced with deteriorating health, thus removing them from the death statistics of their country of residence before they die.^{25,26} Finally, it is

Table 1 Key terms, their explanation and potential impact on national population health metrics

Term	Explanation of term	Potential impact on population health metrics
Migrant mortality advantage	People who migrate to HICs have lower mortality than the host population. ¹⁶	Migration to a country may have a positive impact on its overall health outcomes such as life expectancy.
Healthy migrant effect	People who migrate may have a better health status compared with both their native population and to the new country of residence or host country population. ¹⁵	People who migrate have better health outcomes due to selection processes at the time of migration. Potential cause of the migrant mortality advantage.
Salmon bias	'The compulsion to die in one's birthplace' ²⁵ An out-selection effect relating to the return of some migrants (often frailer) to their country of origin in order to die in their birthplace.	Observed mortality levels of migrants are depressed because only the lower mortality of those migrants who remain in the host country is included in calculations of mortality. Potential cause of the migrant mortality advantage.
Data artefact	Issues relating to the inability of the data source to capture the mobility of migrants and/or their characteristics. For example, country of origin, age etc.	Observed mortality levels of migrants are lower than they would have been in the presence of perfect data. An artificial explanation of the advantage.
Health-mortality paradox	People who migrate may have lower mortality but worse health. ¹⁹	While migrants may live longer, they may spend more time in poor health.

important to consider the accuracy of the data,^{27,28} especially in a situation where government-imposed 'hostile environments', such as the use of barriers to accessing healthcare in immigration enforcement,²⁹ create powerful incentives not to be recorded.

Few studies have sought to quantify these complex effects.^{9,16,30} An Australian study estimated trends in life expectancy at birth with and without the foreign-born population between 1981 and 2003, finding that the foreign-born population contributed almost half a year of increase for men, and a third of a year for women.⁸ Migrants made a net positive contribution to life expectancy in three of four Nordic countries between 1990 and 2019—Denmark, Finland and Norway—with the effect growing over time.⁹ The exception was Sweden, where the largest migrant group was from neighbouring Finland, who brought a higher mortality rate, and initially depressed national life expectancy. This highlights the need for country-specific analyses in the UK where previous work has provided many insights into the health of migrants, many with a mortality advantage. The large number of Irish migrants is a notable exception.³¹ However, to our knowledge, no study has sought to estimate the combined impact of migration overall.

Life expectancy in the USA and the UK has followed similar trajectories in recent years, lagging behind other HICs.^{32,33} Research has shown that the situation in the USA would have been even worse without migrants. Between 1990 and 2017, migrants to the USA added 0.94 and 0.83 years to male and female life expectancy, respectively, but not enough to compensate for the overall decline in life expectancy since 2015 driven by increasing mortality in the US-born population.¹⁰ Remarkably, in 2017 life expectancy in migrants to the USA

was 7 (men) and 6.2 (women) years higher than their US-born counterparts. Could a similar situation pertain to the UK?

Box 1. How might the age structure of international migrants determine their influence on national life expectancy?

The age structure of migrant populations in many HICs tends to be concentrated around young adult ages—the ages at which the majority of migrants arrive to live and work in the host country.

Although migrant populations are gradually ageing over time in HICs, they remain, on average, very young compared with native-born populations. The previous evidence, including from the UK, has demonstrated that while migrants often have lower overall mortality than native-born populations age-adjusted rates/ratios mask major variation in the mortality of migrants at specific ages. Mortality among migrants has been shown to be lower than the native-born population at young adult ages, increasingly similar to—or higher than—the native-born population at older adult ages, and elevated in infancy and childhood too.³⁴ What does this mean for the overall impact of migrants on population health metrics such as life expectancy, which are a product of mortality across the entire age range? If migrants *are* to positively influence national life expectancy, they have the greatest potential to do so at young adult ages where they comprise a larger share of the total population and have the largest mortality advantages over the native-born population. At very young and very old ages, where they comprise smaller shares of the total population but tend to have similar or excess

mortality versus the native-born population, there may be a lack of, or counteracting, effect. In historical high-mortality settings, death at young ages had a larger effect upon life expectancy than death at old ages did. In today's HICs, however, mortality levels at young adult ages are very low already and, while changes in mortality at younger ages would have a substantial impact on life expectancy at birth, the scope for further large reductions in deaths in these ages is low.

How could this impact the UK?

Life expectancy at birth, as a measure of the progress (or regression) of nations, has the great advantage of simplicity. Like GDP as a measure of economic development, it captures trends in a single figure. Yet, in both cases this simplicity comes at a cost as it ignores some compositional issues. Apparent progress can conceal deterioration in the circumstances of some groups contributing to the summary measure.

This matters for both the migrant and the native-born population. If what has been happening in Australia and the USA has also been occurring in the UK then it suggests that the stagnating and, in some places, worsening life expectancy seen in recent years may have been even greater for the native-born population than believed at the time.

Conversely, any excess mortality among migrants may have suppressed what might have been even greater gains in national life expectancy in the UK. As found in Sweden, migrant groups from specific regions or over specific time periods could have had higher mortality than the native-born population.⁹ Given the UK's consistent growth in life expectancy prior to the stalling seen in the last decade, it is possible that national life expectancy masked excess mortality in certain migrant populations over time; not knowing whether and to what degree this occurred limits public health and health and social care systems' ability to respond to the needs of migrant populations.

How can we improve understanding on the role of migrants in contributions to life expectancy in the UK?

Life expectancy in the UK was on a declining trend before the COVID-19 pandemic, performing worse than other HICs, with evidence of inequalities widening.^{3,32} The road to recovery for the nation's health could benefit from better understanding of the role that migration plays in population health metrics, such as life expectancy, and in turn better inform the substantial investment in health and social care needed to reduce inequalities in health outcomes.³⁵

Box 2. Actions to improve understanding of the role of migration on population health indicators

- Research the impact of migrants on life expectancy in the UK
- Record clearer indicators of migration indicators on death certificates e.g. country of birth instead of place of birth
- Avoid conflating ethnicity and migration
- Explore migration subgroups (e.g. labour migrants, forced migrants) and year of migration
- Link data from existing routine administration datasets
- Alongside mortality-based metrics, consider population health metrics that reflect how healthy migrants' lives are and how their well-being is affected by the wider determinants of health

A number of proposed actions are outlined in Box 2. Research is needed to investigate how migration influences indicators of population health. While publication of research on migration health in the UK has increased substantially in recent years,²¹ to date there are no studies examining the impact of migrants on national life expectancy trends. This is, in part, due to the limitations of the available data. In contrast to countries such as Denmark and Sweden, the UK does not have a reliable national death register with country of birth or ethnicity recorded,³⁶ and relies on ethnicity data from the 10-yearly census to link to death records. Novel approaches such as data linkage of routine administrative datasets may provide more accurate data for analysis.³⁷ ONS recently produced experimental statistics on differences in life expectancy and mortality by ethnicity,³⁸ a methodology that should be further refined and developed to address its current limitations.^{36,39,40} Furthermore, ethnicity and migration status are different concepts, and conflation must be avoided.

We have focused on the situation in the UK, where there is greater national surveillance and availability of routine data to conduct such research than many other countries. It is therefore necessary to recognize that this information can be exploited for purposes that undermine public health by those seeking to justify discriminatory policies, particularly for politically sensitive issues like migration. Public discourse and political rhetoric surrounding immigration in the UK is already replete with misinformation—researchers should engage proactively with policy-makers, the public and the media to ensure that sensitive findings are not misrepresented and do not undermine public trust in the benefits of collecting and using routine health data for the advancement of population health and well-being.

Finally, while population health metrics based on measures of mortality, such as life expectancy, are important, so are measures of how healthy people's lives are. While migrants may live longer, some may spend more time in poor health (see Table 1).¹⁹ Additionally, evidence on the negative health impacts of restrictive migration-related policies is well documented.⁴¹ The conditions in which migrants live, work and socialize influence their health status, as do health behaviours and access to healthcare and preventative care. The former is well-researched in the UK; the latter less so. In the latter case, while many studies on behavioural risk factors disaggregate data by related variables such as ethnicity, revealing complex patterns further shaped by intersectional relationships,⁴² few do so by migration status. A recent scoping review found that the literature on health of migrants in the UK is dominated by studies of infectious diseases and mental health, where structural risk factors dominate.²¹ The interplay of these factors and how they impact on other national population health metrics like healthy life expectancy also warrants further investigation. The creation of the new Office for Health Improvement and Disparities (bringing together teams from the Department of Health and Social Care and the previous Public Health England) presents a unique opportunity to 'count migrants in' when generating and applying evidence appropriately to inform policy decisions to improve the nation's health.⁴³

Conclusions

Improving life expectancy trajectories in the UK requires a significant step-change in economic and social policy, including a greater investment in public services. Alongside this, research is needed to examine the impact of migrant populations on population health metrics in the UK, and how a reduction in migration could affect future outcomes. Evidence from other HICs suggests that without migrants the UK's national life expectancy would be in a lower position than it currently is. In planning to 'build back better' following the pandemic, the generation of evidence and its application to policy-making must consider migrant health as a core component of the nation's health.

Funding

Matthew Wallace's involvement was supported by The Swedish Research Council for Health, Working Life and Welfare (Forte) under grant no. 2019-00603 'Migrant mortality advantage lost? Emerging lifespan inequalities among migrants and their descendants in Sweden'.

Conflict of interest

Claire Zhang works in the inclusion health team in the Office for Health Improvement and Disparities.

References

- Office for National Statistics. *Period and cohort life expectancy explained: December 2019* 2019 [updated 2 December 2019; cited 2021 23 September]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/methodologies/periodandcohortlifeexpectancyexplained> (accessed 23 September 2021).
- Bennett JE, Pearson-Stuttard J, Kontis V *et al.* Contributions of diseases and injuries to widening life expectancy inequalities in England from 2001 to 2016: a population-based analysis of vital registration data. *Lancet Public Health* 2018;**3**(12):e586–e97. [https://doi.org/10.1016/s2468-2667\(18\)30214-7](https://doi.org/10.1016/s2468-2667(18)30214-7) [published Online First: 2018/11/27].
- Hiam L, Dorling D, McKee M. Things fall apart: the British health crisis 2010–2020. *Br Med Bull* 2020;**133**(1):4–15. <https://doi.org/10.1093/bmb/ldz041> [published Online First: 2020/03/29].
- Public Health England. *Health Profile for England 2021* 2021 [updated 15 September 2021; cited 2021 16 September]. Available from: https://fingertips.phe.org.uk/static-reports/health-profile-for-england/hpfe_report.html accessed 16 September 2021.
- Hiam L, Harrison D, McKee M *et al.* Why is life expectancy in England and Wales 'stalling'? *J Epidemiol Community Health* 2018;**72**(5):404–8. <https://doi.org/10.1136/jech-2017-210401> [published Online First: 2018/02/22].
- Murphy M, Luy M, Torrissi O. *Mortality change in the United Kingdom and Europe*, Social Policy Working Paper 11–19, London: LSE Department of Social Policy, 2019.
- OECD/The King's Fund. *Is Cardiovascular Disease Slowing Improvements in Life Expectancy?:* OECD and The King's Fund Workshop Proceedings, OECD Publishing, Paris, 2020. <https://doi.org/10.1787/47a04a11-cn>.
- Page A, Begg S, Taylor R *et al.* Global comparative assessments of life expectancy: the impact of migration with reference to Australia. *Bull World Health Organ* 2007;**85**(6):474–81. <https://doi.org/10.2471/blt.06.036202> [published Online First: 2007/07/20].
- Wallace M, Thomas M, Aburto JM *et al.* The impact of the mortality of international migrants on estimates and comparisons of national life expectancy: a comparative study of four Nordic nations. *Stockholm Research Reports in Demography Preprint* 2021. <https://doi.org/10.17045/sthlmuni.14763243.v1> preprint: not peer reviewed.
- Hendi AS, Ho JY. Immigration and improvements in American life expectancy. *SSM - Population Health* 2021;**15**:100914. <https://doi.org/10.1016/j.ssmph.2021.100914>.
- Preston SH, Elo IT. Anatomy of a municipal triumph: new York City's upsurge in life expectancy. *Popul Dev Rev* 2014;**40**(1):1–29. <https://doi.org/10.1111/j.1728-4457.2014.00648.x> [published Online First: 2015/04/07].
- Office for National Statistics. *Population of the UK by country of birth and nationality: 2020* 2021 [updated 17 September 2021; cited 2021 23

- September]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/bulletins/ukpopulationbycountryofbirthandnationality/latest> accessed 23 September 2021.
13. Johnson B. *The EU immigration system is immoral and unfair* 2015 [cited 2021 30 August]. Available from: http://www.voteleavetakecontrol.org/briefing_immigration.html accessed 30 August 2021.
 14. Migration Data Portal. *Migration data relevant for the COVID-19 pandemic* 2021 [updated 7 September 2021; cited 2021 15 September]. Available from: <https://www.migrationdataportal.org/themes/migration-data-relevant-covid-19-pandemic> accessed 15 September 2021.
 15. Helgesson M, Johansson B, Nordquist T *et al.* Healthy migrant effect in the Swedish context: a register-based, longitudinal cohort study. *BMJ Open* 2019;**9**(3):e026972. <https://doi.org/10.1136/bmjopen-2018-026972>.
 16. Aldridge RW, Nellums LB, Bartlett S *et al.* Global patterns of mortality in international migrants: a systematic review and meta-analysis. *Lancet* 2018;**392**(10164):2553–66. [https://doi.org/10.1016/s0140-6736\(18\)32781-8](https://doi.org/10.1016/s0140-6736(18)32781-8) [published Online First: 2018/12/12].
 17. Wallace M, Khlat M, Guillot M. Mortality advantage among migrants according to duration of stay in France, 2004–2014. *BMC Public Health* 2019;**19**(1):327. <https://doi.org/10.1186/s12889-019-6652-1> [published Online First: 2019/03/23].
 18. Kearns A, Whitley E, Egan M *et al.* Healthy migrants in an Unhealthy City? The effects of time on the health of migrants living in deprived areas of Glasgow. *Journal of International Migration and Integration* 2017;**18**(3):675–98. <https://doi.org/10.1007/s12134-016-0497-6>.
 19. Wallace M, Darlington-Pollock F. Poor health, low mortality? Paradox found among immigrants in England and Wales. *Popul Space Place* 2020;**n/a**(n/a):e2360. <https://doi.org/10.1002/psp.2360>.
 20. Jivraj S, Khan O. Ethnicity and deprivation in England: how likely are ethnic minorities to live in deprived neighbourhoods? The Dynamics of Diversity: evidence from the 2011 Census, University of Manchester, Joseph Rowntree Foundation 2013 [updated December 2013; cited 2021 1 December]. Available from: [https://hummedia.manchester.ac.uk/institutes/code/briefingsupdated/ethnicity-and-deprivation-in-england-how-likely-are-ethnic-minorities-to-live-in-deprived-neighbourhoods%20\(1\).pdf](https://hummedia.manchester.ac.uk/institutes/code/briefingsupdated/ethnicity-and-deprivation-in-england-how-likely-are-ethnic-minorities-to-live-in-deprived-neighbourhoods%20(1).pdf) accessed 1 December 2021.
 21. Burns R, Zhang CX, Patel P *et al.* Migration health research in the United Kingdom: a scoping review. *Journal of Migration and Health* 2021;**4**:100061. <https://doi.org/10.1016/j.jmh.2021.100061>.
 22. UNHCR. *Figures at a Glance* 2021 [updated 18 June 2021; cited 2021 1 December]. Available from: <https://www.unhcr.org/en-us/figures-at-a-glance.html> accessed 1 December 2021.
 23. STURGE G. *Asylum Statistics House of Commons: UK Parliament*; 2021 [updated 13 September 2021; cited 2021 15 September]. Available from: <https://commonslibrary.parliament.uk/research-briefings/sn01403/> accessed 15 September 2021.
 24. Walsh P. *Asylum and refugee resettlement in the UK* 2021 [updated 11 May 2021; cited 2021 15 September]. Available from: <https://migrationobservatory.ox.ac.uk/resources/briefings/migration-to-the-uk-asylum/> accessed 15 September 2021.
 25. Pablos-Méndez A. Mortality among Hispanics. *JAMA* 1994;**271**(16):1237–8. <https://doi.org/10.1001/jama.1994.03510400023017>.
 26. Di Napoli A, Rossi A, Alicandro G *et al.* Salmon bias effect as hypothesis of the lower mortality rates among immigrants in Italy. *Sci Rep* 2021;**11**(1):8033. <https://doi.org/10.1038/s41598-021-87522-2>.
 27. Wallace M, Kulu H. Low immigrant mortality in England and Wales: a data artefact? *Soc Sci Med* 2014;**120**:100–9. <https://doi.org/10.1016/j.socscimed.2014.08.032> [published Online First: 2014/09/19].
 28. Wallace M, Wilson B. Age variations and population over-coverage: is low mortality among migrants merely a data artefact? *Popul Stud (Camb)* 2021;1–18. <https://doi.org/10.1080/00324728.2021.1877331> [published Online First: 2021/02/11].
 29. Hiam L, Steele S, McKee M. Creating a 'hostile environment for migrants': the British government's use of health service data to restrict immigration is a very bad idea. *Health Econ Policy Law* 2018;**13**(2):107–17. <https://doi.org/10.1017/s1744133117000251> [published Online First: 2018/01/08].
 30. Shor E, Roelfs D. A global meta-analysis of the immigrant mortality advantage. *Int Migr Rev* 2021;**0**(0):0197918321996347. <https://doi.org/10.1177/0197918321996347>.
 31. Wallace M, Kulu H. Mortality among immigrants in England and Wales by major causes of death, 1971–2012: a longitudinal analysis of register-based data. *Soc Sci Med* 2015;**147**:209–21. <https://doi.org/10.1016/j.socscimed.2015.10.060> [published Online First: 2015/11/26].
 32. Hiam L, Minton J, McKee M. What can lifespan variation reveal that life expectancy hides? Comparison of five high-income countries. *J R Soc Med* 2021;1410768211011742. <https://doi.org/10.1177/01410768211011742> [published Online First: 2021/05/07].
 33. Ho JY, Hendi AS. Recent trends in life expectancy across high income countries: retrospective observational study. *BMJ* 2018;**362**:k2562. <https://doi.org/10.1136/bmj.k2562>.
 34. Guillot M, Khlat M, Elo I *et al.* Understanding age variations in the migrant mortality advantage: an international comparative perspective. *PLoS One* 2018;**13**(6):e0199669. <https://doi.org/10.1371/journal.pone.0199669>.
 35. Hiam L, Patel P. Same storm, different boats: can the UK recapture improving life expectancy trends? *J R Soc Med* 2021;1410768211033895. doi: <https://doi.org/10.1177/01410768211033895> [published Online First: 2021/07/21] **114** **10** 463 466.
 36. Nazroo J. Ethnic inequalities in mortality rates and life expectancy in England and Wales: why we should treat experimental statistics with caution 2021 [updated 29 July 2021; cited 2021 29 August]. Available from: <https://www.nhs.uk/blog/ethnic-inequalities-in-mortality-rates-and-life-expectancy-in-england-and-wales-why-we-should-treat-experimental-statistics-with-caution/> accessed 29 August 2021.
 37. Burns R, Pathak N, Campos-Matos I *et al.* Million migrants study of healthcare and mortality outcomes in non-EU migrants and refugees to England: analysis protocol for a linked population-based cohort study of 1.5 million migrants. *Wellcome Open Res* 2019;

44. <https://doi.org/10.12688/wellcomeopenres.15007.1> [published Online First: 2019/02/26].
38. White C. *Ethnic differences in life expectancy and mortality from selected causes in England and Wales: 2011 to 2014* 2021 [updated 26 July 2021; cited 2021 26 July]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/articles/ethnicdifferencesinlifeexpectancyandmortalityfromselectedcausesinenglandandwales/2011to2014> accessed 29 August 2021.
39. Raleigh V. Ethnic differences in life expectancy in England and Wales: the unexpected? *BMJ Opinion* 2021 [updated 20 August 2021; cited 2021 29 August]. Available from: <https://blogs.bmj.com/bmj/2021/08/20/ethnic-differences-in-life-expectancy-in-england-and-wales-the-unexpected/> accessed 29 August 2021.
40. Stanborough J. *Advancing knowledge on ethnic differences in health* Office for National Statistics, 2021 [updated 19 August 2021; cited 2021 29 August]. Available from: <https://blog.ons.gov.uk/2021/08/19/advancing-knowledge-on-ethnic-differences-in-health/> accessed 29 August 2021.
41. Juárez SP, Honkaniemi H, Dunlavy AC *et al.* Effects of non-health-targeted policies on migrant health: a systematic review and meta-analysis. *Lancet Glob Health* 2019;**7**(4):e420–e35. [https://doi.org/10.1016/S2214-109X\(18\)30560-6](https://doi.org/10.1016/S2214-109X(18)30560-6).
42. Raleigh V, Holmes J. *The health of people from ethnic minority groups in England* London: Kings Fund; 2021 [Available from: <https://www.kingsfund.org.uk/publications/health-people-ethnic-minority-groups-england> accessed 3rd January 2022.
43. Hargreaves S, Hayward SE, Noori T *et al.* COVID-19: counting migrants in. *The Lancet* 2021;**398**(10296):211–2. [https://doi.org/10.1016/S0140-6736\(21\)01339-8](https://doi.org/10.1016/S0140-6736(21)01339-8).