27 February 2019

Technical appendix
The deprivation gap in expected years of life

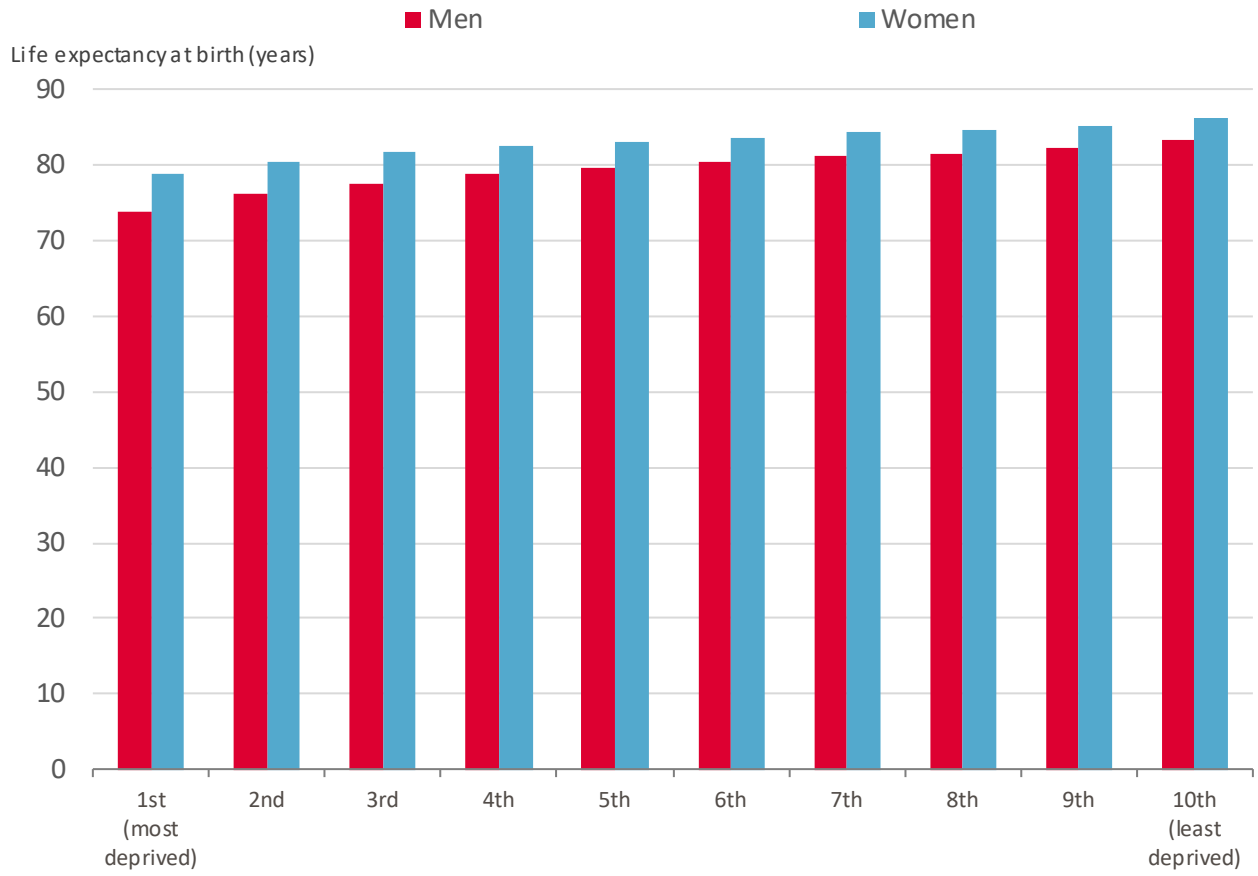
To understand the scale of health inequalities, this analysis considers the total gap in expected years of life between children who are aged under 1 year today and live in the least-deprived 10% of areas and children in more-deprived areas of England.

Inequalities in life expectancy
In 2014–16, the disparity in life expectancy at birth between people living in the least- and most-deprived 10% of local neighbourhoods in England was 9.3 years for males. The average male life expectancy at birth for a child born in the most-deprived 10% was 73.9 years, compared with 83.3 years for those born in the least-deprived 10%. For females, the gap was 7.4 years. Average female life expectancy at birth was 78.8 years in the most-deprived 10% of local neighbourhoods, compared with 86.2 years in the least deprived 10%.[1]

It is worth noting that the gap in healthy life expectancy at birth is wider still. For males and females in England, it was over 18 years in 2014–16.

These estimates of life expectancy are based on the level of deprivation of nearly 33,000 small local areas (known as lower super output areas). The life expectancies used are those of the total population living in each 10% of areas when grouped by increasing level of deprivation. This helps to provide an indication of the scale of health inequality in England. Figure 1 compares life expectancy for men and women by decile of deprivation. It shows the relationship between greater levels of deprivation and lower levels of life expectancy.

Figure 1: Life expectancy at birth by decile of deprivation, England, 2014–16



Source: Office for National Statistics (2018)[1]

Approach to estimating the gap in expected years of life

This analysis goes one step beyond the life-expectancy gap to examine the impact of this inequality on the aggregate number of years people can expect to live given mortality rates today.

The approach takes estimates of life expectancy at birth by sex and decile of deprivation for 2014–16, the latest period for which data is available. The Office for National Statistics (ONS) calculates life expectancy using the overall mortality rate at different ages within each decile of deprivation. The deciles are constructed by ranking Lower Super Output areas by their deprivation score from the Index of Multiple Deprivation published in 2015 by the (then) Department for Communities and Local Government.[2]

We consider a hypothetical scenario in which the life expectancy of each decile equals that of the least-deprived decile. These life-expectancy 'gaps' are then multiplied by the corresponding 2015 mid-year population estimates (the central year of the life expectancy estimate) for children under the age of 1 year, split by sex within the decile.

It is worth noting that these estimates make use of a period measure of life expectancy. Such estimates are more objective in that they are based on out-turn mortality rates. However, they are likely to underestimate actual life expectancy for children born today, because they do not account for any potential improvements in mortality experienced by these infants in future years. The ONS does not publish cohort measures of life expectancy to a sufficient level of geographic detail for them to have been used in these calculations.

Key findings

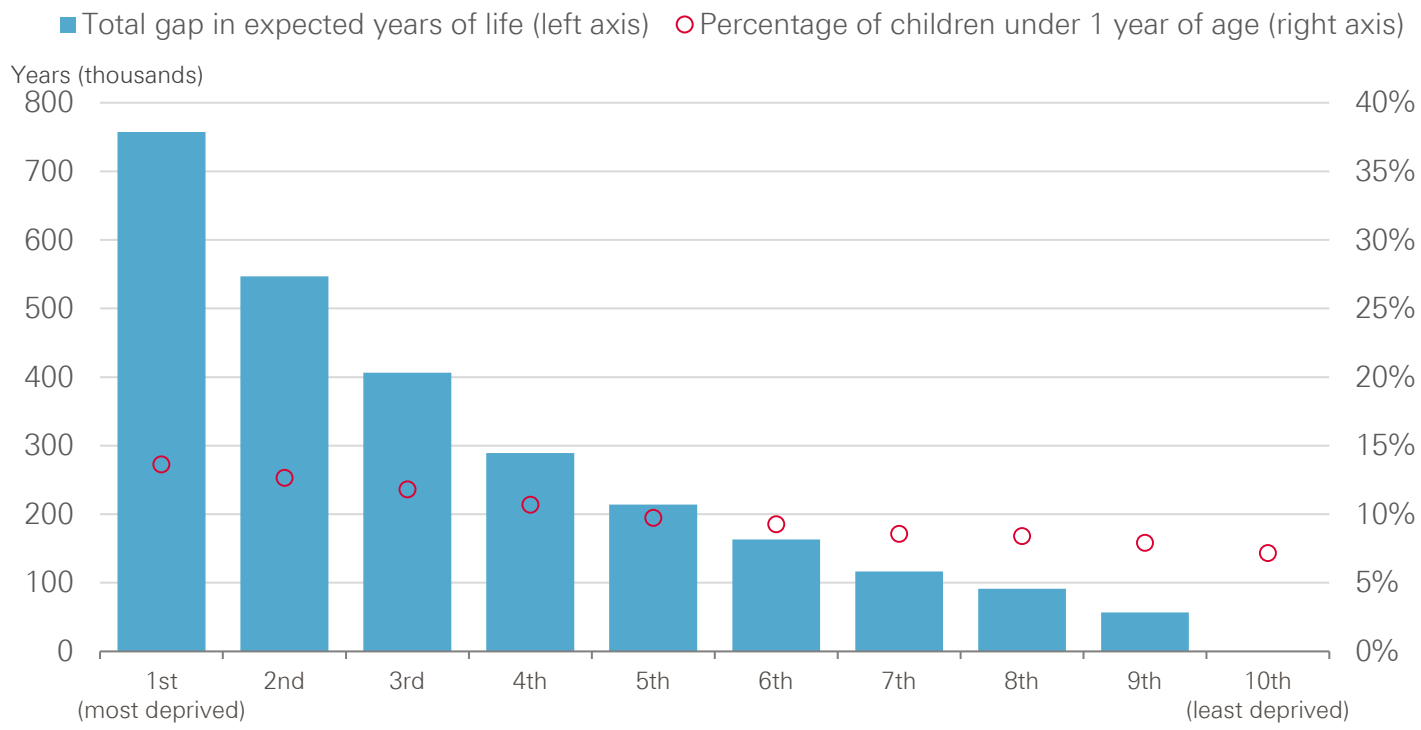
If all children under the age of 1 year in England in 2015 had the same life expectancy as children under the age of 1 year in the least-deprived 10% of areas in the same year, they could expect an estimated additional 2.6 million years of life in total. Across the entire population of that age, this equates to an

average of 4.0 extra years of life per child and 8.4 extra years of life for a child under 1 year of age living in the most-deprived 10% of areas.

Our analysis suggests this position is slightly worse than 3 years earlier (the longest period over which consistent data are available). By holding population constant and using the 2009–11 life expectancy gap estimates, we show that the total expected years of life has grown by 0.1 million life-years. This widening gap is driven by a slower rate of life expectancy improvement in more deprived regions.

Figure 2 shows how this gap in expected years of life differs depending on the extent of deprivation. Almost half (49%) of the gap in life-years can be attributed to children under the age of 1 year living in the most-deprived fifth of areas. In part, this relates to the higher likelihood of young children living in more deprived areas (25% of all children under the age of 1 year live in the most-deprived fifth of areas), but it is mostly driven by differences in life expectancy.

Figure 2: Distribution of total expected years of life lost and population of children under 1 year of age by decile of deprivation, England, 2015



Source: Health Foundation analysis of Office for National Statistics data[1,2,3]

References

1. Office for National Statistics. *Health State Life Expectancies by National Deprivation Deciles, England and Wales: 2014 to 2016*. Office for National Statistics, 2018 (www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthinequalities/bulletins/healthstatelifeexpectanciesbyindexofmultipledeprivationimd/englandandwales2014to2016).
2. Department for Communities and Local Government. *The English Indices of Deprivation*. Department for Communities and Local Government, 2015.
3. Office for National Statistics. *Lower Layer Super Output Area Population Estimates: Mid-2015*. Office for National Statistics, 2015.