Article

Health Expectancies at Birth for Middle Layer Super Output Areas (MSOAs), England: 2009 to 2013

Estimates of health expectancy for small area populations based on self-assessed health and self-assessed activity limitation. Differences between small areas allows the scale of inequality to be determined and which areas are statistically significantly higher or lower than the national and local authority specific average.

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Notice

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This release has been superseded by a newer version of this analysis. For the latest estimates for England and Wales, see our Health state life expectancy estimates for Middle layer Super Output Areas, England and Wales bulletin.

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1 . Background

In recent years, there has been increasing demand for health indicators at small area level to monitor the scale of health gaps between areas and its impact on public health. This release is accompanied by 2 reference tables providing Life Expectancy (LE), Healthy Life Expectancy (HLE) and Disability-Free Life Expectancy (DFLE) for males and females at birth for the Middle Layer Super Output Areas (MSOAs) in England for the period 2009 to 2013.

2 . Methods

The data (health prevalences) used in calculating the health expectancies by sex and 5 year age band is obtained from questions asked in the 2011 Census form on self-rated general health and activity limitation because of health problems. Interim life tables, mortality and population data over the period 2009 to 2013 (centred on the 2011 Census) were aggregated to achieve a minimum sample size required for the calculation of small area level life expectancies using the Chiang II method. We use this method to calculate subnational life expectancies (Life table template (191 kb Excel sheet); subnational expectancies).

UK health expectancies (HEs) are generally calculated using the Sullivan method, which incorporates national period life expectancies. Figures are published along with 95% confidence intervals to allow the user to identify significant differences between populations. Statistical significance is assigned on the basis of a Z test for the difference in HEs between populations with variance estimation proposed by the Sullivan guide.

Issues with calculating LEs for small areas

To calculate life expectancy for small areas, mortality data is aggregated over 5 years to ensure sufficient numbers of deaths are recorded; however, there are still some age bands in some MSOAs without death occurrences during the 5 year aggregated period. Such instances produce zero mortality variance, which has the effect of increasing the likelihood of implausible life expectancies and their precision (Olatunde et al., 2010 (398.4 Kb Pdf)). It is particularly relevant for the final age band (age 85 and over) where a zero death count prevents life expectancy estimation.

To overcome the issue of zero death events, we published a methodological review where it was determined that instances where the age-specific death rate is zero will not bias standard error calculations if the population is 5,000 or above (Toson and Baker, 2003 (288.1 Kb Pdf)). This threshold is used as a standard in all our subnational life expectancies now; in this study, all MSOA populations for the period of 2009 to 2013 were above the 5,000 threshold.

To identify any implausible life expectancies at birth for males and females, a box plot method was used where the co-efficient of the inter-quartile range (difference in the life expectancy between the 75th and 25th percentiles) was doubled to determine the upper and lower outer fence to identify extreme outliers. This criterion suggested that MSOAs where LEs were below 65.2 years and above 93.4 years for males and below 70.4 years and above 96.5 years for females were considered as extreme outliers and excluded. Therefore MSOA-specific LE estimates at birth exceeding these thresholds were treated as extreme outliers and separated out into a distinct sheet in the reference table.

The affected areas are:

Males

- Southwark 009

Females

- Gloucester 014
- Basingstoke and Deane 021
- Crawley 008
- Swindon 027
- Manchester 060

Mortality imputation

In those MSOAs where there were no deaths in the final age band, calculation of the variance in life expectancy estimation was not possible. To overcome this, the relevant English Index of Multiple Deprivation IMD 2010 national decile age and sex-specific mortality rate within which the MSOA was located was used to enable calculation. “Tower Hamlets 033”, “Birmingham 138”, “Manchester 060”, and “Liverpool 060” for males were the only MSOAs where imputation was applied.

General health and disability-free imputation

In the case where there was no population enumerated at the 2011 Census for the final age band, the national decile-specific health and disability prevalence was used to allow the calculation of HLE and DFLE to proceed. This occurred in only 1 case: for males in “Tower Hamlets 033”.

For MSOAs where prevalence of ‘Good’ health and free from disability was either 0 or 1, the calculation of the variance of HLE and DFLE was not possible. To enable the calculation of the variance in these instances, values were changed by imputing 0.99 where prevalence was 1 and 0.01 where prevalence was 0.

3 . Results

Health expectancies can also be used to measure sex inequality across areas by using the proportion. This method takes into account the varying length of life for males and females across areas and compares their average proportion of life expected to be spent in a given state of health (favourable or unfavourable). The proportion of life spent in ‘Good’ health and proportion of life spent without disability are 2 such measures. These proportions are produced by dividing health expectancies by life expectancies and multiplying by 100 to express as a percentage.

In Map 1, the lightest shade represents the MSOAs with the highest proportion of ‘Good’ health; ranging from 85.0% to 90.2% for males and 85.0% to 88.4% for females. Conversely, the darkest shade represents the MSOAs with the lowest proportion of life in ‘Good’ health; ranging from 64.7% to 69.9% for males and 58.0% to 69.9% for females.

There is a clear sex inequality in England where males at birth are expected to spend a higher proportion of their life in ‘Good’ health when compared with females at birth; which is 80.2% for males and 78.1% for females.

There were some geographical differences in England; for example, people living in MSOAs in the south of England were expected to spend a higher proportion of their life in ‘Good’ health than people from the northern part of England, despite having generally longer life expectancies. This divide was more prominent for males in the South East region where 279 MSOAs out of its 1,108 MSOAs fell into the top range.

Map 1: Proportion of life spent in ‘Good’ health at birth by sex, by MSOAs, England, 2009 to 2013

A similar pattern was observed in Map 2 where males in England are expected to spend a higher proportion of their life without disability than females. For MSOAs placed in the darkest shaded boundary for males, 66.4% to 69.9% of life spent free from disability, the number of years lived with a disability ranged from 20.4 years to 25.7 years. For those placed in the lightest shaded boundary, 85.0% to 89.1%, the number of years spent with a disability ranged from 8.7 to 12.9 years. For females, the equivalent for the darkest shaded boundary was 23.1 years to 32.0 years and for the lightest shaded boundary 10.6 years to 13.3 years.

Map 2: Proportion of life spent without disability at birth by sex, by MSOAs, England, 2009 to 2013

. Background notes

1. **Useful information**

   A list of the names of those given pre-release access to the statistics and written commentary is available in the pre-release access list. The rules and principles which govern pre-release access are featured within the Pre-release Access to Official Statistics order 2008.

   Health expectancies combine mortality and health data to measure an average number of expected years spent in various health states during the life span of a population. We routinely publish 2 such measures: healthy life expectancy (HLE) and disability-free life expectancy (DFLE). HLE estimates indicate the number of years spent in “Very good” or “Good” general health and DFLE estimates indicate lifetime free from a limiting persistent illness or disability. These estimates are based on self-rated general health and self-rated assessment of how health problems limit an individual’s ability to carry out day-to-day activities. These expectancies are summary measures and are important indicators of population health status over time.

   Quality and Methodology information reports measure the statistical quality of our outputs against the 5 European Statistics System (ESS) quality dimensions to meet highest standards across European countries; they also provide a summary of the methods used in generating these outputs as well as a list of recent publications. A quality and methodology information report for health expectancies (Pdf 185Kb) (185.7 Kb Pdf) published on March 2014 is available on our website.

   Further details of the Chiang II method can be found in the publication Chiang C L (1984) The Life Table and its Applications, Malabar (FL), Robert E Krieger Publ Co.

   This minimum population threshold (see under section issues with calculating LEs for small areas above) was set following a review of the methodological options for calculating life expectancy at birth for small populations (288.1 Kb Pdf).

   An article on DFLE and LE estimates for MSOAs published for the period of 1999 to 2003 (398.4 Kb Pdf) can be used to assess improvements over time alongside this release.

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3. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gov.uk

   These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.