EE297

Quality-Adjusted Life Expectancy (QALE) by Ethnicity: Updated Estimates Using the New EQ-5D-5L Value Set

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Disclaimer: Koh J. is an employee of NICE. However, the views expressed are those of the author and do not necessarily reflect those of NICE.

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Summary

+ Quality-adjusted life expectancy (QALE) helps measure both how long people live and the quality of their health. It is also a key input for Distributional Cost-Effectiveness Analysis (DCEA).
+ This study explores how QALE varies across ethnic groups in England, by combining ONS life expectancy data and health-related quality of life data from the Health Survey for England to estimate QALE by sex and ethnicity.
+ National average QALE at birth is estimated to be 72.3 years for men and 73.4 years for women. QALE varies significantly across ethnic groups:
  - For men, QALE ranged from 70.7 to 74.2 years for Mixed/multiple and Other ethnic groups, respectively.
  - For women, QALE ranged from 71.8 to 75.3 years for Mixed/multiple and Black ethnic groups, respectively.
+ These estimates provide a valuable measure of health by ethnicity, supporting the assessment of health inequalities and informing targeted public health interventions.

72.3 years
Men: national average QALE at birth

73.4 years
Women: national average QALE at birth

Background

+ Distributional cost-effectiveness analysis (DCEA) extends conventional cost-effectiveness analysis by incorporating equity considerations through the baseline distribution of population health, typically measured using quality-adjusted life expectancy (QALE).
+ The National Institute for Health and Care Excellence (NICE) allows manufacturers to submit DCEA for the appropriate equity-relevant subgroup, which for some diseases may be ethnicity[1].
+ Our previous work estimated QALE by ethnic group using Understanding Society data. This study aims to estimate QALE using the Health Survey for England (HSE) and new EQ-5D-5L Value Set, offering an alternative data source to improve the robustness of subgroup estimates.

Methods

+ Quality-adjusted life expectancy was estimated among ethnic subpopulations by combining life expectancy data with health-related quality of life (HRQoL) measures stratified by ethnic group.

QALE	**Life Expectancy**	Office for National Statistics (ONS): Life table by ethnic group: England and Wales, 2011-2014[2]
	Utility Scores	Health Survey for England (HSE) Special Licence Access 2017-2018[3,4]

+ The analysis was divided into three stages, following the approach used by Love-Koh et al. (2015)[5] across IMD quintiles:

1 Reconstruction of ONS life tables to align age and ethnicity groupings within the HSE

- Sex-specific mortality rates for 5-year age bands were disaggregated into single years of age, assuming uniform mortality rates across each age band.
- Ethnic-specific mortality rates were aggregated to match HSE ethnicity groups using Census 2021 population weights[6].

2 Calculate utility scores by sex and ethnicity

- Utility scores by sex and ethnicity were estimated using pooled HSE Special Licence datasets from 2017 and 2018, the most recent HSE collections containing EQ-5D-5L data.
- The full sample comprised 20,232 adults aged 16 and over, of which 5,819 had missing data in demographic variables.
- Utilities were calculated using the new EQ-5D-5L value set for the United Kingdom by Rowen et al. (2026)[7].
- Nine models were tested and a fractional logistic regression was selected as the final functional form to model the relationship between utility scores and demographic variables.

3 Combine outputs from steps 1 and 2 to obtain estimates of QALE by sex and ethnicity categories

- The health state life expectancy estimates (HSLE) template published by the ONS8 was adapted to estimate QALE from predicted EQ-5D in each ethnic group.

Results

+ Weighted average QALE at birth was estimated from HSE data to be 72.3 years for men and 73.4 years for women. These figures are slightly higher than those reported in our previous work based on the Understanding Society survey and the UK value set (Dolan et al, 1997)[9], which estimated QALE at 70.3 years for men and 71.0 years for women.[10]
+ For **men**, QALE ranged from 70.7 to 74.2 years for Mixed/multiple and Other ethnic groups, respectively.
+ For **women**, QALE ranged from 71.8 to 75.3 years for Mixed/multiple and Black ethnic groups, respectively.
+ For men, White and Black ethnic groups had the highest percentage of life spent in good health (90%), while for women the White ethnic group had the highest proportion (88%). In contrast, the Other ethnic group among men (88%) and Other and Mixed/multiple ethnic groups among women (86%) had the lowest proportions.

Figure 1. Distribution of life expectancy (LE) and quality-adjusted life expectancy (QALE) at birth across ethnic groups in England - Men

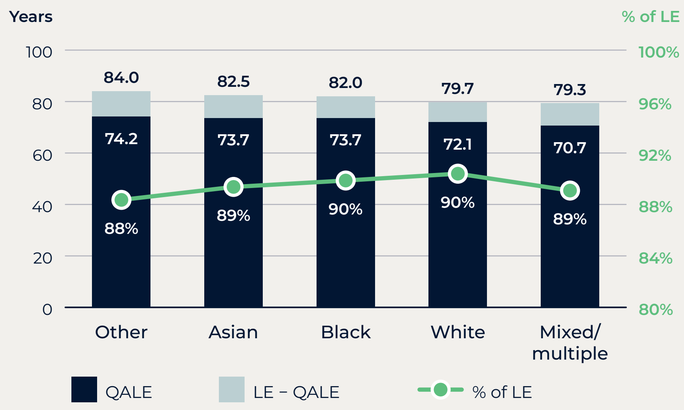

Figure 2. Distribution of life expectancy (LE) and quality-adjusted life expectancy (QALE) at birth across ethnic groups in England - Women

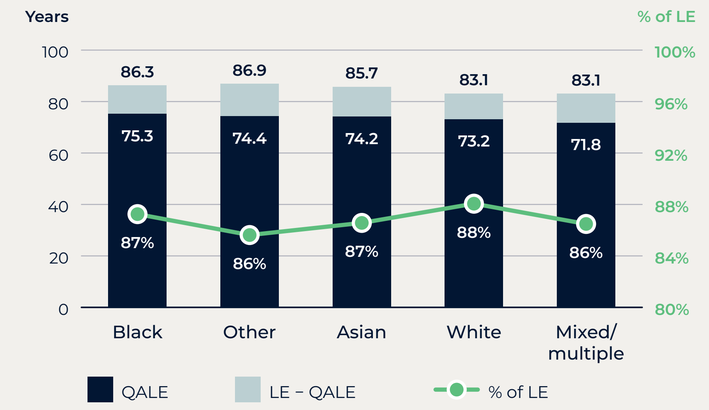

Table 1. Predicted LE and QALE at birth across ethnic groups in England, ranked by QALE - Men

Rank	Ethnic groups	LE	QALE	% of LE
1.	Other	84.0	**74.2**	88%
2.	Asian	82.5	**73.7**	89%
3.	Black	82.0	**73.7**	90%
4.	White	79.7	**72.1**	90%
5.	Mixed/multiple	79.3	**70.7**	89%

Table 2. Predicted LE and QALE at birth across ethnic groups in England, ranked by QALE - Women

Rank	Ethnic groups	LE	QALE	% of LE
1.	Black	86.3	**75.3**	87%
2.	Other	86.9	**74.4**	86%
3.	Asian	85.7	**74.2**	87%
4.	White	83.1	**73.2**	88%
5.	Mixed/multiple	83.1	**71.8**	86%

Assumptions

+ HRQoL for ages 0-15 years was assumed equal to HRQoL for 16-year-olds due to lack of data. Mortality rates and trends are assumed stable over time.
+ Pooling HSE 2017-2018 assumed stable HRQoL relationships across survey years and adequate representativeness after survey weighting, including within smaller ethnic groups.

Limitations

+ ONS LE estimates by ethnicity are limited by underlying data quality and availability. Dropout and loss to follow-up has been found to be higher among ethnic minority groups. This is further compounded by difficulty in recording outmigration which can lead to artificially inflated LE estimates and introduce attrition bias.[11]
+ HSE only samples private households and excludes most institutionalised populations such as care home residents which may bias estimates of HRQoL and QALE.
+ Limited granularity in HSE data required aggregation into broad, heterogeneous ethnic groups, potentially masking within-group differences and introducing bias into the estimates.
+ Modelled utilities at sparsely sampled older age groups are subject to regression uncertainty and may not fully reflect subgroup-specific HRQoL patterns.

Conclusions

+ Using HSE data and the new UK EQ-5D-5L value set, national average QALE at birth was estimated at 72.3 years for men and 73.4 years for women.
+ QALE varied across ethnic groups, indicating inequalities in both length and quality of life. QALE patterns also differed by sex. Ethnic-group rankings were incongruent between LE and QALE, demonstrating that mortality measures alone may not fully capture population health inequalities.
+ Updated estimates of utility and QALE by ethnicity capture inequalities in both length and quality of life, complementing conventional population health indicators, such as LE. These estimates provide an additional evidence base for health-equity analysis and DCEA using ethnicity.
+ Our findings support policymakers and researchers in exploring the multifaceted nature of health inequalities and facilitate the design of tailored public health strategies in response.

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Abbreviations

DCEA - Distributional cost-effectiveness analysis
EQ-5D - European Quality of Life 5-Dimension
HRQoL - Health-related Quality of Life
HSE - Health Survey for England
LE - Life Expectancy
ONS - Office for National Statistics
QALE - Quality-Adjusted Life Expectancy

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