HEALTHSPAN® Calibration Report

Annual Period of Calibration: April 2022 to March 2023
Based on National Bridges to Health Segmentation Dataset v4.0_20230331

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Produced in partnership with:

HEALTHSPAN® Calibration Report Contents

Aim

Population-level **HEALTHSPAN**® is an objective measure of the amount of time individuals spend in good health, usually described as a proportion of their overall lifespan. It measures when people develop their first significant long term condition, and the average age at which this occurs within a population.

Other measures of time spent in good health, such as Healthy Life Expectancy (HLE) and Disability Free Life Expectancy (DFLE) are based on self-reported survey data, from a small sample of the population. They are measures of self-reported good health and absence of limiting, long-standing illness. In simple terms, HLE and DFLE generally report how well people 'feel', and HEALTHSPAN measures how well health and care systems suggest they 'are' (when considered from a service provision and expenditure perspective, based on the presence or absence of significant disease). Therefore using HEALTHSPAN, in combination alongside HLE and DFLE, may be of benefit to comprehensively understand different perspectives on a population's overall 'health state'.

This report provides;

- **Calibration of the HEALTHSPAN measure**: a comparison of national **HEALTHSPAN** against other publicly available measures of length of life spent in good health. It also compares how close the **HEALTHSPAN** figure based on the National Bridges to Health Segmentation Dataset (see slide 3) is to a HEALTHSPAN figure based on a local segmentation dataset, which includes data from all local GP practices, as well as SUS data, for a single ICB ('ICB A').

- **Insights from HEALTHSPAN analytics**: exploring the social gradient and inequalities in HEALTHSPAN nationally.

Data sources

Publicly available measures (Life expectancy, Healthy life expectancy and Disability free life expectancy):

- **Source 1**: the Office for National Statistics licensed under the Open Government Licence, using data for England from 2020-22[1]
- **Source 2**: Office for Health Improvement and Disparities. Public health profiles. 2024 https://fingertips.phe.org.uk © Crown copyright 2024

National Bridges to Health Segmentation Dataset: This refers to the National Bridges to Health Segmentation Dataset created using the National Commissioning Data Repository (NCDR) datasets. These are:

- Master Patient/Person Index (MPI) data (includes data for all people registered to a GP practice in England)
- SUS data (15 years of admitted patient care, outpatient and emergency care data)
- Assuring Transformation data
- Service-level Agreement Monitoring (SLAM) data
- Maternity (MSDS) data
- Community Services Data Set (CSDS)
- Mental Health Data Sets and Improving Access to Psychological Therapies (IAPT) dataset
- Hospital Frailty Risk Score data
- National Diabetes Audit dataset

The National Segmentation Dataset used to produce this report is the v4.0_20230331 Bridges to Health segmentation dataset. This work is undertaken in partnership with NHS England and Improvement (CDAO), and NHS Arden and GEM Commissioning Support Unit.

Local Bridges to Health Segmentation Dataset: This refers to the Bridges to Health Segmentation Dataset created by OBH for ICB A. Data from the following datasets was used:

- SUS data (7 years of admitted patient care, outpatient and emergency care data) for all people registered to ICB A, and

- GP data (all historical data for people registered to a GP practice within the ICB).

The dataset used to produce this report contains data to 2023-06-30.

ICB A: ICB A is a large-sized ICB in Southern England. It has a slightly higher proportion of people aged 65 and over than nationally, and a less deprived (than average) profile.

[1] Healthy life expectancy and Disability free life expectancy are not available at local authority level for 2020-22, so data from 2018-20 has been used for the local calibration section of this report. In addition, due to a mismatch in local authority and ICB geographical boundaries (with multiple local authorities within the same ICB), values for ICB A have been derived using a weighted average method, accounting for local authority population size.

Definitions

HEALTHSPAN®

An objective, whole population view of the median age at which people first enter a period of significant ill health.

Lifespan

The median age at which people die.

Life expectancy

Average time someone is expected to live for from a particular age (see slide 7 for an explanation on cohort and period life expectancy approaches).

Healthy life expectancy (HLE)

Estimate of the span of life that a person can expect to live in (self-reported) 'Very good' or 'Good' health.

Disability-free life expectancy (DFLE)

Estimate of the span of life that a person can expect to live without a (self-reported) limiting or long-standing illness or disability.

Index of Multiple Deprivation (IMD)

The Index of Multiple Deprivation (IMD) is the official measure of relative deprivation in England. This is a measure of deprivation experienced by people living in an area and is calculated by the Office for National Statistics for every Lower Super Output Area (LSOA), or neighbourhood, in England. This report uses IMD in analyses split into deciles of deprivation, with 1 being the most deprived areas and 10 being the least deprived in any analysis. The creation of deciles is performed at either the national level (with all LSOAs used in the calculation) or at 'local' level (restricted to only LSOAs in a geographic region, in this case only those in ICB A).

HEALTHSPAN® flows

Crude **HEALTHSPAN** is the median age at which people 'leave' the Healthy / Generally Well segment over a given timeframe (either by 'moving to' another higher acuity segment, or due to death). It is a population measure of the number of years spent in good health, and the age at which people first enter a period of significant ill health.

It is measured in the context of Lifespan (the age at which people die), and the ratio of HEALTHSPAN to Lifespan, which shows the proportion of a population's life spent in good health. An increasing HEALTHSPAN to Lifespan ratio indicates a tendency towards increasing system sustainability.

This graphic shows the movements 'out of' the Healthy / Generally Well segment, which the **HEALTHSPAN** measurements reflect on subsequent slides.
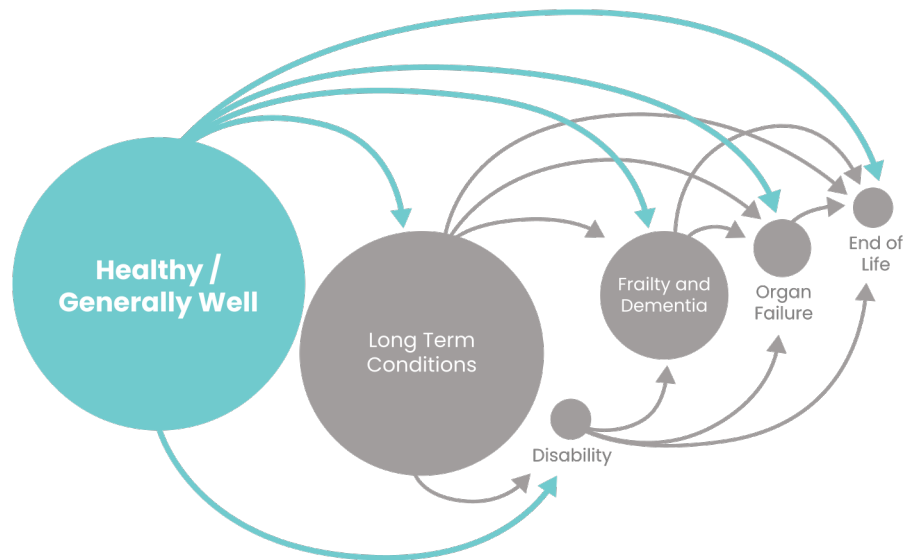
HEALTHSPAN® is a registered trademark of Outcomes Based Healthcare Ltd.

# Comparison of measures of time spent in 'good' health

HLE, DFLE and 'HEALTHSPAN' are all different but complementary measures of time which people spend in 'good' health.

Used together, the measures give a comprehensive view of a population's objective and subjective 'health' status.

	Life Expectancy		Life Expectancy adjusted for years spent healthy		HEALTHSPAN®
	Cohort Life Expectancy	Period Life Expectancy	Healthy Life Expectancy	Disability-Free Life Expectancy	
Definition	Average time someone is expected to live for from a particular age (based on historical and predicted future mortality)	Average time someone is expected to live for from a particular age (based on current mortality)	Estimate of the span of life that a person can expect to live in "Very good" or "Good" health	Estimate of the span of life that a person can expect to live without a limiting or long-standing illness or disability	Average number of years that someone is in good health
Is the measure **'exact'** (rather than an **'estimate'** (i.e. includes unknown factors))?	✗	✓	✗	✗	✓
Does the measure include **predicted future changes** (e.g. to mortality or health)?	✓	✗	✗	✗	✗
Does the measure use **self-reported** or **clinical data**?	N/A	N/A	Self-reported	Self-reported	Clinical data
Does the measure usually evaluate **specific interventions** or **whole population** health?	Whole population	Whole population	Whole population	Whole population	Whole population
Does the metric measure **'healthy years' specifically for each person** in the population?	N/A	N/A	Sample	Sample	Whole population

HEALTHSPAN® Distribution

National HEALTHSPAN® distribution by age (2022/23)
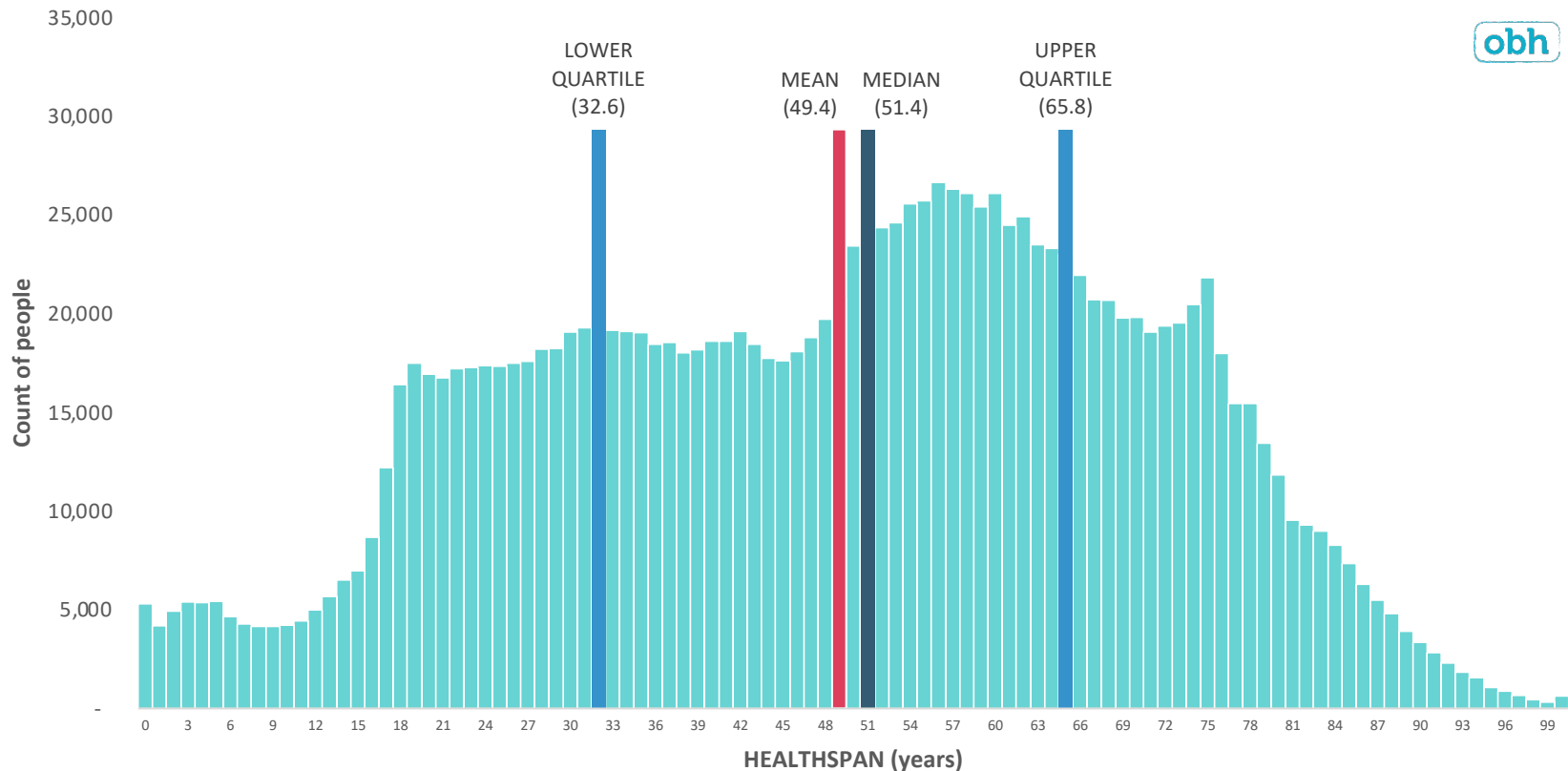
National **HEALTHSPAN** distribution from April 2022 to March 2023 (i.e. count of people 'leaving' the Healthy / Generally Well segment at each age)
National Bridges to Health Segmentation Dataset v4.0_20230331

HEALTHSPAN® Calibration

1. National calibration

1.1 National comparison of years of life and years of life spent in good health related metrics

obh	Years of Life		Years of Good Health			Ratio of Life spent in Good Health		
	Life Expectancy (LE)*	Lifespan†	Healthy Life Expectancy (HLE)*	Disability Free Life Expectancy (DFLE)*	HEALTHSPAN® †	HLE to LE ratio	DFLE to LE ratio	HEALTHSPAN® to Lifespan ratio
Male	78.9	79.6	62.4	61.8	52.7	0.79	0.78	0.66
Female	82.8	84.3	62.7	60.5	50.2	0.76	0.73	0.60
	(a)			**(b)**				

Calibration

a) Life Expectancy (average time someone is expected to live) with Lifespan (average age people die) are similar values across males and females.

Insights

b) **HEALTHSPAN**, the age at which people first develop significant chronic conditions, is 9.8 years younger for males and 12.5 years less for females than Healthy Life Expectancy, which is the time that a person can expect to live in 'Very good' or 'Good' health[1]. This means people are living in worse health for 10-13 years more than previously modelled using subjective survey-based data. It also suggests that people self-report that they are living in 'good health' for a period after they first develop significant chronic conditions. The gap between Disability Free Life Expectancy and **HEALTHSPAN** is slightly smaller, but still around 10 years.

* 2020-22 ONS National Life Expectancy and Health State Life Expectancies publications
† Data for England from National Bridges to Health Segmentation Dataset for financial year 2022/23

[1]Difference between HLE and HEALTHSPAN data calculated before rounding applied

1. National calibration

1.2 National results – HEALTHSPAN® to Lifespan Ratio
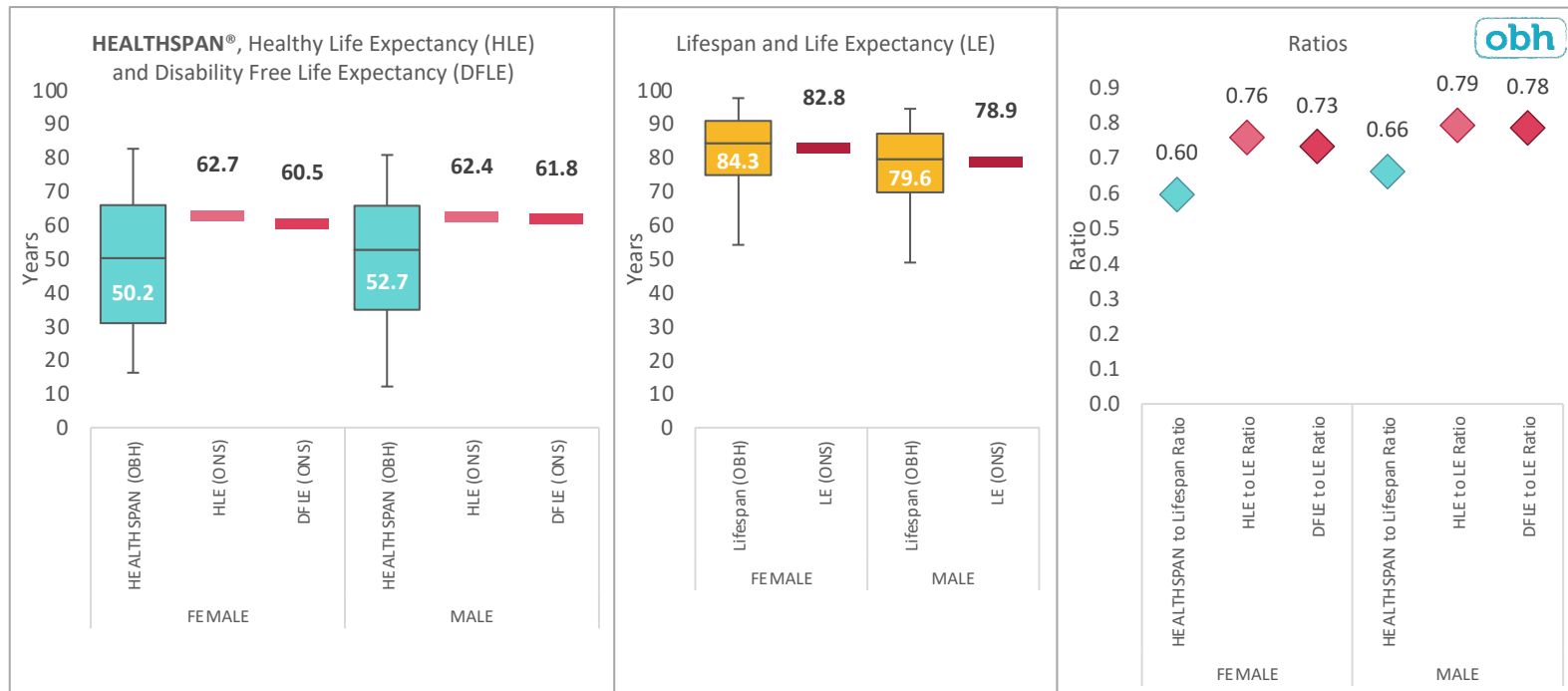
Insights - key points to note

a) Looking at the ratio of **HEALTHSPAN** to Lifespan, on average people can expect to live 63% of their lives in good health.

b) Females, who have a greater lifespan by almost 5 years, can expect to live for longer but with a higher proportion of time spent in poorer health compared to males.

c) This data is for 2022/23, there is an opportunity to measure changes in national **HEALTHSPAN** to Lifespan ratio over time, to monitor outcomes for 'healthy aging'.
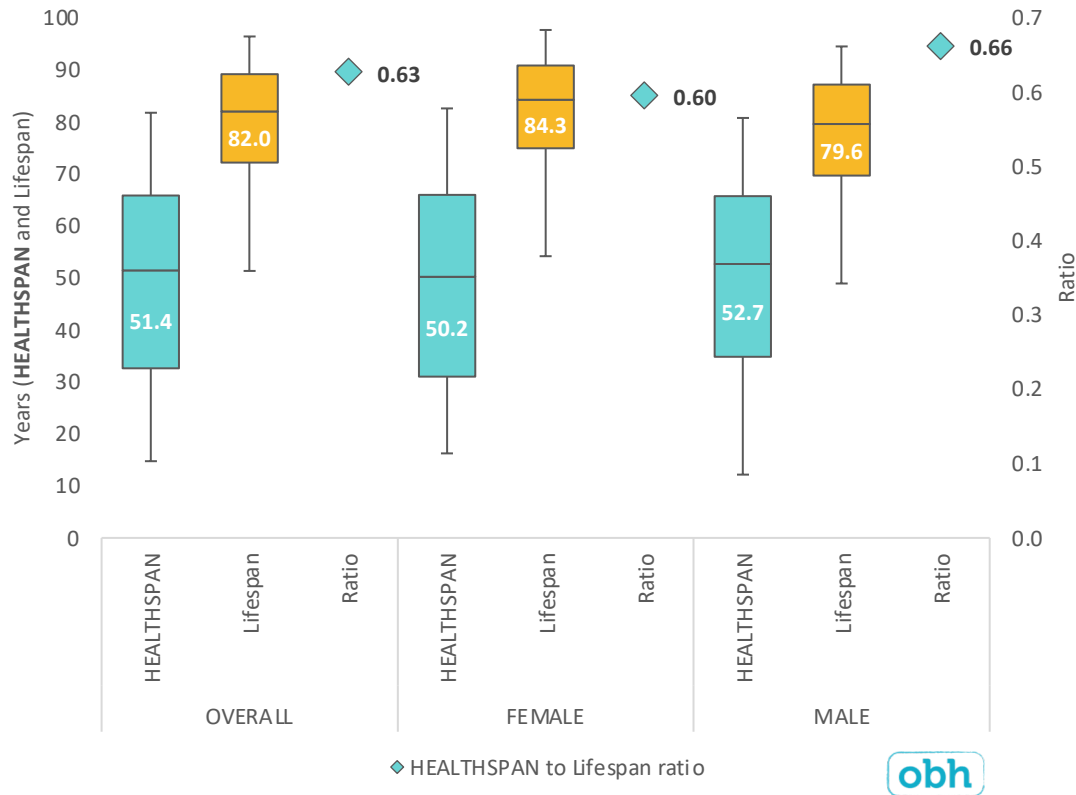
◆ HEALTHSPAN to Lifespan ratio

HEALTHSPAN, Lifespan, and HEALTHSPAN to Lifespan Ratio for England in 2022/23
(boxplots show median, interquartile range, and 5th and 95th percentiles)

1. National calibration

1.3 National results – summary of calibration across related measures (using closest available time periods*)

HEALTHSPAN®, Healthy Life Expectancy (HLE) and Disability Free Life Expectancy (DFLE)

Female: HEALTHSPAN (OBH) 50.2, HLE (ONS) 62.7, DFLE (ONS) 60.5
Male: HEALTHSPAN (OBH) 52.7, HLE (ONS) 62.4, DFLE (ONS) 61.8

Lifespan and Life Expectancy (LE)

Female: Lifespan (OBH) 84.3, LE (ONS) 82.8
Male: Lifespan (OBH) 79.6, LE (ONS) 78.9

Ratios

Female: HEALTHSPAN to Lifespan Ratio 0.60, HLE to LE Ratio 0.76, DFLE to LE Ratio 0.73
Male: HEALTHSPAN to Lifespan Ratio 0.66, HLE to LE Ratio 0.79, DFLE to LE Ratio 0.78

HEALTHSPAN, Lifespan, and HEALTHSPAN to Lifespan Ratio for England in 2022/23
(boxplots show median, interquartile range, and 5th and 95th percentiles)
*HEALTHSPAN and Lifespan uses data for financial year 2022/23. HLE, DFLE and LE uses latest available data (2020-22)

1. National calibration

1.4 National results – trend calibration across related measures (using closest available time periods)

HEALTHSPAN® complements Healthy Life Expectancy (HLE) by providing a dynamic, longitudinal, objective measure that precedes official statistics by several years
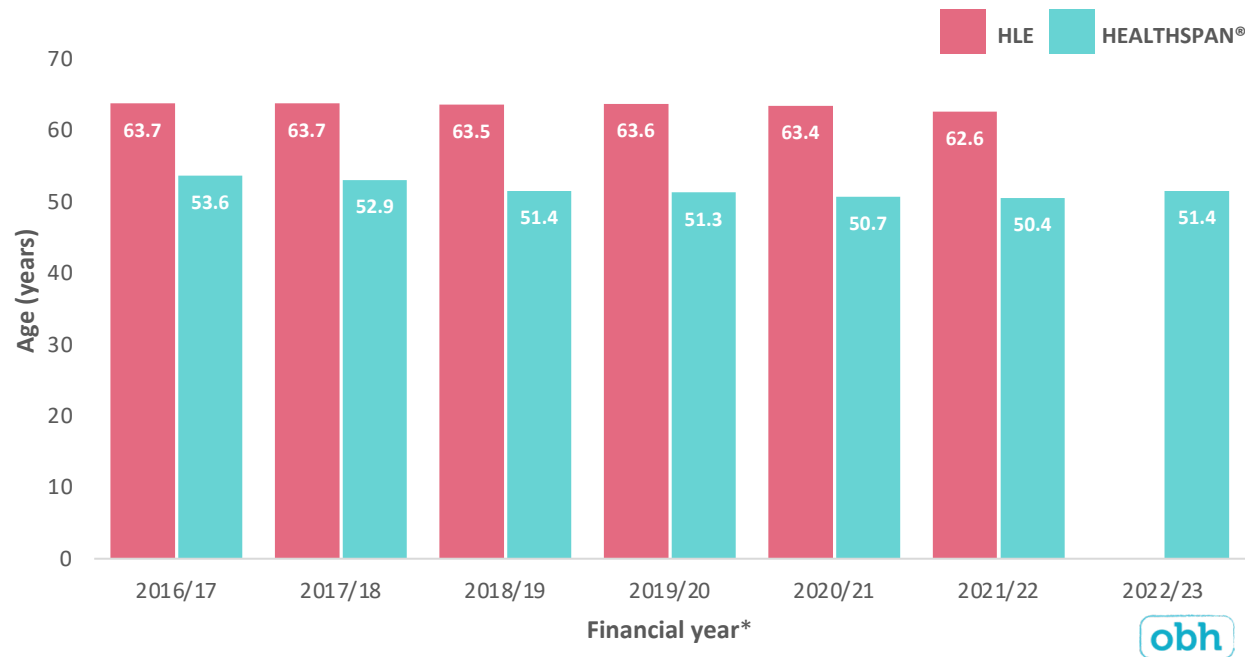
HEALTHSPAN and HLE for England over time

*For HLE this represents the midpoint of the data collection period i.e. 2016/17 corresponds to the 2015-17 (January 2015 to December 2017) HLE data collection period.

2. Local calibration

2.1 Comparison of years of life and years of life spent in good health between national and local datasets

	Years of Life		Years of Good Health				Ratio of Life spent in Good Health			
	Life Expectancy (LE)*	Lifespan†	Healthy Life Expectancy (HLE)*	Disability Free Life Expectancy (DFLE)*	HEALTHSPAN®† (National Segmentation Dataset)	HEALTHSPAN®^ (Local Segmentation Dataset)	HLE to LE ratio	DFLE to LE ratio	HEALTHSPAN® to Lifespan ratio (National Segmentation Dataset)	HEALTHSPAN® to Lifespan ratio (Local Segmentation Dataset)
Male	79.3	79.7	64.1	62.6	54.3	48.0	0.81	0.79	0.68	0.60
Female	83.1	84.3	63.6	61.1	51.5	44.3	0.77	0.74	0.61	0.52

Calibration - key points to note
- This analysis looks at ICB A in the National Bridges to Health Segmentation Dataset (with only very limited GP data from the NDA), compared with the same ICB A using its own local dataset which contains both GP and secondary care.
- There is close calibration across the two datasets for the **HEALTHSPAN** measure. **HEALTHSPAN** median age is around 6-7 years lower with the addition of GP data, looking at the same ICB using the two different data sources (local vs national).

* 2018-2020 ONS Data for LE, HLE, DFLE
† Data for ICB A from National Bridges to Health Segmentation Dataset for financial year 2022/23
^ Data for ICB A from Local Bridges to Health Segmentation Dataset for financial year 2022/23
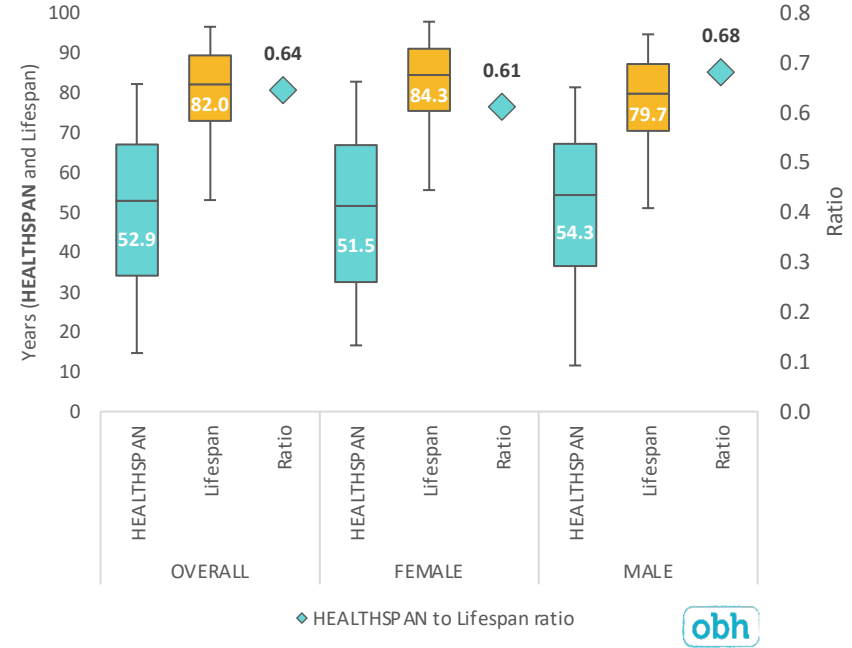
2.2 HEALTHSPAN®, Lifespan and HEALTHSPAN to Lifespan Ratio comparison in national and local datasets

HEALTHSPAN, Lifespan and HEALTHSPAN to Lifespan Ratio for **ICB A**, 2022/23
Local Segmentation Dataset
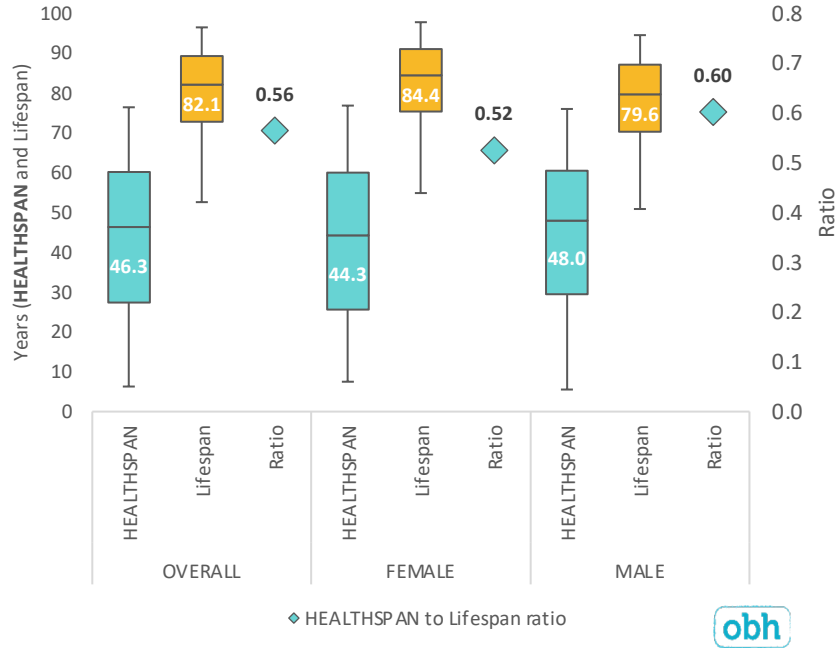
HEALTHSPAN, Lifespan and HEALTHSPAN to Lifespan Ratio for **ICB A**, 2022/23
National Segmentation Dataset

Comparison between Local Segmentation Dataset and National Segmentation Dataset versions of
HEALTHSPAN, Lifespan and **HEALTHSPAN** to Lifespan Ratio, for ICB A, in 2022/23

Incidence by First Condition

3. Incidence and age of onset of __FIRST__ conditions nationally

Number of people and age at diagnosis for people newly diagnosed with each condition as their __first__ condition for England in 2022/23 (boxplots show median, interquartile range, and 5th and 95th percentiles)
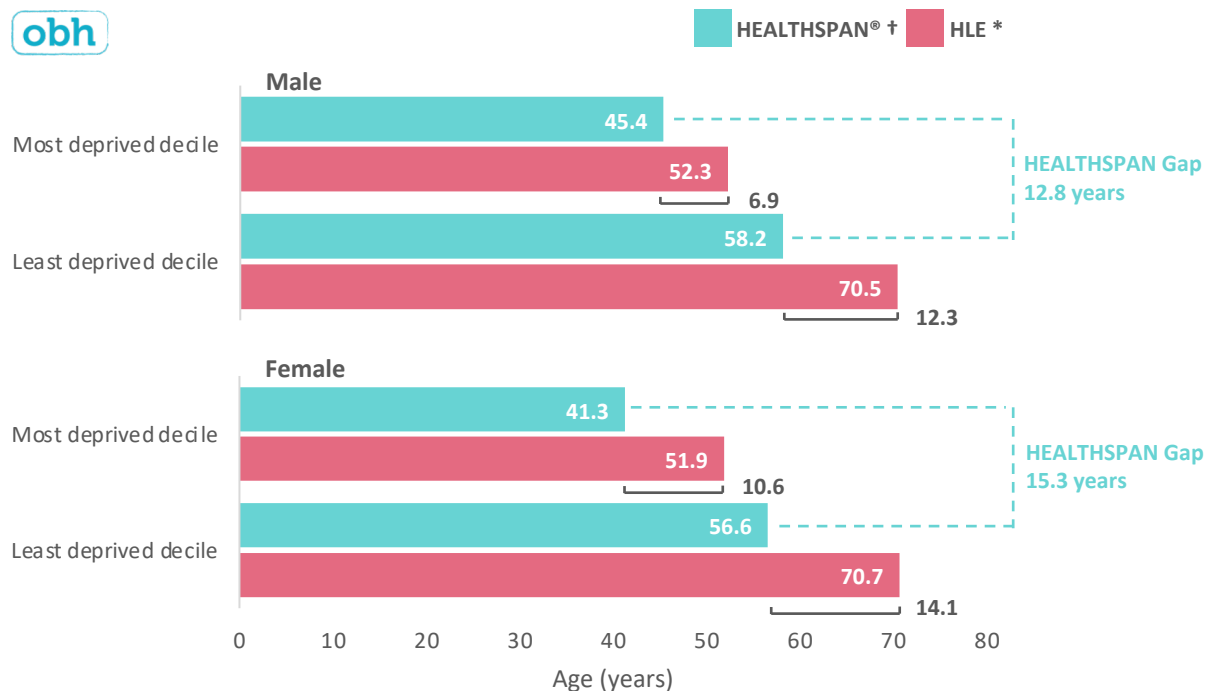
Health Inequalities

4. Health inequalities

4.1 National health inequalities - what is the relationship between deprivation and health?

The difference between HLE and HEALTHSPAN reflects the **delay before objective ill health is perceived as subjective ill health**.

This suggests a potential combination effect where the **most deprived not only get sicker sooner**, they also **feel worse sooner** after developing their first significant condition.

HEALTHSPAN® †   **HLE ***

Male

Most deprived decile — HEALTHSPAN 45.4, HLE 52.3, gap 6.9

Least deprived decile — HEALTHSPAN 58.2, HLE 70.5, gap 12.3

HEALTHSPAN Gap 12.8 years

Female

Most deprived decile — HEALTHSPAN 41.3, HLE 51.9, gap 10.6

Least deprived decile — HEALTHSPAN 56.6, HLE 70.7, gap 14.1

HEALTHSPAN Gap 15.3 years

Age (years)

* Data for England from ONS publications for the most recent comparable period available 2018-20
† Data for England from National Bridges to Health Segmentation Dataset for financial year 2022/23

4. Health inequalities

4.2 National HEALTHSPAN® by deprivation decile, in the National Segmentation Dataset

Insights
Key points to note

a) There is a systematic relationship between deprivation and **HEALTHSPAN**, known as the social gradient in health.

b) People in the most deprived decile can expect to develop significant chronic conditions on average 14 years earlier than those in the least deprived.
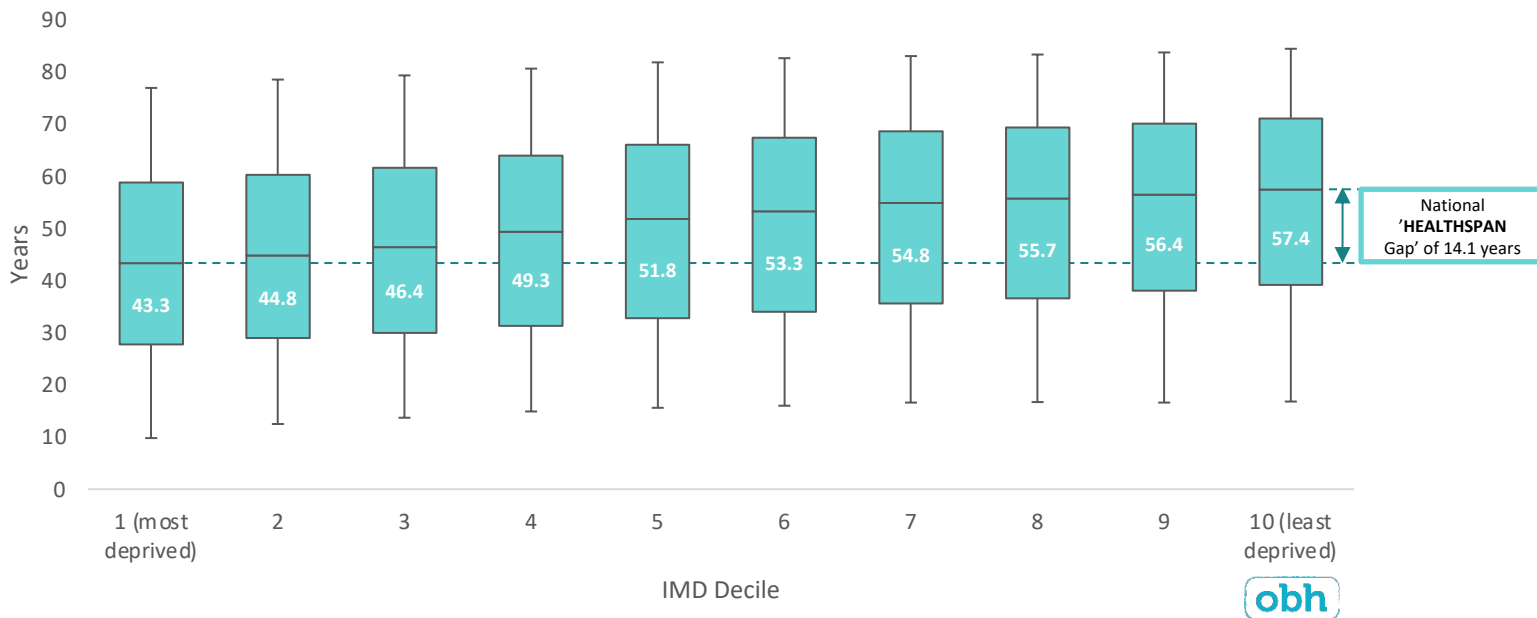
National 'HEALTHSPAN Gap' of 14.1 years

IMD Decile

Years

HEALTHSPAN for England by national deprivation decile (IMD) for people of all ages, 'leaving' the Healthy / Generally Well segment in 2022/23, in the National Segmentation Dataset
(boxplots show median, interquartile range, and 5th and 95th percentiles)

4. Health inequalities

4.3.1 National HEALTHSPAN® in Females and Males by deprivation decile, in the National Segmentation Dataset
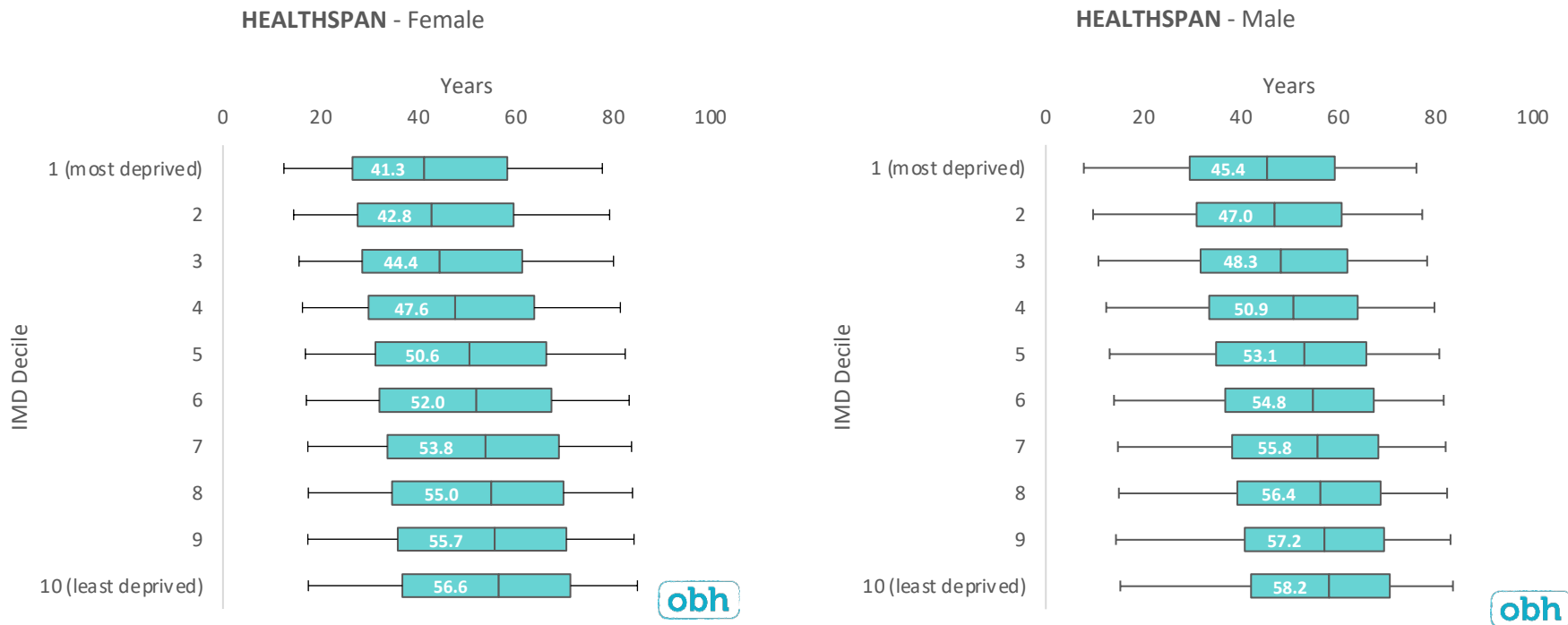
HEALTHSPAN - Female

HEALTHSPAN - Male

HEALTHSPAN for England by national deprivation decile (IMD) for people of all ages, 'leaving' the Healthy / Generally Well segment in 2022/23, in the National Segmentation Dataset
(boxplots show median, interquartile range, and 5th and 95th percentiles)

4. Health inequalities

4.3.2 HLE and DFLE by deprivation decile and gender

Calibration
Key points to note
a) The Healthy Life Expectancy gap between the most and least deprived is 18.2 for males and 18.8 for females.
b) For Disability free Life Expectancy gap this is 16.6 and 16.4 respectively.
c) The deprivation inequalities in these self-reported measures are more pronounced than **HEALTHSPAN®** (see previous slide)

Healthy Life Expectancy

A01A – Healthy Life Expectancy at birth (Female) (2018 – 20) – England, LSOA11 deprivation deciles in England IMD2019
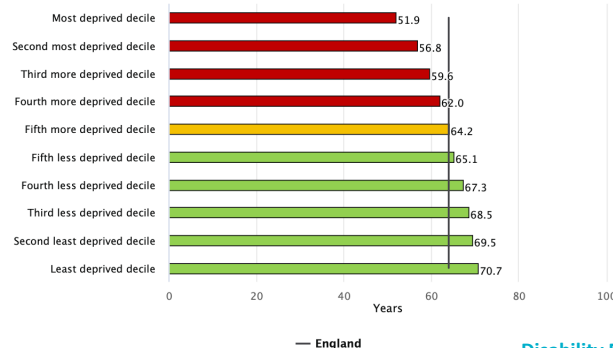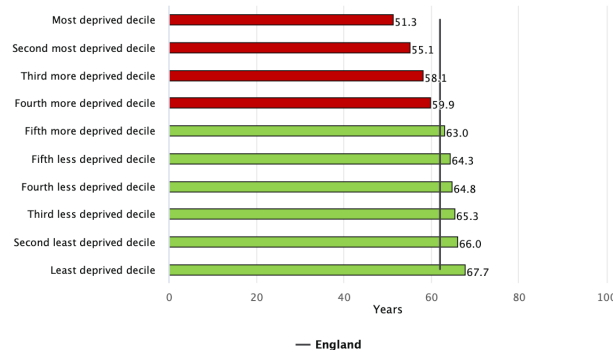

A01A – Healthy Life Expectancy at birth (Male) (2018 – 20) – England, LSOA11 deprivation deciles in England IMD2019
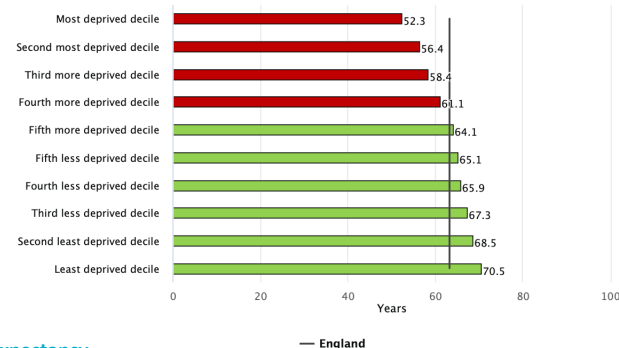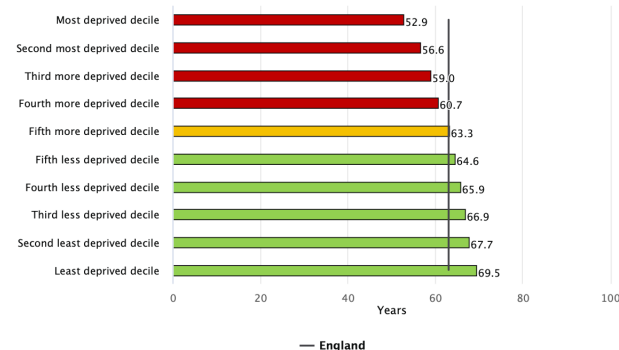

Disability Free Life Expectancy

A01A – Disability free life Expectancy at birth (Female) (2016 – 18) – England, LSOA11 deprivation deciles in England IMD2019
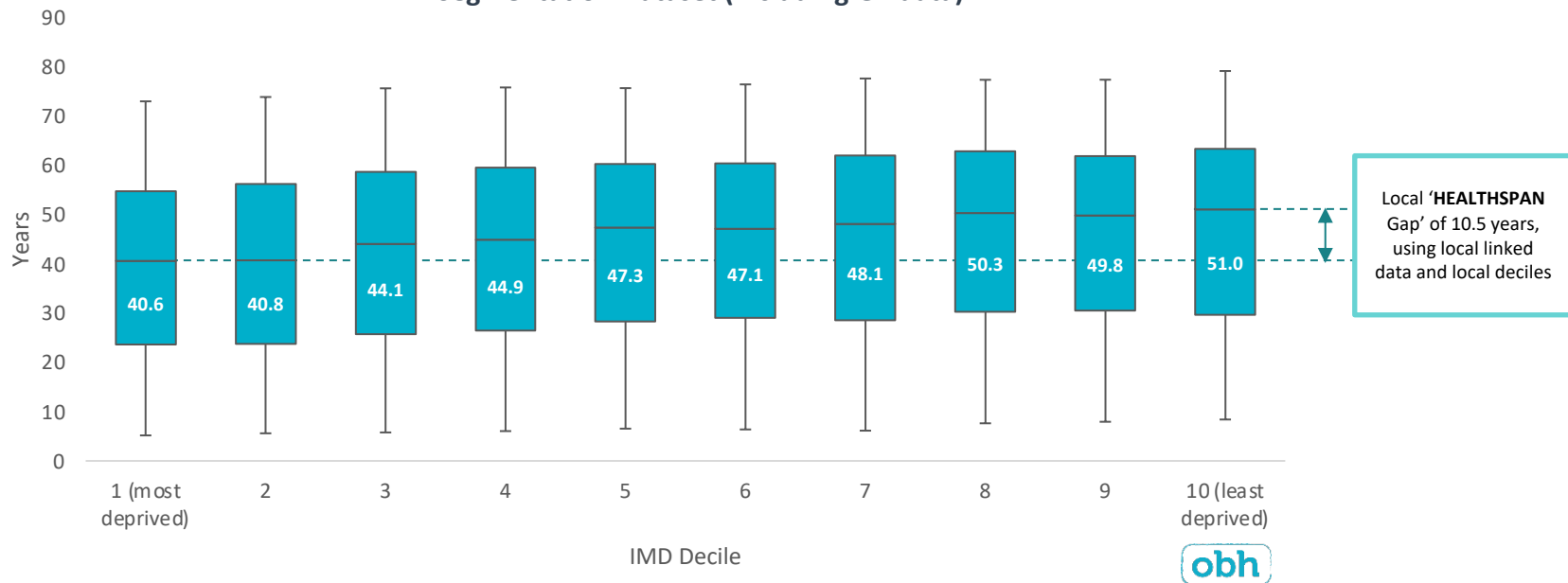

A01A – Disability free life Expectancy at birth (Male) (2016 – 18) – England, LSOA11 deprivation deciles in England IMD2019

Healthy Life Expectancy (2018-20) and Disability Free Life Expectancy (2016-18) in England by deprivation decile, OHID Public Health Outcomes Framework Fingertips tool
(latest HLE and DFLE charts available from Fingertips as of 02/05/2024)

4.4.1 HEALTHSPAN® and HEALTHSPAN Gap for ICB A by local deprivation decile, in the Local Segmentation Dataset (including GP data)

Box plot values by IMD Decile:
- 1 (most deprived): 40.6
- 2: 40.8
- 3: 44.1
- 4: 44.9
- 5: 47.3
- 6: 47.1
- 7: 48.1
- 8: 50.3
- 9: 49.8
- 10 (least deprived): 51.0

Y-axis: Years (0 to 90)
X-axis: IMD Decile

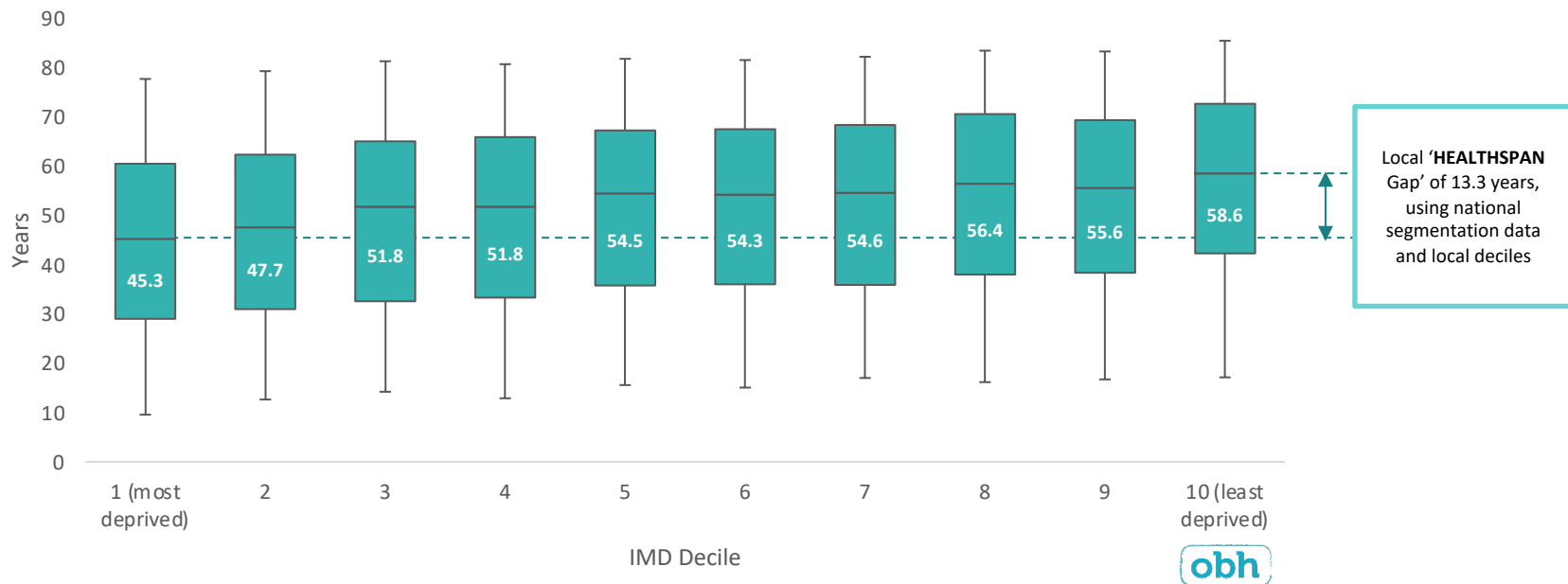Local 'HEALTHSPAN Gap' of 10.5 years, using local linked data and local deciles

HEALTHSPAN for ICB A by local deprivation decile (IMD) for people of all ages, 'leaving' the Healthy / Generally Well segment in 2022/23, in the Local Segmentation Dataset (boxplots show median, interquartile range, and 5th and 95th percentiles)

('HEALTHSPAN Gap' calculated from IMD decile values before rounding applied)

4. Health inequalities

4.4.2 HEALTHSPAN® and HEALTHSPAN Gap for ICB A by local deprivation decile, in the National Segmentation Dataset

Local '**HEALTHSPAN** Gap' of 13.3 years, using national segmentation data and local deciles

HEALTHSPAN for ICB A by local deprivation decile (IMD) for people of all ages, 'leaving' the Healthy / Generally Well segment in 2022/23, in the National Segmentation Dataset
(boxplots show median, interquartile range, and 5th and 95th percentiles)

4. Health inequalities

4.4.3 National HEALTHSPAN® Gap broken down by IMD domains
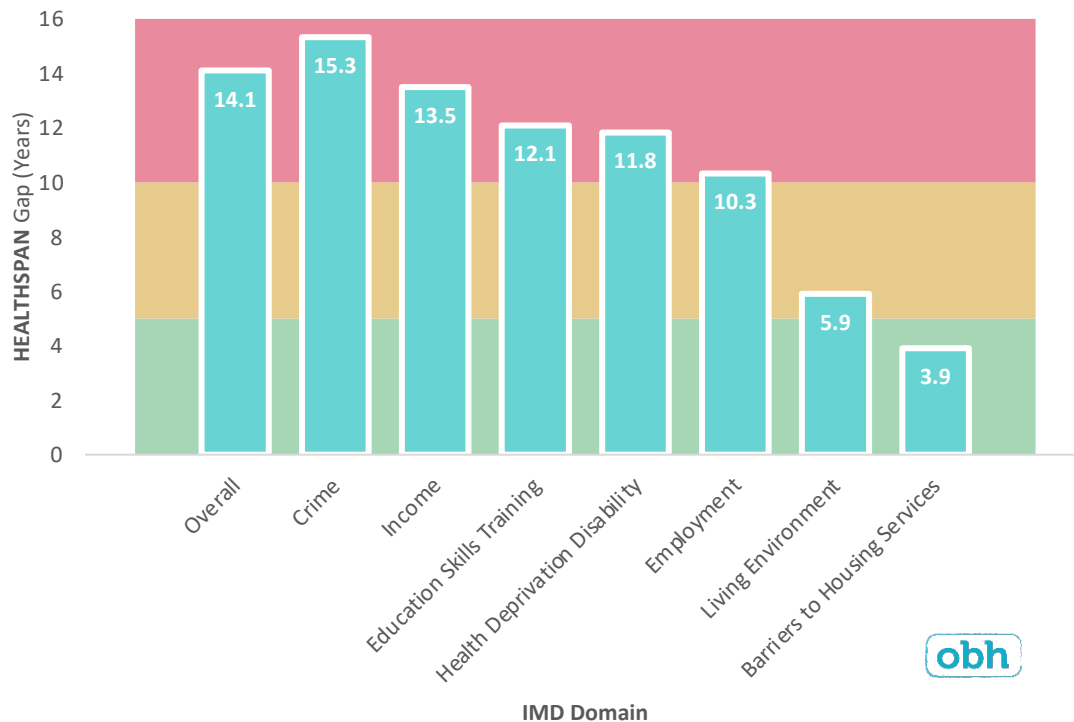
HEALTHSPAN Gap by deprivation domain (IMD 2019)
for people of all ages, 'leaving' the Healthy / Generally Well segment in 2022/23, in England
Pragmatic 5 year gap bandings are visualised on the chart to support comparison between domains

Summary findings

Calibration

This report provides a comparison of existing publicly available survey-based measures of length of life spent in good health with population-level objectively recorded **HEALTHSPAN®**.

- Measures of 'years of life' lived (Life Expectancy and Lifespan) are fairly similar.

- National comparisons against publicly available, self-reported measures of time spent in good health, show that **HEALTHSPAN** tends to be around 10-13 years lower than measures such as HLE and DFLE.

- Comparing the same ICB, 'ICB A' in this report, between the National Bridges to Health Segmentation Dataset and Local Segmentation Dataset leads to fairly similar results for the **HEALTHSPAN** measure. Median age is around 6-7 years lower in the local linked dataset (with the addition of GP data).

- When exploring inequalities, the social gradient with self-reported measures such as Healthy Life Expectancy and Disability Free Life Expectancy is more pronounced than with **HEALTHSPAN**.

Insights

This report provides a comparison of measures of length of life spent in good health, including **HEALTHSPAN**.

- This report examines **HEALTHSPAN**, the age at which people first develop significant chronic conditions. The analysis highlights that the number of years people can expect to live in objectively 'good' health is on average 10-13 years younger, when compared to subjective measures such as Healthy Life Expectancy. This means that people can expect to live more of their life in poor health than self-reported data suggests.

- Based on national **HEALTHSPAN** data, people tend to first develop significant chronic conditions around the age of 51, meaning that on average around 37% of people's lives is spent in poorer health.

This report adds to the growing body of evidence on living well and 'healthy aging', sometimes known as 'Healthy Longevity'.

- It contributes to evidence on the 'Social Gradient', a term used to describe the systematic link between domains of deprivation, and poorer health and shorter lifespan.

- It provides further evidence on inequalities that exist in England.

How these insights could be used:

- **HEALTHSPAN** could be used to track outcomes, monitor success of primary prevention programmes, and post-Covid health and care system recovery.

- **HEALTHSPAN** insights could be examined as part of national and local prevention and improvement programmes, looking to improve the socio-demographic determinants of health and reduce health inequalities.

outcomesbased**healthcare**

The Outcomes Based Healthcare® team of clinicians, developers, data scientists, NHS data analysts, economists, and data governance specialists share a deep commitment to supporting sustainable healthcare, and transforming the way healthcare measures and funds success.

We offer specialist advice, advanced tools and data driven technologies to help commissioners and providers make a reality of value-based healthcare strategies and outcomes-based contracts.

Website
outcomesbasedhealthcare.com

Email
info@outcomesbasedhealthcare.com

Address
Outcomes Based Healthcare
11-13 Cavendish Square
London
W1G 0AN

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