The relationship between NHS waiting lists and health-related benefit claims

Appendix B. Methodology

Here we set out further details on the data and methodology we use throughout the report.

Data sources

NHS waiting lists

We use three data sources for NHS waiting lists. Our primary source is the Consultant-led Referral to Treatment Waiting Times Data produced by NHS England. We use the published data files to create panels for both providers (NHS trusts) and commissioning areas (CCGs then Sub ICB Locations) across all measures. Where needed, we adjust for organisational changes to providers and commissioners. For working-age waiting lists and waiting times, we also use an extract from the Waiting List Minimum Data Set, kindly provided to us by NHS England. Because not all providers consistently report data against this new standard, we restrict to providers that provide valid data at the beginning and end of our analysis period (November 2021 and May 2024). Finally, we combine monthly releases from the NHS Talking Therapies Monthly Statistics Including Employment Advisors data (previously Psychological Therapies, Reports on the use of IAPT services) to construct a panel of waiting times at the Sub ICB Location level.

Hospital Episode Statistics

As part of our estimation of MSOA waiting lists (discussed in more detail below), we use Hospital Episode Statistics. These are administrative data that record a range of NHS hospital activity in England at the patient level. For each year between 2019–20 and 2022–23, we calculate the amount of elective activity (measured as inpatient elective admissions and outpatient appointments) delivered by each provider for patients living in each MSOA.

Benefits data

All data on benefit claims are produced using DWP's Stat-Xplore, exported between December 2024 and January 2025. For disability benefits, we combine data on PIP and DLA claims. For incapacity benefits, we use data on UC health and legacy incapacity benefits.

Population data

We use the latest Office for National Statistics (ONS) estimates for Lower-layer Super Output Area (LSOA) populations, which run to 2022. To extend these to 2024, we use the latest ONS national population projections as the latest sub-national projections are based on 2018 populations. We aggregate LSOA populations to the MSOA level. Recent population estimates are produced for 2021 LSOA/MSOA geographies, while we use 2011 MSOA geographies in our analysis. In a small number of cases, the change in boundaries is complex, and so it is not possible to estimate population levels on 2011 MSOA geographies. In these cases, we drop the affected MSOAs whenever we use population levels in our analysis. To estimate population growth rates in these cases, we use the growth rates of the 2021 MSOAs that came from (parts of) the relevant 2011 MSOA.

Estimating MSOA-level waiting lists and times

To estimate waiting lists and waiting times at the MSOA level, we use our provider panel from NHS RTT data and our activity measures from Hospital Episode Statistics. Our activity measures from Hospital Episode Statistics allow us to quantify which NHS providers the patients living in an MSOA use for elective activity. We then calculate a weighted average waiting list and waiting time of the relevant providers as our estimates of MSOA waiting lists and times. Box 1 provides more intuition on this approach.

Formally, let $N_{m,p,t}$ be the number of patients living in MSOA m treated by provider p in period t, $w_{p,t}$ be the waiting list of provider p in period t and $l_{p,t}$ be a measure of waiting times for the same provider. Then we define our estimates of the MSOA waiting list ($\widehat{w}_{m,t}$) and waiting time ($\hat{l}_{m,t}$) as

$$\widehat{w}_{m,t} = \sum_p \frac{N_{m,p,t}}{N_{p,t}} \times w_{p,t}$$

$$\hat{l}_{m,t} = \sum_p \frac{N_{m,p,t}}{N_{m,t}} \times l_{p,t}$$

where $N_{p,t} = \sum_m N_{m,p,t}$ and $N_{m,t} = \sum_p N_{m,p,t}$.

In practice, we measure waiting lists and times for each month and activity counts for each year (since MSOAs are small, so much shorter periods would involve very small numbers of patients). Our measure of hospital activity only goes up to 2022–23, and so we assume that patterns continue at this level for 2023–24 onwards.