Improvements to healthcare volume output in the quarterly national accounts

An overview of the improvements made to the coverage and cost-weights for quarterly government healthcare volume output for the UK.

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Table of contents

1. Overview

2. Additions to healthcare coverage

3. Updating unit costs

4. Impact on volumes

5. Cite this methodology

1 . Overview

Methodological framework for measuring non-market output

The measurement of non-market output presents a considerable challenge across public services. In the absence of market prices, the volume of non-market output is estimated using a cost-weighted activity index. In these indices, the growth rates of individual types of activity are weighted by their respective shares of expenditure. As a consequence, growth in treatments that are more numerous and more expensive have a greater effect on overall output growth than treatments that are less common or low cost. For example, a hip replacement will have a larger cost-per-activity than an NHS 111 call.

This approach is mathematically equivalent to estimating the volume output measure through a Laspeyres index, in which the unit cost for the previous year is used to weight activity for both the current and previous years, removing the impact of inflation in costs from output. Changes in output are consequently driven by changes in the number of activities performed, rather than by changes in costs.

Approach to measuring healthcare volumes in the quarterly national accounts

Government healthcare, in volume terms, accounted for around 7.7% of gross domestic product (GDP) in 2022, with government healthcare mostly being non-market output. The growth in healthcare non-market output volumes, as measured in the quarterly national accounts, is based on the growth in cost-weighted activity for a variety of timely healthcare-related indicators. These cover a range of healthcare services, such as elective and non-elective treatments in hospitals, outpatient consultations and primary care activities.

However, timely quarterly activity data are not available for all healthcare services and so the quarterly healthcare output growth is estimated based on indicators for the subset of services where data are available. Because of limitations in data availability, these indicators cover data for England only.

In the short term, we assume that the changes in these timely indicators are representative of the changes in the level of healthcare output more broadly. In the longer term, these timely estimates are benchmarked against a more comprehensive measure of healthcare output once more detailed annual data become available.

The benchmark is a much more granular and complete assessment of healthcare activities across the whole UK, for example, including activities outside the quarterly measure such as imaging or pathology services, and capturing greater granularity in the services included in the quarterly measure such as different types of elective and non-elective inpatient services measured in each UK nation. Annual benchmarks are typically available on a financial year basis and are applied to the series with a two-year lag. The latest period benchmarked as of the Quarter 2 (April to June) 2023 quarterly national accounts is for the period up to the financial year ending 2021 (April 2020 to March 2021).

Improvements to healthcare volumes

In recent years, NHS England has established new data collections recording activity in services for which timely activity data were not previously available. As part of the Quarter 2 (April to June) 2023 quarterly national accounts, we have incorporated activity data from these collections to capture the growth in volumes for ambulance, community health, and mental health services.

We have also updated the cost-weighting method for existing services within the quarterly measure of GDP, which gives a better reflection of expenditure weights for each healthcare service.

These data improvements have been introduced into the quarterly measure of GDP from Quarter 1 (January to March) 2022 onwards. Data availability allows the improvements to unit costs to be backdated further back through the data time series, which begins in 1997, although these changes will be implemented in future editions of the annual national accounts.

2 . Additions to healthcare coverage

The three components of ambulance services, mental health services and community health services are calculated from several activity indicators, which capture different elements of each service type.

Ambulance services

Ambulance activity data are taken from NHS England's Ambulance Quality Indicators publication. A number of activity measures are used to distinguish the different types of emergency service activities:

- hear and treat – when a person does not require an ambulance, but a clinician is able to provide treatment and advice over the phone
- see and treat – when an incident is resolved by the patient being treated and discharged from ambulance responsibility at the scene
- convey – when at least one patient is conveyed by ambulance to a medical centre

Mental health services

We use four activity measures to estimate the change in the volume of mental health services delivered. These are obtained from NHS England's Mental Health Services Monthly Statistics and NHS Talking Therapies Monthly Statistics.

From the former we use the change in the number of people assigned to a mental health care cluster to estimate the growth in mental health care cluster activity and the number of people in receipt of mental health services who have been detained to estimate volume growth in secure mental health care cluster activity.

From the latter publication we take the number of appointments attended as a measure of the growth in talking therapies activity and the number of first assessments as a measure of those who have undergone an initial assessment for treatment.

Community services

Community services activity data are taken from NHS England's Community Services Data Set (CSDS) publication. In total we take 20 different types of community health service activities as part of this measure. These are care contacts for services in:

- cancer
- cardiac
- children's community nursing
- continence
- diabetes
- district nursing
- end of life care
- intermediate care
- nutrition and dietetics
- occupational therapy
- physiotherapy
- podiatry
- rehabilitation
- respiratory
- speech and language therapy
- treatment room nursing
- tissue viability
- health visiting
- hearing
- school nursing services

The CSDS is currently badged as an experimental statistic and contains some variation in the number of providers submitting data each month. To avoid a discontinuity in the number of data providers from impacting on the estimation of volume growth in these services, we limit the calculation of a growth rate for each community health service only to those providers submitting data for six consecutive months. This allows us to produce a growth estimate that is not biased by inconsistent reporting.

Timeliness

All four data sources are published monthly and contain monthly activity data for services provided as public services by NHS trusts and other organisations in England. There is typically a lag of 10 weeks in the publication of estimates for mental health and community healthcare services, while the lag is much shorter for ambulance services at around just two weeks.

The time lag ensures that data are available for all three months of the latest quarter within the publication of the quarterly national accounts. However, given the first quarterly estimates of gross domestic product (GDP) are produced a month earlier than this dataset is available, the volume growth in mental health and community health services activity will need to be partially estimated for the latest month of the quarter, which is done using methods consistent with estimation used for other elements of quarterly healthcare output.

These new data will be incorporated in the quarterly national accounts from Quarter 1 (January to March) 2022 onwards, as this reflects the period for which the national accounts are open for revisions in line with the National accounts revision policy. While the quarterly national accounts for earlier periods will not be revised with these data, ambulance, mental health and community services are already included in the annual benchmark measure of healthcare output. In the 2023 annual national accounts (Blue Book) release, the annual benchmark estimates have been updated to cover the period up to 2020. The data sources required to produce annual benchmark estimates for 2021 are set to be available in time for the 2024 Blue Book, at which point ambulance, mental health and community services will be represented throughout the quarterly national accounts data time series.

With ambulance services data published around two weeks after the end of the month, ambulance services output can also be used to inform the contribution of healthcare output to future estimates of monthly GDP to further improve the quality of our most timely GDP estimates.

3 . Updating unit costs

Unit costs (the cost of one unit of health activity, for example, the cost of a GP consultation) are central to the cost-weighting of individual activities and ensure that the contribution to overall healthcare output growth for each component is proportional to the cost of the component. Our existing unit costs for healthcare services have been updated where appropriate to give more representative weights for each healthcare component.

Unit costs have been updated on a financial year basis, as this is the most common periodicity over which new unit costs are available. Unit costs are updated up to the financial year ending 2020 (April 2019 to March 2020), carrying these weights forward for later time periods. This is to align with the current national accounts base year for weighting of 2019.

Average unit costs for components that represent activities performed by NHS trusts are taken from the NHS National Cost Collection (NCC), which presents unit costs for activities provided by NHS trusts in England and are derived from reference costs and from patient-level information and costing systems (PLICS). The NCC is also the principal data source used to measure NHS trust activity in the annual benchmark.

For general practice, we apply the same unit costs for each sub-component as are used in our annual benchmark. Similar methods are also used in the public service healthcare productivity statistics.

For dentistry and ophthalmic services, we ensure the overall cost-weight is representative of expenditure on services, by deriving unit costs through dividing activity for a financial year by the net expenditure on the service as reported in the Department of Health and Social Care (DHSC) annual accounts.

For community prescribed goods, we use the NHS Business Services Authority's Prescription Cost Analysis to cost-weight different prescription products.

The use of unit costs to weight together different service activities follows best practice international guidance and ensures that the effect of different services on the overall output is appropriately proportioned to the relative spending on these services. However, it should be noted that the use of cost-weighting can result in output falling when alternative, lower-cost service delivery mechanisms replace higher-cost mechanisms for delivering similar services. For example, reducing avoidable ambulance conveyance by increasing the provision of telephone-provided services may lead to a fall in observed output, irrespective of the clinical outcomes for patients.

4 . Impact on volumes

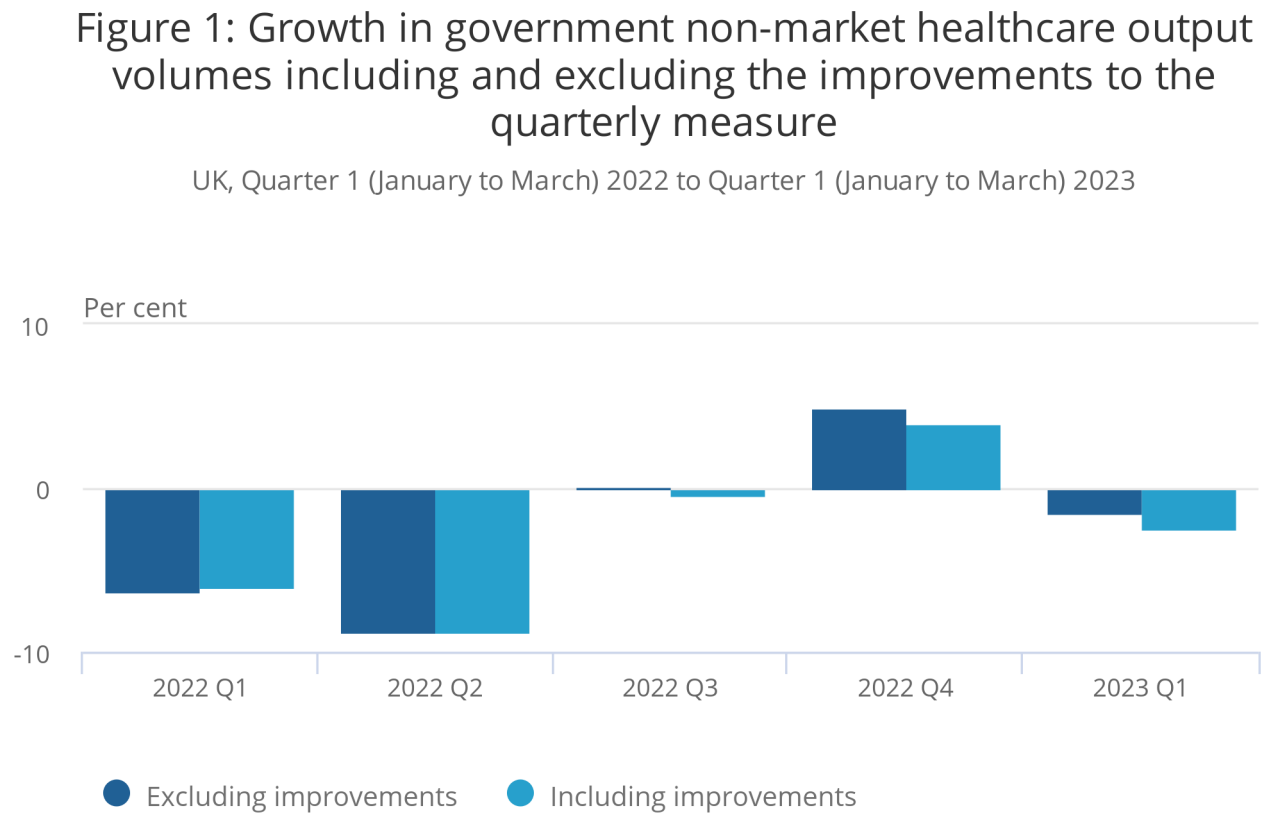
Our approach to estimating volume output for public healthcare services is incorporated within the chained volume measurement (CVM) of gross domestic product (GDP) and consequent breakdowns by sector and industry. CVMs present expenditure on goods and services with the effect of price changes removed.

We have introduced our improvements to the method of estimating quarterly healthcare volumes in the Quarter 2 (April to June) 2023 quarterly national accounts. This allows for changes to be incorporated back to Quarter 1 (January to March) 2022.

Figure 1 shows the impact of these improved methods on government healthcare services. The impact is greatest in Quarter 4 (October to December) 2022 and Quarter 1 (January to March) 2023, where the inclusion of new services in the measure contributed towards lower overall healthcare volume output growth. While volumes fell for all three new components in Quarter 4 2022, the largest fall was in community health services activity, primarily driven by lower volumes for district nursing, health visiting and intermediate care services. By contrast, in Quarter 1 2023, the additional percentage point fall in volumes from the newly included services was primarily driven by less mental health services activity.

Figure 1: Growth in government non-market healthcare output volumes including and excluding the improvements to the quarterly measure

UK, Quarter 1 (January to March) 2022 to Quarter 1 (January to March) 2023



Source: Chained volume measurement of gross domestic product from the Office for National Statistics

5 . Cite this methodology

Office for National Statistics (ONS), released 25 September 2023, ONS website, methodology, Improvements to healthcare volume output in the quarterly national accounts