Office for National Statistics

Statistical bulletin

Public service productivity, quarterly, UK: January to March 2024

UK total public service productivity, inputs and output to provide a short-term, timely indicator of annual productivity estimates. These are official statistics in development.

Contact:
Public Service Productivity Review team
psp.review@ons.gov.uk
+44 3456 013034.

Release date:
15 July 2024

Next release:
To be announced

Table of contents

1 . Main points

- Public service productivity is estimated to be 0.6% lower in Quarter 1 (Jan to Mar) 2024 compared with the same quarter a year ago.
- Public service productivity increased by an estimated 0.3% in Quarter 1 2024 compared with Quarter 4 (Oct to Dec) 2023, the first quarter of growth since Quarter 2 (Apr to June) 2023.
- Public service productivity in Quarter 1 2024 is estimated to be 6.4% below its pre-coronavirus (COVID-19) pandemic peak (Quarter 4 2019) but has remained relatively stable since Quarter 2 2021 through the post-pandemic period.
- Annual estimates suggest that public service productivity fell by 0.2% in 2023 after a partial “bounce-back” of 6.5% in 2021 and 2.6% in 2022, following the first year of the pandemic in 2020.

These are official statistics in development, and we advise caution when using the data. The method is currently under development, which means that these estimates will be subject to revision as methods are redefined and more up-to-date data becomes available. Read more in Section 10: Measuring the data.

2 . About these estimates

This release presents official statistics in development for total public service productivity, inputs and output. This quarterly publication provides a short-term, timely indicator of the annual accredited official statistics of total public service productivity, which include quality adjustments, but are produced with a two-year lag to give time for data on quality factors to become available.

Since the beginning of the Public Services Productivity Review, the Office for National Statistics (ONS) has been working to improve how public service productivity is measured. The description of the first sets of improvements produced within the Public Services Productivity Review can be found in the Improved methods for total public service productivity: total, UK, 2021. These methodological improvements informed the annual accredited official statistics of total public service productivity. Details on data and methods for the estimates presented in this release are described in Section 10: Measuring the data.

This release contains data that are consistent with our Quarterly national accounts bulletin. Therefore, in line with the quarterly national accounts, the revisions included in this bulletin reflect updated data on public administration and defence. In addition, our public service productivity estimates are subject to revisions because of improvements to source data and methodology.

As mentioned in our previous bulletin, comparing the latest estimates with pre-coronavirus (COVID-19) pandemic years should be done with caution, as the structure of inputs and output changed in response to the pandemic.Similarly, quarterly estimates should also be interpreted with caution because of the volatile nature of quarterly inputs estimation.

These estimates are not a measure of the productivity of an individual worker within the public sector. Instead, they reflect the volume of services delivered to end users relative to the volume of total inputs required to deliver these services. The measure is dominated by healthcare and education services because of their relative size.

In reading the following statistics, please consider that, unless stated otherwise, all growth rates reported in this article are indexed to the base year of 1997.

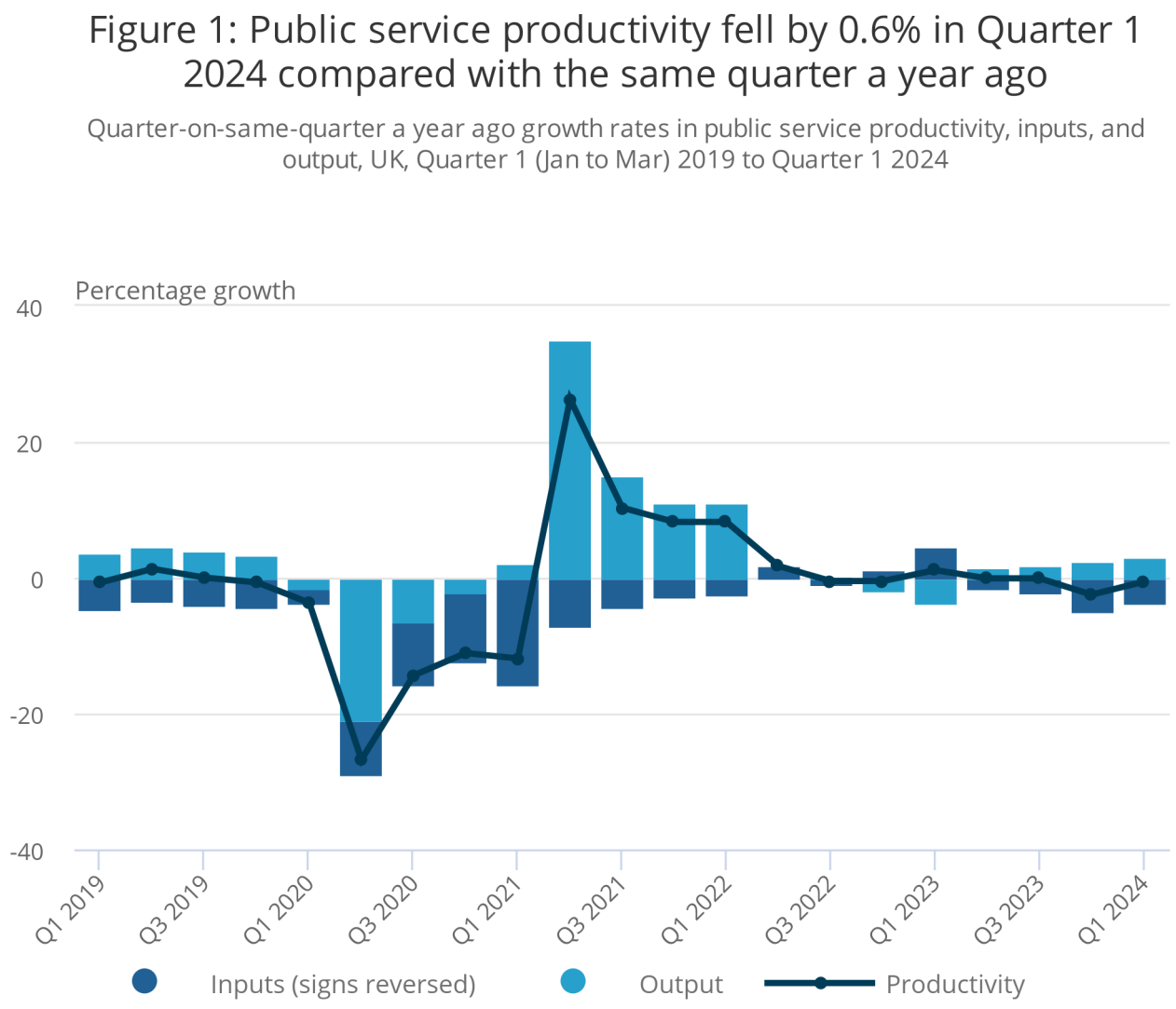
3 . Quarter-on-previous-year productivity estimates

Because changes in productivity represent long-term structural trends, we advise looking at changes over a longer period. This helps to smooth any short-term fluctuations. Comparing the present quarter with the same quarter a year ago provides a yearly point estimate of productivity and is, therefore, a better indication of trend.

Productivity for total public services was estimated to be 0.6% lower in Quarter 1 (Jan to Mar) 2024 compared with the same quarter a year ago. Over this period, inputs and output increased by 3.7% and 3.0%, respectively.

Figure 1: Public service productivity fell by 0.6% in Quarter 1 2024 compared with the same quarter a year ago

Quarter-on-same-quarter a year ago growth rates in public service productivity, inputs, and output, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 1 2024



Source: Public service productivity from the Office for National Statistics

Notes:

1. Official statistics in development quarterly estimates of productivity are calculated using seasonally adjusted inputs and seasonally adjusted output.

2. This chart inverts the growth rates of inputs.

4 . Quarter-on-quarter productivity estimates

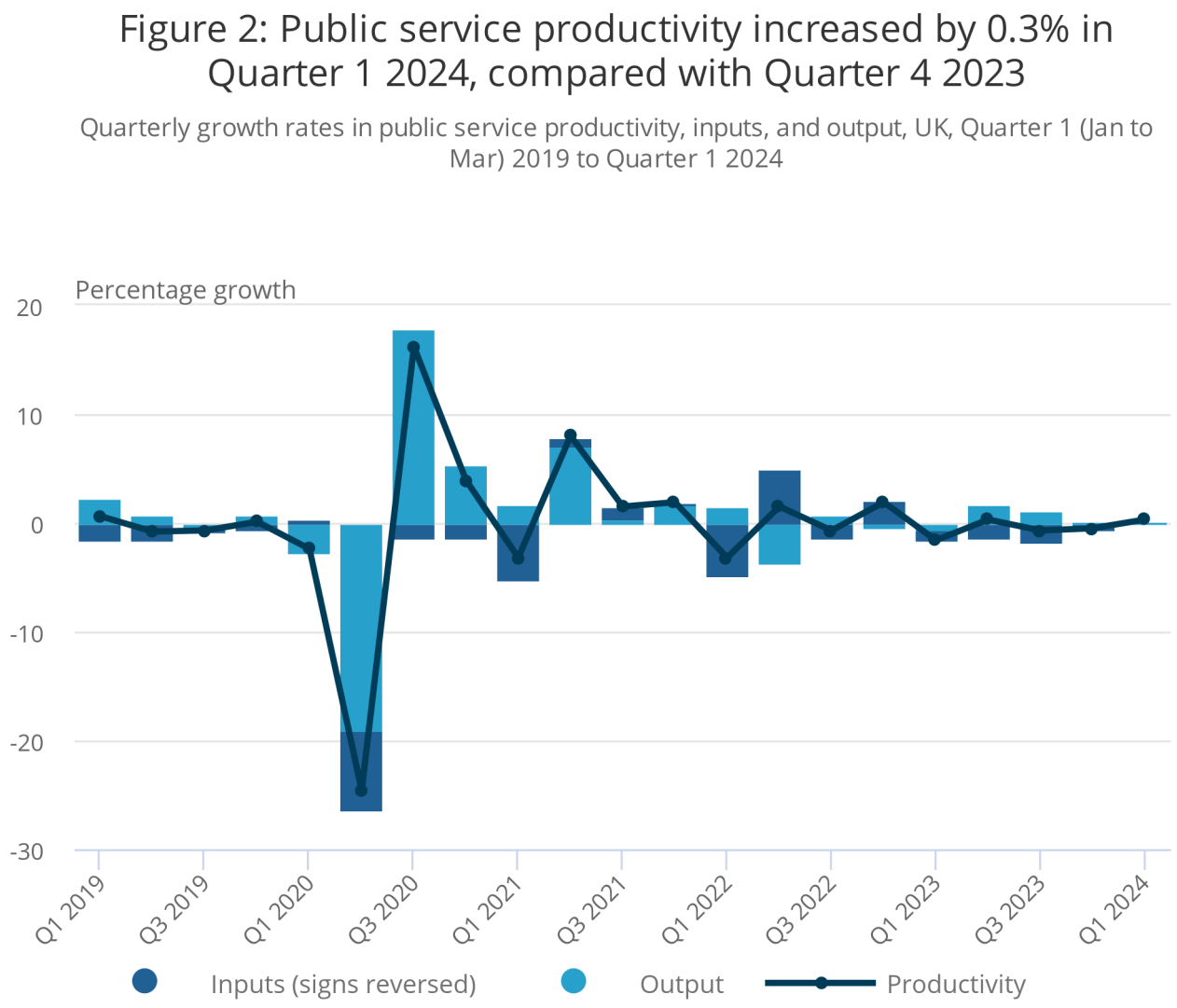
Productivity for total public services was estimated to increase by 0.3% in Quarter 1 (Jan to Mar) 2024 compared with the previous quarter. The trend of both inputs and output are very close to zero growth.

Inputs decreased on the quarter for all service areas (except for social protection), while output increased for healthcare and education, the two largest areas by expenditure share, and social protection.

Military defence, central and local government service areas all adopt an “output-equals-inputs” convention (for more information, see our Sources and methods for public service productivity estimates methodology). This convention assumes that the volume of inputs used to create the volume of output is equal when output cannot be directly measured. Hence, estimated productivity is constant by assumption.

Figure 2: Public service productivity increased by 0.3% in Quarter 1 2024, compared with Quarter 4 2023

Quarterly growth rates in public service productivity, inputs, and output, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 1 2024



Source: Public service productivity from the Office for National Statistics

Notes:

1. Official statistics in development quarterly estimates of productivity are calculated using seasonally adjusted inputs and seasonally adjusted output.

2. This chart inverts the growth rates of inputs.

5 . Post-pandemic estimates

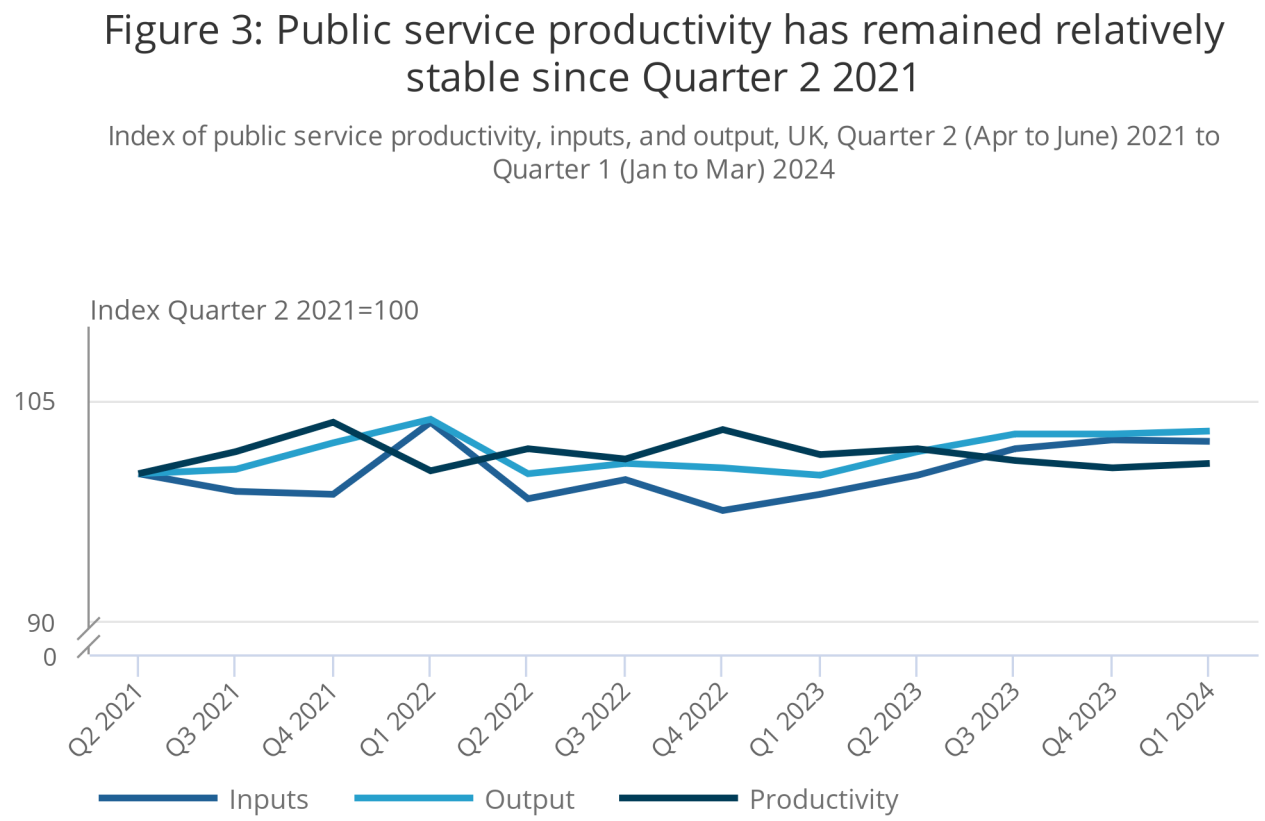
As seen in our previous bulletin, public service productivity levels have remained relatively stable since Quarter 2 (Apr to June) 2021.

Inputs grew by 2.2%, while output grew by 2.9%, leading to productivity growth of 0.7% over a three-year period.

This period of stability follows a large fall in productivity during the months affected by the coronavirus (COVID-19) pandemic. Our estimates show that between Quarter 4 (Oct to Dec) 2019 and Quarter 4 2023, productivity decreased by 6.4%.

Figure 3: Public service productivity has remained relatively stable since Quarter 2 2021

Index of public service productivity, inputs, and output, UK, Quarter 2 (Apr to June) 2021 to Quarter 1 (Jan to Mar) 2024



Source: Public service productivity from the Office for National Statistics

Notes:

1. Official statistics in development quarterly estimates of productivity are calculated using seasonally adjusted inputs and seasonally adjusted output.

6 . Annual estimates

As mentioned in Section 2: About these estimates, the Office for National Statistics (ONS) publishes annual accredited official statistics of total public service productivity, which are produced with a two-year lag to give time for data to become available. This quarterly bulletin focuses on the official statistics in development for total public service productivity, inputs, and output, from which we present annualised quarterly estimates.

Annualised quarterly estimates

Figure 4 places productivity, inputs, and output in an annual context over a longer period, combining our accredited annual estimates from our total public service productivity accredited official statistics publication between 1997 to 2021, with data from our official statistics in development from 2022 onwards.

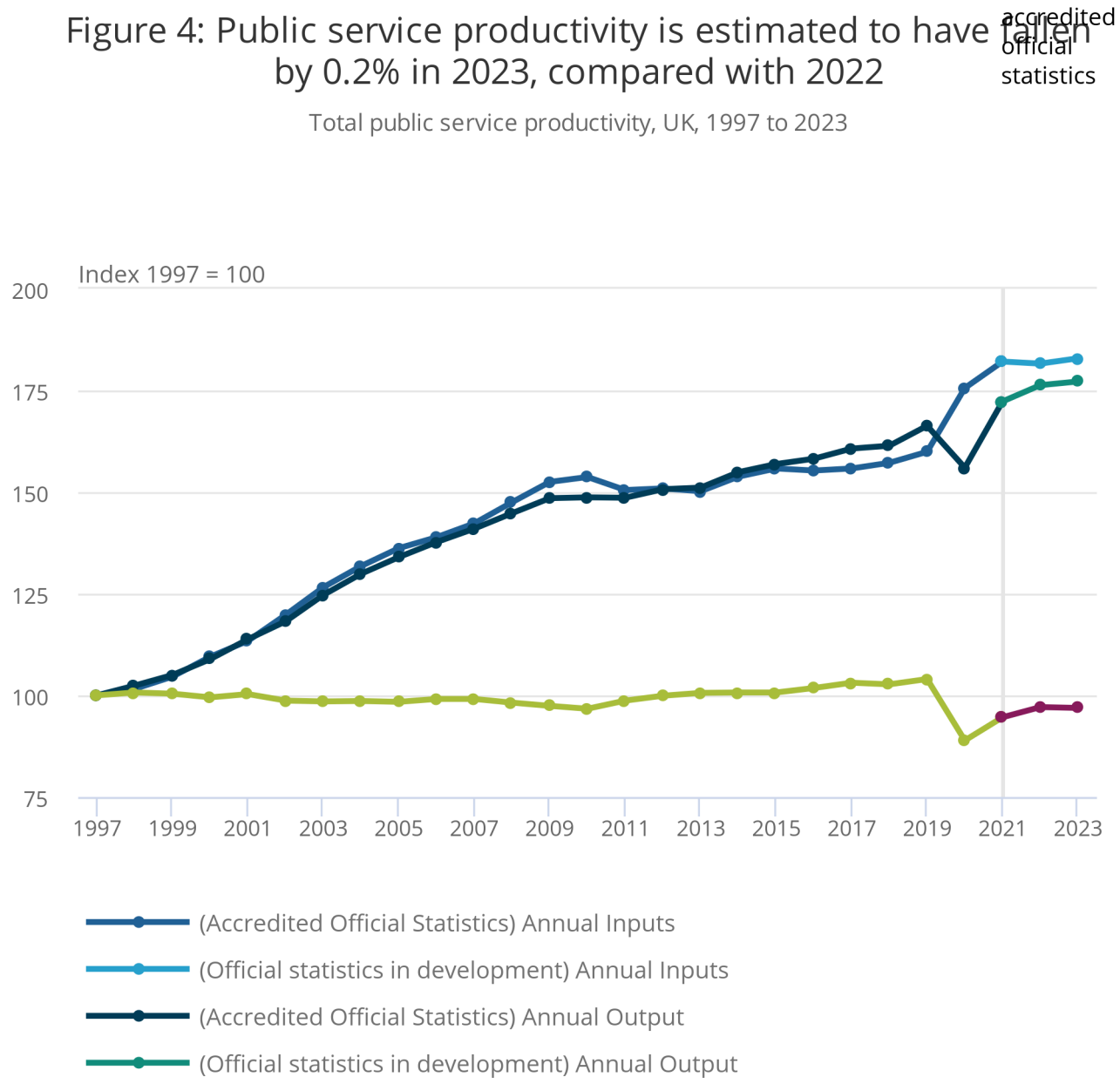
Annualised quarterly estimates from our official statistics in development (which average inputs and output volume across the four quarters) suggest that annual total public service productivity decreased by 0.2% in 2023. Both inputs and output increased in 2023, with inputs growing at a faster pace than output.

Inputs grew by an average of 2.2% per year between 1997 and 2019, while they grew by 0.7% between 2022 and 2023. Similarly, output grew by an average of 2.3% per year until 2019, and by 0.5% between 2022 and 2023.

The fall in productivity in 2023 is the first fall since 2020, which was the first year of the coronavirus (COVID-19) pandemic. Productivity is estimated to have increased in 2021 and 2022 by 6.5% and 2.6%, respectively. In 2021 and 2022, output grew faster than inputs, because fewer restrictions were present compared with the previous year; most of the activities cancelled during the pandemic were slowly reintroduced, including non-urgent healthcare treatments, activities in courts and tribunals, and pupils returning to attend lessons in schools. In addition, new services such as NHS Test and Trace, and COVID-19 vaccinations were introduced.

Figure 4: Public service productivity is estimated to have fallen by 0.2% in 2023, compared with 2022

Total public service productivity, UK, 1997 to 2023



Source: Public service productivity from the Office for National Statistics

Notes:

1. Estimates for 2022 and 2023 are official statistics in development and have not been quality adjusted.

2. Estimates from 1997 to 2021 are accredited official statistics.

The quality adjustment had a negative impact on our final productivity accredited annual estimate for 2021, published in March 2024. We do not currently apply quality adjustments to our quarterly estimates, so there is no quality adjustment effect observed in our annualised quarterly data used to derive 2022 and 2023 estimates. This will be addressed in the Public Services Productivity Review, alongside the nowcasting estimates under development (as shown in Section 7: Revisions to public service productivity estimates).

These official statistics in development estimates for 2022 and 2023 should be treated with caution until our accredited statistics for these years become available.

Annual nowcast under development

While the estimates in Figure 4 annualise the quarterly series for 2022 and 2023, the estimates published in our public service productivity, UK: 1997 to 2022 article are based on the experimental nowcast approach, which the Office for National Statistics (ONS) first released in November 2023. The nowcasting approach differs from the annualised quarterly by incorporating further data sources and applying different techniques. The experimental nowcast measures published in November 2023 continue to be under methodological review and the ONS will communicate updates on this work in the future.

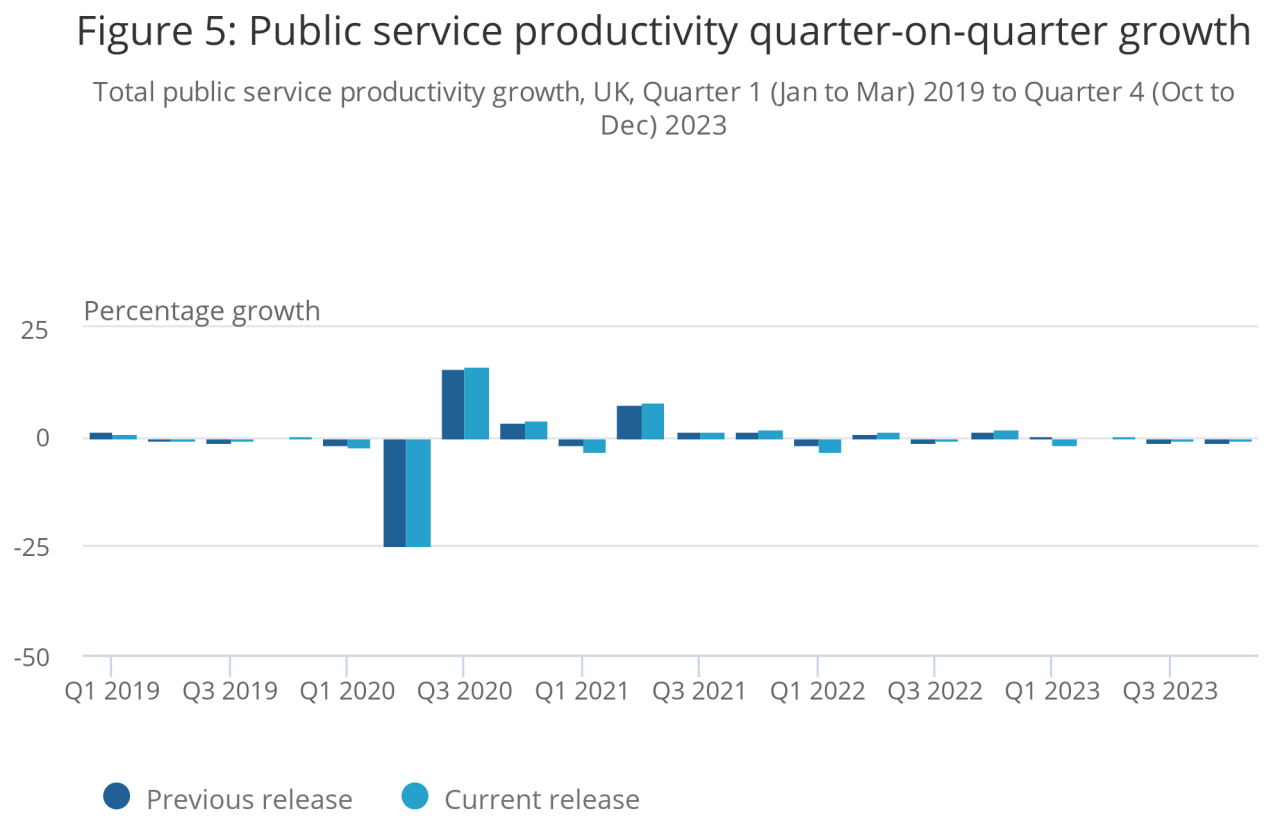
7 . Revisions to public service productivity estimates

The Public service productivity estimates follow the National Accounts revisions policy.

Figure 5 shows the estimates published in our previous bulletin, and the revised estimates on public service productivity, following the changes mentioned in Section 10: Measuring the data.

Figure 5: Public service productivity quarter-on-quarter growth

Total public service productivity growth, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2023



Source: Public service productivity from the Office for National Statistics

For more detailed information on revisions to productivity, inputs, and output, please see Table 4 in our accompanying dataset.

8 . Public service productivity: quarterly, UK January to March 2024 data

Public service productivity: quarterly, UK: January to March 2024
Dataset | Released 15 July 2024
Official statistics in development on UK public service productivity. Includes estimates of inputs, output, productivity, and revisions compared with estimates from the previous quarter.

9 . Glossary

Deflator

A price index used to remove inflation effects from current price estimates of expenditure to provide a volume estimate.

Direct output measurement

Using a cost-weighted activity index to estimate the non-quality adjusted output of a service provided, such as the number of students in state schools, adjusted for attendance to produce an estimate of total hours of schooling delivered each year. Differs from indirect output measurement, where output is assumed equal to inputs.

Intermediate inputs

Also referred to as “goods and services”, or “intermediate consumption” (the national accounts term). Intermediate inputs include goods and services used up in the provision of a public service, such as utilities, energy, professional services, and medical supplies, among others.

Nowcast

The nowcasts are a product of the observed annualised quarterly series in 2021 and 2022 and the relationship between the observed annual series and annualised quarterly series in 1997 to 2019 (excluding 2020 because of the impact of the coronavirus (COVID-19) pandemic). They are produced using an experimental, dynamic regression approach (an extension of autoregressive integrated moving average (ARIMA) modelling). In this method, annualised quarterly data are utilised as predictors of the unavailable annual data.

Public services

These are services delivered by or paid for by government (central or local). If paid for by the government, they may be delivered by a private body – for example, the provision of nursery places by the private sector, where these places were funded by the government.

Quality adjustment

A statistical estimate of the change in the quality of a public service, using an appropriate metric, such as safety in prisons as part of the public order and safety adjustment.

Service area

The way we refer to the breakdown of public services into seven areas, closely following Standard Industrial Classification (SIC) codes.

Standard Industrial Classification

The industrial classification applied to the collection and publication of a wide range of economic statistics.

10 . Measuring the data

Data sources

Different sources and methods are used to produce the official statistics in development quarterly statistics and the accredited official statistics.

This release uses expenditure data from the quarterly UK National Accounts, split into seven categories:

- healthcare
- education
- social protection
- justice and fire
- military defence
- central government services
- local government services

Data sources and methods differ from the annual publication, depending on data availability and appropriateness on a quarterly or annual basis. For example, some inputs measures that are available on an annual basis as direct measures are not available on a quarterly basis. These missing quarterly direct input measures may only be obtainable using indirect measures (deflated expenditure).

The accredited official statistics of total public service productivity also use different deflators to those used in this release to estimate those volumes of inputs. As such, estimates are not directly comparable between the quarterly and annual publications.

This release does not provide adjustments for the quality in public service output, whereas the accredited official statistics of total public service productivity do for some public output.

Estimates of productivity, inputs and output up to 2021 are reported on an annual basis and use data from our Public service productivity, total, UK, 2021 article. Further information about the annual accredited official statistics release can be found in our Public service productivity: total, UK, QMI.

Official statistics in development estimates differ from the annual estimates, as described in Section 9 of our Sources and Methods for public service productivity estimates. Importantly, official statistics in development estimates do not apply quality adjustments.

Revisions

These estimates reflect the revisions included in our GDP quarterly national accounts, UK: January to March 2024 bulletin.

The estimates published in this bulletin are also affected by the quarterly revisions of the seasonal adjusted methods and by the adjustment in the calculation of our deflators. In alignment with national accounts and our accredited official statistics, all deflators in our series are now calculated as Paasche price indices.

Measuring public service productivity

Productivity is calculated by dividing output by the respective inputs used to produce it. Therefore, productivity will increase when more output is being produced for each unit of inputs used. Estimates of inputs, output, and productivity are given both as growth rates between consecutive periods and as indices, showing the cumulative trend over time.

Official statistics in development quarterly estimates of productivity are seasonally adjusted. In official statistics, it is common for the time series to have regular, repeating, predictable variation (for example, the increase in retail sales in December). To help users interpret the series, national statistical institutes use a statistical method called seasonal adjustment to remove these effects. We use the X11 algorithm in the X-13ARIMA-SEATS software to perform seasonal adjustment.

Time series experts in the Office for National Statistics (ONS) review the seasonal adjustment periodically. This includes checking for the impact of outliers. For the public sector productivity series, the coronavirus (COVID-19) pandemic period has been closely analysed for such outliers. The outliers are only included if they are judged by a time series expert to improve the seasonal adjustment. This judgement will include consideration of the charts, statistical tests, and diagnostics. For the pandemic period, some series have additive outliers used to take account of the impact, while others have used level shifts.

For total UK public services, estimates of inputs are made up of aggregated series for individual public services, weighted together by their relative share of total expenditure on public services in current price (expenditure weight). Inputs are composed of labour, goods and services, social transfers in kind, and consumption of fixed capital. Output reflects the total of the general government final consumption expenditure (GGFCE).

Expenditure data, used to estimate most inputs growth, are taken from our Gross domestic product(GDP) quarterly national accounts, UK: January to March 2024 bulletin. The quarterly national accounts also provide estimates of government output, based on direct measures where they are available and indirect measures where they are not.

Public service productivity is measured differently to labour productivity and multi-factor productivity and is not directly comparable. It reflects the volume of services delivered to end users relative to the volume of total inputs (which comprise of labour, intermediate consumption, and capital). The measure is dominated by healthcare and education services because of their relative size.

The estimates are not a measure of the productivity or efficiency of an individual worker within the public sector. For instance, while children within school received fewer hours of education at the start of the pandemic, a teacher may still have had to undertake additional work to modify lesson plans for remote learning. Public service productivity within this statistic only focuses on the education received by end users, or the healthcare services received by end users, rather than the productivity of an individual teacher or an individual nurse to deliver a discrete task.

Similarly, the resource required to deliver some services within the NHS may have increased because of additional restrictions, such as the use of personal protective equipment, but the overall volume of NHS services may still have declined.

Public service productivity uses the expenditure of public services, which defines general government final consumption expenditure (GGFCE). While including services where employees are central or local government, it also includes publicly funded private providers. This differs from the public sector which extends to include public corporations but exclude publicly funded private providers to avoid double-counting.

These estimates should be considered a first estimate on public service productivity. The Office for National Statistics (ONS), together with HM Treasury and other government departments, will continue to develop and improve its methods, which may lead to revisions of these preliminary estimates.

11 . Related links

GDP quarterly national accounts, UK: January to March 2024
Bulletin | Released 28 June 2024
Revised quarterly estimate of gross domestic product (GDP) for the UK. Uses additional data to provide a more precise indication of economic growth than the first estimate.

Public service productivity: total, UK, 2021
Article | Released 26 March 2024
Updated measures of output, inputs, and productivity for UK public services between 1997 and 2021: service area breakdown, quality adjustment, latest revisions.

Improved methods for total public service productivity: total, UK, 2021
Methodology | Last revised 8 March 2024
Explaining data and methodological improvements to education and healthcare inputs, output and quality adjustment, used in the upcoming public service productivity article.

Public service productivity, UK: 1997 to 2022
Article | Released 17 November 2023
An overview of UK annual public service productivity between 1997 and 2020, and a new experimental measure for the path of annual UK public service productivity in 2021 and 2022.

Public service productivity: total, UK QMI
Methodology | Released 17 November 2023
Quality and Methodology Information (QMI) report for the public service productivity: total, UK: 2019 release, detailing the strengths and limitations of the data, methods used and data uses and users.

Public Services Productivity Review progress report: February 2024
Article | Released 20 February 2024
Update on progress toward making improvements to public services productivity measures as part of the Public Services Productivity Review.

12 . Cite this bulletin

Office for National Statistics (ONS), released 15 July 2024, ONS website, statistical bulletin, Public service productivity, quarterly, UK: January to March 2024