

Statistical bulletin

Public service productivity, quarterly, UK: October to December 2022

Experimental estimates for UK total public service productivity, inputs and output to provide a short-term, timely indicator of the future path of the annual productivity estimates.

Contact:
Sara Zella
productivity@ons.gov.uk
+44 1633 455086

Release date:
24 April 2023

Next release:
To be announced

Table of contents

1. [Main points](#)
2. [About these estimates](#)
3. [Quarterly productivity estimates](#)
4. [Annual productivity estimates](#)
5. [Public service productivity: quarterly, UK, October to December 2022 data](#)
6. [Glossary](#)
7. [Measuring the data](#)
8. [Related links](#)
9. [Cite this bulletin](#)

1 . Main points

- Since Quarter 2 (Apr to June) 2021, public service productivity has remained mostly steady.
- Public service productivity rose by around 0.4% in Quarter 4 (Oct to Dec) 2022, after a 1.1% fall the previous quarter.
- Public service productivity fell by 1.6% in Quarter 4 2022, compared with the same quarter a year ago.
- Experimental annual estimates suggest that total public service productivity rose by 1.9% in 2022, following an increase of 7.3% in 2021 and an estimated fall of 13.3% in 2020.

The estimates are not a measure of the productivity of an individual worker within the public sector, but 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 health and education services because of their relative size. Caution should be used when comparing the latest estimates with pre-pandemic years, as the structure of inputs and outputs changed in response to the coronavirus (COVID-19) pandemic.

2 . About these estimates

This release presents [experimental estimates](#) for total public service productivity, inputs and output. This provides a short-term, timely indicator of the future path for the [National Statistics](#) estimates of total public service productivity, which are produced with a two-year lag.

Estimates of productivity, inputs and output up to 2019 are reported on an annual basis and use data from our [Public service productivity: total, UK, 2019 article](#). Further information about the annual National Statistics release can be found in our [Public service productivity: total, UK QMI report](#).

More details on our methods are presented in [Section 7: Measuring the data](#).

3 . Quarterly productivity estimates

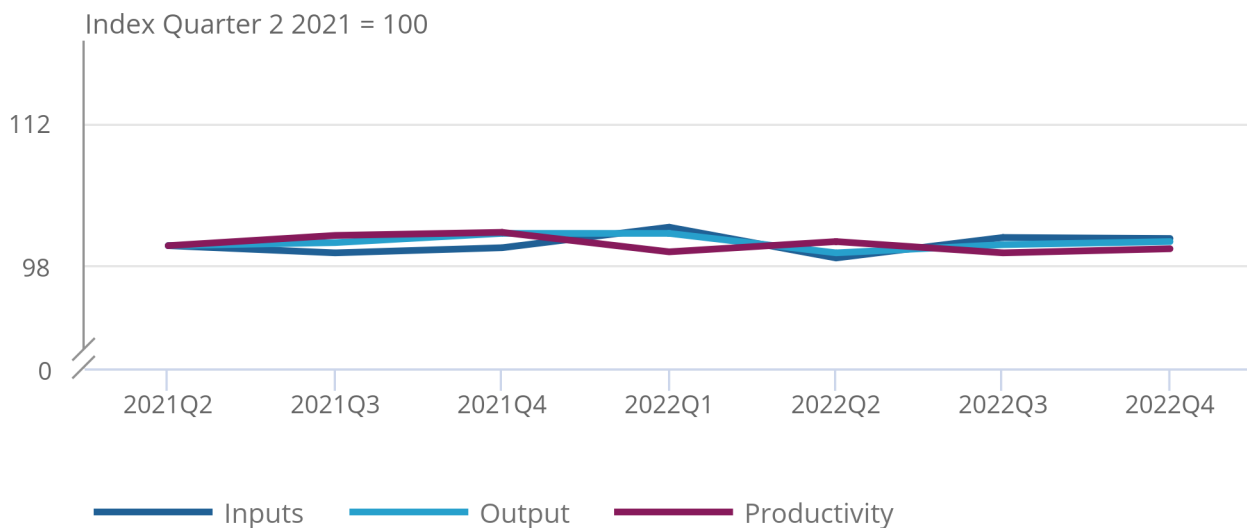
Since Quarter 2 (Apr to June) 2021, public service productivity has remained mostly steady.

Figure 1: Public service productivity has remained mostly steady since Quarter 2 (Apr to June) 2021

Index of public service output, inputs and productivity, UK, Quarter 2 (Apr to June) 2021 to Quarter 4 (Oct to Dec) 2022

Figure 1: Public service productivity has remained mostly steady since Quarter 2 (Apr to June) 2021

Index of public service output, inputs and productivity, UK, Quarter 2 (Apr to June) 2021 to Quarter 4 (Oct to Dec) 2022



Source: Public service productivity, quarterly, UK: October to December 2022 from the Office for National Statistics

Notes:

1. Data are from this experimental quarterly release.
2. Experimental quarterly estimates of productivity are indirectly seasonally adjusted, calculated using seasonally adjusted inputs and seasonally adjusted output.

Productivity increased by 0.4% in Quarter 4 (Oct to Dec) 2022, compared with the previous quarter. This was caused by an increase in output of 0.3%, while inputs fell 0.1%. However, these quarter-on-quarter estimates should be interpreted with caution because of some volatility in quarter-on-quarter inputs estimation.

Both inputs and output fell for healthcare, education, social protection, and military defence, while justice and fire saw an increase in inputs and a decrease in output.

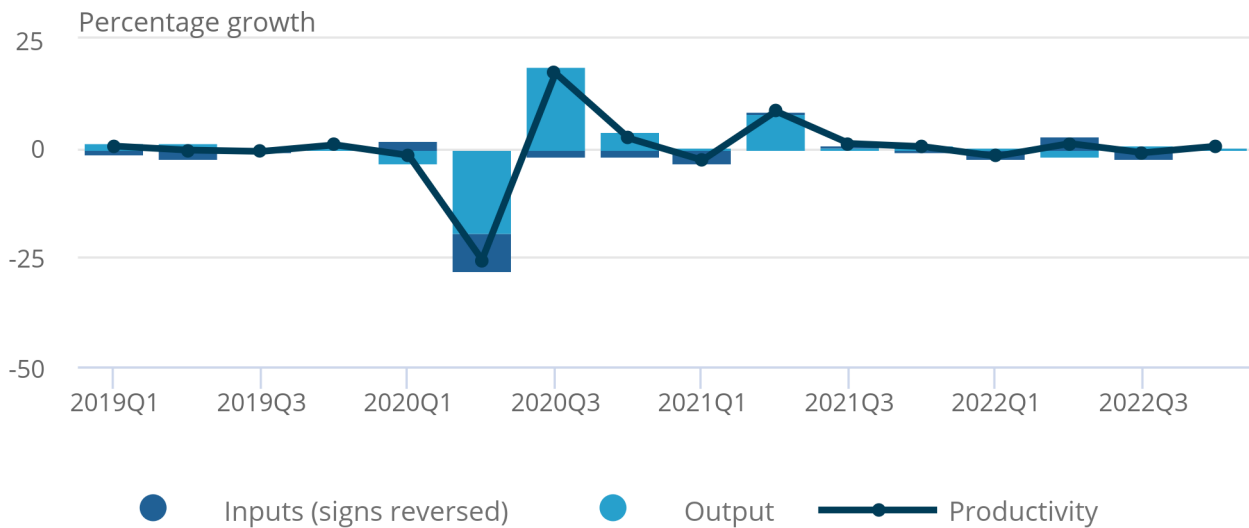
An increase in central and local government services contributed to inputs and output growth. However, for these service areas an ["output-equals-inputs" convention](#) is applied. This is where output volume is assumed to equal the volume of inputs used to create them. In this case, productivity is constant.

Figure 2: Public service productivity increased by 0.4% in Quarter 4 (Oct to Dec) 2022, driven by outputs growing faster than input

Quarterly growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2022

Figure 2: Public service productivity increased by 0.4% in Quarter 4 (Oct to Dec) 2022, driven by outputs growing faster than input

Quarterly growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2022



Source: Public service productivity, quarterly, UK: October to December 2022 from the Office for National Statistics

Notes:

1. Data are from this experimental quarterly release.
2. Experimental quarterly estimates of productivity are indirectly seasonally adjusted, calculated using seasonally adjusted inputs and seasonally adjusted output.
3. This chart inverts the growth rates of inputs.

4 . Annual productivity estimates

Productivity for total public services was 1.6% lower in Quarter 4 (Oct to Dec) 2022, compared with the same quarter a year ago. Over this period, inputs increased by 0.9%, while output decreased by 0.8%.

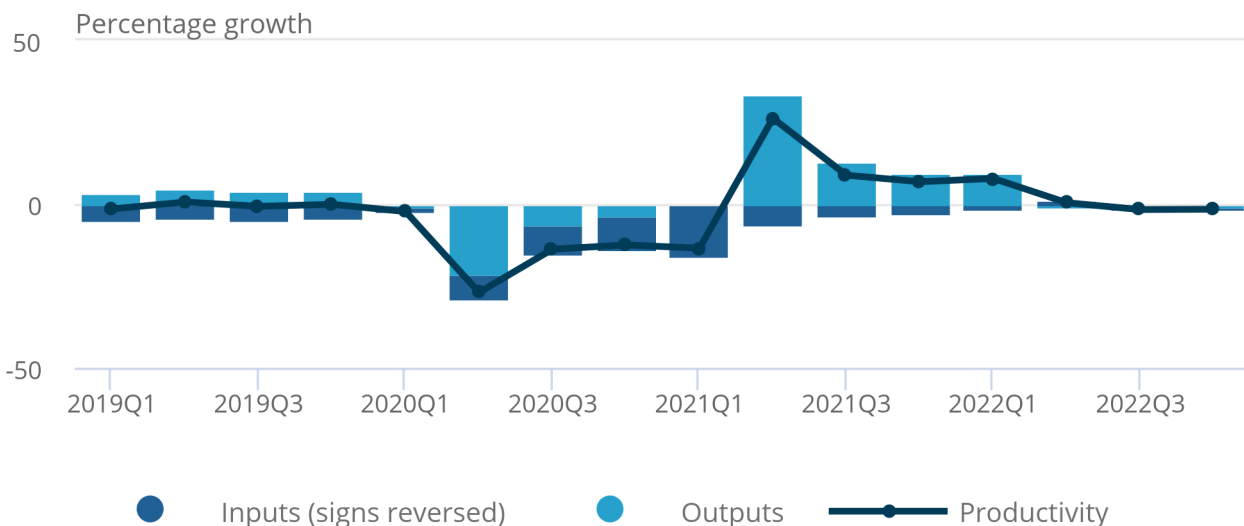
Quarter 4 2022 continued the trend of inputs growth as seen previously. The main services causing the growth seen in this quarter's inputs were for social protection, justice and fire, military defence, central and local government.

Figure 3: Public service productivity fell in Quarter 4 2022 compared with the same quarter a year ago

Public service productivity, inputs and output, quarter-on-same-quarter a year ago growth rates, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2022

Figure 3: Public service productivity fell in Quarter 4 2022 compared with the same quarter a year ago

Public service productivity, inputs and output, quarter-on-same-quarter a year ago growth rates, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2022



Source: Public service productivity, quarterly, UK: October to December 2022 from the Office for National Statistics

Notes:

1. Data are from this experimental quarterly release.
2. Experimental quarterly estimates of productivity are indirectly seasonally adjusted, calculated using seasonally adjusted inputs and seasonally adjusted output.
3. This chart inverts the growth rates of inputs.

Please note that these estimates are subject to revisions because of improvements to source data and methodology. More information on the sources of revisions can be found in the [previous article](#).

In general, because changes in productivity represent long-term structural trends, we advise looking at changes over a longer time period. This can help to smooth any short-term fluctuations. Comparing quarters with the same quarters a year ago provides a rolling annual estimate of productivity and is therefore a good indication of the future path of the [National Statistics](#) annual estimates. These estimates include additional data sources that are less timely than those used for quarterly estimates.

Figure 4 places the inputs, output, and productivity in an annual context over a longer time series, combining the data from our National Statistic with experimental data. Data from 2020 onwards are experimental, while estimates between 1997 and 2019 are instead taken from our [latest annual dataset](#).

Experimental estimates suggest that annual total public service productivity rose by 1.9% in 2022, following an increase of 7.3% in 2021 and an estimated fall of 13.3% in 2020. This reflected an increase of output by 1.9%, compared with a smaller increase in inputs of 0.1%.

In 2020 inputs rose, reflecting the extra resources provided to the public services to deal with the coronavirus (COVID-19) pandemic. Conversely, output fell in 2020, as many services were delivered in a different way compared with 2019, with additional costs and mandatory restrictions present for certain services. In 2021 and 2022, output grew faster than inputs, as fewer restrictions were present and new services such as test, trace and vaccinations were introduced.

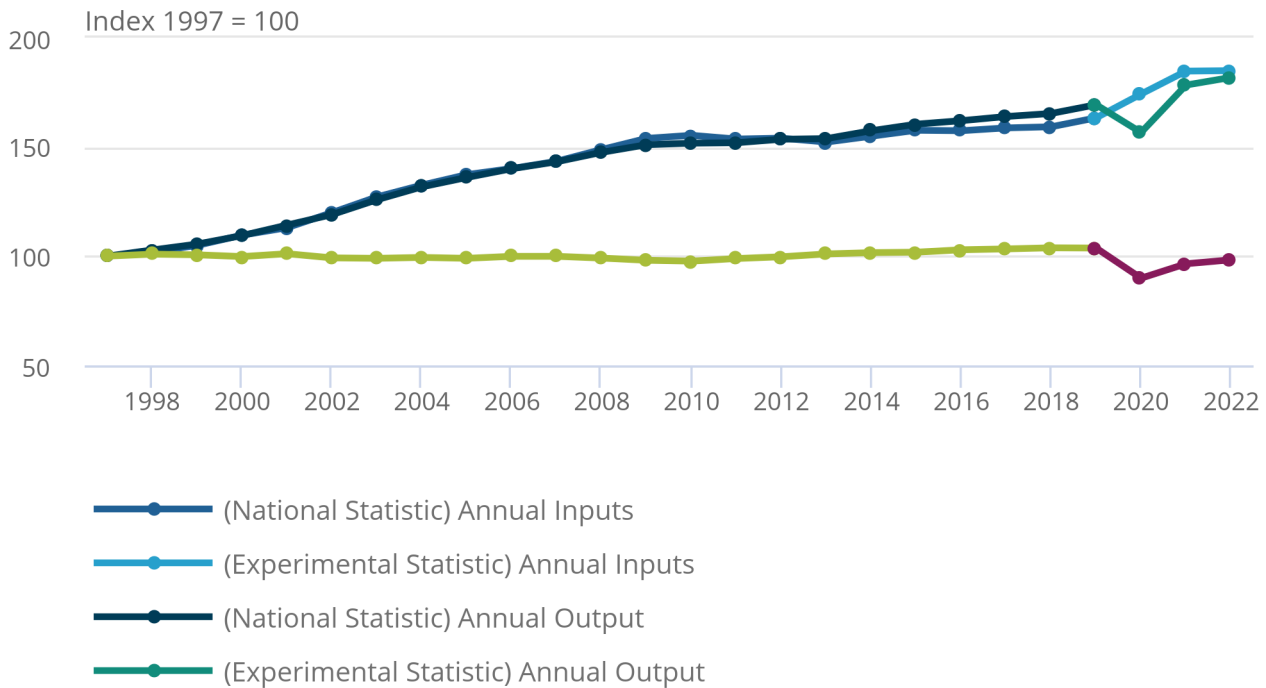
However, productivity comparisons pre and post-coronavirus pandemic are complex, because it is difficult to consider how the present model would appear if the coronavirus pandemic had not occurred. Caution should be used when comparing the latest estimates with pre-coronavirus years.

Figure 4: Public service productivity is estimated to rise by 1.9% in 2022

Total public service productivity, UK, index 1997=100, 1997 to 2022

Figure 4: Public service productivity is estimated to rise by 1.9% in 2022

Total public service productivity, UK, index 1997=100, 1997 to 2022



Source: Public service productivity, quarterly, UK: October to December 2022 from the Office for National Statistics

Notes:

1. Estimates for 2020, 2021 and 2022 are experimental statistics.
2. Estimates from 1997 to 2019 are National Statistics.

Output estimates use data on changes in the quantity of various services delivered, but do not include data on changes in the relative quality of these services. Data including quality adjustment for 2020 will be published with a two-year lag, as many of these quality factors require data collected with a lag.

These experimental statistics should be treated with caution until the [annual estimates](#) are available.

5 . Public service productivity: quarterly, UK, October to December 2022 data

[Public service productivity: quarterly, UK, October to December 2022](#)

Dataset | Released 24 April 2023

Experimental statistics on UK public service productivity. Includes estimates of inputs, output, productivity, and revisions compared with estimates from the previous quarter.

6 . Glossary

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.

Direct output measurement

Using a cost-weighted activity index to estimate the non-quality-adjusted 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.

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.

Classification of the Functions of Government

The [Classification of the Functions of Government \(COFOG\)](#) is the structure used to classify government activities. It is defined by the United Nations Statistics Division.

Service area

The way we refer to the breakdown of public services into nine areas, closely following COFOG.

Intermediate inputs

Also referred to as "goods and services", or "intermediate consumption" (the UK 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.

Deflator

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

7 . Measuring the data

Data sources

Different sources and methods are used to produce the experimental quarterly statistics and the National Statistics.

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

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

The National Statistic uses data from annual UK National Accounts on a government services [Classification of the Functions of Government \(COFOG\)](#) basis. Therefore, there are differences in the source expenditure data and in how public services are categorised and aggregated.

Data sources and methods differ from the annual publication, depending on data availability and suitability, 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 National Statistic also uses different deflators to those used in this release to estimate those volumes of inputs. Therefore, estimates are not directly comparable between the quarterly and the annual publications.

This release does not provide adjustments for the quality in public service output, whereas the National Statistic does for some public output.

Measuring public service productivity

Productivity is calculated by dividing output by the respective inputs used to produce it. Productivity will, therefore, 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.

For total UK public services, estimates of output and inputs are made up of aggregated series for individual public services, weighted together by their relative share of total expenditure on public services (expenditure weight). Inputs are composed of labour, goods and services, and consumption of fixed capital.

Expenditure data, used to estimate most inputs growth, are taken from our [GDP quarterly national accounts, UK: October to December 2022 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 (that comprise of labour, intermediate consumption, and capital). The measure is dominated by health 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 coronavirus (COVID-19) pandemic, a teacher may still have had to undertake additional work to modify lesson plans for remote learning.

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 (PPE), but the overall volume of NHS services may still have declined.

Public service productivity within this statistic only focusses 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.

The pandemic caused widespread pressure and disruption, including new safety measures, urgent healthcare treatments taking priority, remote consultations, remote learning within education, support for care homes and restrictions to courts and tribunals. Productivity estimates have reacted accordingly, but comparisons over time are complex as it is difficult to consider how the present model would appear if the coronavirus pandemic had not occurred. Caution should be used when comparing the latest estimates with pre-pandemic years.

8 . Related links

[Productivity overview, UK - Quarter 1 \(Jan to Mar\) 2020 to Quarter 3 \(Jul to Sep\) 2022](#)

Article | Released 26 January 2023

The main findings from official statistics and analysis of UK productivity, presenting a summary of recent developments.

[Public service productivity: quarterly, UK, October to December 2019](#)

Article | Released 7 April 2020

Experimental estimates for UK total public service productivity, inputs and output to provide a short-term, timely indicator of the future path of the annual productivity estimates.

[Improved methods for total public service productivity: total, UK, 2019](#)

Methodology | Last revised 20 January 2022

Explaining methodological improvements to education quality adjustment, children's social care, and healthcare output, used in the upcoming public service productivity article.

[Public service productivity, healthcare, England: financial year ending 2021](#)

Article | Released 29 March 2023

Estimates of output, inputs and productivity for public service healthcare in England.

[Public service productivity, adult social care, England: financial year ending 2021](#)

Article | Released 25 July 2022

Trends in publicly funded adult social care inputs, quantity and quality of output, and productivity in England, between financial year ending 1997 and financial year ending 2021.

[Sources and methods for public service productivity estimates](#)

Methodology | Last revised 11 May 2022

Sources and methods information for the public service productivity: total, UK publication, detailing the main concepts, output and inputs measures by service area.

[International comparisons of the measurement of non-market output during the COVID-19 pandemic](#)

Methodology | Last revised 21 February 2022

A joint Office for National Statistics - Organisation for Economic Co-operation and Development exploration of international differences in the methodologies used to measure non-market output and analysis of the implications for international comparisons of gross domestic product during the coronavirus (COVID-19) pandemic.

[Productivity overview, UK: July to September 2022](#)

Bulletin | Released 26 January 2023

The main findings from official statistics and analysis of UK productivity, presenting a summary of recent developments.

9 . Cite this bulletin

Office for National Statistics (ONS), released 24 April 2023, ONS website, statistical bulletin, [Public service productivity, quarterly, UK: October to December 2022](#)