

# Public service productivity estimates: total public service, 2013

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## Abstract

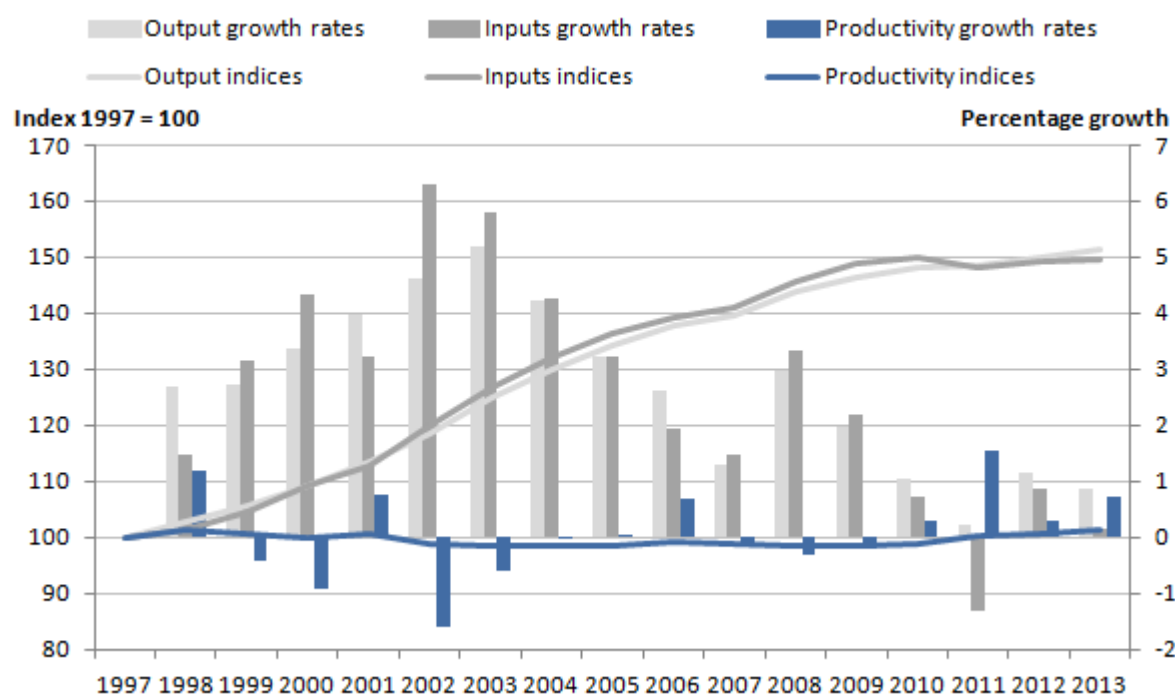
This release contains updated estimates of output, inputs and productivity for public services in the UK between 1997 and 2012, in addition to new estimates for 2013. Productivity of public services is estimated by comparing growth in the total amount of output with growth in the total amount of inputs used. Productivity will increase when more output is being produced for each unit of input compared with the previous year. Separate estimates of output, inputs and productivity are provided for healthcare, education, adult social care, children's social care, public order and safety, and social security administration. Only inputs estimates are provided for the police, defence, and other services as output is not easily measurable, so we assume that output is equal to the inputs used to create them and therefore productivity change is zero. Output, inputs and productivity for total public services are estimated by combining growth rates for individual services using their relative share of total government expenditure.

## Main points

- In 2013, productivity grew for total public services for the fourth consecutive year by 0.7% as output grew by 0.9% and exceeded inputs growth of 0.1%<sup>1</sup>.
- The annual average growth rate<sup>2</sup> of total public service productivity from 1997 to 2013 was 0.1% a year, compared with 0.0% from 1997 to 2012.
- Output continued to grow slowly, with growth in 2013 almost exclusively due to an increase in output for healthcare services offsetting falling output in all other service areas except children's social care and other government services.
- Trends in total public service output, inputs and productivity estimates are mostly determined by changes in healthcare and education which together make up more than half of government expenditure on public services.

**Figure 1: Total public service output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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Dataset: [Indices and growth rates for total public service output, inputs and productivity, 1997 to 2013, UK \(42.5 Kb Excel sheet\)](#)

### Notes

1. Growth rates may not sum due to rounding
2. Average growth rates for cumulative growth across multiple years are geometric means calculated using the formula:  $[(\text{index in current year}/\text{index in base year})^{1/(\text{current year} - \text{base year})}] - 1$

### Understanding public service productivity

This release contains updated estimates of output, inputs and productivity for public services in the UK between 1997 and 2012, in addition to new estimates for 2013. Figures are published on a calendar year basis for consistency with the UK National Accounts. Our public service productivity

estimates were developed in response to the recommendations of the [Atkinson Review on the measurement of government output and productivity for the National Accounts \(1.1 Mb Pdf\)](#).

Previously published [public service healthcare](#) and [public service education](#) output, inputs and productivity estimates are also included in this article, though in less detail than the separate articles.

Productivity of public services is estimated by comparing growth in the total amount of output with growth in the total amount of inputs used. Productivity will increase when more output is being produced for each unit of input compared with the previous year. Estimates of output, inputs and productivity are given both as growth rates, which show the change from the previous year, and as indices, which show the trend over time (1997 to 2013).

Estimated growth rates of output and inputs for individual service areas are aggregated by their relative share of total government expenditure (expenditure weight) to produce estimates of total public service output, inputs and productivity. The growth rate of services with the greater share of total expenditure will contribute more to the overall growth rate for total public services.

Inputs are composed of expenditure on labour, goods and services, and consumption of fixed capital and are adjusted for inflation using a suitable deflator<sup>1</sup>. Expenditure data used to estimate inputs growth is based on the [MAAST supplementary data tables](#) that we publish annually. These tables are consistent with estimates of government deficit and debt reported to the European Commission under the terms of the Maastricht Treaty. These tables are published on a calendar year basis and provide the required detailed breakdown by the Classification of Functions of Government (COFOG).

The method of measuring output varies between service areas as defined in table 1.

Output Measure	Service areas	Definition
Quantity output	Social security administration Adult social care 40% of Children's social care 25% of Education	The number of activities performed and services delivered. Growth in individual activities are weighted together using the relative cost of delivery. For example, adult social care output includes weeks of residential care and number of "meals on wheels" provided.
Quality adjusted output	90% of Healthcare 75% of Education	Quantity output is adjusted for the quality of the services delivered. If the quality adjustment is positive, estimates of output growth will increase. Healthcare quality is measured using a combination of indicators including survival rates, waiting times and patient satisfaction. Education quality is measured using examination performance.
Inputs = output	Police Defence Other services 10% of Healthcare output 60% of Children's social care output	Some services we cannot measure output directly, so we assume the volume of output equals the volume of inputs used to create them, meaning that productivity growth will always be zero.

A table summarising the methods for each service area is provided in Annex A, and further information on methods is available in our [public service productivity sources and methods paper \(111.4 Kb Pdf\)](#).

Estimates in this release are provided for the UK, the amount of data included for each of the devolved administrations varies for each service area based on its availability. As England has the largest expenditure share, trends in output, inputs and productivity for England tend to determine the overall UK trend; therefore, much of the additional context provided in this article to aid interpretation of the estimates relates to services in England.

It is important to note that while these productivity estimates provide a measure of the amount of output produced for each unit of input, they do not measure value for money or the wider performance of public services. They do not indicate, for example, whether the inputs have been

purchased at the lowest possible cost, or the extent to which the desired outcomes are achieved through the output provided.

The estimates in this release have an open revisions policy, meaning that each time a new article is published, revisions can occur for the whole of the time period. The majority of revisions in this article are due to delivery of updated government expenditure data in all service areas for the period 2010 to 2012 in addition to a new quality adjustment measure for education in England and changes to the treatment of academies in education. These [changes to education methods \(182.8 Kb Pdf\)](#) are explained in a previously published methods change paper.

The following sections provide more detailed data on output, inputs and productivity growth rates and indices for individual service areas. Where possible, commentary has been provided to aid interpretation.

## Notes

1. There is some direct measurement of inputs in healthcare and education estimates such as number of staff.

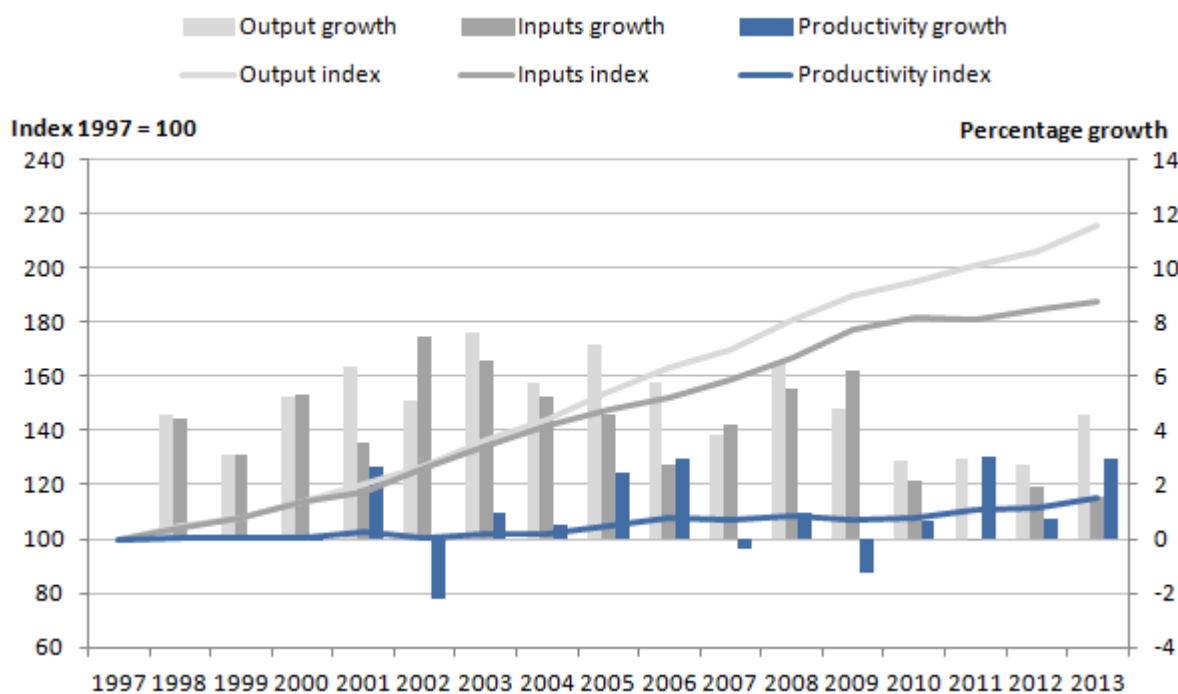
## Healthcare

The healthcare estimates given here have been previously published in [Public Service Productivity Estimates: Healthcare 2013](#) which contains more detailed information on healthcare productivity estimates and methods. The base year for this article is 1997 compared with 1995 in the previously published article.

Healthcare is a principal contributor to overall public service productivity with the largest expenditure share, a third in 2012.

**Figure 2: Public service healthcare quality adjusted output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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Healthcare productivity grew by 2.9% in 2013 due to quality adjusted output growth of 4.5% exceeding inputs growth of 1.6%. This is the fourth consecutive year of productivity growth and the second highest annual growth rate in productivity across the series, with the highest being 3.0% in 2011. The annual average growth rate of public service healthcare productivity from 1997 to 2013 was 0.9% per year compared with 0.7% per year for 1997 to 2012.

Strong quantity output growth in 2013 was driven by an increase in activities for hospital and community health services including trauma and orthopaedics, urology, cardiology, dermatology and oncology as well as increases in long-stay inpatient cases. There has been a steady downward trend in growth rates of GP-prescribed drug activities, partly due to a slowing of growth in the number of items prescribed and falling prices through negotiated discounts and increased use of non-branded equivalent drugs.

Quality of healthcare delivery is measured using a combination of indicators including survival rates, waiting times, primary care outcomes and results from the [National Patient Survey](#). The quality adjustment added 0.2 percentage points to output growth in 2013, compared with the average

annual quality adjustment of 0.4 percentage points since 2001 when the quality adjustment was first applied.

From 2010 to 2013, inputs grew more slowly than in any previous year in the series, falling slightly by 0.1% in 2011. The annual average input growth rate between 1997 and 2009 was 4.9% per year compared with the annual average growth rate of 1.1% per year between 2010 and 2013. This was driven by low growth in labour (measured as salary-weighted full-time equivalent staff numbers) and components of goods and services (administration, non-pay costs and delivery of non-NHS services). These trends coincide with the creation of the [Health and Social Care Act 2012](#) which introduced major reforms to the local commissioning of services in England, and initiatives such as the [Nicholson Efficiency Challenge](#) and [QIPP Programme \(Quality, Innovation, Productivity and Prevention\)](#).

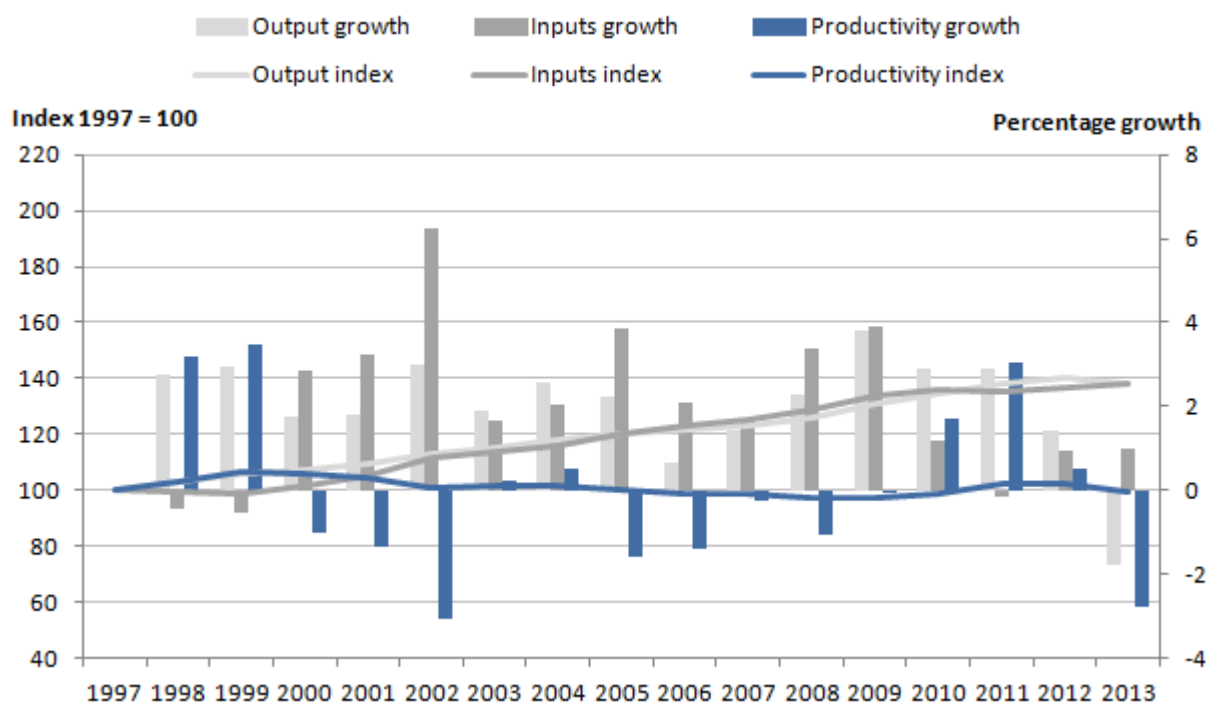
Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Education

The education estimates given here have been previously published in [Public Service Productivity Estimates: Education 2013](#) which contains more detailed information on education productivity estimates and methods. The base year for this article is 1997 rather than 1996 in the previously published article. In 2012, one-fifth of total public service expenditure was on education; the second largest of all the service areas.

**Figure 3: Public service education quality adjusted output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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Education productivity fell by 2.8% in 2013 as a result of inputs growth of 1.0% combined with a fall in quality adjusted output of 1.8%. This fall in education productivity is one of the largest across the series, the lowest being 3.1% in 2002, and follows 3 years of productivity growth from 2010 to 2012.

Quantity output grew by 0.4% in 2013, driven by growth in pupil numbers in primary schools offsetting falls in secondary schools. Since quantity output is measured as the number of students adjusted for attendance, and schools made up 73.5% of education expenditure in 2012<sup>1</sup>, changes in education output are mainly determined by changes in the school age population.

From 1997 to 2007, quality is measured using Key-Stage 4 (GCSE) average points scores (APS) for all examinations. From 2008 onwards, a new quality adjustment for England has been introduced based on Level 2 attainment at age 16, while APS continue to be used for Wales and Scotland. The effect of the quality adjustment is positive in the period from 1997 to 2011. In 2012 and 2013 the negative quality adjustment, at -0.5 and -2.2 percentage points respectively, led to the first fall in quality adjusted output in 2013. Caution should be exercised when interpreting the change in the quality adjusted output trend in recent years due to changes in examinations counting



towards school performance statistics in England. As a result, some of the change in examination performance measures may not be entirely caused by changes in the quality of education provided.

Education inputs continued the recent trend of slowed growth since 2010, with an annual average growth rate of 0.6% over the period 2010 to 2013 compared with the annual average growth rate of 2.0% over the whole series from 1997 to 2013. This trend consists of labour inputs growth due to increased support staff numbers which are offset by a fall in the volume of goods and services.

The new education quality adjustment measure for England and changes to the treatment of academies were introduced in the latest estimates. Along with revisions to source data, these changes have led to downward revisions in the estimates for 2011 and 2012 compared with those previously published in [Public Service Productivity Estimates: Total Public Services 2012](#). These changes are explained in more detail in the revisions section and the previously published [Education Methods Change paper \(182.8 Kb Pdf\)](#).

Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Notes

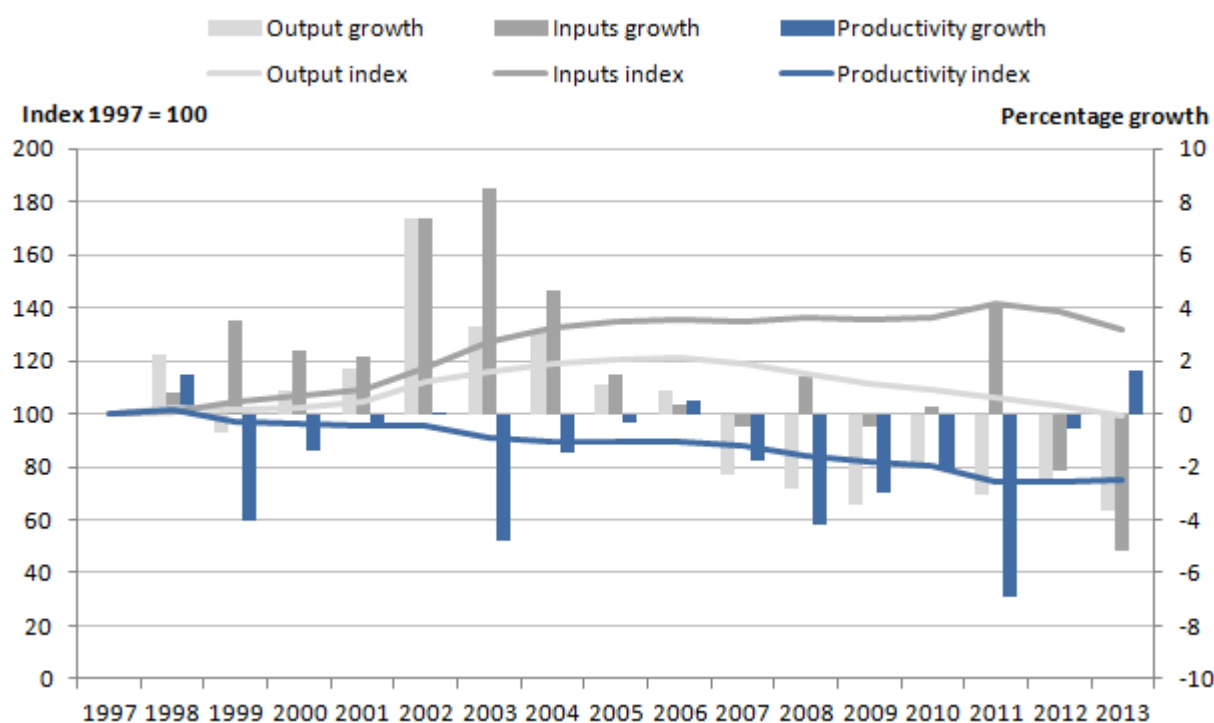
1. The educational sectors included when producing productivity estimates are pre-schools, publicly funded private, voluntary and independent pre-school places (PVI), primary schools (maintained and academies), secondary schools (maintained and academies), special schools (maintained and academies), further education, higher education initial training of teachers (ITT) and higher education training of health professionals.

## Adult social care

Adult social care accounted for 6.8% of total government expenditure in 2012.

**Figure 4: Public service adult social care quantity output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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In 2013, adult social care productivity experienced positive growth for the first time since 2006. The 1.6% productivity growth was due to the inputs fall of 5.2% being greater than the fall in output of 3.7%. This level of productivity growth is the highest seen in adult social care, with the previous high of 1.5% in 1998, and with productivity falling in 12 years across the series. Annual average productivity growth fell by 1.7% per year between 1997 and 2013, but this is smaller than the annual average fall of 2.0% per year between 1997 and 2012.

Quantity output is measured by the number of care activities, ranging from weeks of residential care to the number of “meals on wheels” provided. Output has fallen for the seventh year in a row, with approximately 320,000 fewer people receiving local authority social care between financial year ending 2006 and financial year ending 2013 ([Changes in the Patterns of Social Care Provision in England: 2005-2006 to 2012-2013, Personal Social Services Research Unit: 2013](#)). There are a number of potential reasons for this fall:

- tightening of the eligibility criteria for publicly funded support
- councils’ focus on prevention, improving independence and promotion of non-residential care as outlined in [Adult Social Care funding 2014: state of the nation](#)

- a greater proportion of clients opting for Direct Payments and therefore not receiving services directly

Since 2005, with the exception of 2011 where there was an increase in procurement expenditure, inputs growth has typically been low or falling. In particular, labour inputs have been in decline since 2008 and procurement inputs since 2003. Councils have been seeking to make efficiencies in the delivery of services through, for example, reducing bureaucracy, reducing the cost of commissioned services and outsourcing lower level care to outside agencies. It is recognised that some of the reduction in spending has also been a result of service reduction as reflected in the falling output measure.

This measure of productivity growth may not fully reflect the true value of adult social care productivity for a number of reasons:

- the output measure does not account for the quality of care provided – indicators published by the Health and Social Care Information Centre show improvements in the quality of social care services in recent years suggesting that the inclusion of a quality adjustment would increase estimates of output and therefore productivity ([Personal Social Services Adult Social Care Survey England 2013-14](#))
- output is measured as the number of people receiving care or the number of hours of care received, and does not take full account of the intensity of need of the individual being cared for – this may result in an underestimation of output as reductions in the number of people receiving care are focused on those with lower levels of need leaving a higher proportion of high need individuals.
- Direct Payments are included in the measure of inputs but are not included in the activities which make up the output measure – Direct Payments in England have increased from £610 million in financial year ending 2009 to £1.4 billion in financial year ending 2014 ([Personal Social Services Expenditure 2013-14](#)). As a greater proportion of clients have opted for Direct Payments over time, this results in a reduction in the measure of activity and therefore productivity

Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Public order and safety

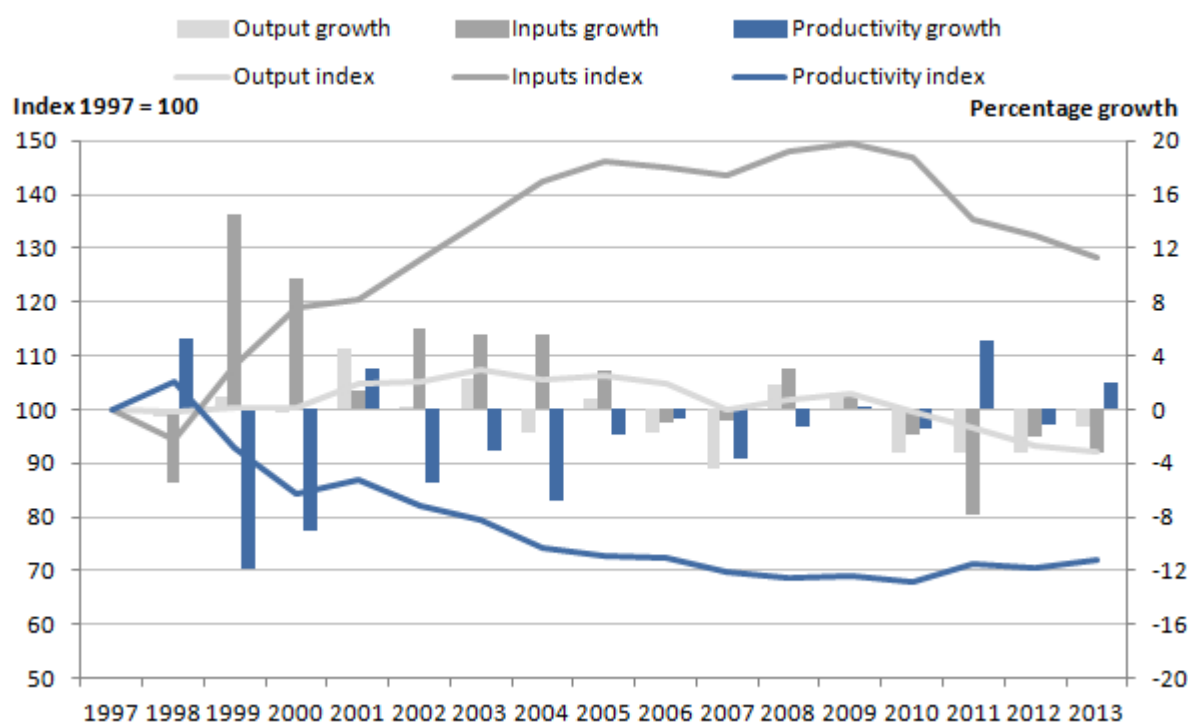
Public order and safety (POS) had an expenditure weight of 3.8% in 2012. It encompasses activities carried out by:

- courts and probation service (50.4%)
- prison service (26.7%)
- fire service (22.9%)

While part of the public order and safety government expenditure classification, the police service is treated as a separate service area for the estimation of productivity.

**Figure 5: Public service public order and safety quantity output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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Productivity of total public order and safety services grew in 2013 by 2.0% as a result of productivity growth in the courts contributing 3.0 percentage points offset by productivity falls in the fire and prison services contributing -0.5 percentage points and -0.6 percentage points respectively<sup>1</sup>. On average between 1997 and 2013, productivity for total public order and safety has fallen by 2.0% per year. In 2013, output fell by 1.3% and inputs fell by 3.2%, the fourth consecutive year of falls in both.

The courts and probation services mainly drive variations in outputs, accounting for nearly half of total expenditure on public order and safety, and include:

- legal aid services
- Crown prosecution service
- Crown court
- county courts
- magistrates' courts
- probation service

There was a fall in output for the courts and probation service in 2013 of 0.5% caused by falls in activity in all services except the crown prosecution service and crown court. This fall is consistent with the long-term trend with an annual average fall in output of 1.7% per year between 1997 and 2013, but is smaller than falls in the most recent years, with an annual average fall in output between 2010 and 2013 of 4.2% per year. The largest contribution to the fall in output in each year from 2010 to 2013 was from legal aid services, potentially attributed to the introduction of the [Legal Aid, Sentencing and Punishment of Offenders Act 2012](#) which reduced the fees paid to legal representatives and narrowed the eligibility criteria for legal aid. Inputs for the courts and probation service fell by 6.4% in 2013 compared with an annual average growth in inputs from 1997 to 2013 of 1.9% per year. The fall in inputs in 2013 was driven by reductions in goods and services expenditure, though labour inputs also fell by a smaller amount.

The prison service in 2013 saw output fall for the first time since 2000, by 2.7%. The fall in output for prisons was the main contributor to the overall fall in output for public order and safety in 2013, contributing -0.7 percentage points to the overall fall of 1.3%. Prison output grew slowly between 2009 and 2012 compared with the historical trend; the [Ministry of Justice's Story of the Prison Population 1993-2012](#) explains the cause of this for England and Wales as a fall in total adult sentencing for indictable offences across all courts, and a decrease in the average time served. Additionally, a high prison population in December 2011 is linked to public order-related offences following the riots in England in August 2011. The large fall in inputs in 2011 was driven by falls in both labour and goods and services consistent with reductions in budgets following the [2010 Spending Review](#).

Overall output for the fire services fell each year since 2010, falling by 1.3% in 2013. The majority of activities in the fire services are responses to fires, but also include fire prevention activities and special activities such as assistance for road traffic collisions and flooding. The largest proportion of activities involved attending false alarms, which have decreased over the series. A corresponding increase in output for prevention activities could be linked to a decrease in activities for fire responses.

Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Notes

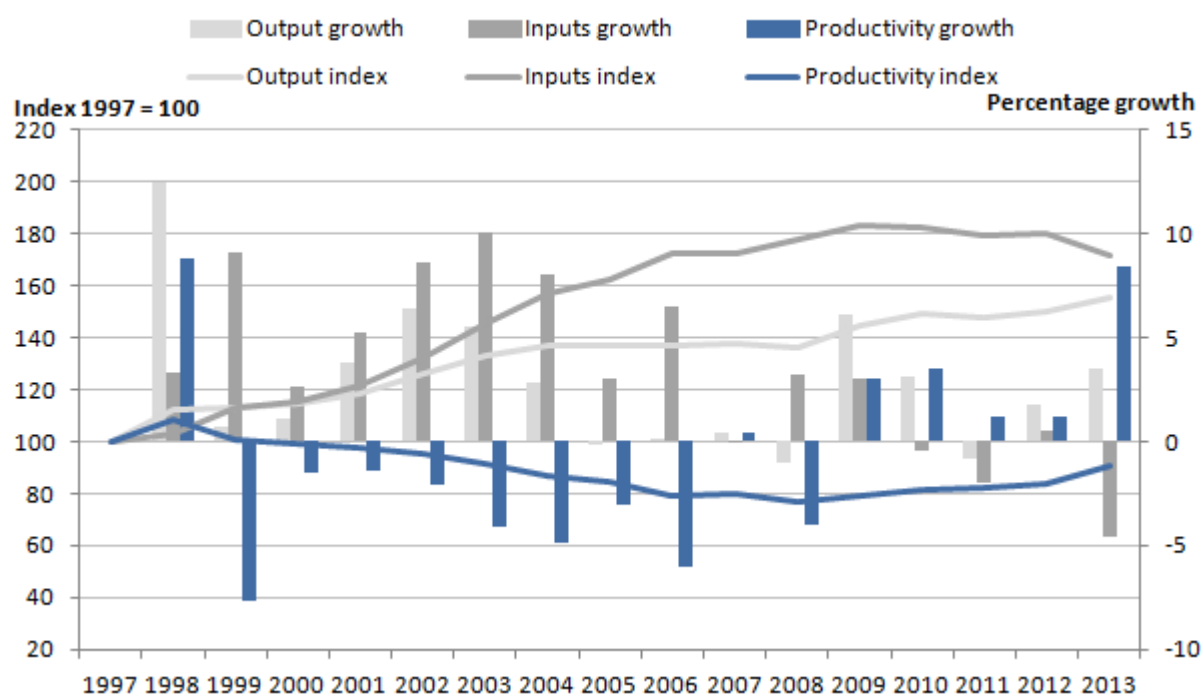
1. Totals may not sum due to rounding.

## Children's social care

Children's social care had an expenditure share of 2.4% in 2012; the second smallest of all service areas. The majority of children's social care is delivered by local authorities, though the Department for Education is responsible for developing and overseeing policy implementation for children's services.

**Figure 6: Public service children's social care quantity output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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Children's social care productivity grew for the fifth consecutive year in 2013 by 8.4%, the largest growth in the series due to output growth of 3.5% combined with a fall in inputs of 4.6%, the largest fall in inputs in the series. Annual average productivity fell by 0.6% per year from 1997 to 2013, due to falling or low productivity growth between 1999 and 2008 of -3.0% per year, combined with productivity growth between 2009 and 2013 of 3.6% per year.

Children's social care output is calculated separately for looked after and non-looked after children. A child is classed as looked after by a local authority if a court has granted an order to place them in care, or a council's children's services department has cared for the child for more than 24 hours. A child is classed as non-looked after if they are not taken out of their home environment but are being monitored. Output is measured directly for looked after children using the number of children in care, accounting for 40% of expenditure on children's social care services and contributing 0.5 percentage points to overall output growth for children's social care in 2013. Output for non-looked after children uses the "inputs=output" assumption and contributed 2.9 percentage points to output growth for children's social care in 2013.

Increase in output for looked after children is seen in all years except 2006, with the number of looked after children in England in March 2013 being higher than at any point since 1985 ([Children](#)

[looked after in England year ending March 2013](#)). Increases in 2013 are also linked to increases in the number of children on remand or committed for trial, due to the implementation of the [Legal Aid, Sentencing and Punishment of Offenders Act \(LASPO\)](#) that came into force on 3 December 2012 which states that all children remanded by the courts will now become looked after.

Inputs fell by 4.6%, the largest input fall in the series, as a result of falls in goods and services of 2.9% and falls in labour inputs of 1.7%. This decline reduces the annual average input growth from 4.0% per year between 1997 and 2012, to 3.4% per year between 1997 and 2013.

Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Social security administration

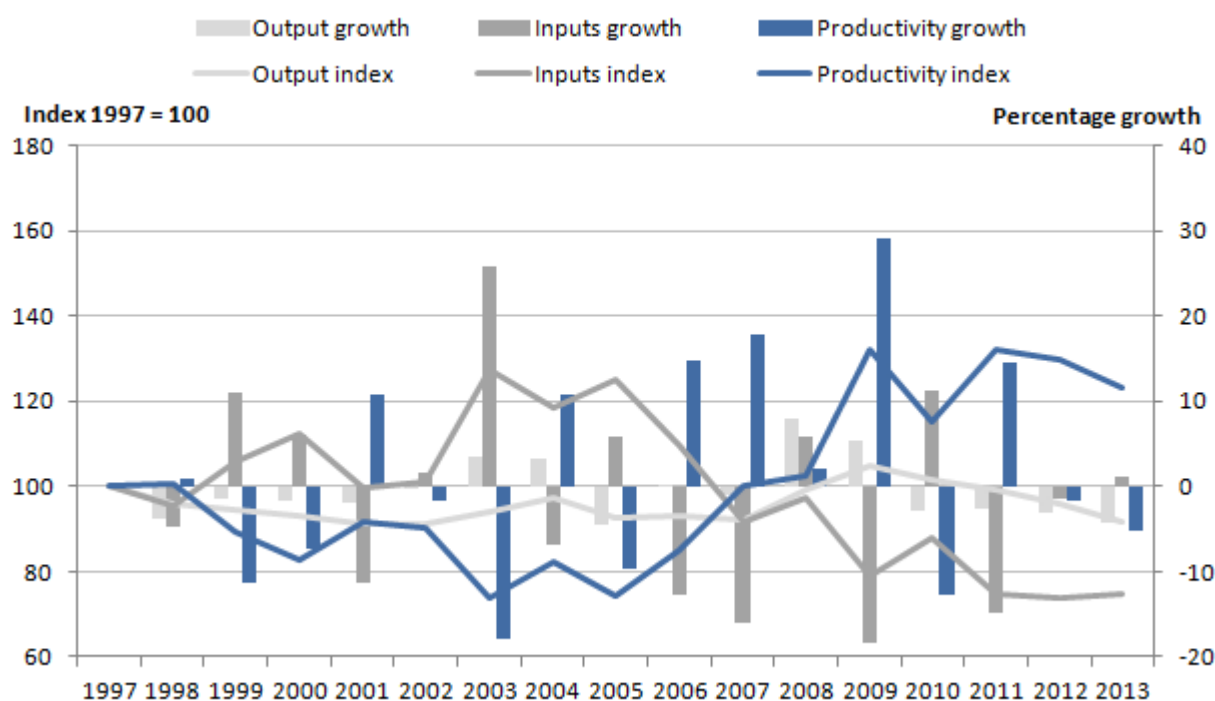
Social security administration (SSA) has the smallest expenditure share of all service areas, at 1.1% in 2012.

A large proportion of SSA covers activities undertaken in the administration of benefits by the Department for Work and Pensions (DWP); however, the estimates presented here cannot be taken as direct estimates of DWP productivity as they both exclude DWP activities that fall outside this service area, and include administrative activities of other departments such as administration of tax credits by Her Majesty's Revenue and Customs (HMRC).

DWP produce their own productivity figures in financial years ([Department for Work and Pensions Annual Report 2013-14](#)) using a similar methodology but with known differences in scope to this article.

**Figure 7: Public service social security administration quantity output, inputs and productivity indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

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SSA productivity fell by 5.2% in 2013 due to inputs growing at a rate of 1.1% and output falling by 4.2%. Historically, SSA productivity has been volatile mostly driven by large fluctuations in inputs growth, with productivity growth ranging from -17.8% in 2003 to 29.1% in 2009. In contrast, changes in estimates of both inputs and output in 2012 and 2013 have been relatively small. These recent estimates have reduced the annual average growth in SSA productivity from 1.8% per year between 1997 and 2012 to 1.3% per year between 1997 and 2013. Despite this, SSA still has the highest average productivity growth over the series of all measured service areas.

Growth rates of SSA output have continued their steady downward trend, falling for the fourth consecutive year. Output growth is partly driven by the economic climate as this influences the number of benefit claims. For example, output growth in 2008 and 2009 coincides with the economic downturn while recent falls are linked with a decrease in both new and existing benefit claims administered by DWP. In particular, DWP saw falls of 700,000 individuals claiming key out of work benefits between November 2009 and November 2013 ([Department for Work and Pensions Annual Report and Accounts 2013-14](#)).



Inputs growth in 2013 was driven by an increase in goods and services (procurement) which offset falling labour inputs. Inputs growth in 2002 and 2003 followed the creation of DWP in 2001 when there was a period of reorganisation and investment including new Job Centre Plus offices, pension centres and modernisation of IT systems. Recent falls in inputs or low inputs growth following the 2010 Spending Review are driven by reductions in staff numbers, launch of digital services and are also potentially linked to increased outsourcing. Contracts for outsourced services account for around 39% of running costs for DWP and include outsourcing of health and disability assessments ([Public Sector Case Study: Department for Work and Pensions, National Outsourcing Association](#)).

Some of the volatility in the series may be caused by changes in the benefits provided which affected inputs through additional expenditure on implementation and output through changes in eligibility and thus number of applications. Inputs growth in 2003 and 2013 coincides with the replacement of Pension Credit with the Minimum Income Guarantee in 2003 and 2013 saw both the first stage roll-out of Universal Credit and the introduction of Personal Independence Payments. Volatility in expenditure on goods and services may also be exaggerated in some years which have large quarterly changes by the presentation of data in calendar years instead of financial years.

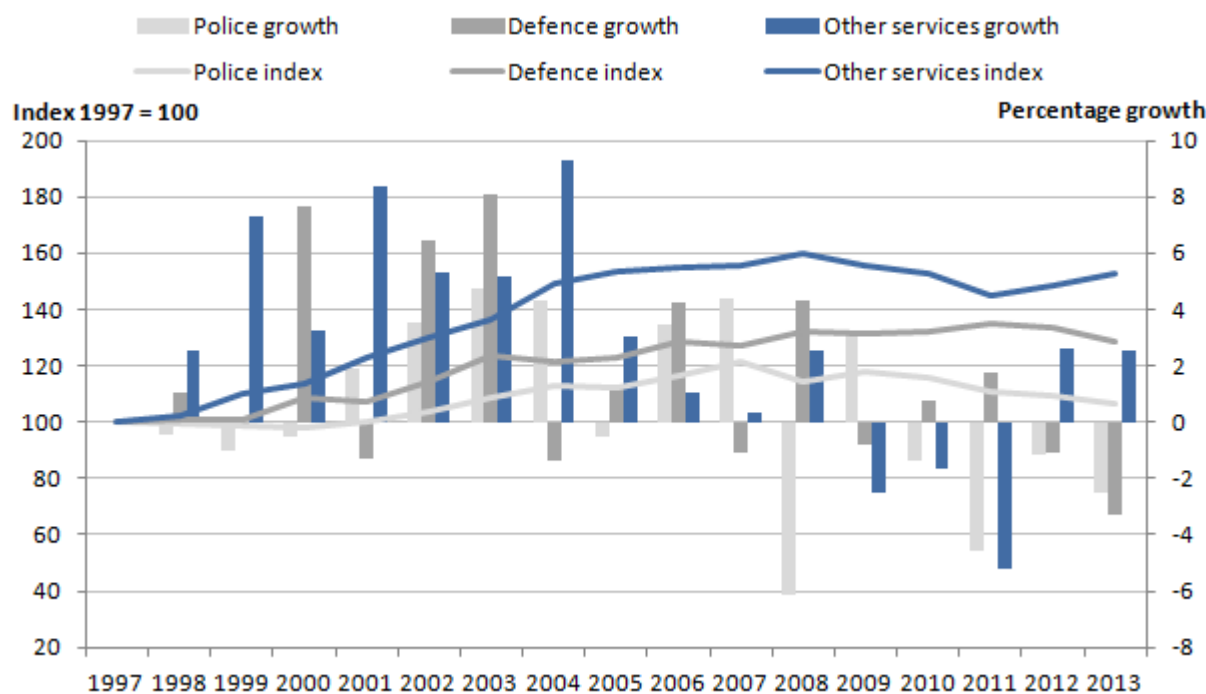
Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## **Police, defence and other services**

Output for police services, defence and other government services is measured using the "inputs = output" convention which assumes that the volume of output is equal to the volume of inputs used in producing the output. As output will always be equal to inputs under this convention, productivity remains constant with a growth rate of zero. Combined, police, defence and other government services had an expenditure share of 31.8% in 2012.

**Figure 8: Indirectly measured public service area inputs indices and growth rates, 1997 to 2013**

UK



Source: Office for National Statistics

**Notes:**

1. Chart shows inputs only as all service areas follow the "inputs = output" convention for which productivity growth is by default zero.

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Police inputs fell by 2.5% in 2013 having fallen each year from 2010 to 2013. Prior to 2010, inputs had been positive or slightly negative in all years except 2008, when inputs fell by 6.2% due to falls in goods and service expenditure outweighing increases in labour. Trends in police inputs do not directly follow trends in the number of police staff, as inputs include expenditure on both labour and goods and services and changes in expenditure on labour are a combination of both police numbers and salaries.

2013 saw the largest fall in defence inputs in the series of 3.3%. This fall is likely to be a reflection of falls in foreign military aid expenditure ([HMT Public Expenditure Statistical Analyses 2015](#)).

Other government services comprise all other classifications of government expenditure which are not covered in the other service areas. These service areas and their expenditure share of other services in 2012 are:

- general government services (28%) which include:
  - foreign affairs
  - economic aid to developing countries
  - basic research
  - other services undertaken by government not specified by function
- economic affairs (26%)
- recreation (18%)
- environmental protection (14%)
- housing (13%)
- other (1%)

Inputs for other government services experienced strong growth early in the series which then slowed leading to falls in inputs between 2009 and 2011. There has been renewed small positive growth in 2012 and 2013 of 2.6%. This is attributed to increased expenditure on economic affairs and the environment. General government services and economic affairs services are mostly delivered by central government, while the remaining services are mostly delivered by local government. Local and central government expenditure has remained relatively evenly split, with each contributing around 50% to expenditure for other government services.

Dataset: [Indices and growth rates of output, inputs and productivity for individual service areas, 1997 to 2013, UK \(116 Kb Excel sheet\)](#)

## Total public services

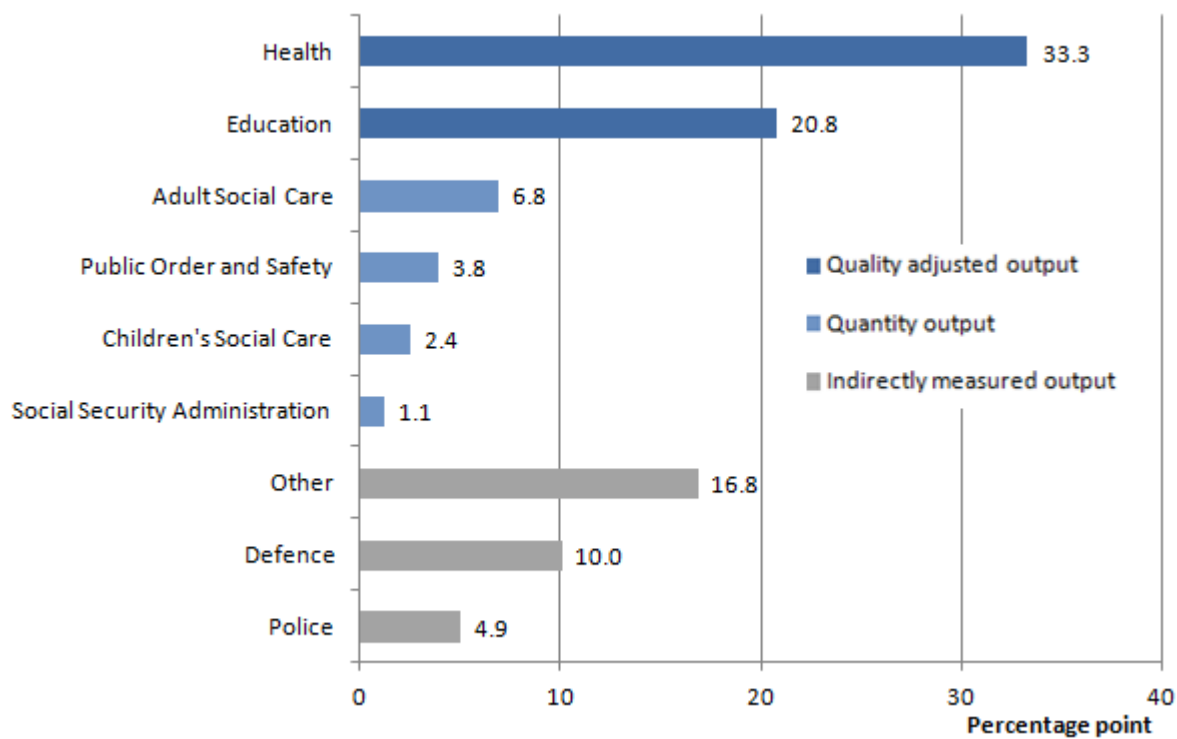
Estimated growth rates of output and inputs for individual service areas are aggregated by their relative share of total government expenditure (expenditure weight) to produce estimates of total public service output, inputs and productivity. The growth rate of services with the greater share of total expenditure will contribute more to the overall growth rate for total public services. The stages of aggregation are outlined in the following figures:

- Figure 9a shows the expenditure share of each service area in 2012
- Figure 9b shows the productivity growth rate of each service area in 2013 and its contribution to total public service productivity growth after weighting by the expenditure share
- Figure 9c shows the contribution of each service area to total public service productivity growth for each year 1998 to 2013

Caution should be exercised when comparing productivity growth between service areas as shown in Figure 9b, as methods of estimating output and inputs differ. Healthcare and education are the only service areas for which a quality adjustment is applied to quantity output, and are also the only service areas to measure inputs for labour using salary weighted staff numbers rather than expenditure. As police, defence and other services are measured as inputs = output their productivity growth is, by default, zero and are therefore these service areas not shown on Figures 9b and 9c.

**Figure 9a : Expenditure weights by service area, 2012**

UK

**Notes:**

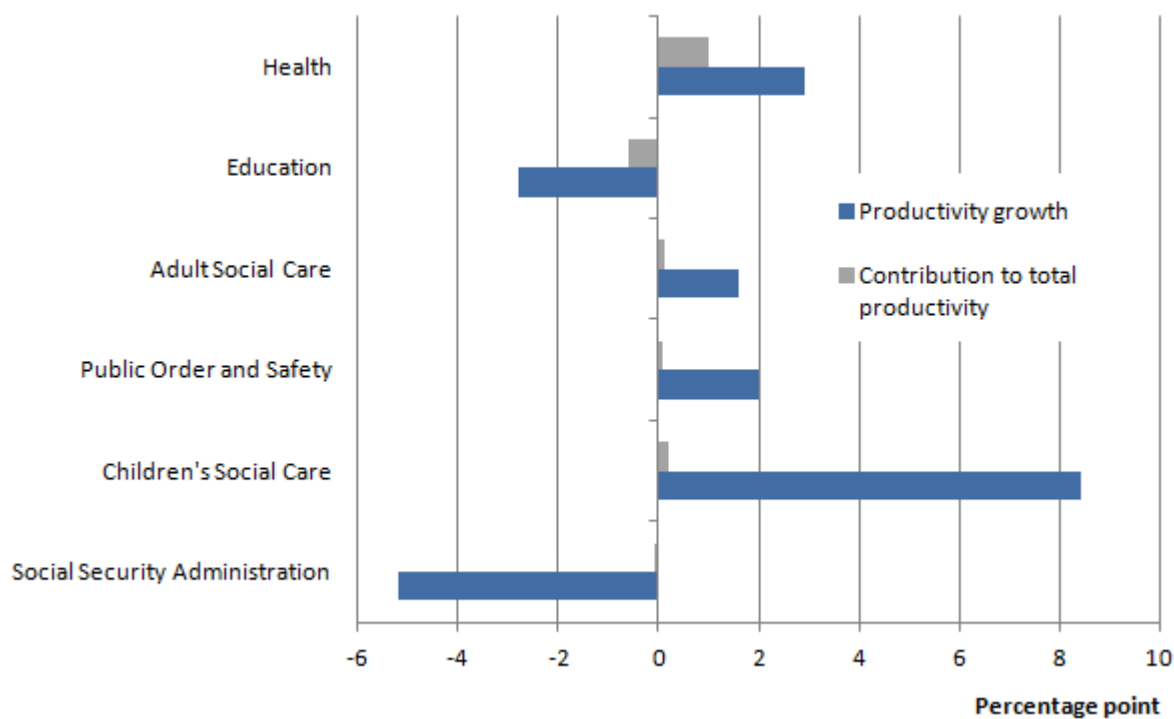
1. Totals may not sum due to rounding.
2. To combine growth rates for each component, expenditure shares for the previous year are used in calculation of a Laspeyres index.

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**Figure 9b: Productivity growth rates and contributions to total public service productivity growth for individual service areas, 2013**

UK



Source: Office for National Statistics

**Notes:**

1. Police, defence and other services are not included as they do not contribute to productivity due to the assumption their "inputs = output".

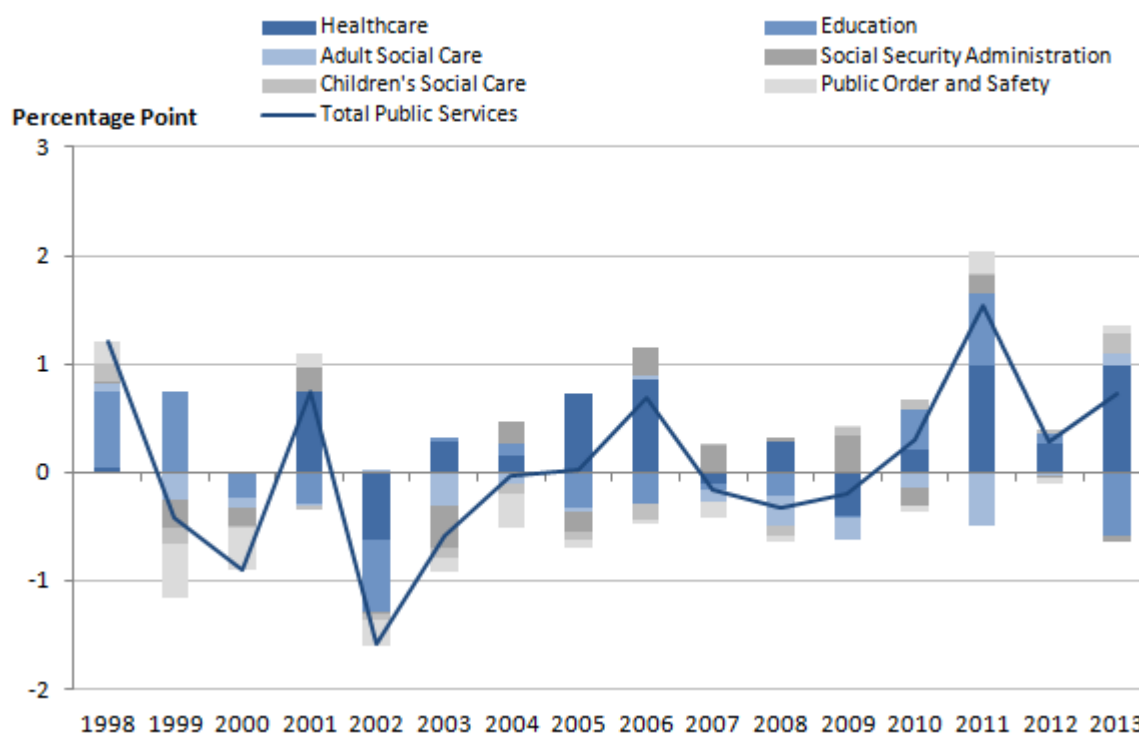
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**Figure 9c: Contributions to growth of total public service productivity by service area, 1998 to 2013**

UK



Source: Office for National Statistics

**Notes:**

1. The above figure does not include indirectly measured output as they do not contribute to productivity due to the assumption their "inputs = output".

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In 2013, productivity growth for total public services increased for the fourth consecutive year by 0.7%, as output grew by 0.9% and exceeded inputs growth of 0.1%<sup>1</sup>. The annual average growth rate<sup>2</sup> of total public service productivity from 1997 to 2013 was 0.1% a year, compared with 0.0% growth on average from 1997 to 2012. The small growth in inputs in 2013 is driven by increased inputs for healthcare, education and other government services. Output continues to grow slowly almost exclusively due to an increase in output for healthcare services offsetting the falling output in all other service areas except children's social care and other government services.

Figure 9b shows that in 2013, falls in education and social security administration (SSA) productivity are offset by increases in all other areas, particularly healthcare. Education and healthcare are the main contributors to total public service productivity growth as together they account for more than half of total government expenditure on public services. In contrast SSA, which has much higher

values of productivity growth and falls, makes a very small contribution as its expenditure weight is just over 1%.

Dataset: [Expenditure weights by service area, 1997 to 2012, UK \(41.5 Kb Excel sheet\)](#)

Dataset: [Contributions to total public service inputs, output and productivity by service area, 1998 to 2013, UK \(76.5 Kb Excel sheet\)](#)

Zero contributions to productivity growth from police, defence and other government services which use the inputs = output convention, have a dampening effect on productivity growth of total public services in proportion to their expenditure weight. Removing unmeasured output makes both negative and positive productivity growth stronger, with productivity growth of all services excluding unmeasured output of 1.1% in 2013. Annual average productivity growth from 1997 to 2013 remained at 0.1% per year with the removal of unmeasured output, as the annual average growth of output and inputs both increased by 0.3 percentage points per year.

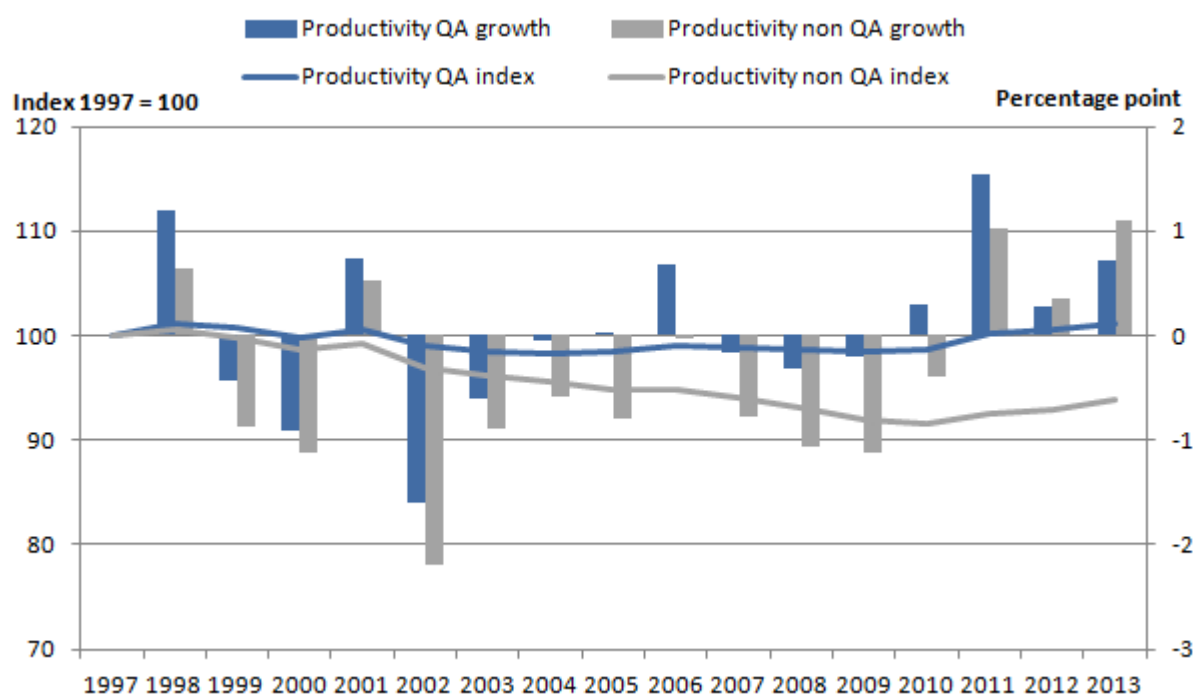
Dataset: [Indices and growth rates of total public service output, inputs and productivity excluding police, defence and other services, 1997 to 2013, UK \(34 Kb Excel sheet\)](#)

Figure 10 compares total public service productivity with and without the quality adjustments for public healthcare and education services. The indices in Figure 10 show that over the series, the inclusion of quality adjustment increases total public service productivity from an overall fall of 6.1% to an overall increase of 1.2% compared with the base year of 1997. Non-quality adjusted productivity growth in 2013 was the highest in the series at 1.1%; however, the inclusion of the quality adjustment reduced this to a growth of 0.7%. Despite this, both quality adjusted and non-quality adjusted productivity growth in 2013 exceeded the long-term annual averages from 1997 to 2013 of 0.1% and -0.4% respectively. The effect of quality adjustment on healthcare output is small, adding 0.2 percentage points to healthcare output in 2013, with the majority of the effect of quality being from the education adjustment.

Caution should be exercised when interpreting the change in the quality adjusted output and productivity trend for both education and total public services in recent years due to changes in examinations counting towards school performance statistics in England. As a result, some of the change in the education quality adjustment may not entirely reflect changes in the quality of education provided.

**Figure 10: Productivity growth rates and indices for quality and non-quality adjusted total public services, 1997 to 2013**

UK



Source: Office for National Statistics

### Download chart

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Dataset: [Indices and growth rates of output and productivity for total public services with and without quality adjustments for healthcare and education, 1997 to 2013, UK \(43 Kb Excel sheet\)](#)

### Notes

1. Growth rates may not sum due to rounding
2. Average growth rates for cumulative growth across multiple years are geometric means calculated using the formula:  $[(\text{index in current year}/\text{index in base year})^{1/(\text{current year} - \text{base year})}] - 1$

### Revisions

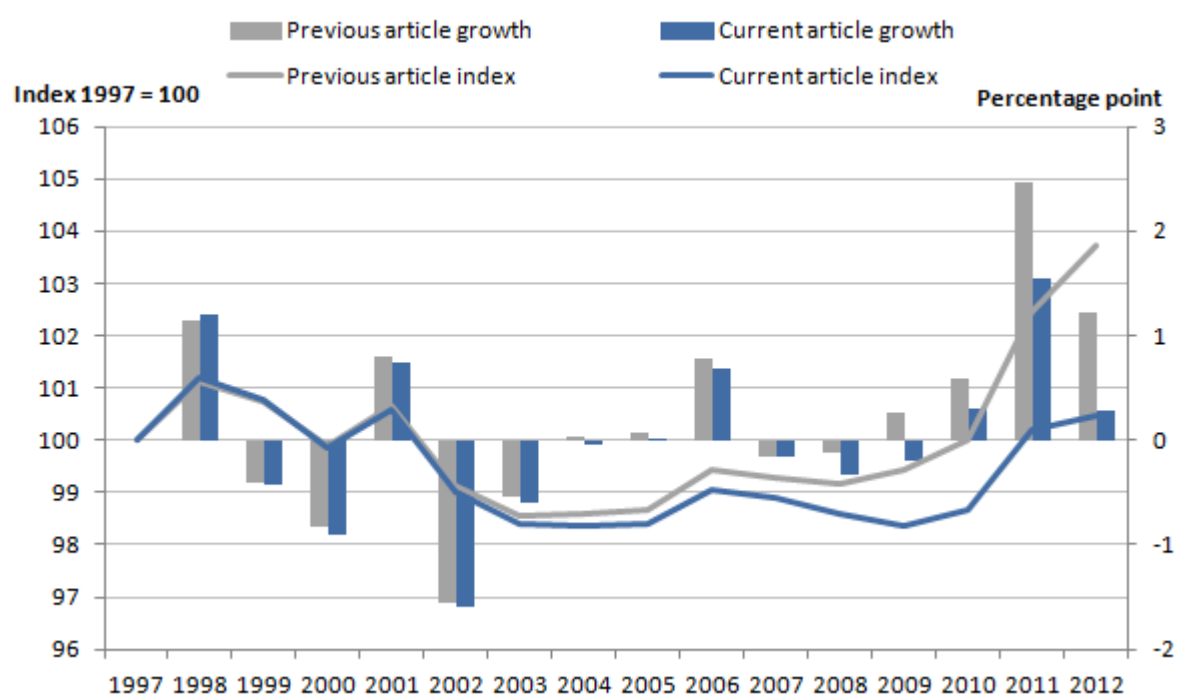
Our public service productivity estimates operate an open revisions policy. This means that new data or methods can be incorporated at any time, and will be implemented for the entire time series of data. Revisions to estimates in this release are due to:



- revisions made to source data by data providers
- the replacement of forecast data with actual data, and re-estimates of forecasts and back-casts using more data points than previously available
- [revisions to UK National Accounts data as a result of changes from the implementation of new guidelines under the European System of Accounts 2010](#)
- a new method of education quality adjustment for England and changes to the treatment of academies in education estimates; a detailed account of these changes can be found in the paper [Methods change in public service productivity estimates: education 2013 \(182.8 Kb Pdf\)](#)

**Figure 11: Revisions to growth rates and indices of total public service productivity from previously published estimates, 1997 to 2012**

UK



Source: Office for National Statistics

### Download chart

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(29 Kb)

Previously published figures showed total public service productivity increasing in 2011 and 2012, after a period of limited growth between 2004 and 2010. Revisions in this article show this increase to be smaller than previously published, mostly as a result of methods changes in quality adjustment and the treatment of academies in the production of estimates for public service education. Annual average productivity growth has been revised downwards from 0.2% per year between 1997 and 2012 to 0.0%. This consists of annual average inputs growth revised upwards from 2.5% to 2.7% while annual average output growth remains unchanged at 2.7% over the same period.

Dataset: [Revisions to growth rates of output, inputs and productivity for total public services and individual service areas, 1998 to 2012 \(117.5 Kb Excel sheet\)](#)

## Background notes

### 1. Chain linked Laspeyres volume index

[Methodology note on annual chain linking \(58 Kb Pdf\)](#) explain how we annually chain-link data series. This technique of annually updating the base period weights produces a rate of change in volume terms over the reference period for the data series.

We use this technique to produce estimates of the volume of output and inputs for public services. [More information on this method and how Laspeyres volume indices are calculated for the estimates in this release \(237 Kb Pdf\)](#).

### 2. Notes on methods

Estimation of the volume of inputs uses data on government expenditure from the most recent Classification of Functions of Government (COFOG) publication. Due to data quality issues at a detailed level a degree of estimation is used for total government expenditure within the social protection classification.

Manual adjustments made to COFOG data for social security administration reflect corrections requested by the Department for Work and Pensions (DWP) to attempt to ensure expenditure is reflected accurately on a calendar year basis and is recorded in the correct expenditure classification. This includes the omission of expenditure and receipts associated with the National Insurance Fund (NIF) which sum to zero in financial years, but due to the timing of quarterly data create a distortion of the figures when presented in calendar years.

Further information on the quality and methodology can be found in the [Quality and Methodology Information paper \(272.5 Kb Pdf\)](#) which describes the intended uses of the statistics presented in this release, their quality and a summary of the methods used to produce them. More detailed methods information can be found in the paper [Sources and methods for public service productivity estimates: total public services \(111.4 Kb Pdf\)](#). The [methods changes incorporated since the published sources and methods paper](#) can be found on our website.

### 3. Data availability

The data in this release is based on the latest published data for expenditure on government services for the different Classifications of Functions of Government (COFOG). The [MAAST supplementary data tables](#), and further unpublished detailed levels of classification required to produce estimates for some service areas, are only available annually after validation by Eurostat 16 months after the year end. Data up to calendar year 2014 will be published in April 2016.

The productivity statistics published in this release are also dependent on the publication of the latest estimates for output, inputs and productivity for the healthcare and education service

areas which we published separately in December 2015. Both of these releases contain quality-adjustment for which the latest complete datasets for healthcare for financial year ending 2014 were available in September 2015 and for education academic year ending 2014 in February 2015.

New methodologies are being introduced to meet the timeliness of our statistics by experimentally producing quarterly estimates on public service productivity to be released in early 2016. Alternative information on public sector spending is published by HM Treasury and can be found in the [Treasury's Public expenditure statistical analysis](#).

#### 4. Comparing ONS estimates of productivity

Productivity statistics published in this release are based on a concept of output as measured by government expenditure rather than government or state production. This means that we are using a measure of government purchased output, regardless of the sector the output was produced by. This follows from the use of the estimates of the volume of government output used in this release (prior to any quality adjustment) to the GDP(E) (expenditure) side of the UK National Accounts.

While most expenditure funds state providers of public services, there is a growing component of expenditure on private or voluntarily-provided services, such as healthcare services delivered by non-NHS providers and pre-school education delivered by private and voluntary providers. The estimates presented in this release should therefore be taken as a measure of the technical efficiency with which government is enabling the provision of public services for individuals in the UK, not producing that service itself. They are not a welfare measure of allocative efficiency that would analyse government's ability to produce at the lowest possible cost or socially desirable outcomes.

In contrast traditional measures of productivity, including our other [productivity estimates](#), use a supply or production framework. These measures group output using Standard Industrial Classification (SIC07) categories of production, and measure output as gross value-added (GVA) which is output less the value of goods and services used up in production. On the inputs side our other productivity estimates count the labour used in the production of services using hours worked and apply an adjustment for the quality of labour to estimate [labour productivity](#). We also produce [multi-factor productivity](#) estimates by industry which includes both labour and capital services as inputs.

Caution should be used when comparing public service productivity estimates to our other productivity estimates. A summary of the differences is provided in the paper [Comparing public service productivity estimates with other productivity estimates \(433.2 Kb Pdf\)](#) and a more detailed discussion is provided in the paper [Comparing different estimates of productivity produced by ONS \(136.3 Kb Pdf\)](#).

#### 5. Comparison with the UK National Accounts Blue Book 2015

The estimates of output and inputs in this release are generally consistent with estimates of government output included in the Blue Book 2015. However there are some exceptions; the main differences are:

- there is no quality adjustment for healthcare or education in the Blue Book 2015 as required under the European System of Accounts 2010 regulations
- there are small variations in the method of estimating output for education and children's social care
- further education output is included in education output for public service productivity but Blue Book 2015 does not use an activity measure of further education output

## 6. Quality and methodology information (QMI)

A [QMI report \(272.5 Kb Pdf\)](#) describes the intended uses of the statistics provided in this article, their quality and a summary of the methods used to produce them.

## 7. Contact details

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8. Details of the policy governing the release of new data are available by visiting [www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html](http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html) or from the Media Relations Office email: [media.relations@ons.gsi.gov.uk](mailto:media.relations@ons.gsi.gov.uk)

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This document is also available on our website at [www.ons.gov.uk](http://www.ons.gov.uk).

## **Annex A**

This table provides an overview of the methods for estimating output and inputs for each service area to enable users to compare quickly how estimates for each service area are derived. More information on estimation methods for each service area is available in the paper [Sources and Methods for Public Service Productivity Estimates: Total Public Services \(111.4 Kb Pdf\)](#).

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**Output**
**Inputs****Healthcare**

Quantity of delivered healthcare services including hospital and community health services, family health services and GP prescribing combined as cost weighted activity index. Non-NHS provision uses 'inputs = output' convention. Adjusted for quality of delivered services including survival rates, health gain, waiting times and results from the National Patient Survey.

Direct measure of volume growth for labour inputs based on full-time equivalent employee numbers in the health service. Indirect measure of volume growth for goods and services and capital consumption dividing current price expenditure by appropriate deflators. Individual growth rates multiplied by previous year expenditure shares to give chain-linked Laspeyres volume index of total inputs.

**Education**

Quantity of full-time equivalent publicly-funded pupil and student numbers in pre-school education, maintained primary, secondary and special schools, and further education colleges, adjusted for attendance combined as cost weighted activity index. Adjusted for quality using change in average point scores at GCSE or equivalent level.

Direct measure of volume growth for local authority labour inputs based on full-time equivalent teacher and support staff numbers adjusted for hours worked. Indirect measure of volume growth for central government labour, general government goods and services and general government capital consumption by dividing current price expenditure by appropriate deflators. Individual growth rates multiplied by previous year expenditure shares to give chain-linked Laspeyres volume index of total inputs.

**Social security administration**

Chain volume measure based on aggregation of output from administration of individual benefit types weighted by associated unit costs. Not quality adjusted.

Current price expenditure on labour, goods and services and capital consumption divided by appropriate deflators to give estimated volume of inputs. Individual growth rates multiplied by previous year expenditure shares to give Laspeyres volume index of total inputs.

**Adult social care**

Quantity of social services activities measured in terms of time or number of items combined as cost-weighted activity index. Not quality adjusted.

Current price expenditure on labour, procurement for independent care, other procurement and capital consumption divided by appropriate deflators to give estimated volume of inputs. Individual growth rates multiplied by previous year expenditure shares to give Laspeyres volume index of total inputs.

**Children's social care**

Quantity for looked after children as cost weighted activity index. Non-looked after children uses 'inputs = output' convention. Looked after children and non-looked after children combined

Current price expenditure on labour and goods and services divided by appropriate deflators to give estimated volume of inputs, separately for publicly and independently provided care. Individual growth rates multiplied by previous

using expenditure shares to give cost-weighted volume index. Not quality adjusted.

year expenditure shares to give Laspeyres volume index of total inputs.

### **Public order and safety**

Individual cost-weighted activity indices for the fire service, the prison service, the courts and the probation service combined using expenditure shares to give cost-weighted volume index. Not quality adjusted.

Current price expenditure on labour, goods and services and capital consumption - separately for the courts, the fire service and the prison service - divided by appropriate deflators to give estimated volume of inputs for each component. Individual growth rates multiplied by previous year expenditure shares to give Laspeyres volume index of total inputs.

### **Police**

'Inputs = output' convention.

Current price expenditure on labour, goods and services and capital consumption divided by appropriate deflators to give estimated volume of inputs. Individual growth rates multiplied by previous year expenditure shares to give Laspeyres volume index of total inputs.

### **Defence**

'Inputs = output' convention.

Total current price expenditure divided by derived deflator to give estimated volume of inputs, converted to index.

### **Other**

'Inputs = output' convention.

Total current price expenditure of all included service areas divided by GDP deflator to give estimated volume of inputs, converted to index.

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