Public Service Productivity Estimates: Total Public Services, 2010

Author Name(s): Nia Pope, ONS

Abstract

This release contains updated output, inputs and productivity estimates for public services in the UK between 1997 and 2010. It provides an analysis of key trends, and identifies which public service areas are the main drivers for total public service productivity.

Acknowledgements

1. The author would like to acknowledge contributions from Fiona Massey, Philip Wales, Chris Payne and Jozef Berila.

User feedback survey

ONS is actively seeking feedback from users of its public service productivity statistics in order to inform its future work priorities. We are particularly interested in user views on the value of these statistics to inform policy and public debate. The user feedback survey provides an opportunity for you to tell us about your use of this release and your perception of the quality of the statistics.

If you would like to be invited to our user consultation sessions, please let us know. Contact details are shown in the Background notes section of this publication.

Key points

- Total public service productivity has remained broadly constant between 1997 and 2010, with an annual average growth rate of 0.0%.
- Both public service output (activities performed and services delivered) and public service inputs (labour, goods and services and capital), grew by 3.0% per year on average.
- The strongest period of growth for both output and inputs was between 2000 and 2005, whereas 2009 and 2010 showed among the slowest growth rates in the 14 year period.
- The strongest annual growth in productivity was in 1998 (+0.7%) and the largest fall was in 2002 (-1.3%).
- The two most recent years, 2009 and 2010, showed modest productivity growth rates of 0.3%.
Summary

Total public service productivity growth is calculated by comparing growth in public service output with growth in public service inputs used.

Total public service output and inputs indices are calculated by aggregating output and inputs for the following service areas. Total public service productivity is then calculated by dividing this index of output by the index of inputs.

- Healthcare
- Education
- Adult social care
- Children's social care
- Public order and safety
- Police
- Defence
- Other (this includes general government services, economic affairs, environmental protection, housing and recreation).

In expenditure terms, the most significant of these service areas are healthcare and education - representing 32.7% and 22.8% of total expenditure in 2010, respectively.

Due to ongoing quality-assurance checks, estimates of output, inputs and productivity for social security administration are omitted from this release. ONS will publish these estimates when available.

For most service areas, output is measured by activities performed and services delivered, together with quality adjustments for healthcare and education. Inputs comprise volume estimates of labour, goods and services and capital used in delivering public services. For most service areas, inputs are measured indirectly - using current expenditure adjusted by a suitable deflator. Further information on this is included in the Background notes and Quality and methodology information sections of this publication.

Our productivity estimates provide a measure of how volumes of inputs are translated into volumes of output. Positive productivity growth indicates that the UK is achieving more output per unit of input, while negative productivity growth indicates that the UK is obtaining less output per unit of input. However, these estimates say nothing about changes in input prices or outcomes delivered. They therefore cannot say whether an increase in productivity is necessarily associated with an increase in value for money. Further information is provided in the user guide in Appendix A. Figure 1 shows that productivity has remained broadly constant between 1997 and 2010, with an annual average growth rate of 0.0%. Average output growth of 3.0% per year was matched by average inputs growth of 3.0%.

The strongest period of growth for both output and inputs was between 2000 and 2005, whereas 2009 and 2010 showed among the slowest growth rates in the 14 year period. Healthcare and education have been the main contributors to both output and inputs growth, with ‘other’ also making a significant contribution.
The strongest annual growth in productivity was in 1998 (+0.7%) and the largest fall was in 2002 (-1.3%). The two most recent years, 2009 and 2010, showed modest productivity growth rates of 0.3%.

The previous total public service productivity release (ONS 2010a), estimated that productivity fell by 0.3% per year on average between 1997 and 2008. There are two key reasons for this change in the productivity estimate from an annual average growth rate of -0.3% to 0.0%.

The main reason is that there have been positive revisions to productivity estimates for most years in the period 1997-2008. These revisions mainly arise from changes to healthcare output estimates, which now explicitly include services delivered by non-NHS providers funded by the NHS. This extension of coverage, combined with more consistent data sources and processing techniques have led to revised healthcare output estimates. More information on the measurement of healthcare output is provided in the healthcare productivity release published in December 2012 (ONS 2012b).

The second reason for this change is the positive productivity growth which occurred in 2009 and 2010. This was driven by growth in education output, the majority of which was due to improvements in education quality. Information on the measurement of education quality is provided in the education productivity release published in March 2012 (ONS 2012a).

The previous total public service productivity release (ONS 2010a), included estimates for social security administration output, inputs and productivity. The expenditure share of social security administration was 1.6% in 2008, and so did not have a significant impact on total public service productivity growth rates. We would expect a similarly marginal impact on overall growth rates for productivity when new social security administration estimates are included, when available. In turn, we would expect revisions attributable to the future inclusion of social security administration data, to be minor.
Figure 1: Total public services output, inputs and productivity estimates 1997-2010

Source: Office for National Statistics

Download chart

XLS  XLS format
(31.5 Kb)

Figure 2 shows that between 1997 and 2010, there have been periods of both positive and negative productivity growth. Positive productivity growth occurs in years when the output growth rate exceeds the inputs growth rate. Conversely, productivity falls when output grows at a slower rate than inputs. The largest fall in productivity was in 2002, when output and inputs growth rates were at their highest.

The first period of recession arising from the financial crisis was in 2008 and 2009. A recession does not impact directly on the output of service areas. The budgets and spending reviews implemented by the coalition government are likely to impact on inputs estimates for 2011 and beyond.
Figure 2: Growth rates for total public services output, inputs and productivity 1998-2010

Source: Office for National Statistics

Download chart

Table 1 shows that between 1997 and 2010, total public service productivity fell by 0.2%. Output increased by 46.3% and inputs increased by 46.5%.
Table 1: Indices of total public services output, inputs and productivity 1997-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Output</th>
<th>Inputs</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1998</td>
<td>102.2</td>
<td>101.5</td>
<td>100.7</td>
</tr>
<tr>
<td>1999</td>
<td>104.6</td>
<td>103.7</td>
<td>100.8</td>
</tr>
<tr>
<td>2000</td>
<td>108.8</td>
<td>108.1</td>
<td>100.6</td>
</tr>
<tr>
<td>2001</td>
<td>112.6</td>
<td>111.4</td>
<td>101.1</td>
</tr>
<tr>
<td>2002</td>
<td>118.0</td>
<td>118.2</td>
<td>99.8</td>
</tr>
<tr>
<td>2003</td>
<td>123.6</td>
<td>124.1</td>
<td>99.6</td>
</tr>
<tr>
<td>2004</td>
<td>128.1</td>
<td>129.1</td>
<td>99.2</td>
</tr>
<tr>
<td>2005</td>
<td>132.3</td>
<td>133.0</td>
<td>99.4</td>
</tr>
<tr>
<td>2006</td>
<td>135.8</td>
<td>135.7</td>
<td>100.1</td>
</tr>
<tr>
<td>2007</td>
<td>137.2</td>
<td>138.0</td>
<td>99.4</td>
</tr>
<tr>
<td>2008</td>
<td>141.7</td>
<td>142.7</td>
<td>99.2</td>
</tr>
<tr>
<td>2009</td>
<td>144.6</td>
<td>145.3</td>
<td>99.5</td>
</tr>
<tr>
<td>2010</td>
<td>146.3</td>
<td>146.5</td>
<td>99.8</td>
</tr>
</tbody>
</table>

Percentages, annual average growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Output</th>
<th>Inputs</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2010</td>
<td>3.0</td>
<td>3.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:
1. Means are geometric

Download table

Download in XLS format

Reference tables are available to download containing more detailed data by service area.

This publication includes a revisions section which shows how the statistics published in this release differ from those published in 2010 (ONS 2010a).
Background notes include a guide to the interpretation of the estimates in this release. Appendix A is a user guide (13.8 Kb Pdf) to the key statistics in this release.

A user feedback survey is also available, to enable us to gather feedback on the usefulness and relevance of the statistics in this release.

Notes

1. General government services include foreign affairs, economic aid to developing countries, basic research, and services undertaken by government not specified by function.

2. Value for money is commonly understood to refer to how far expenditure on a public service achieves its desired outcome for society. Value for money is therefore a function of how much is paid for inputs to the public service, the productivity of that public service (how inputs are converted to output) and how far the output of the public service delivers the desired outcome for society (independently of other social or economic factors). ONS public service productivity figures only cover one of these interactions. It is therefore not possible to say that a rise or fall in productivity is necessarily associated with better or worse value for money, unless more information is known about changes in input prices and the relationship between output and outcomes.

Estimates of productivity

Estimates of public service productivity are calculated by weighting the growth rates of output and inputs in different service areas to produce aggregated output and inputs indices. Figure 3 shows the relative size of each service area in 2010, in terms of expenditure shares. The largest service areas - healthcare and education - accounted for 55.5% of all government expenditure in 2010, and have a correspondingly large impact on estimates of productivity. Children’s social care is the smallest service area by expenditure share and has an equivalently smaller impact on the aggregated indices.

Different measurement techniques for output are adopted for different service areas. Healthcare and education, as well as adult social care, children's social care and public order and safety all involve some degree of direct volume measurement.

Output estimates for police, defence and ‘other’ are all based on the ‘output=inputs’ convention. That is, output is deemed to be equal to the volume of inputs used in generating the output. Together, these areas account for 31.6% of total expenditure in 2010, as shown in figure 3.

Within healthcare, we assume that output=inputs for approximately 9% of output; this output is services delivered by non-NHS providers. Similarly, within children’s social care, we assume that output=inputs for approximately 60% of output; this output relates to ‘non looked after’ children. Together, these account for approximately 4% of total expenditure in 2010.

Therefore in total, approximately 36% of output is measured using the ‘output=inputs’ convention. The other 64% is measured directly by activities performed and services delivered.
The forthcoming Quality and Methodology Information (QMI) publication will present a sensitivity test for productivity - i.e. productivity estimates which exclude the three service areas for which output is not measured directly. The main result is that annual average productivity growth remains at 0.0% as presented in this release.

**Figure 3: Expenditure weights by service area 2010**

![Expenditure weights by service area 2010](chart.png)

Source: Office for National Statistics

Download chart

XLS XLS format (29 Kb)

Productivity is calculated by dividing the index of output by the index of inputs. Our estimates show that growth in output is broadly matched by growth in inputs for most of the period 1997-2010.

**Key Trends 1997-2010**

- As figure 2 shows, output growth has been positive throughout the period; the slowest rate of growth was in 2007 (+1.1%) and the fastest annual growth rate was in 2003 (+4.8%). Inputs growth has also been positive throughout; the slowest growth occurring in 2010 (+0.8%) and the fastest in 2002 (+6.1%).
- Between 2000 and 2005, output growth rates were above the whole period average. Inputs growth rates were also at or above the whole period average between 2000 and 2005.
In general over the period, when the rate of inputs growth was increasing, the rate of output growth increased more slowly. Similarly, when inputs growth rates fell, output growth rates fell more slowly. That is, there could be a time lag as output growth rates ‘catch up’ with inputs.

Output and inputs growth rates show broadly similar patterns over the period, which is why the productivity growth rate has been zero on average.

Productivity by service area

Figure 4 shows the annual average growth rates in productivity for each service area. Both healthcare and education have small positive average growth rate figures, whereas other areas have zero or negative growth rates. The small positive growth rates in healthcare and education balance out the larger negative growth rates in other areas, because healthcare and education have the largest expenditure weights. This gives zero productivity growth overall. For police, defence and ‘other’, we assume that output is equal to inputs - so productivity growth is zero by definition.

Figure 4: Productivity annual average growth rates by service area 1997-2010

Source: Office for National Statistics

Download chart

XLS format
(20 Kb)
Table 2 shows the index of productivity for each service area. Between 1997 and 2010, healthcare and education productivity grew by 6.2% and 4.5%, respectively. Adult social care and children’s social care showed falls of 20.0% and 11.6%, respectively. Public order and safety showed the largest fall of 25.9%. More detail is given in the service area sections of this release.

Table 2: Productivity indices by service area 1997-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Healthcare</th>
<th>Education</th>
<th>Adult Social Care</th>
<th>Children’s Social Care</th>
<th>Public Order &amp; Safety</th>
<th>Police</th>
<th>Defence</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1998</td>
<td>100.0</td>
<td>101.3</td>
<td>101.5</td>
<td>107.9</td>
<td>104.3</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.7</td>
</tr>
<tr>
<td>1999</td>
<td>100.1</td>
<td>105.9</td>
<td>97.4</td>
<td>107.7</td>
<td>92.8</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.8</td>
</tr>
<tr>
<td>2000</td>
<td>100.2</td>
<td>106.5</td>
<td>96.1</td>
<td>110.3</td>
<td>85.5</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.6</td>
</tr>
<tr>
<td>2001</td>
<td>102.6</td>
<td>105.1</td>
<td>95.2</td>
<td>105.7</td>
<td>90.1</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>101.1</td>
</tr>
<tr>
<td>2002</td>
<td>100.5</td>
<td>103.2</td>
<td>94.3</td>
<td>104.1</td>
<td>85.9</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.8</td>
</tr>
<tr>
<td>2003</td>
<td>101.6</td>
<td>103.4</td>
<td>90.0</td>
<td>98.9</td>
<td>83.2</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.6</td>
</tr>
<tr>
<td>2004</td>
<td>102.3</td>
<td>103.0</td>
<td>88.7</td>
<td>93.9</td>
<td>77.4</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.2</td>
</tr>
<tr>
<td>2005</td>
<td>104.6</td>
<td>100.8</td>
<td>88.9</td>
<td>91.9</td>
<td>76.7</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.4</td>
</tr>
<tr>
<td>2006</td>
<td>107.7</td>
<td>100.0</td>
<td>90.0</td>
<td>86.1</td>
<td>76.6</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.1</td>
</tr>
<tr>
<td>2007</td>
<td>107.2</td>
<td>98.8</td>
<td>88.6</td>
<td>86.5</td>
<td>74.2</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.4</td>
</tr>
<tr>
<td>2008</td>
<td>108.4</td>
<td>98.4</td>
<td>84.1</td>
<td>83.2</td>
<td>73.3</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.2</td>
</tr>
<tr>
<td>2009</td>
<td>107.2</td>
<td>101.0</td>
<td>81.9</td>
<td>87.9</td>
<td>74.4</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.5</td>
</tr>
<tr>
<td>2010</td>
<td>106.2</td>
<td>104.5</td>
<td>80.0</td>
<td>88.4</td>
<td>74.1</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>99.8</td>
</tr>
</tbody>
</table>

Percentages, annual average growth

<table>
<thead>
<tr>
<th>Period</th>
<th>Healthcare</th>
<th>Education</th>
<th>Adult Social Care</th>
<th>Children’s Social Care</th>
<th>Public Order &amp; Safety</th>
<th>Police</th>
<th>Defence</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2010</td>
<td>0.5</td>
<td>0.3</td>
<td>-1.7</td>
<td>-0.9</td>
<td>-2.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Table notes:
1. Means are geometric
Productivity in 2009 and 2010

- Output and inputs both grew in 2009 and 2010, but growth rates were slower than in 2008 and were below average for the period 1997-2010. Output grew by 1.2% in 2010, compared with 3.2% in 2008. Inputs grew by 0.8% in 2010, a fall from 3.4% in 2008.
- Output growth exceeded inputs growth in both 2009 and 2010, leading to productivity growth of 0.3% in both years.
- Education was the main driver of productivity growth in 2009 and 2010. In these two years, education experienced strong output growth and a slowdown in inputs growth. This output growth was driven by increased quality; this is explained in more detail in the education section.

Estimates of output

Direct output estimates have two elements. The first is the quantity of activities performed and services delivered. The second element is the quality of these activities and services; however a quality adjustment is only applied to healthcare and education. Output estimates for education are produced using a quality adjustment based on GCSE and equivalent scores. Output estimates for healthcare are produced using a quality adjustment based on a range of variables, including survival rates, health gain and patient experience. More detail on the methodology of these quality adjustments is given in ONS 2012a and ONS 2012b. For both education and healthcare, quality adjustments have been positive over the period. I.e. quality adjustments have boosted output estimates for both service areas. No quality adjustments are applied to the other service areas, which may lead to the under or over estimation of output.

Figure 5 shows the annual average growth rates in output for each service area between 1997 and 2010, and table 3 shows the index of output for each service area. The strongest output growth rates were in healthcare and children's social care, followed by education and 'other'. Adult social care showed growth in output between 1997 and 2006; it then fell each year until 2010 - giving an increase of 5.6% over the period as a whole.
Figure 5: Output annual average growth rates by service area 1997-2010

Source: Office for National Statistics

Download chart

XLS format
(19.5 Kb)
**Table 3: Output indices by service area 1997-2010**

*United Kingdom*

<table>
<thead>
<tr>
<th>Year</th>
<th>Healthcare</th>
<th>Education</th>
<th>Adult Social Care</th>
<th>Children's Social Care</th>
<th>Public Order &amp; Safety</th>
<th>Police</th>
<th>Defence</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1998</td>
<td>104.6</td>
<td>102.6</td>
<td>102.3</td>
<td>111.9</td>
<td>99.9</td>
<td>99.6</td>
<td>98.4</td>
<td>101.4</td>
<td>102.2</td>
</tr>
<tr>
<td>1999</td>
<td>107.8</td>
<td>105.7</td>
<td>101.5</td>
<td>121.1</td>
<td>101.0</td>
<td>98.5</td>
<td>94.6</td>
<td>108.5</td>
<td>104.6</td>
</tr>
<tr>
<td>2000</td>
<td>113.5</td>
<td>107.5</td>
<td>102.5</td>
<td>127.7</td>
<td>101.2</td>
<td>98.0</td>
<td>101.5</td>
<td>114.1</td>
<td>108.8</td>
</tr>
<tr>
<td>2001</td>
<td>120.5</td>
<td>109.5</td>
<td>104.2</td>
<td>128.9</td>
<td>105.6</td>
<td>99.9</td>
<td>97.3</td>
<td>123.3</td>
<td>112.6</td>
</tr>
<tr>
<td>2002</td>
<td>126.9</td>
<td>112.9</td>
<td>111.9</td>
<td>137.9</td>
<td>105.9</td>
<td>103.4</td>
<td>103.0</td>
<td>130.0</td>
<td>118.0</td>
</tr>
<tr>
<td>2003</td>
<td>136.5</td>
<td>115.0</td>
<td>115.6</td>
<td>144.5</td>
<td>108.4</td>
<td>108.4</td>
<td>109.8</td>
<td>134.7</td>
<td>123.6</td>
</tr>
<tr>
<td>2004</td>
<td>144.6</td>
<td>117.6</td>
<td>119.2</td>
<td>148.7</td>
<td>106.3</td>
<td>109.3</td>
<td>108.0</td>
<td>144.9</td>
<td>128.1</td>
</tr>
<tr>
<td>2005</td>
<td>155.0</td>
<td>119.5</td>
<td>120.5</td>
<td>150.7</td>
<td>107.0</td>
<td>112.1</td>
<td>107.6</td>
<td>148.7</td>
<td>132.3</td>
</tr>
<tr>
<td>2006</td>
<td>164.1</td>
<td>120.6</td>
<td>121.5</td>
<td>149.7</td>
<td>105.1</td>
<td>114.7</td>
<td>109.3</td>
<td>151.9</td>
<td>135.8</td>
</tr>
<tr>
<td>2007</td>
<td>170.0</td>
<td>122.4</td>
<td>118.8</td>
<td>151.2</td>
<td>100.4</td>
<td>115.2</td>
<td>106.5</td>
<td>153.8</td>
<td>137.2</td>
</tr>
<tr>
<td>2008</td>
<td>181.6</td>
<td>126.6</td>
<td>115.3</td>
<td>150.8</td>
<td>102.2</td>
<td>116.0</td>
<td>112.2</td>
<td>152.8</td>
<td>141.7</td>
</tr>
<tr>
<td>2009</td>
<td>190.9</td>
<td>133.7</td>
<td>111.5</td>
<td>162.5</td>
<td>103.4</td>
<td>115.1</td>
<td>110.3</td>
<td>147.6</td>
<td>144.6</td>
</tr>
<tr>
<td>2010</td>
<td>197.0</td>
<td>140.8</td>
<td>105.6</td>
<td>167.8</td>
<td>101.9</td>
<td>111.8</td>
<td>109.0</td>
<td>143.2</td>
<td>146.3</td>
</tr>
</tbody>
</table>

**Percentages, annual average growth**

| 1997-2010 | 5.4 | 2.7 | 0.4 | 4.1 | 0.1 | 0.9 | 0.7 | 2.8 | 3.0 |

**Table source:** Office for National Statistics

**Table notes:**

1. Means are geometric
Estimates of inputs

Inputs comprise the labour, goods and services and capital used in delivering public services. The inputs figures in this publication are estimates of the volume of inputs used in providing public services.

Figure 6 shows the annual average growth rates in inputs for each service area and table 4 shows the index of inputs for each service area. The strongest inputs growth rates were in healthcare and children’s social care - the same service areas which showed the strongest output growth rates.

Figure 6: Inputs annual average growth rates by service area 1997-2010

Source: Office for National Statistics

Download chart

Download table
### Table 4: Inputs indices by service area 1997-2010

United Kingdom

<table>
<thead>
<tr>
<th></th>
<th>Healthcare</th>
<th>Education</th>
<th>Adult Social Care</th>
<th>Children's Social Care</th>
<th>Public Order &amp; Safety</th>
<th>Police</th>
<th>Defence</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1998</td>
<td>104.5</td>
<td>101.3</td>
<td>100.8</td>
<td>103.7</td>
<td>95.8</td>
<td>99.6</td>
<td>98.4</td>
<td>101.4</td>
<td>101.5</td>
</tr>
<tr>
<td>1999</td>
<td>107.7</td>
<td>99.7</td>
<td>104.3</td>
<td>112.5</td>
<td>108.8</td>
<td>98.5</td>
<td>94.6</td>
<td>108.5</td>
<td>103.7</td>
</tr>
<tr>
<td>2000</td>
<td>113.3</td>
<td>100.9</td>
<td>106.7</td>
<td>115.8</td>
<td>118.3</td>
<td>98.0</td>
<td>101.5</td>
<td>114.1</td>
<td>108.1</td>
</tr>
<tr>
<td>2001</td>
<td>117.4</td>
<td>104.2</td>
<td>109.5</td>
<td>122.0</td>
<td>117.1</td>
<td>99.9</td>
<td>97.3</td>
<td>123.3</td>
<td>111.4</td>
</tr>
<tr>
<td>2002</td>
<td>126.2</td>
<td>109.4</td>
<td>118.6</td>
<td>132.6</td>
<td>123.3</td>
<td>103.4</td>
<td>103.0</td>
<td>130.0</td>
<td>118.2</td>
</tr>
<tr>
<td>2003</td>
<td>134.4</td>
<td>111.1</td>
<td>128.4</td>
<td>146.1</td>
<td>130.3</td>
<td>108.4</td>
<td>109.8</td>
<td>134.7</td>
<td>124.1</td>
</tr>
<tr>
<td>2004</td>
<td>141.4</td>
<td>114.1</td>
<td>134.3</td>
<td>158.3</td>
<td>137.4</td>
<td>109.3</td>
<td>108.0</td>
<td>144.9</td>
<td>129.1</td>
</tr>
<tr>
<td>2005</td>
<td>148.2</td>
<td>118.5</td>
<td>135.5</td>
<td>163.9</td>
<td>139.4</td>
<td>112.1</td>
<td>107.6</td>
<td>148.7</td>
<td>133.0</td>
</tr>
<tr>
<td>2006</td>
<td>152.4</td>
<td>120.7</td>
<td>135.0</td>
<td>173.8</td>
<td>137.1</td>
<td>114.7</td>
<td>109.3</td>
<td>151.9</td>
<td>135.7</td>
</tr>
<tr>
<td>2007</td>
<td>158.6</td>
<td>124.0</td>
<td>134.0</td>
<td>174.8</td>
<td>135.3</td>
<td>115.2</td>
<td>106.5</td>
<td>153.8</td>
<td>138.0</td>
</tr>
<tr>
<td>2008</td>
<td>167.6</td>
<td>128.7</td>
<td>137.0</td>
<td>181.4</td>
<td>139.3</td>
<td>116.0</td>
<td>112.2</td>
<td>152.8</td>
<td>142.7</td>
</tr>
<tr>
<td>2009</td>
<td>178.1</td>
<td>132.3</td>
<td>136.2</td>
<td>184.9</td>
<td>139.0</td>
<td>115.1</td>
<td>110.3</td>
<td>147.6</td>
<td>145.3</td>
</tr>
<tr>
<td>2010</td>
<td>185.5</td>
<td>134.8</td>
<td>132.1</td>
<td>189.7</td>
<td>137.5</td>
<td>111.8</td>
<td>109.0</td>
<td>143.2</td>
<td>146.5</td>
</tr>
</tbody>
</table>

Percentages, annual average growth

<table>
<thead>
<tr>
<th></th>
<th>Healthcare</th>
<th>Education</th>
<th>Adult Social Care</th>
<th>Children's Social Care</th>
<th>Public Order &amp; Safety</th>
<th>Police</th>
<th>Defence</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2010</td>
<td>4.9</td>
<td>2.3</td>
<td>2.2</td>
<td>5.1</td>
<td>2.5</td>
<td>0.9</td>
<td>0.7</td>
<td>2.8</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**Table source**: Office for National Statistics

**Table notes**:

1. Means are geometric
Healthcare

Figure 7: Growth rates for healthcare output, inputs and productivity 1998-2010

Source: Office for National Statistics

Healthcare had a weighting of 32.7% in 2010; the highest weighting of all service areas.

Key points:

- Between 1997 and 2010, there have been periods of both positive and negative productivity growth for healthcare. Over this period, productivity has increased by 6.2%, an average of 0.5% per year.
- Both output and inputs have risen significantly over the period - by 97.0% and 85.5%, respectively. On average, output grew by 5.4% each year and inputs grew by 4.9%.
• Until 2000, growth in output broadly matched growth in inputs - so there was zero productivity growth.
• In 2002, productivity saw its largest fall, in the same year as inputs saw its strongest growth. By 2003, output had 'caught up' with inputs, and productivity grew.
• There was further improvement between 2004 and 2006, when output grew more than inputs.
• 2007-2010 saw a levelling off or slight decline in productivity. In the two most recent years, 2009 and 2010, inputs growth exceeded output growth, leading to falls in productivity.

The main contributor to output growth has been more patient treatments in hospital and community health services. Other contributors to output growth have been more drugs prescribed by GPs and more services delivered by non-NHS providers, such as private companies and charities. In addition, there have been increases in the quality of healthcare.

The main contributor to inputs growth has been an increase in the volume of goods and services procured. This includes goods and services procured by the NHS, such as drugs and electricity. It also includes services delivered by non-NHS providers, which are funded by the NHS. In addition there has been an increase in the volume of labour inputs; this includes healthcare professionals and administrative staff.

The healthcare estimates in this release are as published in ONS 2012b. Further information on healthcare productivity can be found in this publication.
Education

Figure 8: Growth rates for education output, inputs and productivity 1998-2010

Source: Office for National Statistics

Download chart

XLS format
(30.5 Kb)

Education had a weighting of 22.8% in 2010; the second highest weighting of all service areas.

Key points:

- Between 1997 and 2010, there have been periods of both positive and negative productivity growth for education. Over this period, productivity has increased by 4.5%, an average of 0.3% per year.
- Both output and inputs have risen significantly over the period - by 40.8% and 34.8%, respectively. On average, output grew by 2.7% each year and inputs grew by 2.3%.
- Until 2000, there was growth in productivity, as output growth rates exceeded inputs growth rates. The highest rate of productivity growth was in 1999, when inputs actually fell.
- The period 2001-2008 showed falls in productivity. The largest falls were in 2002 and 2005 when inputs growth was strongest.
- Productivity grew again in 2009 and 2010. This was caused by strong output growth and a slowdown in inputs growth. This recent output growth was driven by increased quality.
There are two key contributors to output growth. The first is the number of pupils and students in the education system, adjusted for attendance. This is the quantity of output, and is driven by demographic factors. The second driver of output growth is the quality of output - this is measured using GCSE and equivalent scores. This has had a growing effect on output estimates, due to strong growth in scores - particularly since 2008.

There are also two key drivers for inputs growth. The main driver has been increases in the volume of goods and services procured. This includes equipment for schools, pre-school education delivered by private and voluntary providers, and energy costs. In addition, there have been increases in the volume of labour inputs. This includes teachers, teaching support staff and administrative staff.

The education estimates in this release are as published in ONS 2012a. Further information on education productivity can be found in this publication.

**Adult social care**

**Figure 9: Growth rates for adult social care output, inputs and productivity 1998-2010**

![Chart showing growth rates for adult social care output, inputs and productivity 1998-2010](Download chart)

Source: Office for National Statistics

**Download chart**

<table>
<thead>
<tr>
<th>XLS</th>
<th>XLS format</th>
</tr>
</thead>
<tbody>
<tr>
<td>(30.5 Kb)</td>
<td></td>
</tr>
</tbody>
</table>
Adult social care had a weighting of 6.2% in 2010.

Key points:

- The period 1997 to 2010 included 10 years of negative productivity growth for adult social care. Productivity has fallen by 20.0% over this period, an average of 1.7% per year.
- Output has grown by 5.6% over the period, while inputs have shown much stronger growth of 32.1%. On average, output grew by 0.4% each year and inputs grew by 2.2%.
- Each year between 1999 and 2004, inputs growth exceeded output growth, so productivity fell. Each year between 2007 and 2010, output fell by more than inputs, so productivity fell.

The main drivers of output growth in the first half of the period were the expansion of homecare provision and residential care. The falls seen in the latter part of the period were driven by several areas, including residential care and nursing for over 65 year olds, and residential and day care for adults with learning disabilities.

The main reason for positive inputs growth rates in the first half of the period was greater expenditure on independent care providers. Expenditure in this area stabilised in the latter part of the period.

These output estimates take no account of quality, or of the intensity of need, which may have been increasing. Output may be understated, for example, if an increasing proportion of people have services provided to them at home instead of being taken into residential care. Residential care is more expensive than care at home, so this kind of shift would reduce output growth because of the lower weight of home care.
Children’s social care had a relatively small weighting of 2.5% in 2010.

Key points:

- Children’s social care experienced six consecutive years of negative productivity growth between 2001 and 2006.
- Between 1997 and 2010, productivity has fallen by 11.6%, an average of 0.9% per year.
- Both output and inputs have risen significantly over the period - by 67.8% and 89.7%, respectively. On average, output grew by 4.1% each year and inputs grew by 5.1%.
- There was some positive growth in productivity at both the beginning and end of the period, when inputs growth was relatively low. In the middle of the period, inputs grew more strongly than output - leading to falls in productivity.

Output is measured separately for ‘looked after’ and ‘non looked after’ children. The latter category has the largest expenditure weight, and is measured using the ‘output=inputs’ convention. Output for
'non looked after' children drives the output growth pattern seen in figure 10, with both procurement of goods and services and labour costs following broadly similar patterns. Output for 'looked after' children has followed a different path, with falls between 1997 and 2007 - followed by positive growth rates between 2008 and 2010. Over the time period, there has been a switch away from children's homes towards fostering. Our methodology combines the output of residential care homes with fostering - and this is then aggregated together with output for 'non looked after' children.

The main driver of inputs growth is goods and services procurement expenditure.

**Public order and safety**

**Figure 11: Growth rates for public order and safety output, inputs and productivity 1998-2010**

Public order and safety had a relatively small weighting of 4.2% in 2010. It includes activity carried out by the fire service, the courts, the prison service and the probation service.

Key points:
- Productivity growth for public order and safety has fluctuated significantly over the period, showing its largest fall of 11.0% in 1999, and its strongest growth of 5.4% in 2001.
- Over the period 1997-2010, productivity has fallen by 25.9%, an average of 2.3% per year.
- Output grew by 1.9% over the period, with inputs showing much stronger growth of 37.5%. On average, output grew by 0.1% each year and inputs grew by 2.5%.
- The volatility in productivity growth is mainly driven by inputs. Inputs growth rates ranged between -4.2% and +13.6%.
- There have been periods of both positive and negative growth for output - ranging between -4.5% and +4.4%.
- Both output and inputs growth were weaker on average in the latter part of the period.
- In 2009, positive growth in output and a fall in inputs gave rise to a small increase in productivity. 2010 saw small falls in output, inputs and productivity.

Output for the prison service has increased over the period 1997 to 2010, as the prison population has grown. However, this has been outweighed by falls in the other components, whose combined weights are twice as large, and as a result output has remained relatively flat over the period.

The key contributors to inputs growth are the prison service and the courts. Together, these account for more than two-thirds of total public order and safety expenditure. Goods and services procurement is the main driver behind the growth rates seen in 1999 and 2000, and also between 2002 and 2004 - particularly within the courts and the fire service. Inputs for the prison service have also increased significantly over the period.
Police

Figure 12: Growth rates for police inputs 1998-2010

Source: Office for National Statistics

Download chart

Police had a weighting of 5.1% in 2010.

Key points:

- Police output is measured using the ‘output=inputs’ convention. That is, output is deemed to be equal to the volume of inputs used in generating the output.
- Inputs growth rates over the period 1997-2010 ranged between -2.8% and +4.7%.
- Over the period, police inputs increased by 11.8%, with annual average growth of 0.9%. The main driver behind inputs growth was the volume of labour.
- There were falls in inputs at the beginning of the period, followed by positive growth rates for 8 consecutive years between 2001 and 2008.
• 2009 and 2010 showed falls of 0.7% and 2.8%, respectively. The fall in 2010 was driven by falls in goods and services procurement and support staff labour.

Defence

Figure 13: Growth rates for defence inputs 1998-2010

Source: Office for National Statistics

Download chart

Defence had a weighting of 10.6% in 2010.

Key points:

• Similarly to police, defence output is measured using the ‘output=inputs’ convention.
• Inputs growth rates over the period 1997-2010 ranged between -4.1% and +7.3%.
• Over the period, defence inputs increased by 9.0%, with an annual average growth rate of 0.7%.
• The largest fluctuations in inputs growth were seen in the first half of the period. After 2003, growth rates were smaller - with the exception of 2008 - but continued to fluctuate between positive and negative.
The two most recent years, 2009 and 2010, both showed small falls in inputs of 1.6% and 1.2%, respectively.

The Afghanistan and Iraq wars, which commenced in 2001 and 2003 respectively, will have been key drivers for the growth rates seen in 2002 and 2003.

**Other services**

**Figure 14: Growth rates for 'other' inputs 1998-2010**

Download chart

XLS format

Other services had a weighting of 15.9% in 2010. Therefore, collectively ‘other’ services represented the third largest share of expenditure.

The service areas included in this category are: economic affairs (30%), general government services (19%), recreation (18%), environmental protection (16%), housing (16%) and other (1%).

Key points:

- Similarly to police and defence, other output is measured using the ‘output=inputs’ convention.
- Over the period, inputs increased by 43.2%, with an annual average growth rate of 2.8%.
• Inputs grew each year until 2007, the strongest growth rates being in the first half of the period.
• 2009 and 2010 showed falls of 3.4% and 3.0%, respectively.
• General government services include foreign affairs, economic aid to developing countries, basic research, and services undertaken by government not specified by function.
• The key contributors to the positive growth rates seen in the earlier years were economic affairs and housing. The slowdown seen in the latter part of the period was driven by falls in expenditure for all services.

Revisions

This section explains the differences between the estimates published in this release, and those published in the last total public service productivity release in 2010 (ONS 2010a).

The education and healthcare estimates in this release are as published in our education productivity and healthcare productivity releases in March and December 2012, respectively (ONS 2012a and ONS 2012b). For all other service areas, this release includes the first revised estimates since ONS 2010a.

Figure 15 shows the differences between the annual growth rates in output, inputs and productivity in this release, compared with ONS 2010a.

Output growth for the period 1997-2008 has been revised upwards by an average of 0.3 percentage points per year - from an annual average rate of 2.9% to 3.2%. The inputs growth rate has been revised upwards by an average of 0.1 percentage points per year – from an annual average of 3.2% to 3.3%. Productivity growth has been revised upwards by an average of 0.2 percentage points per year - from an annual average rate of -0.3% to -0.1%. 
Figure 15: Revisions to annual growth rates of total public services output, inputs and productivity 1998-2008

Reasons for revisions

Revisions have been made to estimates for all included service areas, due to:

- Revisions made to data, by data providers.
- The replacement of forecast data with actual data - particularly for 2008.
- Using the latest expenditure weights data.
- Re-estimated forecasts and back-casts using more data points than previously available.

In addition, revisions have been made due to methods changes for some service areas. These changes are summarised below.

Healthcare output methods changes
The coverage of healthcare output estimates has been extended to include an ‘output=inputs’ treatment for services which are funded by the NHS but delivered by non-NHS providers. In addition, more consistent data sources and processing techniques have been applied (ONS 2012d).

**Education methods changes**

Revisions to education inputs estimates have arisen from changes to methods for calculating school support staff labour (ONS 2012e). Revisions to education output have arisen from extending coverage of Further Education to all ages, having previously covered only the under-19 age group.

**Police inputs methods changes**

The new method involves using data from the Annual Survey of Hours and Earnings as a deflator for expenditure. This has led to revisions in police inputs estimates, but as police has a low weighting, this has had a relatively small impact on total inputs. There is no impact on total public service productivity because we assume that output=inputs for police, so productivity growth is zero by definition (ONS 2013).

Over the period 1997-2008, the majority of revisions to total public service productivity arose from positive revisions to healthcare output estimates, which boosted productivity. The largest positive revisions to productivity growth rates were in 2003 (+1.2%), 2005 (+0.6%) and 2008 (+0.7%). The largest negative revision to productivity was in 2007 (-0.7%). The main reasons for this were a positive revision to education inputs and a negative revision to education output.

Reference tables provide additional detail on revisions to estimates for each service area. Further information on revisions to education and healthcare estimates is provided in ONS 2012a and ONS 2012b.

**Reference tables**

The following reference tables are available to download:

Reference table 1: Expenditure weights by service area 1997-2010 (22 Kb Excel sheet)

Reference table 2: Indices of healthcare output, inputs and productivity 1997-2010 (30 Kb Excel sheet)

Reference table 3: Indices of education output, inputs and productivity 1997-2010 (29.5 Kb Excel sheet)

Reference table 4: Indices of adult social care output, inputs and productivity 1997-2010 (30 Kb Excel sheet)

Reference table 5: Indices of children’s social care output, inputs and productivity 1997-2010 (21.5 Kb Excel sheet)
Reference table 6: Indices of public order and safety output, inputs and productivity 1997-2010 (22.5 Kb Excel sheet)

Reference table 7: Indices of police output, inputs and productivity 1997-2010 (21.5 Kb Excel sheet)

Reference table 8: Indices of defence output, inputs and productivity 1997-2010 (20.5 Kb Excel sheet)

Reference table 9: Indices of other output, inputs and productivity 1997-2010 (21.5 Kb Excel sheet)

Reference table 10: Public services output: current index and previous index 1997-2010 (31.5 Kb Excel sheet)

Reference table 11: Public services inputs: current index and previous index 1997-2010 (22.5 Kb Excel sheet)

Reference table 12: Public services productivity: current index and previous index 1997-2010 (22 Kb Excel sheet)

Reference table 13: Healthcare output, inputs and productivity: current indices and previous indices 1997-2010 (24.5 Kb Excel sheet)

Reference table 14: Education output, inputs and productivity: current indices and previous indices 1997-2010 (23.5 Kb Excel sheet)

Reference table 15: Adult social care output, inputs and productivity: current indices and previous indices 1997-2010 (24 Kb Excel sheet)

Reference table 16: Children’s social care output, inputs and productivity: current indices and previous indices 1997-2010 (24 Kb Excel sheet)

Reference table 17: Public order and safety output, inputs and productivity: current indices and previous indices 1997-2010 (26 Kb Excel sheet)

Reference table 18: Police output, inputs and productivity: current indices and previous indices 1997-2010 (32.5 Kb Excel sheet)

Reference table 19: Defence output, inputs and productivity: current indices and previous indices 1997-2010 (24 Kb Excel sheet)

Reference table 20: Other output, inputs and productivity: current indices and previous indices 1997-2010 (23.5 Kb Excel sheet)

**Background notes**

1. Chain linked Laspeyres volume index
A methodology paper by Robjohns (Robjohns 2006) explains how ONS annually chain-links 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.

ONS uses this technique to produce estimates of the volume of output and inputs for public services. See ONS 2008 for more information on this method and how Laspeyres volume indices are calculated for the estimates in this release.

2. **Interpreting estimates of public service productivity**

It is important to recognise that the productivity statistics published in this release are based on a concept of output as measured by government consumption expenditure rather than government or state production. This follows from the submission of the estimates of the volume of government output that are used in this release (prior to any quality adjustment) to the GDP (E) (expenditure) side of the UK national accounts. This means that we are using a measure of government purchased output, regardless of what type of business unit produced the output.

Most expenditure is used to fund state providers of public services. There is, however, 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. This is counted as a component of government output in our estimates, even though it is provided (or supplied) by business units which are classified as private business or ‘non-profit institutions serving households’ (NPISH) units in the National Accounts.

Traditional measures of productivity, including those published by ONS, use a supply or production framework. These measures of productivity use Standard Industrial Classification (SIC 07) categories of production as the measure of output, and are on a gross value-added (GVA) basis. Inputs measures count the labour (jobs or hours) used in the production of these goods and services to estimate labour productivity series such as those produced by ONS. Multi-factor productivity estimates include labour and capital services as inputs. See ONS 2012c for an article on estimates of multifactor productivity for the UK economy.

The interpretation of the expenditure-based productivity 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 (from whatever type of business unit), not producing that service itself. Caution should therefore be used when considering the differences between productivity measures published using the expenditure approach and those using the traditional production approach. Papers by ONS (2011, 2010b) describe some of these differences in approach in more detail.

A user guide (13.8 Kb Pdf) to public service output, inputs and productivity estimates contained in this release is included at Appendix A.

3. **Comparison with the UK National Accounts Blue Book 2012**

The estimates of output and inputs in this release are generally consistent with the Blue Book 2012. However there are some exceptions on the output side; the main differences are:
• There is no quality adjustment for healthcare in the Blue Book, whereas this release includes a quality adjustment from 2002.
• The Blue Book applies a quality adjustment for education which increases output by 0.25% per year. This release uses GCSE and equivalent scores to calculate a quality adjustment factor for each year in the period; therefore the amount by which output is adjusted for quality varies from year to year.
• The Blue Book does not include the experimental method for the output of children’s social care used in this release.

4. Quality and methodology information (QMI)

The forthcoming QMI publication will describe the intended uses of the statistics presented in this release, their quality and a summary of the methods used to produce them. It will also present a sensitivity test for productivity, that is, productivity estimates which exclude the three service areas for which output is not measured directly. The main result is that annual average productivity remains at 0.0% as presented in this release.

5. Pre-release access

A list of persons receiving pre-release access to this publication is available on the ONS website.

6. The new ONS website

The launch of the new ONS website in August 2011 has brought changes to the design and format of publications. The release main body is available in html and pdf format with detailed data tables available as Excel spreadsheets. You can follow ONS on Twitter and Facebook and watch our videos at YouTube/onsstats.

7. Contact details

Statistical contacts:

• Nia Pope +44 (0)1633 456932
  Nia.pope@ons.gsi.gov.uk
• Fiona Massey +44 (0)1633 651552
  Fiona.massey@ons.gsi.gov.uk

Media contact details:

• Telephone 0845 604 1858 (8.30 am - 5.30 pm weekdays)
  media.relations@ons.gsi.gov.uk
• Emergency out of hours (limited service): 07867 906553

8. Issuing body: Office for National Statistics
Planned date of next release: Spring 2015

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

Copyright

© Crown copyright 2013

You may use or re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/ or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

This document is also available on our website at www.ons.gov.uk.

References


Appendix A: A user guide to key statistics in Public Service Productivity Estimates: Total Public Services, 2010

Appendix A (13.8 Kb Pdf) contains a user guide to the key statistics in this release.