

**Written evidence submitted by Professor Jagjit S. Chadha
(Director at National Institute of Economic and Social
Research) and Professor Huw Dixon (Cardiff University)**

*Measuring GDP during a pandemic: distortions from non-market health service output.*¹

Summary

- Howsoever we decide to interpret the preliminary, unbalanced estimates for GDP growth in 2020, the fall is large by historical standards and has had material and substantive impact on the living standards of many households;
- Given the magnitude of the changes in estimated GDP and because much of the change in activity has been concentrated in specific areas and in varying directions, rather than in a uniform manner across the sectors, measurement errors are likely to distort the aggregate measures of GDP;
- Non-market health service is particularly problematic as the measures of output omit many of the large increases in health-related activity related to the treatment of Covid-19 by concentrating on the measurement of activities that have been hampered.
- This means that the implied price index (which is derived by taking the ratio of nominal expenditures in any sector to the measurement of activity) for health services seriously overestimates inflation in the health sector. The net effect is that the output of health services has been measured to have fallen when it has almost certainly increased. Because health services account for some 7.5% of GDP, it means that we are likely to have overstated the fall in GDP in 2020.

Background

From 1998 the ONS moved towards using a direct measure for non-market health service output as part of Government consumption. As part of this process, the Atkinson Report of 2003 was a milestone. This approach was developed as a method of catching productivity improvements, which was not possible when output was measured as equal to input as productivity is the ratio of outputs to inputs. The measures have developed over time, particularly in terms of quality adjustment.

As explained by the ONS in 2020:

¹ We thank Hande Küçük, Rory Macqueen and Janine Boshoff for helpful conversations.

"Healthcare output is measured as the quantity of healthcare provided, adjusted for the quality of delivery. Quantity of output is estimated using a cost-weighted activity index, where the growth rates of individual activity types are weighted by the share of expenditure that activity type accounts for. Because of this approach, growth in treatments that are common and expensive has a greater effect on overall output than a similar rate of growth in treatments that are uncommon or low cost."

The cost weighting of activities is collected by the ONS to derive the unit cost for each activity and hence the total cost associated with that activity. These weights are updated each year with a lag of over 2 years (e.g. the 2011/12 weights were published in 2015).

The four types of activity used are:

1. Hospital and Community Health Services (HCHS) - includes hospital services, community care, mental health and ambulance services;
2. Family Health Services (FHS) - includes GP visits and publicly-funded dental treatment and sight tests;
3. GP-prescribed drugs;
4. non-NHS provision - includes healthcare funded by the government but provided by the private or third sector.

The Pandemic Effect

Usually the cost weightings evolve gradually from year to year. The problem with 2020 is that the pandemic has caused a rapid shift in the type of activity undertaken away from those in the output measure. Many of the activities in the output measure either ceased or were greatly reduced, for example, dental, eyesight tests, most non-emergency surgery and so on. And new activities were developed rapidly during the pandemic: Covid-19 treatment, testing, building and manning temporary "Nightingale hospitals". These new activities were not included in the output measures. Also, additional expenditures were incurred (for example for PPE kit, ventilators, Track and Trace etc.)

The proportionate change in the healthcare deflator is defined by the (proportional) change in healthcare expenditure divided by the change in output. The fall in output in healthcare in Q2 was about 30% according to the Quarterly National Accounts (ONS, 30 September 2020) but this did not count the new activities. The fall in output combined with an increase in expenditure implies a huge surge in the health deflator (similar issues arose in Education as schools were closed). This was so large that it gave rise to an increase in the overall GDP deflator (which was 6.7% quarter on quarter in 2020 Q2).

This fall in Healthcare output amplified part of the fall in GDP: since health and social care constitute about 7.5% of GDP, the fall contributed an additional fall of some 2.5% in overall GDP in Q2.

But note this "measured" fall in healthcare output is not real and rather a product of the method employed by the ONS. Normally, this

method works well and can capture productivity improvements, but it cannot cope with rapid shifts in the activities undertaken in the NHS. Clearly, when the data becomes available later, we will be able to measure the output differently.

A rough calculation

However, much of this data will not be available for some time. In the meantime, we can construct a couple of simpler and more timely "ball-park" estimates of real output. First, if we assume that productivity and quality are unchanged, which may be a reasonable short run assumption, we can measure output simply by using expenditure and adjusting for the changes the cost of inputs. As the bulk of NHS costs are wages and salaries, changes in total input costs can be approximated by the change in the level of wages and salaries. If we are comparing Q2 2020 with Q4 2019, changes in wages and salaries will be very small and hence the growth of output comparing Q2 2020 with Q4 2019 will be just slightly less than the growth total expenditure.

The increase in health expenditure for 2020 will be substantial. In the March 2020 budget, the 2020/21 allocation to NHS England was about £130bn (£32.5bn per quarter). Covid-19 related expenditures have been estimated by the Kings Fund to be to be a further £30bn in Q2 and Q3. This might indicate that health expenditure has increased by almost 50% in Q2 and Q3. It turns out that the implications of this for GDP, if taken at face value, would be large. As an illustration, for example, in Q2 we would have an increase of 50% rather than a fall of 30%. Using the weight of 7.5%, this would mean GDP fell by up to 6% less than the published figures. This is of course a very rough and ready approximation, but it may turn out to be more indicative than the published (preliminary) estimate.

An alternate approach is to substitute the economy-wide deflator for the implicit health deflator i.e. divide the nominal series for 'Health and Social Care' by the deflator series for the whole economy to get a new real series for the sector. The new series shows health and social work activity rising by nearly 20% between 2019Q4 and 2020Q2 (in nominal terms it rose by 27%). And applying the same approach to 2020Q3 would suggest that GDP was 7% below its 2019Q4 level, rather than the 10% in the volume (or real) series. So we might draw a conclusion that real GDP is some 3-6% higher than the current estimates suggest. But it would not be wise to place too much weight on these "corrections" without further work.

Interpretation and Next Steps

That said these simple approaches produce startling results. They are open to the criticism that "disasters increase GDP" - when a natural disaster such as a volcano or hurricane can increase measured GDP because it generates expenditures that would otherwise not have happened. Similarly, the increase in health expenditures in response to the pandemic. However, the health expenditure in response to the pandemic are clearly related to the saving of life hence can be treated as a valid "output".

For international comparisons, many other countries – such as Germany- use to old methodology of treating output as equal to inputs (no changes in quality or productivity). This makes comparisons of the impact of the pandemic on GDP difficult even before we start to control for country-specific factors. However, the ONS could in principle create an “experimental measure” of GDP using the input-based method for both Education and Health which would provide a better basis for international comparison.

December 2020

References

Atkinson Review: Final report. Measurement of Government Output and Productivity for the National Accounts. HMSO 2005.

<https://webarchive.nationalarchives.gov.uk/20160106223636/http://www.ons.gov.uk/ons/guide-method/method-quality/specific/public-sector-methodology/articles/atkinson-review-final-report.pdf>

GDP quarterly national accounts, UK: April to June 2020. (ONS, 30th September 2020)

<https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/quarterlynationalaccounts/apriltojune2020>

Public service productivity, healthcare, England: financial year ending 2018 (ONS January 8th, 2020)

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthcaresystem/bulletins/ukhealthaccounts/2018>

The Comprehensive Spending Review and Covid-19. (The Kings Fund, 15th September 2020).

<https://www.kingsfund.org.uk/blog/2020/09/comprehensive-spending-review-and-covid-19>