DH Department of Health

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The 'Experimental' NHS Cost Efficiency Growth Measure

Background

1. DH wishes to replace its previous measure of efficiency, the Cost Weighted Efficiency Index, with a new measure of value for money that encompasses both cost efficiency and quality. DH is therefore developing two new measures of VfM growth:

    - NHS cost efficiency growth measure;
    - NHS service effectiveness growth measure.

2. Both of these measures need to tackle the substantial problem of capturing the effect of changes in NHS quality on NHS VfM, which is a complex challenge. These measures will not be a final solution for NHS VfM measurement improvement. They are a first step and a foundation for further improvements.

3. As such, these new measures are 'interim' and 'experimental'. They will be used to assess short-term progress, but for the longer-term the Department of Health has further work in progress to improve NHS VfM and productivity measurement.

4. This paper provides details of the NHS cost efficiency growth measure using 2002/3 data.

Overview of the 'experimental' NHS cost efficiency growth measure

5. Under the new experimental cost efficiency growth measure; VfM growth from cost efficiency improvements is measured as the **inverse** of unit cost growth after adjustment for:

    - Changes in the mix of NHS services provided;
    - Input cost inflation;
    - Expenditure on improving NHS quality.

6. This measure estimates that VfM increased by around 0.4% as a result of cost efficiency improvements in 2002/3.

7. The new experimental measure is a step forward in VfM measurement. It has been reviewed by several leading academic experts and when regarded as an *interim* measure it is seen as an improvement over existing measures and reasonable for use in assessing NHS VfM.

8. A breakdown of the calculation of NHS cost efficiency growth is given in table 1. By attempting to account for quality change; an element of judgement is inevitably introduced into the calculation, which increases its subjectivity compared to traditional measures and impinges on the precision of the result. However, this ball-park result is more realistic than that implied by measures that fail to take any account of quality change. Further developmental work will allow increasing confidence in the measure.

Table 1: Breakdown of the NHS cost efficiency growth in 2002/3

a	Unit Cost Growth (taking into account casemix)	5.9%
b	Input Cost Inflation	3.6%
c	Real Unit Cost Growth ([a]-[b])	2.3%
d	Effect of Quality Improvement Expenditure	2.6%
e	Quality Improvement Expenditure Adjusted Real Unit Cost Growth ([c]-[d])	-0.4%
f	VfM Growth from Cost Efficiency Improvements ([e]*-1)	0.4%

Errors due to rounding

Methodology for estimating NHS cost efficiency growth

9. There are four main stages to estimating NHS cost efficiency growth:

- Calculate NHS unit cost growth;
- Adjust for input cost inflation;
- Adjust for the impact of expenditure on quality improvements;
- Invert adjusted unit cost growth to indicate cost efficiency growth.

Calculating NHS unit cost growth

10. NHS unit cost growth is calculated using data on unit cost and activity levels of over 1,700 specific categories of NHS activity, which cover around three-quarters of NHS activity in expenditure terms. The services covered are:

- Elective inpatients (over 500 activity categories);
- Non elective inpatients (over 500 activity categories);
- Outpatients (around 300 activity categories);
- A&E (9 activity categories);
- Mental health services (30 activity categories);
- Primary care prescribing (almost 200 activity categories);
- Primary care consultations (5 activity categories);
- NHS Direct calls answered (1 activity category);
- NHS Direct online internet hits (1 activity category);
- Walk in centre visits (1 activity category);
- Ambulance Journeys (1 activity category);
- General Ophthalmic Services (1 activity category);
- General Dental Services (1 activity category);
- Others including Critical care, Audiological Services, Pathology, Radiology, Chemotherapy, Renal dialysis, Community services, Bone marrow transplants & Rehabilitation (over 100 activity categories).

11. This detailed data is used to calculate:

    - NHS output growth;
    - The growth in input expenditure on those outputs.

12. NHS output growth is measured using a unit-cost weighted activity index, which gives more weight to increases in more complex / expensive NHS activities. This helps capture the effect of changes in the specific mix of NHS activities undertaken on unit cost growth.

13. The NHS outputs index has recently been adopted by the ONS to improve the measurement of healthcare outputs in the National Accounts. It has therefore passed the rigorous ONS independent scrutiny process for National Account methodologies.

14. The data underpinning the NHS outputs index can also be used to calculate the expenditure on the activities covered by the measure; and hence also to calculate the growth in input expenditure.

15. The difference between the growth rate of NHS input expenditure and the growth rate of NHS outputs is the growth rate of NHS unit costs.

Adjusting for input cost inflation

16. Rising nominal unit costs do not necessarily indicate falling VfM. To get a fair picture, the effects of input cost inflation must be accounted for. As such, public sector pay and price inflation, calculated using ONS data, is deducted from the rate of nominal NHS unit cost growth to calculate real unit cost growth.

17. Traditional productivity measures, as used by the ONS, deflate unit cost growth by NHS specific input cost inflation. This is entirely appropriate for a productivity growth measure, which compares output growth to growth in the *volume* of inputs. In contrast, the new Department of Health measure assesses VfM. As such, *both* the unit cost and volume of inputs are relevant. Under a traditional productivity measure, if the NHS doubled the wages of all its staff then productivity would be unchanged. However, intuitively VfM would be expected to suffer.

18. The NHS cost efficiency measure captures this concern for the unit cost of NHS inputs. It attempts to only deflate NHS input expenditure by unavoidable external pressures on input costs. Public sector input cost inflation is taken as the proxy indicator of these external pressures.

Adjusting for the impact of expenditure on quality improvements

19. When assessing NHS VfM or productivity growth, the growth in NHS output is compared to the growth in NHS inputs. Current measures of NHS outputs do not capture quality change, but through increasing expenditure current measures of NHS inputs do capture efforts to improve quality. This makes the comparison of

input growth and output growth inconsistent and is likely to lead to underestimates of VfM and productivity growth.

20. To make the output and input measures consistent, the optimal solution is to add a quality dimension to the output measure. This is the direction of the longer-term work set in motion by the Department of Health, but is not possible in the short-term. As an alternative interim solution, the NHS cost efficiency growth measure tries to remove the quality dimension from the input measure. The growth in outputs is compared to the growth in inputs net of the effect of expenditure to improve quality.

21. There are three main stages to accounting for the impact of quality improvement expenditure on unit cost growth:

    - Estimate the level of expenditure on quality improvements;
    - Estimate the impact of this expenditure on nominal input expenditure growth;
    - Deduct this from the real unit cost growth rate.

22. The expenditure on quality improvements is estimated by considering spending on:

    - Improving NHS premises and capital stock;
    - Adopting newer and more effective drugs;
    - Improving the clinical supplies used by the NHS;
    - Improving food and cleaning standards;
    - Improving IT systems;
    - Increasing the skill mix of NHS staff;
    - Reducing waiting times.

23. The costing methodologies to calculate spend on these items are designed to:

    - Exclude spending associated with activity growth;
    - Exclude the impacts of inflation;
    - Scale down spending to reflect the incomplete coverage of the measure.

24. To estimate the impact of quality improvement spending on unit cost growth:

    - Deduct estimated quality improvement expenditure from 2002/3 input expenditure;
    - Calculate the implied growth rate of input expenditure had quality improvement spending not occurred;
    - The difference between the actual input expenditure growth and the adjusted input expenditure growth is the impact of quality improvement expenditure;
    - Deduct this from real unit cost growth to give the quality investment adjusted real unit cost growth.

25. The weakness in this approach is that expenditure on quality improvements do not necessarily deliver quality gains of equivalent value. To justify the treatment

of expenditure on quality in the cost efficiency growth measure, quality gains equivalent to the level of quality improvement expenditure must be demonstrated.

26. This will be handled by the cost efficiency growth measure's sister measure – the service effectiveness growth measure. This measure's purpose is to assess VfM gains resulting from improvements in NHS quality. It demands that only quality gains in excess of the level of quality improvement expenditure will reflect VfM growth. This condition has two purposes: it will require that spending on improving NHS quality does indeed deliver equivalent quality gains; and it ensures that 'paid-for' quality improvements do not count as VfM growth.

Inverting adjusted unit cost growth to indicate cost efficiency growth

27. The final stage of the calculation is to invert (multiply by minus one) the quality investment adjusted real unit cost growth to give the overall result of the NHS cost efficiency growth measure.

Comparison to the existing Department of Health cost efficiency measure

28. The existing measure of cost efficiency used by the Department of Health is known as the Cost Weighted Efficiency Index (CWEI). It is the ratio of real NHS expenditure and the Cost Weighted Activity Index (CWAI), which is based on only twelve broad categories of NHS activity and places undue emphasis on hospital inpatient activity.

29. The cost efficiency growth measure is a large improvement over the CWEI as:

- It adjusts for quality improvement expenditure;
- It corrects the undue emphasis on hospital inpatient activity;
- Its greater detail in activity classification (over 1,700 vs 12) allows a much better account of changes in the specific mix of NHS services provided;
- It adds some additional NHS activities.

Further work on NHS VfM and productivity growth measurement

30. This new measure is not perfect. However, it is a step forward that improves on existing measures. To build on this foundation of progress the following Department of Health work streams are in-place:

- Ongoing work to improve the coverage and classification of NHS activity data;
- Development of the experimental service effectiveness growth measure;
- Continued support to the ONS Atkinson Review of Measuring Government Output;
- The Department of Health have commissioned the University of York / NIESR to conduct a longer-term research project into developing new measures of NHS output and productivity.