Productivity in UK healthcare during and after the Covid-19 pandemic

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Overview of comments

1. Values and volumes
2. Volume indices of output
3. Quality adjustment
4. Looking ahead

1. Values and volumes

Nominal output of health service providers

Market providers: output = revenues

Non-market providers: output = costs

Costs = Intermediate consumption

+ Compensation of employees

+ CFC

+ Other net taxes on production

Productivity (1)

Growth of nominal output = growth of nominal inputs for non-market providers

Does *not* imply productivity (growth) = zero

Depends on how nominal output and nominal inputs are **split into volumes and (quasi) prices**

Productivity (2)

$$\underbrace{\sum w_i^t x_i^t}_{\text{Value of inputs (labour, capital,...)}} = \underbrace{\sum u_j^t a_j^t}_{\text{Value of activities (treatments)}} = \underbrace{Y^t}_{\text{Value of output}}$$

$$\text{Productivity} = \underbrace{\left[\frac{\sum u_j^{t-1} a_j^t}{\sum u_j^{t-1} a_j^{t-1}}\right]}_{\text{Volume index output}} \Big/ \underbrace{\left[\frac{\sum w_i^{t-1} x_i^t}{\sum w_i^{t-1} x_i^{t-1}}\right]}_{\text{Volume index input}} \neq 1$$

2. Volume indices of output

Direct Output measures (eg UK)

Direct Laspeyres volume index of output

$$= \left[\frac{\sum u_j^{t-1} a_j^t}{\sum u_j^{t-1} a_j^{t-1}} \right]$$

- Cost-share weighted change in # of treatments (DRGs)
- More complex with quarterly data
- Possible downward bias under Covid

Deflated Output measures (e.g. Germany)

Deflated value index = Paasche volume index of output

$$= \left[\frac{Y^t}{Y^{t-1}}\right] \Big/ \left[\frac{\sum u_j^t a_j^{t-1}}{\sum u_j^{t-1} a_j^{t-1}}\right] = \left[\frac{\sum u_j^t a_j^t}{\sum u_j^t a_j^{t-1}}\right]$$

- Cost-share weighted change in unit costs of treatments (DRGs)
- Laspeyres and Paasche volumes similar in normal times
- Possible upward bias
- But consequences need to be worked out fully

What do others do for QNA? A mixed picture

Hospital services:

Deflation of outputs: CHL (private), JPN, KOR (private), MEX (private), US, ZAF, DEU

Output indicators: DK, HU, IT, NO, PT, SE, AUS, UK

Deflation of inputs: AT, BE, CZ, ES, FI, FR, IS, LV, PL, SI, SK, CAN, CHL (public), COL, IND, ISR, KOR (public), NZL (public) Input indicators: MEX (public), NZL (private)

3. Quality adjustment

Implicit and explicit quality adjustment

- Stratification with DRGs = *implicit* quality adjustment
- *Explicit* quality adjustment may come on top (e.g. waiting time), but tricky
- Quality adjustment complicated for *both market and non-market producers* of health services

4. Looking ahead

- ✓ Good proposal: *providing for peak load* = *additional insurance service*, not decline in efficiency
- ✓ Explore more systematically consequences of *direct output vs deflated output (vs inputs)* in QNA and ANA: ONS/OECD project

- ✓ I much enjoyed reading this paper!

Thank you!