

Cost methods.

Objective

We aimed to estimate the trend in National Health Service (NHS) expenditure over time, reflecting the change in length of stay (LOS) observed.

Grouper and reference cost methods

Using Hospital Episode Statistics (HES) data for the same group of patients as for LOS, we generated healthcare resource use group (HRG) classifications for the index episode for each patient using the 2015/16 NHS reference costs grouper [1], which were subsequently used to estimate inpatient costs per patient using NHS reference costs from 2015/16 [2]. In order to estimate the mean change in NHS expenditure we estimated an adjusted average bed day cost.

Estimating the adjusted average bed day cost

For each HRG we estimated the average cost per bed day (defined as any part of a day spent in hospital) by dividing the total cost of the index episodes for that HRG by the total number of bed days for that HRG. This generated a single average bed day cost per HRG.

For each patient we estimated the adjusted episode cost by multiplying their LOS (bed days) by the average bed day cost for the HRG that they had been assigned by the NHS reference costs grouper [1]. Therefore, instead of assigning the same unit cost to all patients with the same HRG who had a LOS below the trim point, the adjusted cost differed according to a patient's LOS, even if that LOS was below the trim point for the HRG. Using this method, we were able to estimate the average difference in true NHS expenditure even when the LOS was below the trim point.

The 2015/16 grouper and reference costs [1,2] were used to estimate costs for all patients in all years, as there are differences in the methodologies used for HRG classification in different cost years [3]. This prevents a like-for-like comparison between years if different groupers and/or costs are used.

Costs were estimated for a total of 173,106 patients undergoing hip replacement and 210,723 total and unicompartmental knee replacements.

References for Supplementary Material File 8

1. HRG4+ 2015/16 Reference Costs Grouper. Copyright © 2015 Health and Social Care Information Centre. Grouper version: RC 15/16. Implementation version: 1516.RC.8
2. Department of Health. NHS reference costs 2015 to 2016.
<https://www.gov.uk/government/publications/nhs-reference-costs-2015-to-2016>
3. Reference Costs 2015-16. Department of Health.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/577083/Reference_Costs_2015-16.pdf.