

# Patient-level information and costing systems (PLICs): a mixed-methods study of current practice and future potential for the NHS health economy

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## Scientific summary

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# Scientific summary

## Background

To undertake a costing exercise, a cost object is necessary. Traditionally, the cost object in health care has been either a service line (e.g. orthopaedics) or a clinical intervention (e.g. a hip replacement). Costs can be used to set reimbursements. Since 2003–4, payment by results (PbR) has reimbursed trusts through tariffs set at the national average Health Resource Group (HRG) cost. A HRG is a group of clinically similar interventions requiring similar amounts of resources.

Since the mid-2000s, the Department of Health (DH) has recommended the patient as the cost object to enable a more granular analysis of the cost drivers in health care, resulting in patient-level information and costing systems (PLICs). The benefits were expected to be (1) an enhanced ability to understand financial drivers, enabling cost benchmarking at patient, specialty and hospital levels; (2) much-improved clinical ownership of costs, with the ability to compare the cost profiles of different clinicians for similar patients; (3) a detailed knowledge of individual patient costs to inform patient classification, rather than reliance on the average cost; (4) the ability to progress PbR through setting a long-term sustainable price to an efficient provider; and (5) informed dialogue between providers and commissioners.

The introduction of PLICs heralded a shift in hospital costing methodology from a mainly 'top-down' mode of cost allocation (like HRG costing) to a more direct 'bottom-up' approach, based on the principles of activity-based costing, in which every effort is made to cost all the cost drivers (e.g. interventions, activities and events) that can be associated with individual patients. One of the strengths of activity-based costing is that it reveals how traditional top-down costing methods (like HRG costing) overcost routine products or services, but undercost complex products or services.

Identifying cost drivers at the patient level should also enable better resource allocation not only along care pathways within hospitals, but also across the whole NHS economy. Moreover, PLICs have the potential to produce a granular analysis of the cost of individual pathways both within trusts (from referral to discharge) and across 1 'year of care' (for chronic conditions, which cross organisational boundaries). In addition to allocative efficiency, PLICs can enable better technical efficiency; this implies the use of resource inputs to maximum advantage in terms of either outputs (e.g. numbers of patients treated) or outcomes (e.g. numbers of patients benefiting from treatment).

The Health and Social Care Act 2012 (Great Britain. *Health and Social Care Act 2012*. London: The Stationery Office; 2012) transferred responsibility for tariffs and price setting from the DH to the NHS Commissioning Board (now NHS England) and Monitor (the economic regulator for health care). Monitor proposes that PLICs will now form the basis for the payment system through pricing health-care services and, therefore, will become mandatory across all care settings. The Health and Social Care Act 2012 requires both competition and the collaboration needed to achieve care integration, although policy commentators note that the two may not always be compatible.

## Objectives

Against this background, we aim to analyse the potential of PLICs in four areas as follows:

1. cost improvement through enhanced technical efficiency

2. better allocative efficiency of resources and congruence with patient preferences within health-care economies (first, within and between trusts; second, between primary and secondary/tertiary care; and, third, along care pathways and year of care)
3. understanding clinical variation in resource use and the relationships between cost and quality
4. greater clinical engagement through more clinical ownership of costs and information systems.

## Methods

Our 'sequential exploratory design' undertook quantitative data collection and analysis through a large-scale, online survey of all English trusts, before undertaking qualitative data collection and analysis of four case studies at different geographical locations in England. Three sites were generalist foundation trusts and one site was a specialist foundation provider. We surveyed commissioning support units to explore the potential for PLICs in commissioning.

The design strategy uses the initial quantitative results to inform secondary qualitative data collection, with the two forms of data remaining separate but connected. This can be particularly useful when unexpected results arise from the quantitative stage. In our study, the percentage of trusts that considered their PLICS data to be commercially sensitive was unexpectedly high at 74%, and sharing these data with commissioners was unexpectedly low at 5%. In consequence, in the interviews we investigated the issues of commercial sensitivity and data sharing in the context of Monitor's current role to enable both competition and collaboration. The interviews were semistructured in design, audio recorded and transcribed as Microsoft Word® 2010 (Microsoft Corporation, Redmond, WA, USA) documents, except for one case in which consent to audio record was withheld and hand-written notes were taken instead. The total number of interviewees was 54.

To triangulate our findings at the case study sites, we collected 25 sets of documents relating to PLICs, including samples of PLICS data, business cases for investment, service line reports, presentations on PLICs and strategy documents. We also undertook exploratory observational work (covering presentations and interactions) during the PLICS implementation process at one of the case study sites and at a National Benchmarking Group (NBG). Both the documentary evidence and the observational work enabled corroboration of some putative PLICS uses, as discussed in the interviews. A notable aspect of the study was the involvement of practitioner team members (a senior clinician, provider director of finance and commissioner director of finance), who provided advice, guidance and support.

Survey data were analysed using the Statistical Package for the Social Sciences (SPSS), version 22 (IBM SPSS Statistics, Armonk, NY, USA). For the interview data, a sample of six transcripts were analysed through an initial 'hand-coding' exercise in which content was organised into themes, generating a draft theme code template, enabling two researchers to review each transcript. Once hand-coding was complete, the data set was imported into the qualitative data analysis package NVivo version 10 (QSR International, Warrington, UK) to generate codes, segment text and filter the data, and to describe, label and group together different themes.

Our methodology and ontology followed a 'critical realist' approach, which accepts that the nature of the object determines the form of its science. Working from participants' views, we paid attention to 'what works' with PLICs, specifically in which contexts and with which mechanisms, thus conforming to critical realist research guidelines for social science research.

The study took place between July 2012 and October 2015.

## Findings

We discuss findings under our research objectives, which assess the potential for PLICs in four areas.

### ***Cost improvement through enhanced technical efficiency***

The most significant use of PLICs was cost improvement within the trusts, particularly to meet Cost Improvement Programmes (CIPs). In the survey, 50% of respondents at the trusts stated that they were members of a CIP or similar initiative. Sometimes cost improvements were achieved simply through cost reduction (e.g. using less expensive equipment or prostheses) rather than being driven by greater technical or allocative efficiency. However, technical efficiency was achieved, when possible, through (1) switching patients who would have been inpatients to day cases; (2) reducing lengths of stay and thereby raising throughput; and (3) improving theatre utilisation.

In the survey, 83% of respondents stated that they use PLICs to identify how much a particular patient costs using direct and attributed costs. Perhaps unexpectedly, given that patient-level costs generate costings at the individual patient level, in terms of cost improvement, at interview, we did not find much interest in outliers (i.e. either very high or very low patient costs for a particular intervention). Rather, attention focused on 'shifting the cost curve graph for the majority of patients', that is, on a consideration of how to reduce costs for the majority of patients within the normal cost range.

Most controversially, respondents at the three generalist case study sites commented that cost improvement for the trust as a whole could be achieved through simply disinvesting in high-cost areas of clinical work. At interview, this was clearly a sensitive area, but the indication was that at two sites disinvestment was an active issue. In our survey, 55% of respondents stated that services had been terminated or moved to a different provider as the result of a trust initiative, while 14% said that PLICs data had informed this decision.

### ***Better allocative efficiency of resources and congruence with patient preferences within health-care economies***

There was only modest utilisation of PLICs to allocate resources across services and settings. The main focus for resource reallocation was within the trusts. Service lines that made a surplus under the tariff cross-subsidised those making a loss. PLICs were used to pinpoint which HRGs were loss-making within service lines. In the survey, 61% of respondents stated that they use PLICs to benchmark services against other providers. Congruent with this, two case study sites were part of a NBG and both trusts used PLICs benchmarking data to determine whether or not the extent of the loss on a particular HRG was comparable within the benchmarking peer group. If the loss was comparable, that was taken to indicate a tariff issue (i.e. the tariff reimbursed below the level of a cost-efficient provider), but if the loss was less (or there was no loss) then the HRG was closely scrutinised for cost inefficiencies before any cross-subsidisation occurred.

In the survey, only 2% of respondents at the trusts reported sharing PLICs data with patient groups; however, 86% of respondents stated that patient preferences had influenced service redesign as part of a trust initiative, with 5% saying that PLICs data had informed this decision. However, at interview, we found few indications that patient preferences were actively sought, as opposed to being discussed, before decisions were made on resource allocation across services and settings.

Resource allocation between trusts most often involved reconfiguration of services to reduce care variation and duplication between sites. Such reconfiguration proposals sometimes came up against the difficulty of satisfying Monitor that the proposal was not anticompetitive and did not jeopardise the financial standing or sovereignty of the trusts concerned.

With regard to the use of PLICs in decisions on resource allocation between primary and acute care, in the survey, 52% of respondents said that services had been moved to a different care setting as part of a trust initiative and 13% said that PLICs data informed this decision. The main interview evidence on resource allocation between primary and acute care comes from one of our case studies with a transformation programme which sought to reduce duplication between the trust and community services and also to strengthen partnerships with local general practitioners. However, the trust became concerned about commercial sensitivity and, at the time of writing, it looked unlikely that PLICs data would be shared with the external (to the trust) health-care organisations along the pathway or with commissioners.

In terms of 'year of care', in the survey, 39% of respondents stated that their organisation collected data that would allow costing on 1 'year of care'. However, this reported figure should be treated with caution because we assume that respondents were aware only of the acute part of the year-of-care costs. Generally, in the community, there are no standard currencies (units of health care for which payment can be made, e.g. a 'HRG', a 'year of care' or a 'mental health cluster'), no standard service definitions and no adequate data collection systems, so there is little infrastructure to build PLICs.

### ***Understanding clinical variation in resource use and the relationships between cost and quality***

In the survey, 63% of respondents stated that they use PLICs to identify resource variation and, hence, cost between consultants, but only 17% use PLICs to understand the relationship between cost and quality (defined in the survey as 'clinical outcomes'). This situation begs the question of whether or not any resource variation between clinicians is justified by better clinical outcomes. At interview, respondents commented favourably on the use of PLICs to identify clinical variation, but respondents were divided on the question of whether clinicians were open to changing their practice when shown the PLICs costs. Other clinicians referred to the imperative to include the cost of adverse events (e.g. falls) and downstream costs, for example longer time in theatre may improve clinical outcomes. However, they recognised that making links between costs and quality was not (currently) possible. At interview, we found that the trusts had separate reporting systems for costs and clinical outcomes, creating problems for using PLICs to link cost with quality.

### ***Greater clinical engagement through more clinical ownership of costs and information systems***

In the survey, 88% of trusts reported sharing PLICs data with clinicians, but clinical ownership does not occur without the finance function strategising over how to engage clinicians. Strategies included (1) communication events; (2) finance 'hit squads' to assist service lines with specific issues; (3) mandating PLICs data for clinical investment business cases; (4) creating clinicians as PLICs champions; (5) using artefacts such as profitability 'bubble charts' to create consensus around PLICs data; and (6) involving clinicians in decisions about cross-subsidisation and the inclusion of overheads in PLICs costs.

Generally, clinicians lack formal financial training; this sometimes resulted in decisions that seemed to represent cost savings for variable costs but that neglected fixed costs and the need to run at or near capacity to generate income under the tariff.

Clinicians do not receive PLICs data as frequently as service line reports. Fifty-eight per cent of respondents reported receiving PLICs reports quarterly, with only 23% having a monthly PLICs report. Operational financial management at the trusts was undertaken through service line reporting and traditional directorate budgets and hence these were often more relevant to clinicians. At interview, both clinicians and finance staff considered PLICs to be more of a strategic tool.

Finally, we did not anticipate all PLICs uses. In the specialist case study, much of the work with PLICs was in accordance with its activity-based costing principles (i.e. to identify the funding shortfall under the HRG-based tariff for their complex care and to press for boosting the tariff). Another development was the use of PLICs to cost, and thus identify, the profitability of private patients and, potentially, drive new health-care initiatives that may be financially rewarding to the trusts but marginal in terms of patient benefit.

## **Conclusions**

We conclude that financial pressure within the NHS, along with its current competitive, business-oriented ethos, induces trusts to act in their own interests rather than those of the whole health economy. This seems likely to continue as Monitor develops PLICs into rule-based pricing mechanisms. Yet it is still unclear if equivalent health-care interventions are cheaper outside acute care. If PLICs are developed for

community services, they have a significant role as an evidence base but, currently, their potential is not being realised because of the general lack of robust PLICS data for community services and the reluctance of trusts to share their data with commissioners. Overall, we found that competitive forces rather than collaborative cross-organisational initiatives drove the use of PLICs.

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