



Building strong foundations for pricing

Setting prices for NHS-funded services will be one of the most important levers that Monitor will have in our new role as Health Sector Regulator to achieve our core duty to protect and promote patients' interests. One of the key findings of the recent report, [An evaluation of reimbursement systems for NHS funded care](#) was that the information underpinning the current reimbursement system requires significant improvement. To help us understand how this might be achieved, we commissioned this report on costing from PwC.

The focus of this report is on the costing information that underpins the current Payment by Results (PbR) system, and its findings will therefore be of most direct current relevance to the acute sector.

However, over time the principles should also be relevant to the costing of services in other care settings.

The PbR system is currently based on reference costs. All providers submit these data for each particular service, and prices are then set based on the average across all providers. The Evaluation report noted above identified that 40% of prices set under PbR change by 10% or more each year. The main reason for these price variations are the costs reported by providers. However, it is often unclear whether these variations reflect real differences in the cost of providing the service, or 'artificial' differences in reported costs arising from different ways of costing, such as the approach to overhead allocation. The costing report makes a number of recommendations to help improve the reliability and consistency of reported costs.

Working with providers to improve understanding of healthcare costs

There has already been a significant increase in the number of providers recording cost data at the patient level, and this has the potential to be a rich source of data for price setting in the future. However, for this data to be useful there would need to be increased consistency between providers in how costs are recorded at the patient level.

PwC have identified that one option would be to set more detailed and consistent costing standards, and to collect patient level costing information from providers. This would be supported by improved assurance processes to improve the quality of data submissions. However, not all providers have the required patient level costing systems, and not all of those that do use them in a consistent way. For this reason, we asked PwC to investigate the option of using cost data from a representative sample of providers to set prices. PwC's analysis suggests that collecting costs from a sample of providers would be a valuable approach, but they recognise that it may take time to establish a reliable data set, and that there should therefore be a period of parallel running where the current reference costs continue to inform price setting in the short term.

PwC have also suggested that the long-term goal should be for all providers to achieve the standards required for their data to be used for price setting. This recognises that improved costing has benefits far beyond the setting of prices, in helping NHS managers and clinicians to understand their organisations better, which will drive improved management, innovation and the redesign of services for the benefit of patients.

As well as the use of quantitative analysis on sampling, PwC engaged a wide range of stakeholders in the preparation of their report and this qualitative analysis supports their recommendations. They also undertook a review of approaches to costing in other healthcare systems.

Taking forward the recommendations of this report

We are now reviewing the findings of this report, and considering how PwC's recommendations might be taken forward. We are keen to develop our costing strategy as quickly as possible, so that the potential benefits can be realised at the earliest opportunity.

Costing data is of course only one aspect of the pricing system, and we are working, together with the NHS Commissioning Board, to develop our broader pricing strategy.

We are now seeking views on the findings and recommendations in this report. We will be developing and consulting on our costing proposals and guidance later in the year, taking into account the findings of this report and the feedback received from stakeholders.

A handwritten signature in black ink that reads "Adrian Masters". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Adrian Masters

Director of Strategy

How you can respond

Monitor welcomes comments on this report. In particular:

1. Do you have any comments on the need for further development of a standardised costing methodology?
2. Do you agree that Monitor should move towards collecting a representative sample of more granular patient level data to inform its price setting?
3. Do you agree that assurance processes should be focused on self-assessment and peer review, with a targeted approach to external assurance?
4. Do you have any comments on the practicality of implementing the recommendations in the time scales indicated in the report?
5. Do you agree that the recommendations in this report are also applicable to mental health and community services and do you have any views on how they could be implemented in these settings?

Please send your answers and/or general comments to pricing@monitor-nhsft.gov.uk or complete the online response form [here](#) on our website.

If you do not have internet or email access please write to: Pricing, Monitor, 3rd Floor, Wellington House, 133-155 Waterloo Road, London, SE1 8UG.

This document was published on 19 June 2012. Please submit your responses to the questions and any other comments that you have by **5pm on 27 July 2012**.

Please note that we may use your details to contact you about your responses or to send you information about our future work. We do not intend to send responses to each individual respondent. However, we will analyse responses carefully and give clear feedback on our website and through other channels later in 2012 on how we have developed our approach to pricing as a result.

You can sign up to receive emails when we publish information on pricing, and on our proposed new role in general, [here](#) on our website.

www.pwc.co.uk

Strategic options for costing

Final Report for Monitor

Monitor: Economic
Research Framework

pwc

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This report has been prepared for and only for Monitor in accordance with the terms of our engagement letter dated 14 March 2012 and for no other purpose. We do not accept or assume any liability or duty of care for any other purpose or to any other person to whom this report is shown or into whose hands it may come save where expressly agreed by our prior consent in writing.

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Chapter 1

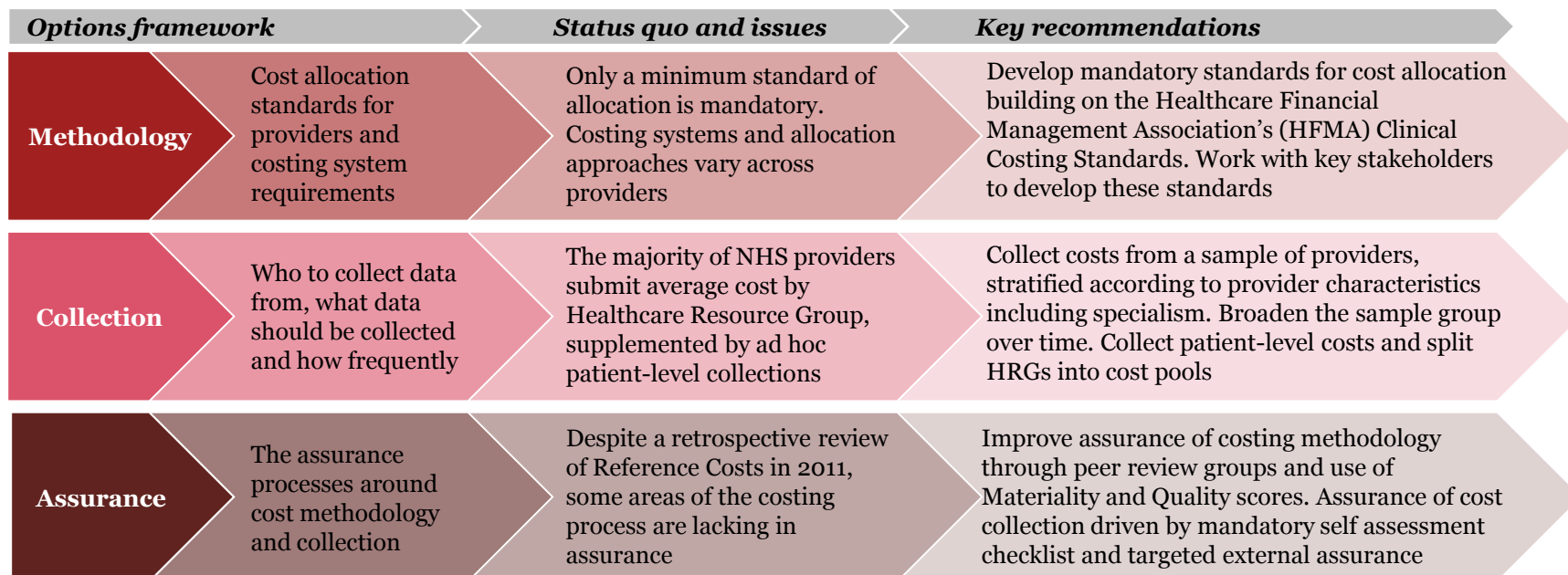
Executive summary

Summary on a page: We recommend that Monitor should collect patient-level cost data from providers that can meet a mandated cost allocation methodology and assurance requirements

Under Payment by Results (PbR), the National Tariff is used to reimburse acute providers for certain NHS-funded services. In 2011, £28bn worth of NHS-funded secondary care was paid for through PbR. The National Tariff is based on Reference Costs – the average reported cost of a service across NHS providers. In our report *An evaluation of the reimbursement system for NHS-funded care*, we found that the information underpinning reimbursement (including Reference Costs) needed significant improvement.

Monitor commissioned PwC to identify and assess options to improve the cost data from acute providers that is used to set prices. PwC was then asked to make recommendations, based on this assessment. We have consulted widely with industry stakeholders – including providers and public bodies – and worked closely with a health costing academic. We have drawn on existing evidence and insights from health costing overseas. In coming to our recommendations, we assessed the options against five criteria. Improving data quality was our foremost objective in this assessment.

Figure 1.1. Summary of options and key recommendations



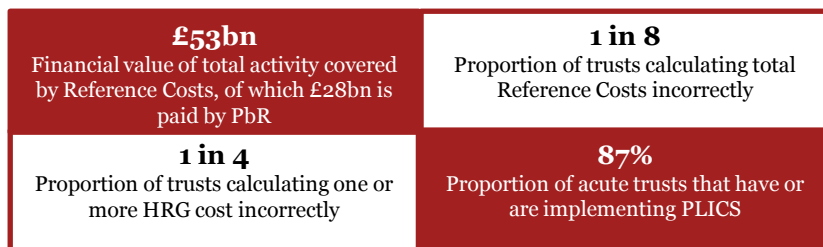
Effective price setting can drive efficiency and reallocate resources to the benefit of patients. To set effective prices, Monitor must have good data on the real cost of service provision

Costing is important for managers and regulators

The primary reason why providers need good cost data is to manage their organisations effectively. But good cost data is also vitally important for setting prices, one of Monitor’s new regulatory roles. Under Payment by Results (PbR), acute providers are reimbursed through the National Tariff. In 2011, £28bn worth of NHS-funded secondary care was paid for through PbR. Prices are set based on Reference Costs – the average reported cost across all NHS providers of a particular service.

The 2011 Audit Commission review of Reference Costs identified a number of data quality issues (see Figure 1.2) and PwC’s *An evaluation of the reimbursement system for NHS-funded care* for Monitor (PwC, 2012) identified large variations in reported Reference Costs. In its new price setting role, (and setting rules for local prices and local modifications) Monitor needs more accurate, comparable, and rich data to set prices than has been collected in the past. The NHS Commissioning Board (NHSCB), who will be responsible for designing currencies, will also have an interest in the cost data that is collected.

Figure 1.2. Key facts about costing



Source: Department of Health, Audit Commission

Figure 1.3. Stakeholders we consulted

Public and industry bodies	Providers
<ul style="list-style-type: none"> • Department of Health • Audit Commission • HFMA • Foundation Trust Network • Health and Social Care Information Centre • NHS Commissioning Board 	<ul style="list-style-type: none"> • Guys and St Thomas’ NHS FT • Maidstone and Tunbridge Wells NHS Trust • Birmingham Children’s NHS FT • Liverpool Heart and Chest NHS FT • The Christie NHS FT • University College London Hospitals NHS FT • Plymouth Hospitals NHS Trust

Scope and approach

Our scope was to identify options and make recommendations to improve the quality of cost data used to inform tariff. Costing of services not currently reimbursed through PbR (ie, some acute and mental health and community services) were outside our scope.

Our work was conducted between January and May 2012. We have taken an evidence-based approach to identifying and assessing the various options for NHS costing. We have:

- Worked closely with public and industry bodies, providers, Professor Chris Chapman (Imperial College), hosted a workshop attended by over 20 stakeholders and conducted seven case studies (see Figure 1.3)
- Reviewed the existing evidence on costing in the NHS and other health systems
- Conducted analysis on the 2011 Reference Cost data set.

Our framework includes the costing methodology used by providers and cost collection by the regulator. Assurance underpins both of these. There is scope for improvement in all three building blocks

The framework

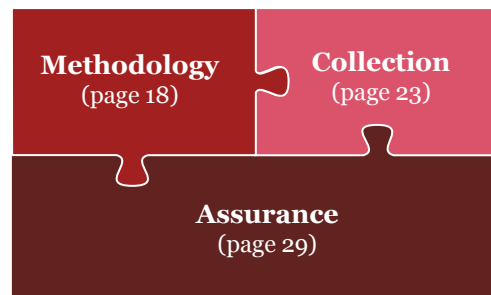
Our framework, in Figure 1.4, shows the interdependence between the three building blocks of costing. We have developed and assessed options for each element of the framework, and considered the interdependence in our recommendations.

Methodology

Methodology includes all aspects related to the production of cost data such as allocation rules, cost pool design, top-down vs bottom-up and patient-level costing and the IT systems that record the data.

Currently, as a minimum standard, providers are required to follow the methodology rules in the NHS Costing Manual – a top-down approach for allocating total costs to HRGs. Also, there are voluntary standards for patient-level costing – the HFMA Clinical Costing Standards (the HFMA standards). 90% of trusts performing patient-level costing report using the HFMA standards to some extent (DH, PLICS Survey, 2011), but there is no assurance that they have been followed correctly. There are 12 different PLICS systems in place in acute NHS trusts – one example of the difference in approaches between providers.

Figure 1.4. Costing framework



Collection

Collection captures issues relating to costing for the regulator, including: who costs are collected from, what costs are collected and how frequently collection takes place.

Reference Costs are collected from all NHS Trusts and Foundation Trusts annually. Providers report their average costs by HRG and care setting and their levels of activity. The costs of individual patients or the cost pools (eg operating theatres, pathology, medical staffing) driving total HRG cost are not reported. Some costs and income are required to be excluded from Reference Costs (“netting-off”). Also, providers have to separate out the cost of some patient care (“unbundling”) for reimbursement and HRG design purposes.

Assurance

Assurance underpins the methodology and collection blocks of the framework. Assurance can take several forms, such as self-assessment, peer review or external audit. But the end objective is the same – to increase confidence that the data is accurate and prepared according to standards.

There are existing assurance processes for the financial accounts of providers and recorded activity of clinical care. There was also a review of Reference Costs by the Audit Commission in 2011. But this review did not extend into methodology and no systematic external review of providers costing methodology has been conducted. The HFMA has developed a materiality and quality score (MAQS – see page 19) toolkit that can be used to assess the sophistication of cost allocation to patients, but this has not been widely used and requires further development.

A standardised methodology for cost pool design and cost allocation is required for cost data to be sufficiently comparable, reliable and accurate. Costs should be recorded at the patient-level

Figure 1.5. Options for methodology

	Standardised methodology	Certified systems
Costing system ¹	Status quo (no certification of systems)	<ul style="list-style-type: none"> • System certification process • Approved systems with built-in rules
Granularity	PLICS compulsory for trusts submitting cost data	
Cost pool design	<ul style="list-style-type: none"> • Mandatory minimum standard cost pool design • Targeted refinement of cost pool design 	<ul style="list-style-type: none"> • Cost pool design built into system • Targeted refinement of cost pool design
Allocation methodology	<ul style="list-style-type: none"> • MAQ scoring mandated • HFMA standards mandated, backed up by assurance 	<ul style="list-style-type: none"> • Allocation rules built into system
Guidance	<ul style="list-style-type: none"> • Unification of costing guidance • Alignment with collection guidance 	

Our recommendations

We recommend that Monitor mandates the use of a **standardised methodology** for the allocation of costs to individual patients, building upon the HFMA standards. These standards should only be mandated for those providers from whom Monitor collects patient-level data to inform tariff (see page 9).

Monitor should work with the key stakeholders (including the HFMA, providers and system providers) to develop mandatory standards, building upon the existing HFMA standards. Incremental improvements each year should focus first on the most material areas of cost, where current differences in approaches hinder the comparability of data.

It will take time to develop mandatory standards for all of the HFMA standards, and for providers to be able follow them. As these standards develop Monitor will have to set a minimum standard that must be met by providers who patient-level data to inform tariff.

We do not recommend adopting a systems certification process at this stage, although some form of industry certification could be investigated as an option once a more precise standardised methodology is established.

Monitor should support the continued development of the MAQS by the HFMA, to assess the sophistication of cost allocation across providers. We recommend that Monitor mandate the use of MAQS by those providers submitting patient-level data to inform prices (see assurance recommendations on page 10).

¹ The IT system which is used to produce costs

² Non-contractual income includes income from teaching, research and development, private patients and other income sources (eg car parking)

We recommend that Monitor collects PLICS data from a sample of providers alongside the collection of Reference Costs from all NHS providers

Our recommendations

We recommend that Monitor collects patient-level cost data, from a **stratified sample** of NHS providers. The sample should include all NHS provider-types (to facilitate representativeness). These providers must follow Monitor's prescribed methodology (building on the HFMA standards) and meet data quality thresholds.

Figure 1.6. Options for collection		
	Two tier approach	Stratified sample
Who to collect from?	<ul style="list-style-type: none"> All NHS providers (but exclude data that does not meet quality thresholds) Use a small subset of providers for unbundled HRGs 	Sample of NHS providers, stratified according to provider characteristics
What to collect?	<ul style="list-style-type: none"> Average HRG cost HRGs split by cost pools 	<ul style="list-style-type: none"> Patient-level costs HRGs split by cost pools
How frequently to collect?	Consider moving to a less frequent collection period dependent upon pricing decision	

Monitor should collect the costs of individual patient spells from providers. The cost of these patient spells should be tagged to the appropriate HRG, and separated into standardised cost pools (based on HFMA standards). Providers should be required to net off the costs (as opposed to the income) of activity associated with allowable non-contractual income where possible.

The PLICS data should not be used to inform prices until Monitor is comfortable with both the representativeness of the sample and the quality of data collected. At the earliest, 2013/14 PLICS data could be used to inform the 2016/17 tariff (assuming the same time frame as under current processes).

In the meantime we recommend that Reference Cost collection from all NHS providers continue, and be used to inform prices, until at least 2015/16. Providers should report their Reference Costs split by cost pools, to increase transparency and assist with data validation. We also recommend that providers be required – where possible – to net off the costs (as opposed to the income) of any activities associated with allowable non-contractual income from Reference Costs. Improved guidance on costing of education and teaching, for example, may be required.

The PLICS sample could be expanded over time as costing improves across providers. If cost data is no longer collected from all providers, the pricing methodology will be affected. Monitor will need to rely on another source (such as hospital episode statistics) to estimate the total quantum for the tariff.

Independent sector providers – Under the licence condition Monitor may request that independent sector providers (independents) of NHS-funded services provide cost data. Independents provide almost 5% of NHS funded services (excluding general practitioner services), but data on the costs of providing these services is not collected. Especially for services such as orthopaedics, where independents provide a greater proportion of services. We recommend that Monitor consult with the NHS Confederation and investigate whether cost data from independents could be collected either as part of, or in addition to its sample group.

We recommend that new assurance measures are introduced for Reference Costs and the PLICS sample group. These measures build on the work by the Audit Commission and HFMA

Our recommendations

PLICS methodology

For the PLICS sample group, we recommend that **peer review** groups are established to provide assurance that Monitor's mandated costing standards (building on the HFMA standards) are being followed (see page 32).

Figure 1.7. Options for assurance			
	Self assessment	Peer review	External assurance
Cost methodology	<ul style="list-style-type: none"> Self assessment, with Board sign-off, that states that costs have been properly prepared in accordance with Costing Standards Mandatory use of MAQS to assess sophistication of costing 	Peer review of costing methodology	External audit report that states that costs have been properly prepared in accordance with Costing Standards
Cost collection	<ul style="list-style-type: none"> Compulsory reformed Quality Checklist Board sign-off on submission 		External audit report that states that Reference Cost submission has been prepared in accordance with Reference Cost Collection Guidance

Additionally, we recommend that the sample group would be required to use the HFMA MAQS toolkit to score their cost allocation methodology, report scores to Monitor and identify areas for improvement. External assurance of costing methodology is likely to be costly – due to the complex nature of some costing systems.

Reference Cost collection

For Reference Cost collection that occurs in tandem with PLICS collection, we recommend that the Audit Commission **Quality Checklist** is revised to be made more explicit and precise and mandated for all providers. Board sign-off on a provider's Reference Cost submission should be made mandatory.

This should be supplemented by **external assurance** of Reference Costs collection at some trusts, through independent audits. External assurance could be targeted at poorer performers or chosen at random (to incentivise accurate Reference Cost submissions).

Accurate recording of activity and clinical coding is vitally important for costing – especially since reimbursement is based on unit costs (cost divided by activity). The Audit Commission (or successor) and Information Centre are best placed to provide assurance on activity and Monitor should engage with these bodies to ensure that their assurance work continues to improve.

PLICS collection

A **Quality Checklist** should be developed for PLICS collection (similar to that for Reference Cost collection). Use of this checklist should be mandated for providers in the sample group and Board sign-off required for PLICS submission (once the data being used to set prices). PLICS collection guidance should also contain validation checks, similar to those currently used for Reference Cost collection.

Establishing a new PLICS-based data set will take several years. During this time, the collection of Reference Costs should continue

Figure 1.8. Implementation timeline

2012	2013	2014+
Reference Costs		
<ul style="list-style-type: none"> • Collect 2011/12 Reference Costs • Update collection guidance to include cost pool collection and excluded costs • Update Quality Checklist • Mandate reformed Quality Checklist and elevate Reference Cost sign-off to Board level • Form plan for external assurance 	<ul style="list-style-type: none"> • Issue 2012/13 collection guidance • Collect 2012/13 Reference Costs broken down by cost pool • Collect return of Quality Checklist questionnaire and Board sign-off • Target external assurance of Reference Cost collection at selected providers 	<ul style="list-style-type: none"> • Consider dropping use of Reference Costs for setting The National Tariff
PLICS Sample		
<ul style="list-style-type: none"> • Obtain existing PLICS data set • Select sample group and get a minimum time period commitment from participants • Work with sample group to create PLICS collection guidance • Work with HFMA to mandate Costing Standards and MAQS • Build data collection capability 	<ul style="list-style-type: none"> • Issue 2012/13 PLICS collection guidance • Collect patient-level costs and MAQS from sample group • Compare PLICS data with Reference Costs • Assess representativeness of sample group and refine membership if required • Work with HFMA, sample group and other stakeholders to further develop standards (subgroups to focus on different areas of cost as required) 	<ul style="list-style-type: none"> • Issue 2013/14 PLICS collection guidance • Collect patient-level costs and MAQS from sample group • Consider using the sample collection for 2016/17 tariff • Broaden the sample group over time • Adjustments to pricing methodology as sample data now used to set prices • Continue development of costing standards

Application to Mental Health and Community Services

These recommendations apply primarily to the acute sector. Costing in Mental Health and Community Services is further behind the acute sector, especially with regard to the take-up of patient-level costing and allocation of costs according to explicit standards. Improvements in the quality of data in these care settings is required for a better understanding of resources consumed by individual patients.

Chapter 2

Background and approach

Monitor asked us to identify and assess options for costing to improve the data that underpins The National Tariff

Monitor's new responsibilities and establishing an evidence base

Monitor will be setting the national tariff from 2014/15. Given its new responsibilities, Monitor is broadening the evidence base that will inform policy. For example, Monitor commissioned PwC to evaluate the NHS reimbursement system (PwC, 2012). In our report, we identified the quality of information as an important element of the reimbursement system (see Figure 2.1). Also, a Monitor-commissioned report on local modifications has recently been published (Frontier, 2012) which recommended that a consistent approach to cost allocation should be adopted across providers.

Figure 2.1. Select findings from PwC's evaluation

Finding 1: Providers report very different average costs in providing the same treatment to patients

Finding 2: Some of the variation in average costs is due to differences in the approaches to costing and variations in the quality of cost information between providers

Finding 3: Some cost drivers – particularly patient casemix – are not captured adequately in the current information underpinning the reimbursement system

Finding 4: Local reimbursement negotiations (through block contracts, and local tariffs) are not based on reliable cost information

What we were asked to do

We were commissioned by Monitor to assess options for improving costing, bearing in mind the overall objective of setting a more informed tariff. Our work has taken place between January and April 2012. Costing of services not currently reimbursed through PbR (ie mental health and community services) was outside our scope.

Monitor asked us to:

- Develop options for improving costing
- Assess the options
- Dig deeper on the potential for collecting costs from a sample of providers (“sampling”)
- Make recommendations and implementation timelines

The evidence informing our assessment

Our assessment of the options is largely qualitative in nature, with the exception of sampling analysis of Reference Cost data which also informs our assessment (see Appendix 3).

The sources comprising our evidence base were:

- Case studies with providers (see Appendix 1)
- Consultation with experts and stakeholders
- Experience of other countries
- Literature and other existing evidence

Prices are set based on Reference Costs. In the Evaluation, we found that some Reference Costs showed unexplained variation, part of which is likely driven by differences in costing and data quality

The large variation in some Reference Costs could be caused by a number of factors

There is a very large range in the reported costs of providing certain HRGs between trusts. For example, Figure 2.2 shows the range of costs for an MRI Scan. The most expensive trust has reported a unit cost 100 times larger than that of the cheapest trust. We have adjusted these costs to remove cost variation that is reimbursed by the Market Forces Factor.

These large cost differences could be caused by a number of factors including:

- Recording of activity and clinical coding
- Cost allocation
- Cost pool design
- Error in calculating Reference Costs
- Legitimate cost variation eg differences in: casemix; capital structure; efficiency; clinical practice

A regulator needs comparable costs to have confidence in price setting

It is difficult to identify the cause of cost variation from the data that is currently reported in Reference Costs. If HRG costs were separated into cost pools or the distribution of patient costs within an HRG data were reported, Monitor would be better enabled to validate the data. Better cost data is needed to give Monitor the confidence to set an informed tariff.

Figure 2.2. MRI Scan (RA01Z), one area, no contrast¹
Unbundled, Unit cost £

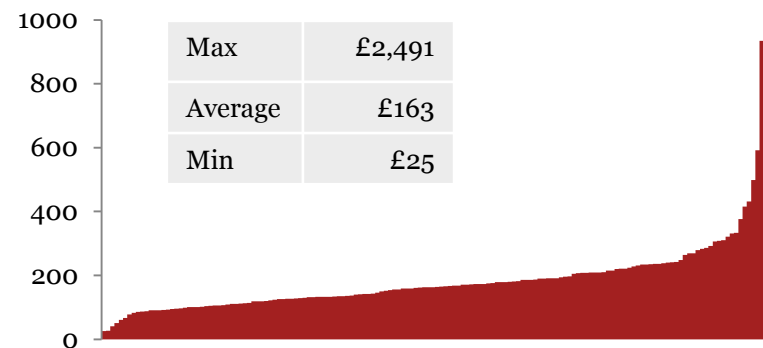
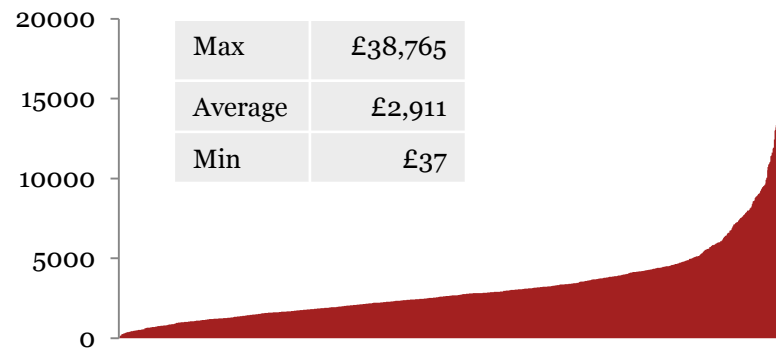


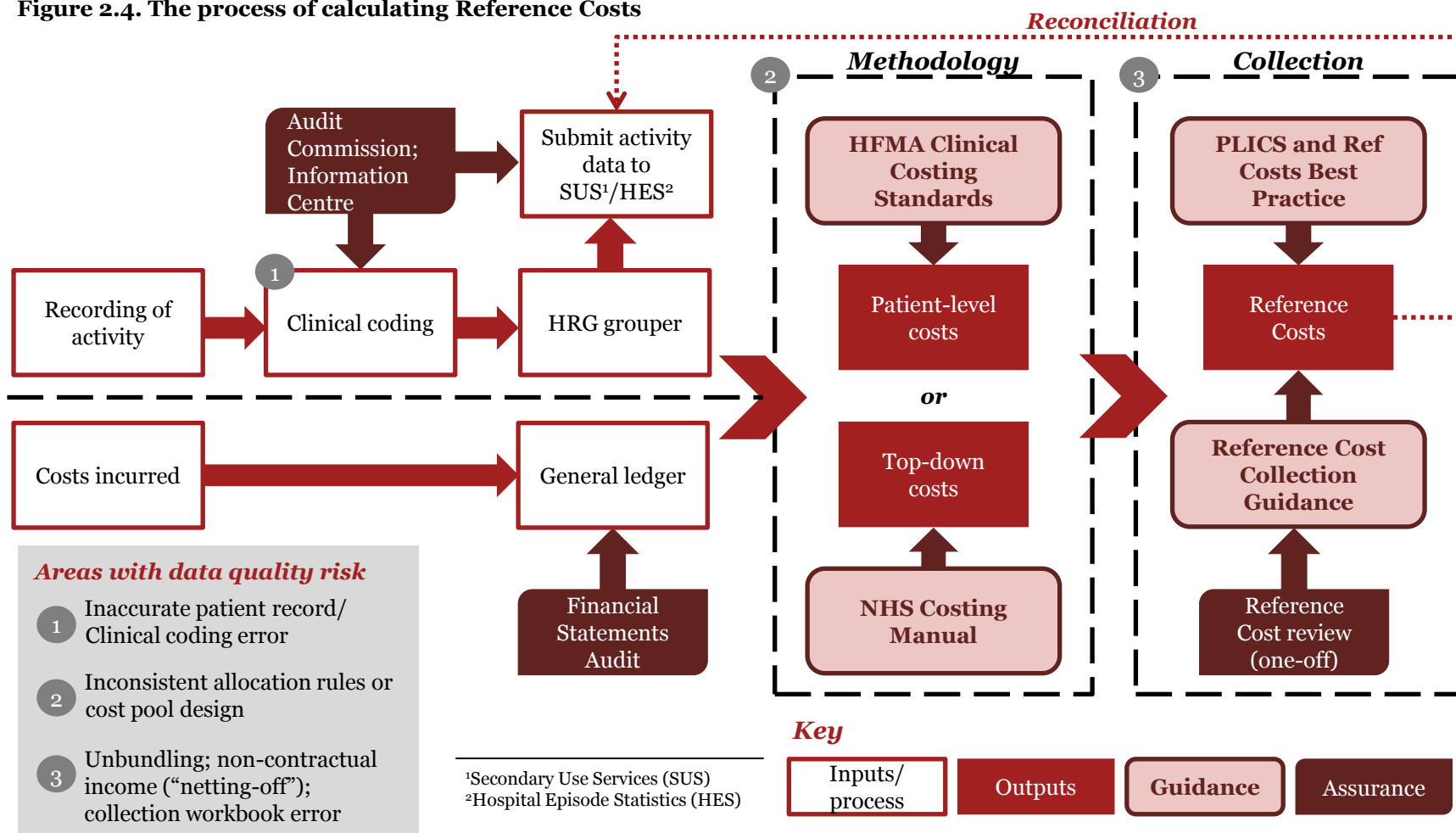
Figure 2.3. Non-Transient Stroke (AA22A) or Cerebrovascular Accident
Non-elective long stay, Unit cost £



¹Adjusted to remove cost variation reimbursed by the Market Forces Factor

There are many steps involved in the process of costing. At a number of places, guidance and assurance are required to achieve consistency and reliability in the cost data

Figure 2.4. The process of calculating Reference Costs



Our costing framework splits costing into three building blocks: the costing methodology used by providers, collection of costs by the regulator and assurance processes underpinning the whole system

Methodology

Methodology is the approach to costing used by providers. It includes issues such as:

- Costing software system
- Top-down (average) vs bottom-up costing (PLICS)
- Cost pool design
- Allocation of costs
- Use of guidance documents and Costing Standards

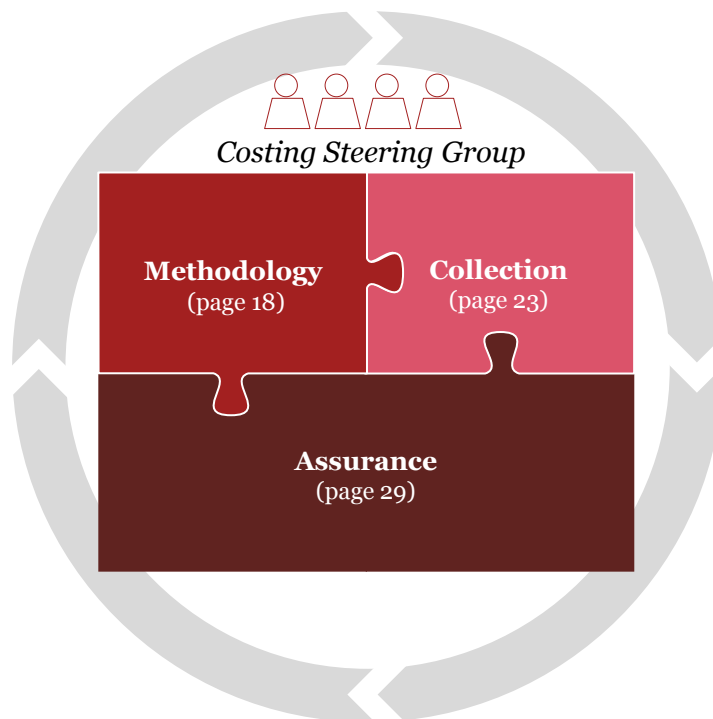
Assurance

Assurance relates to the internal and external processes to ensure data quality. This includes:

- Audit of cost collection
- Audit of costing methodology
- Materiality and quality (MAQ) of cost allocation scores

Figure 2.5. Costing Reform Framework

The framework allows us to create stylised options for costing. The three blocks are interdependent, for example the size of the sample in collection affects the costs of assurance. We draw out this interdependence in the options assessment (Chapter 3) and our recommendations (Chapter 4).



Costing Steering Group

Reform to methodology, collection or assurance will take several years to implement. The establishment of a Costing Steering Group would help guide the reform process. The group could include providers, academics and other stakeholders. Also, the group would need to be closely aligned with, or potentially even led by, the HFMA.

Collection

Collection captures issues relating to the process of obtaining costs for pricing. This includes:

- What data to collect
- Who to collect from
- How frequently to collect
- Guidance documents and processes for data collection

We assessed the options for costing reform against five criteria, the most important of which is data quality. Also, we highlighted which actions could deliver quick wins

Better quality data to set an informed price

The primary purpose of reforming the costing process is to improve data quality, so that Monitor can set more informed prices. Effective price setting can drive efficiency and reallocate resources to the benefit of patients. Also, greater reliability of cost data should help to get buy-in from clinicians on costing, benchmarking and the National Tariff.

The assessment criteria

1. Data quality

The options should improve the accuracy of cost data and comparability between costs from different providers.

2. Representative data

Cost data should be representative, where possible, of the full range of provider characteristics that affect costs. Monitor needs to have a good understanding of the range of costs faced by providers to set an informed tariff. There can be a trade-off between data quality and representativeness since the quality of data across providers is variable.

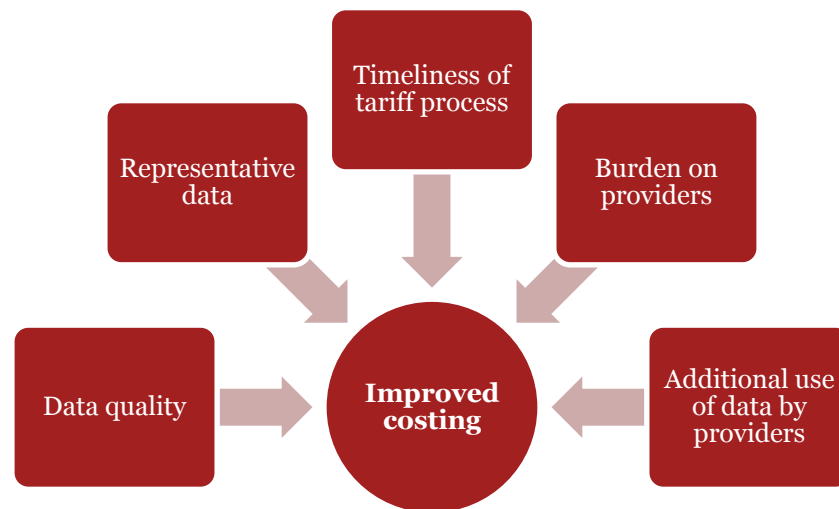
3. Timeliness of tariff process

The time lag between the point at which costs are incurred and the implementation of tariff is already three years. Options should not lengthen this process but, in fact, potentially reduce it.

4. Burden on providers

Options should avoid placing undue burden on providers in terms of time or resource requirements.

Figure 2.6. Criteria for assessing changes to costing



5. Additional use of data by providers

Although our primary objective is to get better data for pricing, better data quality will also benefit providers. Managers use cost data to make decisions on resource allocation and for benchmarking. Where possible, changes to the costing system should improve the usefulness of cost data for management purposes.

Quick wins

Data collected from 2011/12 will inform the 2014/15 tariff. The long time lag involved makes it particularly important that quick wins are prioritised, otherwise the improvements will not be tangible for a number of years.

Chapter 3

Options assessment

(a) Methodology

(b) Collection

(c) Assurance

The methodology block of the framework captures issues relating to costing such as the IT system, cost pool design and allocation method

Status quo

In the current system there is flexibility about which methodology providers use for costing. All providers must at least comply with the NHS Costing Manual for top-down costing. There is voluntary guidance in the HFMA standards (see Appendix 5), primarily focussed on patient-level costing. The inconsistency in approaches between providers may explain some of the large variation in unit costs seen in Reference Costs. Mental health and community service providers are also required to comply with the NHS costing manual. The HFMA has also produced clinical costing standards for mental health, but as yet no best practice guidance exists specifically for costing of community services.

Elements of costing methodology

Costing system: The software that is used to produce costs is called the costing system. The costing engine draws activity information from the Patient Administration System (PAS) and other data recording systems such as in radiology, pathology or pharmacy (these are frequently recorded separately). Also, the system draws in financial data and allocates this according to assumptions to produce unit costs. These systems range in sophistication and may be producing patient-level costs or Service Line Reporting (SLR).

Granularity: HRG-level costs can be estimated from the top-down, as per the Department of Health (DH) Costing Manual, or from the bottom-up as per the HFMA standards. Bottom-up costing gives more granular data – at the level of individual patients. The ability to drill down into individual patient records helps providers engage clinicians to understand cost drivers.

Cost pool design: Cost pools are used to group similar costs together (eg costs related to wards) which can be useful for benchmarking, reporting and audit purposes. The current HFMA standards use 19 cost pools, but most trusts group costs at a more granular level. For example, underneath the theatre cost pool, a provider may have cost centres for orthopaedic surgery and cardiac surgery, among others.

Allocation method: The basis by which costs are allocated from cost pools to patients is called the allocation method. Currently, there are no reported metrics on which to contrast allocation methodologies across trusts (although providers can report MAQS as part of the 2011/12 Reference Cost collection).

Guidance: The main guidance documents are the DH Costing Manual and the HFMA Clinical Costing Standards. There is also the HFMA PLICS Implementation Guidance - supplementary to the Standards. There are several other guidance documents focussed on cost collection (Reference Cost Collection Guidance and PLICS and Reference Costs best practice guidelines).

Figure 3.1. Materiality and Quality Score

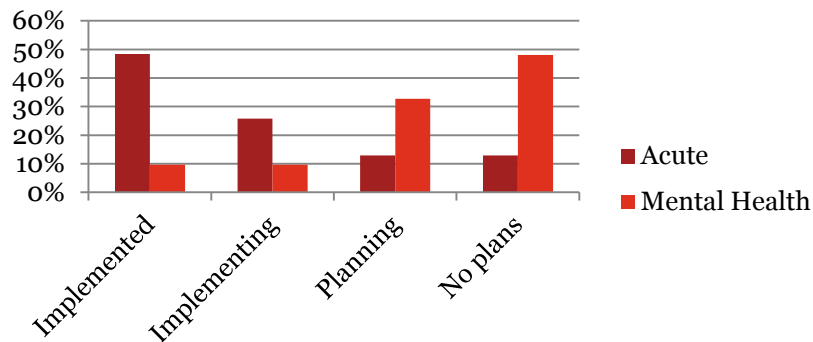
Developed by the HFMA, Materiality and Quality Scores (MAQS) are a way of measuring the sophistication of cost allocation. The HFMA have assigned scores to different allocation methodologies between 0.25 and 1.00. To calculate the MAQ score of an individual cost pool, all the allocations within the cost pool are weighted by the volume of cost they represent (the materiality). The weighted sum gives the overall MAQ score for the cost pool. It takes approximately ½ a man day to calculate a MAQ score and we are aware of at least one systems supplier is working to integrate MAQS into their costing system.

PLICS are increasingly widespread amongst acute providers, although still rare in mental health

Patient-level costing traces the resource consumption of individual patients

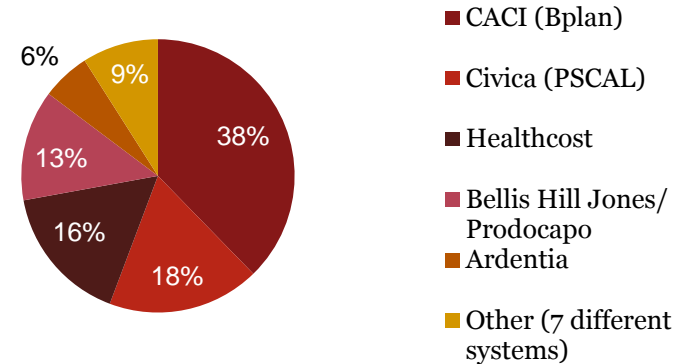
Patient-level costing is a bottom-up approach to estimating the cost of patient care. Rather than allocating and apportioning total costs to determine an 'average patient' cost per HRG, patient-level costing builds up the cost of an episode from the actual resources used by the patient. Therefore, variations in patient costs within the same HRG can be identified. Events such as theatre minutes, diagnostic tests and prosthetics are tagged to the patient record (electronically where such data capture systems are in place). There are many benefits for providers of adopting patient-level costing such as greater clinical engagement, benchmarking and identifying inefficiency. Also, there are benefits for a regulator in collecting this information. Patient-level data would greatly improve the scope for data validation, open options for reimbursement and may lead to better HRG design.

Figure 3.2. Prevalence of PLICS IT



Source: DH PLICS Survey 2011

Figure 3.3. Suppliers of PLICS IT



Source: DH PLICS Survey 2011

PLICS has become more widespread in recent years

87% of acute trusts are either using, implementing or planning to implement PLICS. As of 2011, 75 acute trusts have implemented PLICS (although they may not be collecting PLICS data across all service lines), up from 48 in 2010. Mental Health trusts are much further behind with PLICS take-up. Only five trusts had implemented PLICS, although more than 50% were planning to or currently implementing PLICS.

Diversity of IT suppliers

The market for PLICS IT is very diverse. The Synergy system provided by CACI is the most widespread. It is implemented or being implemented at 46 trusts. The top five systems make up 91% of the market. The remaining 9% consists of seven different systems providers, five of which are only used in one trust.

The objective of the methodology options is to achieve greater consistency, reliability and accuracy of costing between providers

Our two options for methodology are intended to improve accuracy and consistency in the costing methodology for providers that submit data to Monitor. The standardised methodology option would mandate a more explicit and precise set of costing standards, backed up by assurance processes. The standardised methodology could build upon the HFMA standards. An alternative option, certified systems, may achieve even greater consistency by building allocation assumptions (as per the standardised methodology) into certified costing systems.

To become certified for regulatory costing, the systems provider would have to demonstrate that their system complied with costing rules set by Monitor. Certification of systems is used in other sectors such as telecoms where Ofcom has established an approval process of billing and metering systems (Ofcom, 2008). Telecoms operators must obtain approval for their systems from one of three officially sanctioned approval companies.




Figure 3.4. Options for methodology













Status quo	Standardised methodology	Certified systems
Costing system <ul style="list-style-type: none"> • 12 different PLICS systems in use • 6 trusts with unique (in England) PLICS software • Most common system provider is CACI 	<ul style="list-style-type: none"> • Status quo 	<ul style="list-style-type: none"> • Certification of allocation rules used by costing systems • Approved systems with built-in allocation rules
Granularity <ul style="list-style-type: none"> • 87% of acute trusts implemented/planning PLICS 	<ul style="list-style-type: none"> • PLICS compulsory for trusts submitting cost data to Monitor 	
Cost pool design <ul style="list-style-type: none"> • No mandatory standard • HFMA voluntary standards, which 91% of trusts with PLICS use to some extent 	<ul style="list-style-type: none"> • Mandated cost pool design building on the HFMA standards • Targeted refinement of cost pool design 	<ul style="list-style-type: none"> • Cost pool design built into system • Targeted refinement of cost pool design
Allocation methodology <ul style="list-style-type: none"> • Minimum standard in DH Costing Manual • HFMA voluntary Costing Standards • MAQ scoring used at 18 trusts 	<ul style="list-style-type: none"> • MAQ scoring mandated • HFMA Standards mandated, backed up by assurance 	<ul style="list-style-type: none"> • MAQ scoring mandated • Allocation rules according to standardised methodology built into system
Guidance <ul style="list-style-type: none"> • NHS Costing Manual • HFMA Clinical Costing Standards 	<ul style="list-style-type: none"> • Creation of a costing guidance document to support the standardised methodology (unification of current guidance) • Alignment with collection guidance 	

Our assessment of methodology suggests that in the short run Monitor should develop and mandate a standardised methodology for costing

Developing a more prescriptive standardised methodology – that leaves less room for discretion in cost pool design and cost allocation – would improve the quality of cost data used to inform tariff. We recommend that the current HFMA standards be set as ‘minimum standards’ and built upon to create mandatory standards for cost pool design and allocation rules. The mandatory standards would give Monitor increased confidence that costs have been allocated in accordance with the actual level of resources consumed by individual patients. The development of mandatory standards should focus on the most material areas of cost first. Current system suppliers would need to be engaged with in the development of mandatory standards. However, we do not recommend that Monitor require providers to use certified systems for cost allocation.

Figure 3.5. Assessment of options for methodology

Key:	 Positive impact	 No net impact	 Negative impact
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	Standardised methodology	Certified system
Data quality	 <ul style="list-style-type: none"> • Greater consistency • Assurance required to realise full benefits and systems may have different capabilities 	 <ul style="list-style-type: none"> • Potentially far greater consistency because methodology is fixed in the system • Further work required to assess feasibility
Representative data	 <ul style="list-style-type: none"> • Not all providers may be able to comply 	 <ul style="list-style-type: none"> • Not all providers may be able to comply
Timeliness of tariff process	 <ul style="list-style-type: none"> • Uncertain impact – better data quality could reduce calculation time 	 <ul style="list-style-type: none"> • Uncertain impact –better data quality could reduce calculation time
Burden on providers	 <ul style="list-style-type: none"> • Some burden on providers to comply with standards, although 91% of PLICS users already report using the HFMA standards to some extent 	 <ul style="list-style-type: none"> • Upfront costs – expensive and time consuming to develop certified systems • But potential longer-term efficiencies – from pooling of resources, diffusion of tools etc.
Additional use of data	 <ul style="list-style-type: none"> • Improved accuracy and comparability • But potentially inflexible to different circumstances 	 <ul style="list-style-type: none"> • Improved accuracy and comparability • But potentially inflexible to different circumstances
Quick win?	 <ul style="list-style-type: none"> • Yes – could begin to be implemented for 2012/13 collection 	 <ul style="list-style-type: none"> • No – would require several years of systems and certification work

Chapter 3

Options assessment

(a) Methodology

(b) Collection

(c) Assurance

Monitor must decide who to collect costs from, how frequently to carry out cost collection and which costs to collect

Status quo

The Department of Health (the DH) collects Reference Costs from all NHS acute providers on an annual basis. Providers submit their average cost for each HRG. Around 1,000 HRGs are used by a typical district general hospital. The DH uses this data to calculate a national Reference Cost, the Reference Cost Index (a measure of efficiency) and the National Tariff. The current system is representative, in that all types of NHS providers (but not independent providers of NHS services) are included, but suffers from data quality issues. The first tariff Monitor sets in 2014/15 will be informed by data collected by the Department from 2011/12.

There are other uses of Reference Costs apart from price setting as described in Figure 3.6. It may be that even if price setting moved away from Reference Costs, they would be still be collected for these other purposes.

Figure 3.6. Other uses of Reference Costs

- a) Hold the Department and its Ministers to account for the use of NHS resources
- b) Help assess whether NHS trusts are ready to become NHS foundation trusts
- c) Support elements of national programme budgeting
- d) Support Office for National Statistics (ONS) estimates of NHS productivity
- e) Inform the design of HRGs
- f) Inform academic research.

Source: Department of Health, 2012

Issues with cost collection

1. Who to collect cost data from?

There is a trade-off between data quality and representativeness when choosing how many providers to collect cost data from (Schreyogg, 2006). The English system is quite representative (ie all NHS providers are included) but this affects data quality. To reflect the full range of costs, data could also be collected from the independent sector. Alternatively, costs can be selected from fewer providers, such as in Germany where the regulator collects costs from only 20%¹ of providers.

A sample could be selected ex post or ex ante data submission. In an ex post sample, eligible participants are selected after the quality of the data submission has been assessed. This approach is used in Germany. In an ex ante sample, the participants are chosen before the quality of their submission has been assessed. An ex ante sample could be stratified according to provider characteristics, which would mitigate the risk of poor representativeness from ex post sampling.

2. How frequently to collect?

Currently Reference Costs are collected on an annual basis in line with the price setting period. Even if the price setting period lengthened, data may still need to be collected annually because of innovation in healthcare which changes clinical practice and therefore the underlying costs of service provision. Once per year is the most frequently that fully allocated cost data can be collected, because of year-end processes to establish the total cost quantum. But Monitor could collect other data, such as detailed activity data, more frequently. This could potentially be achieved through an add-on to the Commissioning Data Set collection.

¹InEK, 2011. 332 hospitals out of 1,649 total DRG hospitals. In previous years approximately 10% of hospital submissions were rejected for data poor data quality.

Collecting more granular data, such as costs at the patient-level or broken down into cost pools, would be useful for data validation

3. Which costs to collect?

In the current system, only average costs by HRG are collected – in Finished Consultant Episodes (FCEs). Spell costs have been added to the 2011/12 collection. There are other dimensions of data that Monitor could collect, including breaking costs down into cost pools or collecting individual patient costs (or both).

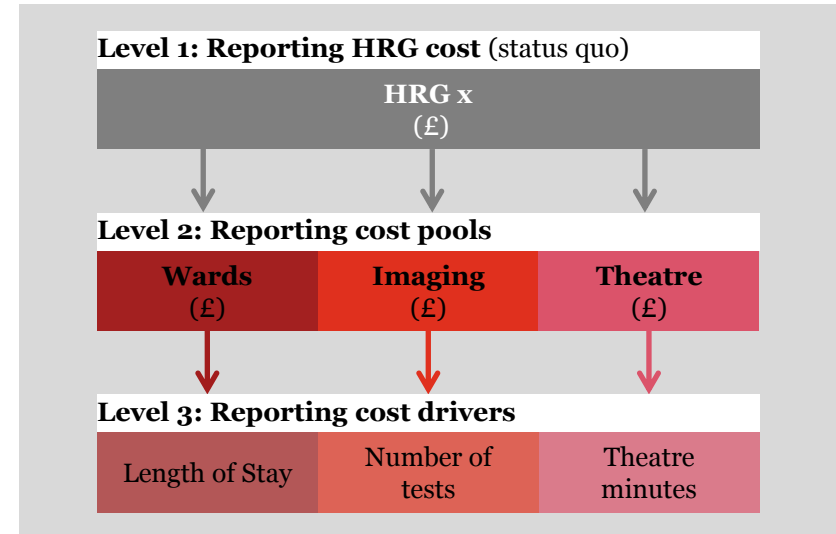
Splitting HRG costs into cost pools would provide useful information for validation and benchmarking

Cost pools are groupings of similar cost centres. For example, drugs may be classified under a number of cost centre codes in the General Ledger, these are all pulled together to form the drugs cost pool. The current HFMA standards uses 19 cost pools. A provider following these standards will have a number of other categories beneath the cost pools which are not standardised. Rather than simply reporting the HRG cost, providers could report the cost of an HRG split into its cost pools (Figure 3.7) or even down to the cost driver level (Figure 3.8).

Figure 3.7. Cost pools from the HFMA standards

- | | |
|--|---|
| <ul style="list-style-type: none"> • Medical staffing • Ward and other settings • Emergency department • Critical care • Outpatients • Operating theatres • Other specialist nursing staff • Pathology • Imaging • Other diagnostics • Drug costs | <ul style="list-style-type: none"> • Pharmacy services • Prostheses/implants/devices • Therapies • Special procedure suites • Radiotherapy • Other clinical supplies and services • Secondary commissioning costs • Non-patient care activities |
|--|---|

Figure 3.8. Examples of different levels of cost collection



Collection of patient-level cost data

Monitor could collect patient-level cost data rather than average cost per HRG. This would be useful for validation, benchmarking and potentially pricing. Also, a national patient-level cost data set would be valuable for the NHSCB, as it would be helpful for HRG design. The type of data fields that could be collected include:

- Patient characteristics
- Cost split by cost pool
- Cost drivers (eg theatre minutes)
- Diagnoses and procedure codes

Unbundling and netting-off of income were issues with collection that emerged repeatedly in our case studies with providers

Unbundling causes many of the difficulties with Reference Costs

Unbundling is an important concept in HRG design that is intended to align HRGs with cost and activity and support patient choice. However, providers have told us that unbundling causes the most difficulty with Reference Cost collection.

Figure 3.9. Unbundled areas

a) chemotherapy	e) radiotherapy
b) critical care	f) rehabilitation
c) diagnostic imaging	g) specialist palliative care
d) high cost drugs	

Source: Department of Health, Reference Cost Collection Guidance, 2012

The National Cancer Action Team has a specialist group of providers looking at costing for chemotherapy¹ and radiotherapy. These are some of the unbundled areas in Reference Costs, as shown in Figure 3.9. Given the difficulty most providers have with costing these areas, Monitor could work with a sample of providers to collect accurate and comparable cost data for these unbundled areas – we have proposed this as the “two tier” option on page 27.

Patient-level cost collection could make it much easier to pull out unbundled costs. If unbundled costs were identified in a separate cost pool, then Monitor or the trust could easily distinguish between the full cost of a patient’s care and the unbundled cost.

Netting-off allowable non-contractual income encourages cross subsidisation and distorts Reference Costs

Reference Costs are designed to estimate the cost of NHS patient care. However, providers engage in several non-NHS patient care activities such as training (of medical students), research and development and treating private patients. These services are not intended to be reimbursed through tariff so need to be excluded from Reference Costs.

The DH requires providers to net-off income associated with these activities from Reference Costs. This can cause a problem with cross-subsidisation. Using the example of training income:

- Training income is greater than cost of providing training, ie trusts profit from receiving training income
- Income from training is netted-off from quantum of Reference Costs, including the profit
- The cost of treating patients, shown in Reference Costs, is subsidised by the profit on training income
- Hence tariff is below the actual cost of providing patient care
- Trusts with above average training income can subsidise the losses made on tariff, but trusts with below average training income will not be able to subsidise the loss made on tariff.

Where possible, services should be costed and accounted for separately rather than allowing profit from one service to subsidise another. See our case studies with providers in Appendix 1 for a more detailed explanation of this issue.

¹See for example, Chemotherapy Costing and Tariff Development Project, 2012

Our options for collection have been designed to balance the need for more accurate data with representativeness, and the need for detailed data with burden on providers

There is a trade-off between data quality and representativeness associated with sample size. A large sample (i.e. all or a majority of providers) might be representative but inaccurate and vice versa. Under the two tier approach option, the regulator continues to collect data from all providers, but rejects some submissions that do not meet data quality standards. This sample would be large (or all providers) for most HRGs, but with a smaller subset for the more difficult areas (unbundled). The stratified sample option would involve fewer providers so consistency of the approach can be more easily achieved. Participants are required to submit PLICS data, instead of just average cost data.

Figure 3.10. Options for collection

Status quo	Two tier approach <i>Whole population with adjustments for data quality and unbundled areas</i>	Stratified sample <i>Sample of provider population</i>
Who to collect from? • NHS and Foundation Trusts	<ul style="list-style-type: none"> • Collect cost data from all providers • Reject submissions (or part of submissions) that do not meet data quality threshold • Only collect from a subset of providers for unbundled HRGs 	<ul style="list-style-type: none"> • Collect costs from a sample of providers • Stratify the sample according to provider characteristics (see Appendix 3) • All sample group adopts same costing methodology
What to collect? • Average cost • Spells and episodes	<ul style="list-style-type: none"> • Average cost • HRG cost split into cost pools 	<ul style="list-style-type: none"> • Patient-level costs • HRG patient costs split into cost pools
How frequently to collect? • Annually	<ul style="list-style-type: none"> • Annual collection likely to continue regardless of option pursued • If price setting periods lengthened, intensity of annual data collection could potentially reduce. As innovation in healthcare can change clinical practice the cost of service provision may need to be monitored frequently 	

Figure 3.11. Benefits of collecting PLICS




Reference Costs only report the average cost of providing an HRG. Patient-level data would provide a very rich and detailed data set which would be useful for:













- Validation
- Benchmarking
- HRG design
- Unbundling

Our assessment of the options for collection suggests that a small stratified sample would yield the greatest benefits for data quality

According to our assessment, a stratified sample would yield the greatest benefits for data quality because it would be possible to achieve greater consistency of costing methodology in the group and the PLICS data would be useful for validation. However, it may take some years to establish a representative sample group which produces accurate data. In the short run, this risk should be mitigated by keeping the Reference Cost return mandatory for all trusts. The sample group could be broadened over time once the PLICS methodology and collection standards are developed and new entrants are able to meet a data quality threshold.

Figure 3.12. Assessment of options for collection

Key:	 Positive impact	 No net impact	 Negative impact
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	Two tier approach		Stratified sample	
Data quality		<ul style="list-style-type: none"> Inaccurate submissions rejected Unbundled areas left to subset Cost pools data useful for validation Inconsistency approaches remain 		<ul style="list-style-type: none"> Used in other countries Consistency of costing methodology with sample group PLICS data useful for validation
Representative data		<ul style="list-style-type: none"> Large sample – only small reduction in representativeness 		<ul style="list-style-type: none"> Some reduction in representativeness Although can be mitigated by stratification (see Appendix 2)
Timeliness of tariff process		<ul style="list-style-type: none"> No impact 		<ul style="list-style-type: none"> No impact
Burden on providers		<ul style="list-style-type: none"> Providers have indicated that reporting cost pools would be a low burden No unbundling for some providers 		<ul style="list-style-type: none"> Burden of regulatory costing removed from providers outside the sample group (based on the assumption that requirement to submit Reference Costs stops)
Additional use of data		<ul style="list-style-type: none"> Depth of data set improved (cost pools) Small reduction in breadth of data set 		<ul style="list-style-type: none"> Depth of data set improved (PLICS) Breadth of data set worsened
Quick win?		<ul style="list-style-type: none"> Yes – could begin to be implemented for 2012/13 Reference Costs 		<ul style="list-style-type: none"> No – would require a testing period against wider Reference Cost data set

Chapter 3

Options assessment

(a) Methodology

(b) Collection

(c) Assurance

Assurance underpins the collection and methodology elements of the costing framework. Assurance is a vital part of data quality and Monitor should seek to invest in this area

Status quo of Assurance work

There are existing assurance processes for some elements of the costing process (see costing diagram – page 15). However, the review of Reference Costs by the Audit Commission is not an annual occurrence. Also, there are no consistent procedures across providers to provide assurance over the cost methodology.

Figure 3.13. Audit Commission Reference Cost review

The Audit Commission conducted a one-off review of 2010/11 Reference Costs. The review investigated:

- organisational arrangements
- the total quantum of costs
- quality of activity reporting
- accuracy of unit costs

Also, the Audit Commission has developed a Quality Checklist for Reference Costs and a National Benchmarker tool.

Activity data

Audit of activity data is carried out by the Audit Commission and the Information Centre. The Audit Commission reviews the clinical coding of 200 FCEs for every trust each year as part of the PbR Assurance Framework. The Information Centre has data quality processes in place to review the activity data that feeds into the national activity database – Hospital Episodes Statistics.

Financial data

Total costs are audited in the financial statements. The auditor's opinion states that the accounts give a true and fair view and were properly prepared in accordance with the relevant rules.

Cost collection

There are validation mechanisms in the Reference Cost Guidance and collection workbook including:

- Validation built into the workbook
- Compulsory reconciliation of cost quantum to the audited accounts
- Finance Director sign-off to confirm that:
 - i. costing has followed Reference Cost Guidance and DH Costing Manual
 - ii. internal reconciliation shows costs and activity to be a true and fair view
 - iii. clinicians have been involved
 - iv. the Quality Checklist has been used

Parts (iii) and (iv) have been introduced for the first time in the 2011/12 collection, in part due to the Audit Commission review of Reference Costs. The Audit Commission found that the submissions from one in eight trusts did not reconcile to their financial statements.

Cost methodology

Currently there are no systematic assurance processes of the costing systems or the allocation assumptions used to estimate costs. The current costing guidance is insufficiently specific and precise to facilitate effective audit.

Providers have responsibility over assurance that costs have been allocated correctly. Clinical engagement is an important factor here. For example, sense-checking with clinicians why a patient has a particularly high or low cost attached to his or her treatment.

Assurance can improve data quality but at a cost. Our options for assurance reflect increasing levels of independence but also increasing cost

We are not proposing changes to the assurance around activity and financial data that already takes place. Monitor should work with the Audit Commission (or Capita, who will be taking over some Audit Commission work) and the NHS Information Centre to continue the current assurance practices around activity recording, such that it can feed into assurance on costing where appropriate. The options relate to assurance that the changes to cost methodology and collection are being followed. Our three options for assurance reflect increasing independence with the least independent being self assessment and the most independent being external assurance (see page 32 for examples of how these options may work).

Figure 3.14. Options for assurance

Status quo	Self assessment	Peer review	External assurance
Cost methodology <ul style="list-style-type: none"> • Various internal processes • Only a minimum standard of cost allocation mandated 	<ul style="list-style-type: none"> • Self assessment, with Board sign-off, that costs have been properly prepared in accordance with costing standards • Mandatory use of MAQS to score allocation sophistication 	<ul style="list-style-type: none"> • Peer review of costing methodology including: systems, standards and processes 	<ul style="list-style-type: none"> • External audit opinion that costs have been properly prepared in accordance with costing standards
Cost collection <ul style="list-style-type: none"> • One-off Audit Commission work review • Voluntary Quality Checklist/National Benchmark tool • Finance Director sign off 	<ul style="list-style-type: none"> • Compulsory updated Quality Checklist • Board sign-off on submission 		<ul style="list-style-type: none"> • Targeted external assurance, building on the Audit Commission review of Reference Costs, that the submission has been prepared in accordance with Reference Cost Collection Guidance

Figure 3.15. Audit Commission Quality Check List

The Audit Commission Quality Checklist is a useful tool for providers. We suggest that, in places, the checklist could be improved by making the questions more specific and testable. For example, this question:

“Is the total quantum of cost quantum correct?”

A more testable question form could be:

“Confirm total quantum has been reconciled to accounts. Confirm calculation has been reviewed and enter name of reviewer below.”

Source: Audit Commission, 2011, PwC analysis

Existing examples of self-assessment, peer review and external assurance are useful comparators to the options for costing

Self assessment

Existing examples of assurance processes in the NHS and application to costing

Self assessment has already been used in Reference Costs but could be improved.

- For the 2011/12 collection, each trust must obtain FD sign-off against four statements (see page 30) regarding the preparation of Reference Costs.
- Self assessment could be made more effective by mandating an improved Quality Checklist and elevating sign-off to Board level.

Peer review

The National Cancer Peer Review (NCPR) is an example from the NHS of using peer review for quality assurance. This approach could potentially be used in costing. Providers have told us that peer review is under-used in costing and could be particularly valuable to the geographically isolated.

- The NCPR uses a combination of self assessment, externally verification peer review visits to provide quality assurance of cancer clinical practice (NCPR, 2011)
- Peer review visits could be used in costing. Costing specialists could review one another's methodology and help to spread best practice. Peer review could be effective in health costing because of relatively niche skill set and knowledge held by costing specialists.

External assurance




External audit opinions are primarily used for financial statements, but audit can be adapted to give an opinion on other topics, such as Quality Reports (Monitor, 2012).



















- Monitor developed a bespoke audit plan for the Quality Reports so that auditors could give a limited assurance report on the validity of its content and other certain indicators.
- For an audit opinion to be a viable option for cost methodology, a similar bespoke audit plan would need to be developed. Anecdotal evidence from our discussions with providers and stakeholders suggests that an external audit of cost methodology may be costly and not add much value. Previous experience suggests that opaque costing systems and numerous allocation assumptions can make audit of cost methodology difficult.

Although external assurance is independent, it can be expensive so should only be used in targeted cases. Peer review of the cost methodology is a more cost-effective way to drive up best practice

There is a trade-off between increasing the independence of assurance and the cost. External assurance will provide an independent view of data quality, which can help to improve it. The downside of greater independence is increased cost. External assurance is likely to be particularly costly for audits of the costing methodology – because of the sheer number of assumptions underpinning cost allocation. However, the Audit Commission review has shown that external assurance is more feasible for cost collection. The reviews took 10-15 man days per trust. The burden on providers from increased assurance could be mitigated if a sampling approach to cost collection was taken (ie costs for pricing were only collected from a subset of trusts). Also, the requirement for assurance over the costing methodology could be reduced if a uniform costing system was used across trusts with built-in cost allocation rules.

Figure 3.16. Assessment of options for assurance

Key:	 Positive impact	 No net impact	 Negative impact
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	Self assessment		Peer review		External assurance	
Data quality		• Low independence		• Medium independence • Spreading best practice		• High independence
Representative data		• No impact		• No impact		• No impact
Timeliness of tariff		• No impact		• Potential small delay		• Potential small delay
Burden on providers		• Low cost		• Medium cost		• High cost
Additional use of data		• Improved data quality		• Improved data quality		• Improved data quality
Quick win?		• Yes – could be implemented for 2012/13		• Yes – could be implemented for 2012/13		• No – may need “dry runs” before audit goes public

Chapter 4

Recommendations and implementation

Based on the options assessment in Chapter 3 we have made recommendations under each block of our costing framework

Methodology:

We assessed whether a standardised methodology or certified system approach should be pursued by Monitor. Based on this assessment, we recommend that:

- Monitor should develop a more prescriptive standardised methodology for allocating costs at the patient level (mandatory standards), building upon the HFMA's Clinical Costing Standards
- Incremental improvements to create mandatory standards from the existing HFMA standards should be made each year, focusing first on the most material areas of cost and / or complex costing areas
- Monitor should mandate that providers submitting PLICS data to inform tariff must follow these mandatory standards (see *Collection*)
- System providers should be engaged with as mandatory standards are developed, but Monitor should not prescribe the use of 'certified systems'

Collection:

We assessed who Monitor should collect data from, what data it should collect and how frequently data should be collected. Based on this assessment, we recommend that:

- Monitor collect PLICS data from a stratified sample of providers on an annual basis
- The data collected should be the costs of each individual patient spell, tagged to the appropriate HRG code and broken down into cost pools
- Monitor should develop a PLICS collection guidance document in 2012 for use by the sample group
- In 2012 and 2013 Monitor should collect and analyse the patient-level data alongside the Reference Cost data to road test the results produced
- Reference Costs should continue to be collected and until at least 2013 and used to inform tariff until at least 2015/16. The 2012/13 collection should require providers to report HRGs at the cost pool level

Assurance:

We assessed whether self assessment, peer review or external assurance should be used to improve the assurance of cost data. Based on this assessment, we recommend that:

Methodology

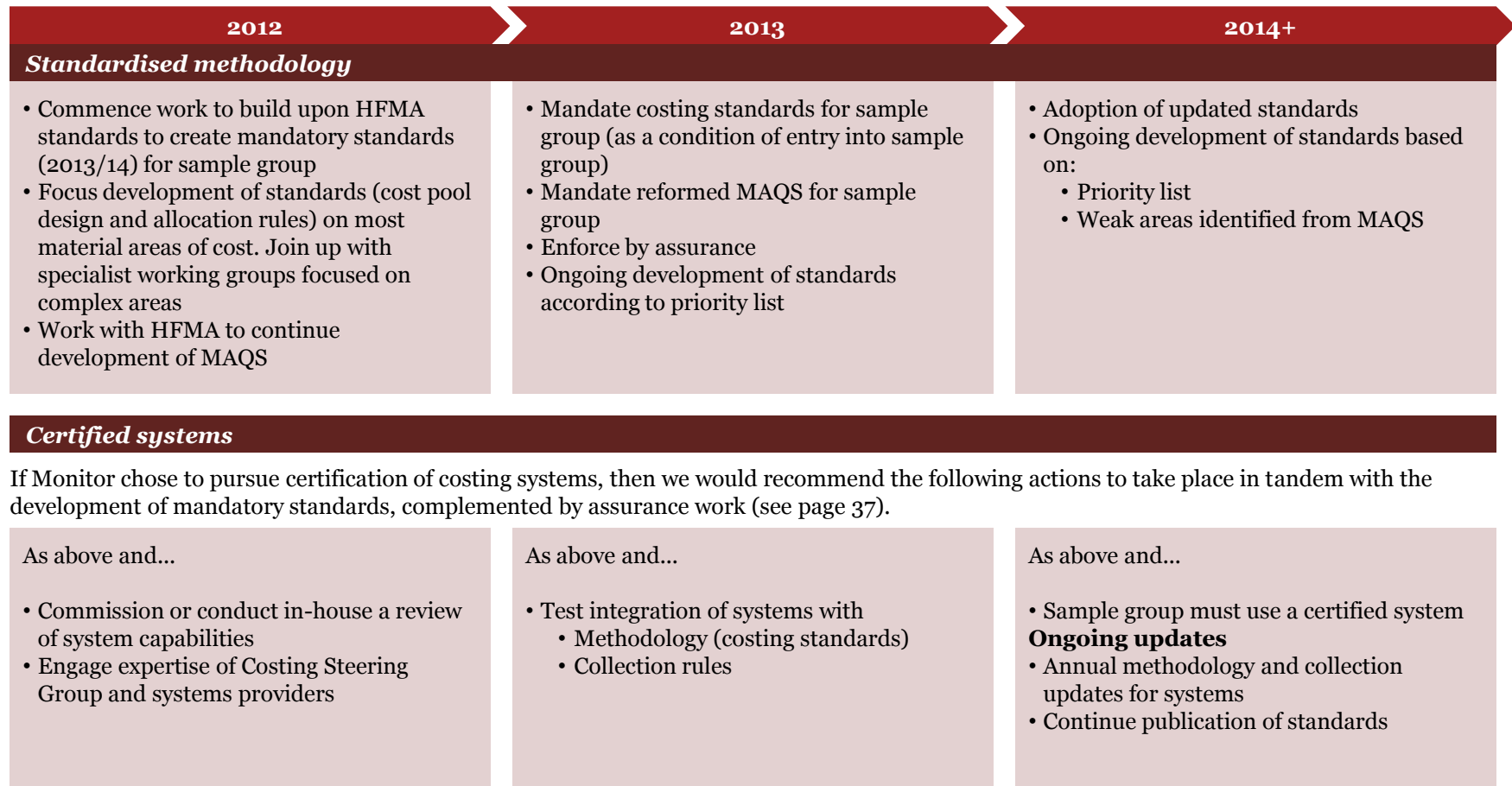
- Peer review groups are established to provide assurance and spread best practice that the mandatory standards are followed by the sample group
- MAQS mandated for the sample group and scores reported to Monitor. Monitor should work with the HFMA to see that MAQS are refined in the future

Collection

- A mandatory Quality Checklist – building upon the Audit Commission checklist – is followed and signed-off by the Board, for Reference Costs and patient-level cost data collection
- External audits of Reference Costs should be targeted at poorer performing trusts

Methodology: Mandatory standards for cost allocation and cost pool design for the sample group will improve the comparability of cost data. Once a standardised methodology is established, the certification of systems may become more feasible

Figure 4.1. Recommendations for methodology



Collection: 87% of acute trusts currently operate or are planning to implement PLICS, but this rich data set has not been used to inform pricing. We recommend that Monitor collects PLICS from a sample of providers alongside the Reference Cost collection

Figure 4.2. Recommendations for collection

2012	2013	2014+
Reference Costs		
<ul style="list-style-type: none"> • Announce that Reference Costs will be used to inform pricing until at least 2015/16 tariff • Work with DH to develop capability to collect Reference Costs by cost pool • Work with DH on continued update of Reference Cost collection guidance 	<ul style="list-style-type: none"> • DH collects 2012/13 Reference Costs by cost pool • Work with DH on continued update of Reference Cost collection guidance 	<ul style="list-style-type: none"> • DH collects 2013/14 Reference Costs by cost pool
PLICS Sample		
<p>As above and...</p> <ul style="list-style-type: none"> • Select stratified sample group. Board must commit for minimum participation period (to be determined) • Consider including independent sector representation in sample group • Develop guidance for PLICS collection • Recruitment of systems staff • Establish data warehouse capabilities 	<p>As above and...</p> <ul style="list-style-type: none"> • Collect PLICS from sample group • Analyse PLICS sample data <ul style="list-style-type: none"> ○ Determine representativeness ○ Compare PLICS submission with Reference Costs submission for individual trusts and HRGs ○ Review distribution of cost within HRG • Refine sample group if necessary • Consider using PLICS data to develop a shadow 2015/16 tariff (alongside Reference Costs) 	<p>As above and...</p> <ul style="list-style-type: none"> • Collect PLICS from sample group • Analyse PLICS sample data • Refine sample group membership if necessary • Consider using PLICS sample to inform 2016/17 tariff

Assurance: We suggest peer review groups to improve assurance of costing methodology, supplemented by self assessment checklists and audit processes for collection. Adopting a certification process for systems could reduce the need for assurance in the long run

Figure 4.3. Recommendations for assurance

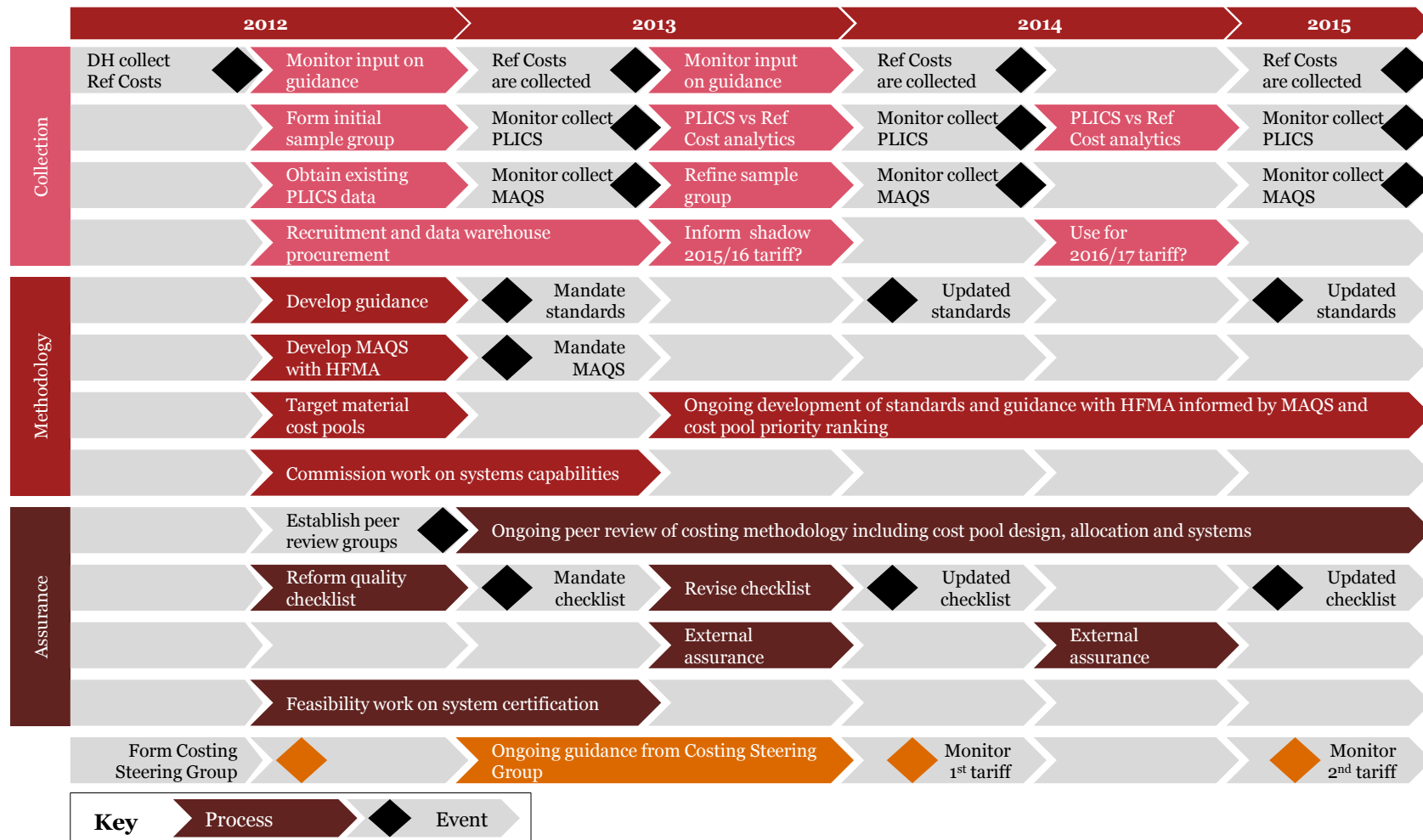
2012	2013	2014+
Assurance for standardised methodology		
<p>Methodology Assurance</p> <ul style="list-style-type: none"> • Establish peer review groups • Review MAQ score design <p>Collection Assurance</p> <ul style="list-style-type: none"> • Reform Reference Cost Quality Checklist and develop Checklist for PLICS collection • Plan for external assurance of collection in selected trusts 	<p>Methodology Assurance</p> <ul style="list-style-type: none"> • Peer review groups take place for first year • MAQ scores used to identify good data and areas for improvements <p>Collection Assurance</p> <ul style="list-style-type: none"> • Implement checklists and MAQ scores with PLICS collection • External assurance at select trusts 	<p>Methodology Assurance</p> <ul style="list-style-type: none"> • Ongoing peer review groups • Ongoing MAQ scoring <p>Collection Assurance</p> <ul style="list-style-type: none"> • Ongoing collection of checklist and MAQ scores • Ongoing targeted external assurance • Assessment of progress
Assurance for certified system		

If Monitor pursues the certified system approach, there are additional assurance processes that we recommend are taken to prepare for a system certification process

<p>As above until implementation of certified systems</p> <ul style="list-style-type: none"> • Work with team scoping system requirements • Initial planning on certification process 	<p>As above until implementation of certified systems</p> <ul style="list-style-type: none"> • Establish/authorise certifying body • Design of certification process • Dry-run audits of costing system (s) 	<p>As above until implementation of certified systems</p> <ul style="list-style-type: none"> • Audit and certification of costing system (s) <p>Ongoing actions</p> <ul style="list-style-type: none"> • Limited audit required for methodology/collection updates to systems
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Establishing a new PLICS-based data set will take several years. During this time, the collection of Reference Costs should continue

Figure 4.4. Implementation timeline



Appendix 1

Stakeholder consultation and case studies

Through workshops, interviews and presentations we have engaged with the key stakeholders in costing over the course of this project

Strategy for engaging stakeholders

Our approach throughout this project has been to engage and listen to the views of stakeholders. This process began with a interactive workshop attending by over 20 people. We discussed themes including:

- Who to collect costs from
- Standardisation of methodology
- Bottom-up vs top-down costing
- Assurance

Building on the workshop we conducted a series of meetings with the Department of Health and Audit Commission. Also we discussed costing in detail with providers in case studies.

Case studies with providers

A write-up of each case study is included in this appendix. The providers have reviewed this text and agreed for it to be included in the report. We have anonymised the case studies such that the views expressed cannot be attributed to specific providers.

Providers

- Birmingham Children's NHS FT
- The Christie NHS FT
- Guys and St Thomas' NHS FT
- Liverpool Heart and Chest NHS FT
- Maidstone and Tunbridge Wells NHS Trust
- Plymouth Hospitals NHS Trust
- University College London Hospitals NHS FT

Attendees at the stakeholder workshop

Public and industry bodies

- Department of Health
- Audit Commission
- Health and Social Care Information Centre
- NHS Commissioning Board
- Monitor

Advisors

- Professor Chris Chapman

Providers

- Guys and St Thomas' NHS FT
- Maidstone and Tunbridge Wells NHS Trust
- University College London Hospitals NHS FT
- North Middlesex University Hospital NHS Trust

Ongoing engagement and consultation

At an early stage in the project we presented to the HFMA Costing Special Interest Group. Questions posed at this meeting and follow-up discussions were incorporated into our report. Also we presented to, and took questions from, a large group of Finance Directors at the Foundation Trust Network.

Case study 1

Fast facts

SHA	London
Trust status	Foundation Trust
Provider type	Teaching hospital
HRGs	1,290

- **HRG catalogue**

From a statistical perspective we undertook a review of HRG v4 compared with HRG v3.5 and discovered there was less homogeneity on a cost basis with v4 than with v3.5. From a costing perspective, the HRG catalogue appears to be too disaggregated in places and too aggregated in others since there are some HRGs with very little activity/cost recorded. 50% of the cost of admitted patients (£130m) is reported in 10% of the HRG codes.

- **Problems with Reference Cost Indexes and tariff construction**

Reference Costs are collected in episodes and reimbursement is in spells. The ratio of episodes to spells is not consistent across providers. The reference cost index is therefore not calculated on a comparable basis. The recommendation is that if in future Reference Costs are used to calculate tariff, they should be collected in the same categories as that in which the tariff will be constructed

- **Local tariff undermining national tariff**

Approximately half of our NHS patient care income falls under the national tariff, the other half is agreed with Primary Care Trusts (PCTs) and reimbursed under local tariffs. Very rare HRGs that are only performed by a few providers may not need a national tariff.

- **Impact of out of hours services on costing**

Out of hours wage rates are 33% higher than normal hours wages. At our trust the cost of staffed out-of-hours capacity in operating theatres is allocated across the patients that use those out-of-hours services. These out-of-hours patients are almost all non-elective. Many Trusts however spread the costs of out-of-hours activities across all patients, the Reference Cost, and therefore the tariffs, are understating the true cost of non-elective patients (since they should have more capacity costs allocated to them) and overstates the cost of elective patients (since they should have less excess capacity costs allocated to them). This in turn unfairly over reimburses organisations who only provide elective services, and under reimburses organisations who provide non-elective services

Case study 1 (cont)

- **Development of guidance**

New guidance on costing has to come from the industry to get buy-in from providers. There is a view that the DH has listened to and then ignored the views of providers in the past. Our trust is looking forward to the potential for a new level of engagement by Monitor. We would be very keen to take part in the sample if Monitor would give providers a role in developing guidance.

- **Netting off costs from the total quantum**

Before calculating Reference Costs, income (not cost) from non-NHS patient care sources (ie commercial activities), has to be taken off from the total quantum of hospital costs. As providers can charge prices above cost on commercial activities to make a profit, the cost of providing the services and the profit is taken off from the quantum of costs for Reference Costs. If profit on commercial activities increases, all other things being equal, our Reference Cost Index would improve. The Reference Costs submitted to DH are below the costs of actually providing the service. These costs then feed into tariff which will understate the true cost of NHS patient care. This accounting treatment currently prevents Trusts from declaring the true cost of treating NHS patients, and means comparisons of costs between providers are not possible. An alternative way to address income not related to NHS care could be for all hospitals to declare all of their costs separated into; NHS patient care and non NHS patient care activities, for Reference Cost calculation. National tariff would then be based on the cost of NHS patient care.

- **Electronic patient records**

In the intensive care units at our trust, the patient record is electronic. Every time the team visit the patient's bedside the event is tagged to the patient record and the associated costs included onto PLICS. Likewise in theatre, nurses use an electronic ID card to access vending machines of consumable parts (eg hip replacements). When the nurse swipes her ID, she can view her patient list on a screen and tag any item and associated cost automatically to the patient record. Time and staffing used for surgery in theatres is recorded on computer, as are the radiology examinations, and time spent by therapists with patients.

- **Development of cost pools**

We have grouped their costs into cost pools since the late 1990s. This is the basis upon which the Synergy system was developed. The DH and a number of hospitals including us, under the direction of Peter Donnelley (ex North West London SHA Finance Director), created a set of Clinical Costing Standards. The HFMA have been commissioned by the DH to maintain and develop these standards, under the leadership of Tony Whitfield from Salford Royal NHS FT.

Case study 2

Fast facts

SHA	South East Coast
Trust status	NHS Trust
Provider type	District General Hospital
HRGs	1,148

- **Sampling**

Although prices may be improved by using costs from a sample, there is a danger that the sample is not representative of costs across the NHS. Institutions that have invested constructively in costing are not necessarily representative of a typical district general hospital. For example robust costs based on a sample of teaching and specialist providers alone, would not be representative. Likewise, if the sampling route is chosen, it is important that differences in income streams are accounted for such as those relating to private patients and R&D. The effect of differences in income streams on unit costs is probably greater than that attributable to differences in approach to allocation.

- **Importance of HFMA Standards**

It is crucial that any revised emphasis on costing incorporates the work that HFMA has produced on Costing Standards. Assurance processes should assess and report on whether costs have been produced in adherence to the Standards.

- **Reporting greater detail in Reference Costs**

Providers could report Reference Costs split into direct, indirect and overhead or broken into cost pools. This would be useful for validation, pricing or benchmarking. The additional burden on providers of reporting this data is low.

- **Reference Cost exclusions and investment**

The Reference Cost Index is used to measure the comparative efficiency of trusts. However, rules on exclusions can lead to sudden jumps in the RCI. For example, we recently built a new hospital on PFI. During the building process, Reference Cost rules allow impairments to be excluded. But now the building is completed, we are expecting a sudden jump in the RCI as the unitary payment on the PFI cannot be excluded from Reference Costs.

- **Allocation of excess capacity**

Costs associated with excess capacity are allocated to patients. For example, the cost of unused doctors out-of-hours is allocated between the out-of-hours patients, making the cost of these patients very high. It was suggested that the capacity costs of medical cover/on-call doctors should be reimbursed separately from activity-based reimbursement. Otherwise this capacity cost is inflating the cost of the HRG.

- **Transparency of tariff calculation**

In order to increase the credibility and reliability of prices, it is imperative the tariff calculation process is transparent. Transparency is important because it increases the confidence of providers in the tariff and the tariff-setter.

Case study 3

Fast facts

SHA	West Midlands
Trust status	Foundation Trust
Provider type	Specialist (Children's)
HRGs	610

- **Use of cost pools**

Although the trust does not use the same cost pools as in the HFMA Standards, it is a relatively simple mapping exercise to produce costs that match the HFMA cost pools. This approach is acceptable as per the Costing Manual.

- **Resource constraints**

The amount of resource available for costing is limited. This year the trust will be taking on extra work such as reconciling the Reference Cost submission to HES and considering MAQ scoring. However all these additional activities consumes resource which is challenging to meet in the current economic environment.

- **Educational Resource Groups**

The work being done by DH on ERGs should address some of the problems with cross subsidisation caused by education and training funding. We are involved in the pilot collection exercise.

- **Guidance**

It would be helpful if there was one unified guidance document rather than the disparate collection of guidance that exists currently.

- **Differences with costing at a specialist trust**

With specialist trusts such as us there are challenges with costing complex services and bespoke procedures. For these complicated and specialist areas the costing team calculates the costs from the bottom-up using a patient pathway approach and working closely with clinicians and other key stakeholders. This is reconciled to the top down costing in service line reporting to ensure accuracy in these areas of costing.

- **Areas of support for costing**

The most important avenue of support for the costing team is to engage clinicians. They understand the clinical practice specific to the trust and are able to offer information that is key to ensuring the costing principles used reflect the service as accurately as possible. This will ensure the costing/SLR information produced is meaningful and reliable. There are also forums for sharing costing practice and help is provided from the DH for Reference Costs.

- **Treatment function codes**

The treatment function codes are used to identify different types of activity. The introduction of additional treatment function codes aids the trust to identify and cost its activity at a more granular level. For example the introduction of TFC 264 for paediatric cystic fibrosis will help us to more clearly identify our CF activity and to cost it more accurately with clinical support and input.

Case study 4

Fast facts

SHA	North West
Trust status	Foundation Trust
Provider type	Specialist
HRGs	623

- **Costing system**

At our trust the Synergy costing system is used – supplied by CACI. Costing requires knowledge of SQL both to understand the scripts within the system and those held in other databases. Because of the difference between Reference Costs and PLICS requirements, the system needs to be amended to enable the reference costs submission data to be run.

- **Turning PLICS into Reference Costs**

To convert PLICS data produced by the costing system into Reference Costs requires several difficult manipulations. Such as issues with netting-off the Category C income and the unbundled areas. Also, there may be timing issues - Reference costs requires patients to be included where they have been discharged within the period reported whereas the PLICS system looks at patients FCE completed in a period and will therefore have an element of work in progress

- **MAQ scoring**

We have used MAQ scoring and found it a useful process for considering cost allocation. Calculating the scores took approximately ½ day for one of the costing team.

- **Standards could be mandatory**

Mandating standards for costing would ensure consistency across providers. However, any mandatory standards should be focussed on the most material areas in terms of cost. There is a danger that very detailed guidelines for immaterial areas could create a disproportionate burden on trusts. However it would definitely be useful to have one set of standards not the three we currently have, Acute Costing, Reference Costs and the Costing Manual.

- **Reference Cost collection guidance**

The collection guidance for 2011/12 is a substantial improvement on previous years in terms of clarity of expression. Monitor should endeavour to make any guidance clear and easy to understand.

- **Engagement of work by specialist groups**

There has been a national group on costing for radiotherapy – led by the National Cancer Action Team. Monitor should engage groups such as these who have deep and specialised knowledge on costing in niche areas such as radiotherapy and chemotherapy.

- **Difficult areas for costing**

The areas that cause particular difficulty with costing are Chemotherapy, Radiotherapy and Adult Critical Care.

Case study 5

Fast facts

SHA	North West
Trust status	Foundation Trust
Provider type	Specialist
HRGs	277

- **Costing system**

The system we use is a sophisticated cost system called Prodacapo. The system can allocate costs according to resource use and can go down to a level of sufficient granularity. By having a well developed PLICS system, more costs can be traced and directly attributed to patients rather than apportioned or allocated.
- **Problems with Reference Costs**

Some HRGS are under (or over) rewarded due to poor costing and averaging. Also, costs include excess capacity and therefore reimbursement rewards inefficiency. Under utilisation of staff/theatres should not be feeding into Reference Costs. The PLICS model we use removes excess capacity from the patient cost.
- **Reporting of costs**

Reference Costs could be collected in terms of cost pools. It is important to show costs at a granular level. This would help with the validation process.
- **Unbundling**

Unbundling is an important concept because otherwise the tariff for outpatients and some inpatients would be too high.
- **Difficulty of allocating overheads**

Overheads are difficult to allocate to patients. One way to circumvent this problem is to minimize the costs going into overheads by tracing them to patient rather than aggregating costs as overhead.
- **HFMA standards**

The HFMA standards are a work in progress and trusts should be able to go above these standards. The HFMA group needs to raise the bar to drive up costing practices across trusts.
- **PLICS could replace Ref Costs in the long run**

To use PLICS data for pricing the following three steps would need to occur:

 1. Improve the costing standards for PLICS
 2. Implement PLICS at all trusts
 3. Benchmark to identify inefficiency
- **Sampling**

Sampling by specialities may be appropriate to get consistency regarding costs – for example cardiology. This would require:

 - Compulsory, detailed costing standards specific to the speciality
 - Same costing system
 - Assurance on the methodology
- **Netting-off costs**

Private patient income and training income can cause issues with cross subsidisation. This is not easy to solve.

Case study 6

Fast facts

SHA	South West
Trust status	NHS Trust
Provider type	District General Hospital
HRGs	1,331

- **Costing system**

At our trust the Allocate SAPPS costing system is used for allocating costs. To enable patient-level costing, the trust has developed a bespoke SQL database. This is not a conventional PLICS, but can be used to trace costs to the patient level. The costing system is only as good as the input data. Traditionally this has been weaker in areas such as pharmacy and theatre consumables. The costing system is used to run SLR reports on a monthly basis.

- **Reference Costs**

Unbundling is a difficult area. Most trusts should be able to cost inpatients accurately but outpatients cause difficulty because of the unbundled areas. For example, radiology can be a problem as the patient record must be matched from the PAS system to the radiology system and the scan can often be sometime after the initial appointment. It takes approximately 2 months to prepare Reference Costs.

- **Use of standards**

The HFMA clinical costing standards are good, and we follow the standards wherever possible. If the standards were mandated, some areas may be difficult to implement for some trusts especially for those with inflexible costing systems. HFMA MAQ scoring could be a valuable tool for identifying accuracy of cost allocation.

- **Flexibility**

The costing system we use gives more flexibility than those used by other providers – especially with regard to cost pools.

- **Costing community services**

Plymouth provides a limited number of community services such as community midwifery. Costing these services is particularly difficult because of the lack of recording of activity, if this was recorded accurately (perhaps by remote recording systems onto PAS) then it would be possible to cost community services more accurately. If costing at the patient-level, then it should be possible to report costs at the level of acute, mental health or community.

- **Sampling**

With sampling, there is no guarantee that a trust can have robust costs in all areas and there may be other trusts with more accurate costs for a particular area who are outside the sample. Reference Costs should be mandatory for all providers, so as to provide a measure of comparability. If sampling is used, trusts outside the sample can still compare themselves with those within. Reference Costs are important for local tariff.

Case study 7

Fast facts	
SHA	London
Trust status	Foundation Trust
Provider type	Teaching hospital
HRGs	1,289

- Incentives**
 To improve the accuracy of reported costs, Monitor needs to ensure that trusts have an incentive to provide good data. This could either be a reward for providing high quality data or a penalty for non-compliance with data quality rules.
- Comparability between trusts**
 If all trusts complied fully with the HFMA Standards then this should make the cost data sufficiently comparable – however, different trusts use different cost pool definitions, which may be equally valid. This makes comparisons difficult, and there is a significant local cost (both financial and in terms of losing comparable historical trend information) associated with moving to a single standard. There are areas where the Standards could be more granular, so development and refinement should continue in the future using international best practice.
- Reporting of costs**
 It would be easy to report patient-level HRG costs by cost pool as this data is already collected. Also, it is easy for trusts to report costs at spell rather than FCE level – collection of the latter is of questionable usefulness.

- Audit of cost submission**
 A good audit should focus on the quality of assumptions and input data (eg evidence of clinician engagement and the allocation of consultant time, a key driver of cost) rather than simply benchmarking outputs.
- Specialist services**
 Further work is required to understand the costs of delivering specialist activity, particularly where the current HRG structure is insufficient to capture the true case-mix and cost of complex work. The cross-subsidisation issue described above may also distort specialist costs as there may be a correlation between, say, specialist activity and private patient income. Taking this sizeable funding stream out of Reference Costs underestimates the cost of specialist services, potentially making the tariff too low.
- Non-NHS patient care income – (Category C income)**
 Netting off Category C income from Reference Costs causes problems with understanding the true cost of delivering patient care – there may be some cross subsidisation and distributional issues between trusts. Although it is difficult to isolate the costs associated with some of these income streams it is easier to cost others (see below).

Income stream	Difficulty of isolating cost
Devolved income (eg car parks)	Low
R&D	Medium
Private patients	Medium
Education and training	High

Appendix 2

Costing in mental health and community services

The development of PbR reimbursement for mental health has helped drive data improvements, but take up of patient-level costing is still behind the acute sector

The development of a currency-based reimbursement model for mental health has driven the need for accurate and reliable cost data

Historically, mental health has been funded through a mix of block contracts and local tariffs. The quality of data on the costs of individual services, and the volume of services performed, has been poor. The development of currencies for mental health – 21 clusters of service users with similar clinical needs – which are intended to form the basis of reimbursement from 2012, has increased the need to understand costs.

MH Reference Costs are now being collected by cluster, however there are concerns with data quality

The DH is working with 85 mental health providers to collect Reference Costs for each of the 21 clusters. 2011 was the first time that Reference Costs were reported by cluster. Of 85 Mental Health providers that submitted Reference Cost data, only 57 were able to provide cost data by cluster. £1.9 billion – or 41% of eligible expenditure – was reported by cluster.

The DH noted a number of concerns with the quality of data in this first cluster Reference Cost submission, including:

- Variation in unit costs (ie inpatients, outpatient contacts) within clusters and between providers
- Variation in the number of service users and length of stay in each cluster
- Missing data from Reference Cost returns.

Clinical Costing Standards for mental health have been developed, the ability of providers to follow them may be influenced by system capabilities

Clinical Costing Standards for mental health were first published by the DH in 2009. Responsibility for these standards have since been taken over by the HFMA. The ten standards for mental health are very similar to the standards for the acute sector. But there are differences, such as cost pools being less developed in mental health than in the acute standards. Also, Standard 5 (work in progress) is less relevant for mental health because timing is not as important for a cluster currency compared to an episode-based currency.

System capabilities influence the extent to which mental health providers can follow the Costing Standards. In the latest PLICS survey (DH, 2011), 20% of mental health providers had implemented or were implementing PLICS, with a further 32% planning to implement PLICS in the future. This compares to 87% of acute trusts who have implemented or are planning to implement PLICS.

In the future the HFMA is intending to align the acute and mental health standards into a single document, reflecting a consistent approach to patient-level costing between acute and mental health.

Accurate recording of activity remains a key challenge in improving the cost data on community services

Historically recording of activity undertaken in the community has been poor

There are currently no specific clinical costing standards for care services conducted in the community (community services). Historically, a key barrier to costing community services – and indeed the resources consumed by individual patients – has been a lack of accurate recording of activity. Reasons for the poor quality of data include the following:

- The nature of the services – being performed ‘out in the community’ with limited access to electronic data systems. This was highlighted in our case study with Plymouth Hospitals NHS trust, who provide community midwifery services. Community data recording systems are not integrated with PAS, and patient notes are recorded by hand and entered manually onto the system at a later date.
- The incentives created by the reimbursement model – most community services are paid for through block contract arrangements (essentially a payment for capacity as opposed to activity). Community service providers have not had incentives to understand the costs of individual services.

However the ability to cost at the patient level is intertwined with system capabilities. In its PLICS survey only one community care provider¹ identified having PLICS. Twenty-three respondents (82%) indicated that they had no plans to implement PLICS.

¹The DH groups community service providers ambulance care trusts and PMS together in this survey

There are targeted efforts to improve data quality

In July 2011 the NHS Benchmarking Network released its Phase 12 report benchmarking data from community service providers across England. In total 58 providers contributed data. The community services benchmarking project was initially formed at the request of interested members of the NHS Benchmarking Network. The 2011 report notes this is the most comprehensive data on community services. However the Community Information Data Set has been launched during 2012, which brings together national data on patient treatments conducted in the community. Despite improvements recording of activity and costing of specialist activities remains a significant challenge.

Pilot sites are being used to improve data quality for specialist community services

One example of this is the palliative care pilot sites that will collect cost and activity data over the next two years (commencing April 2012). This data will contribute towards developing a fairer funding system for palliative care. In total, the seven adult palliative care and one children’s palliative care pilot sites covering around 5.4 million people.

Working with sample groups may speed up the benefits from data quality improvement

Working with a smaller group of providers – that have good activity recording and costing processes and systems – may help to get a better understand of the costs of community services. Understanding the resources consumed by patients, in different settings, will be vital to develop reimbursement methods that cross current care-setting boundaries. This may help to deliver improved patient outcomes (through care closer to the home) and improve efficiency.

Appendix 3

Sampling

A smaller sample could improve data quality but at the expense of representativeness. Reference Costs are very representative but have questionable data quality in some areas

Trade-off between data quality and sample size

There is a trade-off between high quality data and representativeness of provider characteristics. A large sample has the advantage that it covers the full HRG catalogue and all types of provider characteristics, which may influence cost. A small sample has the benefit that only hospitals with comparable and sophisticated cost accounting systems can be included. The quality of cost data obtained from a sample would therefore be higher.

Schreyogg (2006)¹ identified four approaches to solving the problem of trading off between data quality and sample size:

1. Stratified sampling to cover provider characteristics – eg the Netherlands
2. Strict cost accounting standards – eg Germany
3. Compulsory cost accounting system – eg Spain
4. All hospitals participate in the sample – eg England

We have recommended that Monitor move away from collecting cost data from all provider types, to collecting cost data from a small sample that can meet data quality requirements. Stratifying the sample can mitigate the problem of representativeness, but ideally the sample would be broadened over time to include more providers.

How they do sampling other countries

In several European countries the regulator collects cost data from a sample of hospitals. For example in Germany in 2010, InEK (the German health regulator) had 253 hospitals participating in the sample – although 28 of these submissions were rejected due to not meeting the required data quality standard. Also, over one million data records were rejected from submissions of the hospitals that were accepted into the sample group.

Figure A3.1. Sample size across Europe

Country	Number of participants in sample	In context
England	392	100% of hospitals
Germany	332 ²	20% of hospitals
France	99	13% of inpatient admissions
Austria	20	8% of hospitals
Netherlands	20	20% of hospitals
Finland	5	30% of specialised care

Source: EuroDRG Project (2012), InEK for Germany

Incentives for participation in the sample

In Germany hospitals that pass the data quality threshold are paid for their data by the regulator. In 2008, the total value of this compensation was €9m which was shared between the hospitals.

¹ Methods to determine reimbursement rates for diagnosis related groups (DRG): A comparison of nine European countries

² The number of providers in the sample in 2011, which increased from 253 in 2010

From a statistical perspective, a large sample is needed to give reasonable accuracy – but this assuming that the population mean is accurate

How to determine sample size for a normal distribution?

Sample size theory tells us how large a sample we need to estimate the population mean for a desired confidence level. This applies to the normal distribution. Estimating sample size requires three parameters:

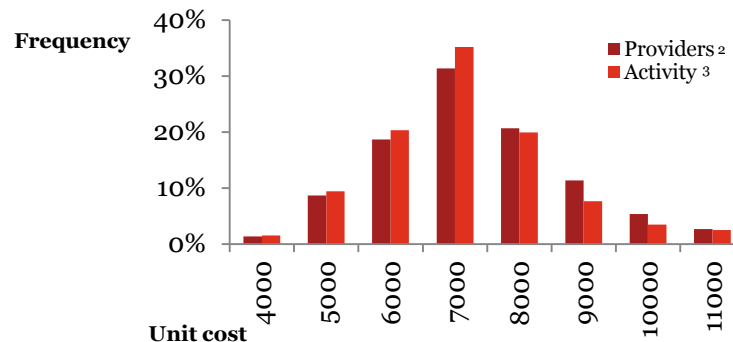
- Determining the desired precision of results (or margin of error)
- Determining the confidence level
- Estimating the degree of variability

Sample size formula for normal distribution

n = sample size	$n = \left(\frac{P(1-P)}{\frac{A^2}{Z^2} + \frac{P(1-P)}{N}} \right)$
N = population size	
P = variance in the population	
A = error margin	
Z = confidence interval	

Although the statistical approach to choosing sample size is appealing in its robust methodology, there are flaws with this approach. The intrinsic assumption is that including more providers increases the accuracy of our estimates. However, a larger sample is only better for accuracy if all providers are using a consistent methodology. In fact a smaller sample could improve the accuracy of cost estimates if all participants used a consistent methodology.

Figure A3.2. Normal unit cost distribution: HA12C Major Hip Procedures¹



Example

There are 150 observations for the hip procedure HRG shown in Figure A2.2. Assuming the normal distribution formula applies, a sample size of 59⁴ would be required to accurately estimate the population mean for our desired level of significance. A greater significance level, or smaller error margin would require an increased sample size.

Methodology notes:

¹The HRG have been filtered so that only costs from the same care setting are included. For HA12C the data is filtered according to non-elective services provided in trauma & orthopaedics

²“Providers” is the count of providers who perform the HRG within the unit cost bracket

³“Activity” is the count of activity within the unit cost bracket. All the activity for each provider falls in the same cost bracket since unit costs are reported as an average only

⁴Estimated using the following parameters: 95% confidence, +/-10% error margin and 50% variance in the population

An alternative approach to choosing the sample size is identifying which providers are essential to include such that there is good coverage of activity or rare HRGs

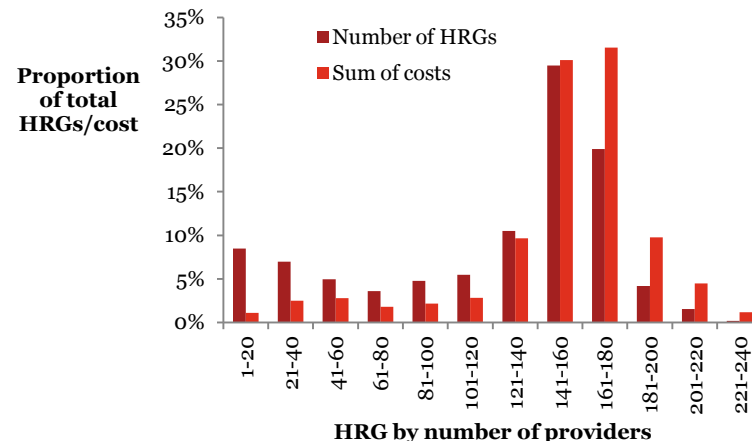
Ensuring sufficient coverage

Important providers: Some providers account for a disproportionate share of costs, all HRGs and “rare” HRGs. (We have defined rare HRGs as those with 20 or less providers.) Monitor should consider mandating that these providers, typically teaching hospitals, participate in the sample. If the 10 providers shown in Figure A3.3 were included in the sample, this would cover 11% of total costs, 98% of HRGs and 75% of rare HRGs.

Figure A3.3. Coverage of HRGs by top 10 providers by cost

Provider	Top 10 by cost?	Top 10 by HRGs?	Top 10 “rare” ¹ HRGs?
Trust 1	✓	✓	✓
Trust 2	✓	✓	✓
Trust 3	✓		
Trust 4	✓	✓	✓
Trust 5	✓	✓	✓
Trust 6	✓	✓	✓
Trust 7	✓		
Trust 8	✓	✓	✓
Trust 9	✓		✓
Trust 10	✓	✓	✓
Proportion of total	11%	98%	75%

Figure A3.4. HRGs grouped according to number of providers



Rare HRGs: 8% of HRGs are rare, although this only represents 1% of cost as shown in Figure A3.4. If Monitor wished to include all the data points for the rare HRGs this would require data from 192 providers. Alternatively, if Monitor required at least one data point on each of the rare HRGs this would require only 15 providers (since rare HRGs are concentrated in specialist providers).

¹ To calculate the providers with the greatest coverage of rare HRGs, each HRG was scored according to one divided by the square root of its number of providers. Providers were then scored according to the sum product of its HRG scores and activity by HRG (ie providers with lots of activity of rare HRGs received a high score).

Stratifying the sample group according to provider characteristic could mitigate the need for large sample sizes. But this must be balanced with improving the consistency of the methodology

Choosing a sample to get coverage of rare HRGs may not deliver sufficient coverage of provider characteristics

We built a mock sample group to consider the characteristics that a sample group selected on the basis of being a PLICS user and covering a wide range of HRGs.

As shown in Figure 3.5, even with a small sample of 30 trusts selected in this way, the sample would cover 90% of the SHA regions and 29% of total costs of the acute sector. However, selecting participants according to this methodology may lead district general hospitals to be underrepresented.

Figure A3.5. Sample characteristics based on targeting HRG coverage

	Small sample	Medium Sample	Large sample
Proportion of acute trusts	20%	30%	40%
Number of trusts	32	49	65
Regions covered	90%	100%	100%
Teaching hospitals	20	20	20
Specialist hospitals	12	25	25
District general hospitals	0	4	20
With or implementing PLICS	32	49	65
Proportion of cost	29%	37%	47%

This sample group was selected by:

- Set the overall number of trusts to include
- Only include trusts with or implementing PLICS
- First target teaching hospitals
- Second target specialists
- Third target district general hospitals

A fully stratified sample would need to take into account a wide range of provider characteristics

A range of hospital characteristics may be causing legitimate variation in cost. A fully stratified sample may need to include the following strata (in proportion to the representation of these characteristics in the full population):

- Hospitals from each SHA region
- Teaching hospitals
- Metropolitan and rural hospitals
- PFI hospitals
- District general hospitals
- Speciality hospitals
- Reflect a range of quality outcomes (or the quality outcomes that Monitor expects providers to be meeting)

Balancing consistent methodology, provider characteristics and HRG coverage

A consistent methodology, full HRG coverage, and a range of provider characteristics are aspects of cost information that would help Monitor to set prices. But achieving all three simultaneously may be difficult to achieve in the short-run.

One way to reduce the need for full HRG coverage is to remove national prices for very rare HRGs. Instead these could be negotiated locally. Also in the dual running period (Reference Costs and the sample are used to inform pricing), it may be acceptable to initially sacrifice provider characteristics whilst a consistent methodology is established. Over time the sample could be broadened and would become more representative.

Appendix 4

International Comparison

Appendix 5: Other countries

A sampling approach to cost collection is widespread across Europe

Germany, France, Austria, the Netherlands, Finland, Australia are example of countries that use a sampling approach to collecting cost data for setting prices. It is common practice to exclude the costs associated with some services such as teaching and research. In some countries, for example Germany, submitted data that does not meet the required quality threshold is rejected and not used for price setting. Also, in other countries such as Australia (Victoria) a bottom-up/patient-level approach to costing is mandatory.

England



- **Size of sample:** All Foundation and NHS Trusts from 2011/12 collection
- **Cost allocation:** Top-down as minimum standard
- **Excluded costs:** Teaching, research and development, private income
- **Assurance:** One-off review by the Audit Commission of Reference Costs



- **Tariff calculation lag time:** 3 years
- **Number of HRG equivalents:** 1,534
- **Healthcare expenditure:** 9% GDP (secondary care 5% GDP)

Germany



- **Size of sample:** 332 hospitals, self-selection with financial incentive (although teaching hospitals encouraged to participate)
- **Cost allocation:** Bottom-up
- **Excluded costs:** Teaching and research; capital costs, interest
- **Assurance:** Validation for all submitted data by the regulator, data not meeting required quality threshold rejected from sample group



- **Tariff calculation lag time:** 2 years
- **Number of HRG equivalents:** 1,200
- **Healthcare expenditure:** 11% GDP

The Netherlands



- **Size of sample:** 15 – 25 hospitals, stratified by provider characteristic
- **Cost allocation:** Bottom-up
- **Excluded costs:** Teaching and research
- **Assurance :** No external validation for submitted data



- **Tariff calculation lag time:** at least 2 years
- **Number of HRG equivalents:** 30,000 (reducing to 4,000 by 2013)
- **Healthcare expenditure:** 11% GDP

Australia (Victoria)



- **Size of sample:** All hospitals
- **Cost allocation:** Bottom-up
- **Excluded costs:** Research, training and medical education
- **Assurance:** Data quality review by government body



- **Tariff calculation lag time:** 2 years
- **Number of HRG equivalents:** 760
- **Healthcare expenditure:** 9% GDP

Appendix 5

Reference documents

Audit Commission quality checklist and HFMA Clinical Costing Standards

Figure A5.1. Audit Commission Reference Cost Quality Checklist

Checklist to improve the quality of reference costs	
1 Total costs	<ul style="list-style-type: none"> Is the total cost quantum correct? Has the guidance on standard adjustments been correctly applied?
2 Sense check	<ul style="list-style-type: none"> Has a simple sense check been completed? Are unit costs under £5 and over £50,000 justifiable? Do other unit costs seem correct? Are the reasons for outliers documented and signed off?
3 Checking against other sources	<ul style="list-style-type: none"> Has the activity information used in the reference costs submission been reconciled to other sources, such as Hospital Episode Statistics (HES) or contract monitoring information? Has the reference costs submission been compared with last year's, particularly the reported unit costs? Are the reasons for outliers documented and signed off?
4 Benchmarking	<ul style="list-style-type: none"> Has the previous submission been benchmarked against national data, both for individual unit costs and for activity volumes? (This information is available in the Audit Commission's National Benchmark.) Are the reasons for outliers documented and signed off?
5 Non-PAS systems	<ul style="list-style-type: none"> Where non-PAS systems are used is there a consistent and robust approach to accessing and producing information in the currency required for costing?
6 Known data quality issues	<ul style="list-style-type: none"> Where data quality is known to be poor, is there a suitable approach to producing activity and cost information? Is there a plan in place to address the poor data quality?
7 Documentation	<ul style="list-style-type: none"> Are there documented processes in place for completing reference costs submissions? Have the areas of difficulty been adequately explained? Has this been tested and signed off?
8 Reporting and clinician engagement	<ul style="list-style-type: none"> Is costing information routinely reported to clinicians and other service leaders? Are they supported in using this information to run their departments? Are the implications of poor data quality on funding understood?
9 Board engagement	<ul style="list-style-type: none"> Is the reference cost index (RCI) reported to the board, with suitable information on the implications of changes and national performance? Is the board updated on known data quality issues and the work to resolve them?
10 PCT engagement on non-tariff	<ul style="list-style-type: none"> Is the PCT properly engaged in the non-admitted patient care, non-tariff parts of reference costs when they underpin local contracts? Is the PCT involved in resolving known issues?

Source: Audit Commission

Figure A5.2. The Clinical Costing Standards

- **Standard 1**
Classification of direct, indirect and overhead costs
- **Standard 2**
Creation of cost pool groups and cost pools
- **Standard 3**
Allocation of costs
- **Standard 4**
Allocation of costs into fixed and variable categories
- **Standard 5**
Work in progress (no standard issued)
- **Standard 6**
Treatment of income
- **Standard 7**
Treatment of non-patient care activities
- **Standard 8**
Data integrity
- **Standard 9**
Quality assessment and measurement (MAQS)
- **Standard 10**
Audit

Source: HFMA Clinical Costing Standards 2012/13

Glossary

Term	Definition
Acute care	Short-term medical treatment, usually in a hospital, for patients having an acute illness or injury or recovering from surgery.
Acute trust	A legal entity/organisation formed to provide health services in a secondary care setting, usually a hospital.
Block contracts	Block contracts usually involve a fixed sum to purchase a defined set of care services during a given period. More sophisticated block contracts have payments determined based on the achievement of quality outcomes and / or the level of activity undertaken. It is the current method of funding around one-third of acute care, two-thirds of mental health care and ninety per cent of community services.
Community services	Locally-based health or social care services provided to patients in and around their home.
Currency	A unit of healthcare activity such as spell, episode or attendance. Under PbR, currency is the unit of measurement by which the national tariff is paid. Admitted patient care healthcare resource groups (HRGs) are an example of PbR currency.
Finished Consultant Episode (FCE)	An FCE or episode of care is a completed period of care of a patient using an NHS hospital bed, under the care of one consultant within one healthcare provider. If a patient is transferred from one consultant to another, even if this is within the same provider unit, the episode ends and another one begins. (Audit Commission)
Foundation Trust	NHS Foundation Trusts are NHS Trusts that have achieved independent legal status or public benefit corporations. They have unique governance arrangements and are accountable to local people, who can become members and governors. They are free from Government control and are not performance managed by health authorities. They are overseen by Monitor.
Healthcare Resource Group (HRG)	The currency for the admitted patient care tariff based on standard groupings of clinically similar treatments which use similar levels of healthcare resource.
Hospital Episode Statistics (HES)	Hospital Episode Statistics (HES) is the national statistical data warehouse for England of the care provided by NHS hospitals and for NHS hospital patients treated elsewhere.

Glossary

Term	Definition
MAQS	Materiality and Quality Score (MAQS) are a way of measuring the sophistication of the methodology of allocating costs to individual patients. The MAQS toolkit has been developed by the HFMA.
National Tariff	The nationally mandated schedule of prices under PbR, for a unit of healthcare activity. Tariffs are published by the DH each year.
PAS	Patient administration system (PAS) is an electronic system for recording, storing and analysing patient information.
Patient-level costs	Patient-level costs are calculated by tracing resources actually used by a patient and the associated costs by using actual costs incurred by the organisation in providing a service or event.
Payment by Results	Payment by Results is an approach to reimbursing providers on the basis of activity undertaken, in accordance with national rules and a national tariff. This was first introduced to pay for certain acute care services in the NHS in 2003/04.
PLICS	Costing system which produces costs at the patient level. Patient-level costs are calculated by tracing resources actually used by a patient and the associated costs by using actual costs incurred by the organisation in providing a service or event. (DH)
Providers	The term providers covers all organisations who either currently, or in future, may provide services within the scope of PbR, including: NHS Acute Trusts, NHS Foundation Trusts, Mental Health Trusts, Consultants, Independent Sector Providers, Primary Care Practices, GPs, Pharmacies, community services, social services and the voluntary sector.
Reference Costs	Reference Costs are the average cost to the NHS of providing a defined service in a given financial year. NHS Health Care Providers are mandated to provide annual Reference Costs data (for a wider range of services) to the Department of Health. Reference Costs have been collected annually since 1998.
Reimbursement system	The term used to describe the collection of different reimbursement mechanisms (PbR, local tariff and block contracts) that are used to reimburse NHS-funded secondary care.
Spell	The period from the date of admission of a patient into hospital until the date of discharge, which may contain one or more episodes of treatment.

References

Audit Commission (2011)
Improving Coding, Costing and Commissioning

Bailey and Moore (2012)
Chemotherapy Costing and Tariff Development Project

Christopher S. Chapman and Anja Kern (2010)
Costing in the National Health Service: from reporting to managing

Department of Health (2011, 2010)
PLICS Survey

Department of Health (2011)
PLICS and Reference Costs Best Practice Guide

Department of Health (2012)
NHS Costing Manual

Department of Health (2012)
PLICS and reference costs best practice guidance for 2011-12

Department of Health (2012)
Reference Cost Guidance for 2011-12

EuroDRG Project (2011)
Diagnosis-Related Groups in Europe: Moving towards transparency, efficiency and quality in hospitals

Finkler (2007)
Essentials of Cost Accounting for Health Care Organizations

Frontier Economics (2012)
A methodology for approving local modifications to the national tariff

HFMA (2012)
Acute Health Clinical Costing Standards 2012/13

HFMA (2012)
Mental Health Clinical Costing Standards 2012/13

Monitor (2012)
Detailed Guidance for External Assurance on Quality Reports 2011/12

National Cancer Action Team (2011)
National Cancer Peer Review Programme Report 2010/11

Ofcom (2008)
The Ofcom Metering and Billing Direction

PwC (2012)
Evaluation of the reimbursement system for NHS-funded care

Schreyogg (2006)
Methods to determine reimbursement rates for diagnosis related groups (DRG): A comparison of nine European countries

Tan et al (2009)
Comparing methodologies for the cost estimation of hospital services

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