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Research Report
Cost Variability in Health Care

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Executive Summary

The National Reference Cost Exercise (NRCE) imposes a requirement on all NHS Trusts to report their costs for a comprehensive range of healthcare activities. The resulting Index (NRCI) ranks Trusts on their relative cost efficiency. In 1998 Trusts' results ranged from 33% below average to 62% above average. By 2002 this range had increased to 39% below average up to 99% above average, suggesting that variability remains a key feature of this cost data. The NHS Executive has stated that they will use the Index to guide resource allocation and to establish differential targets for efficiency improvements. In addition, national average reference costs are now to form the basis for setting standard price tariffs for health care purchasing (see: DoH, 2002b; p14). However, before NRCE information can be used for these purposes, the causes of cost variability should be clearly understood to ensure that inappropriate decisions are not made.

This study aims to identify, explore and elucidate the factors that contribute to cost variability within the NRCE. The research indicates that many complex and diverse factors contribute to cost variability, firstly caused by differences in:

Costing approaches:

- Cost allocation practices
- Production methods for costed 'care profiles'.

Underlying clinical activities:

- Casemix between Trusts that are not taken into account within HRG measures
- Length of stay (and its impact on excess bed-day costs) between Trusts (where LOS reflects casemix).

Information quality:

- Counting of activity (Finished Consultant Episodes, or FCEs)
- Clinical coding practices
- Data collection capacity of Trusts' information systems.

Secondly, efficiency differences themselves have several dimensions: the unit cost of resources (e.g. salaries vary geographically); hospital running costs (infrastructure and overheads); and clinical practices that drive cost. There will be differential relationships between these aspects of efficiency and costing approaches, clinical activities and information quality. Preliminary evidence indicates that all of these factors have a significant impact (reflecting up to 13% of the unexplained variability within categories). Inconsistencies in clinical coding appear to be a major source of cost variability and will be assessed in a further study.

1. Introduction

1.1 Introduction

Improving financial management has been central to successive governments' programmes for reform of the health sector. Since the 1980s, a growing body of literature has examined the nature and impact of these financial management reforms (see, for example, Bourn and Ezzamel, 1986a; Broadbent et al., 1991; Broadbent, 1992; Preston et al., 1992; Armstrong, 1993; Lapsley, 1994; Power, 1995; Hood, 1995; Llewellyn, 1998). There have also been evaluations of the costing initiatives that have informed attempts to enhance financial management (see, for example, Bourn and Ezzamel, 1986b; Bates and Brignall, 1993; King et al., 1994; Ellwood, 1996a, 1996b & 2000; Jones, 1999).

The costing of health care activities has long been recognised as problematic (see for example: Berry, 1970; Lave et al., 1972; Feldstein, 1973; Connell et al., 1996; Ellwood, 2000). Health care costing is complicated by heterogeneous 'products', intricate and varied 'production processes' and complex cost structures, which include a high proportion of fixed or semi-fixed cost that are not easily attributable to individual activities or patients (Coles, 1989; Ellwood, 1992). Despite the challenges it presents, health care costing has grown in prominence over the past decade or more. In particular, once the NHS internal market was introduced in 1991, "costing was in the ascendancy" (ACCA, 2001, p.7). This report builds on previous health care costing research by examining a recent major initiative that has both extended and transformed NHS costing requirements – the National Reference Costing exercise (NRCE).

Six English NHS Trusts were selected as research sites. These included: large teaching hospitals, non-teaching metropolitan hospitals and non-metropolitan hospitals serving more disparate, rural populations. The six sites were spread around England, one in each of the North West, Trent, South West and London regions, and two in the South East.

1.2 The NRCE and cost variability

The NRCE is a high profile costing system introduced in 1998 by the Financial Development Branch of the NHS Executive as part of the Government's health sector reforms. It will provide the largest cost information resource ever made available to support NHS cost management and decision-making. The aim of the NRCE is to produce reliable and comparable cost data ("reference costs") for all clinical treatments across all NHS Trusts and to use this information to pinpoint, and eventually reduce, healthcare cost variability. The underlying assumption is that cost variability, (i.e. where different NHS Trusts report different costs for the same clinical treatment), highlights inefficiency between Trusts.

However, understanding the causes of healthcare cost variability is complex and problematic. Despite the intentions of the NRCE, it is not clear whether the cost information it produces allows NHS managers to identify potential areas for efficiency improvement. Reference cost variability may reflect factors other than efficiency, such as inconsistent costing practices and differences in the nature and complexity of clinical activities captured within the unit costs reported by different Trusts (Department of Health [DoH], 1998b, p.16). It is also probable that differential quality of data capture impacts upon reference cost results, particularly in regard to the counting and coding of clinical activity. The problem for users of NRCE data is that it remains unclear what contribution each of these factors is making to the overall cost variability that is identified.

1.3 Research aims

Understanding the causes of cost variability is essential if NRCE information is to be used for its purposes of benchmarking, cost management and decision-making (DoH, 1998a). This report presents the findings of a study that examined the extent to which cost allocation methods, differing underlying clinical activities and differences in cost efficiency give rise to variability in NHS reference costs. In particular, the following questions were explored:

- Is uncertainty about the causes of reference cost variability a significant obstacle to the use (and usefulness) of NRCE data?
- What factors contribute to apparent cost variability, and what are their relative impacts on NRCE data?
- Is the compilation and use of NRCE data more problematic in regard to medical (as compared to surgical) areas of healthcare activity?

Overall, the study aimed to enhance the decision-usefulness of management accounting information for cost management and control in the NHS.

1.4 Follow-up study

In the course of pursuing the above aims the research identified problems with the counting and coding of clinical activity¹. Overall, the quality of healthcare data capture was a concern both for clinical activities and for costs. Interview and survey evidence gathered in the course of this study suggested that NHS actors involved in compiling and using NRCE data perceived information quality as an important issue. However, these factors have not featured in any DoH discussion of reference cost results, and the extent of their impact on reference cost variability remains unknown. In view of this, the authors are undertaking a further study of clinical activity measurement and coding entitled "Clinical activity data as a source of reported healthcare cost variability". The findings of this further study, will supplement and extend the results of this research. Therefore, this study of cost variability should be considered alongside the findings of the follow-up study. The next chapter outlines all the factors contributing to cost variability identified so far but the precise differential impact of these factors on overall cost variability cannot be pinpointed until the follow-up study has been completed.

1.5 Report structure

This report has the following structure. Chapter Two identifies the major sources of cost variability identified so far. This chapter both provides some preliminary findings on the relative significance of the factors impacting on cost variability and the complexity surrounding their quantification. Chapter Three outlines the nature and aims of the NRCE, providing a context for exploring the issue of variability in the cost figures produced by NHS Trusts. Chapter Four details the methods employed in this study and the sources of research evidence. Chapter Five details key findings of the study, drawing on interview evidence to determine the perceived significance of cost variability as an obstacle to using and interpreting NRCE data. Chapter Six reports on the findings of the survey undertaken to identify key players' assessments of the relative significance of the factors impacting on cost variability. Finally, a concluding chapter reflects on the implications of this study's findings for the current utility and future development of the NRCE.

¹ These issues have been raised by other studies of healthcare organisations (see for example: Benster, 1994; Radical Statistics Health Group, 1995).

2. Explaining Cost Variability

2.1 Background

The problems of constructing the cost of hospital services have been well noted (see for example Ellwood, 1996a & 2000; Jones, 1999). Nonetheless, the National Reference Cost Index (NRCI) claims to present a single figure for each NHS Trust that “compares the actual cost for its case-mix with the same case-mix calculated using national average costs” (DoH, 1998b, p.15). The purpose of this index is to rank NHS Trusts against each other. Accordingly, an index score of 100 is interpreted as ‘average’ cost performance, whereas scores above or below 100 suggest above or below average cost performance respectively, (e.g. a score of 102 indicates costs 2% above the average whereas a score of 98 may indicate a more efficient hospital performance). The figures in Table 2.1 reveal considerable variation within the index. Table 2.1 shows that, for the five years from 1997/98 to 2001/02, more than one in ten Trusts had an NRCI score falling outside +/- 20% of the average. When the margin is reduced to a 10% variation around the average, around 30 – 40% of Trusts lie beyond this range.

Table 2.1: Key National Reference Cost Statistics

	1997/98	1998/99	1999/00	2000/01	2001/02
NRCI results					
NRCI range*	-33% to +62%	-33% to +86%	-37% to +74%	-46% to +112%	-39% to +99%
% of Trusts within 20% of the average (100 score)**	90%	86%	87%	82%	88%
% of Trusts within 10% of the average (100 score)	60%	61%	62%	58%	72%

Compiled from data in: DoH (1998b); DoH (1999c); DoH (2000b); DoH (2001b); DoH (2002a).

* All index statistics presented here are based on the trimmed index adjusted for ‘market forces’ (i.e. differential regional costs). This is the index selected for comment in the published reference cost documents. See Section 3.4 for more on the various NRCE indices.

** This +/- 20% range is highlighted in NHS Executive reference cost publications.

These results suggest that, while that some ‘normal’ (although wide) cost band appears to exist, variation beyond it is considerable². In order for the efficiency improvement aims of the NRCE to be met, it is crucial that differences in costs between Trusts can be understood and appropriately interpreted. However, for users there are problems in interpreting this data. Although the inherent aggregation of information within the NRCI is its *raison d’être* since aggregated information aids comparability and benchmarking across Trusts, this aggregation makes it difficult to pinpoint the causes of cost variability.

² Appendix 2 presents examples of the range of Trusts’ NRCI index results, as presented in the 1998, 1999, 2000, 2001 and 2002 reference cost publications (DoH 1998b, 1999c, 2000b, 2001b & 2002).

While the issue of interpreting healthcare cost differences has been brought to the fore by the introduction of the NRCE, it should be noted that variation in costed HRGs is not new. Ellwood (1999, p.6) observed considerable variation in HRG cost-based prices compiled for internal market purposes since the mid-1990s, although she suggested that, as at 1995/96, published HRG costs seemed to be converging across Trusts. This trend does not appear to have continued into the NRCE era. The extreme cost variability reflected in the NRCE seems likely to reflect underlying difficulties in compiling comparative national indices of this nature. As noted in a recent King’s Fund review of health policy: “The costs vary by very large, indeed unbelievable, amounts, suggesting that although in principle they have been drawn up in a similar way, in practice they have not” (Appleby and Harrison, 1999, p.67).

2.2 Variability in medical and surgical HRGs

It has always been the Government's intention that the NRCE should be comprehensive across all clinical activities: "Much depends on the completeness of reference costs, all services must be included" (HFMA, 2000, p.6). The first round of the NRCE collected cost data for only surgical HRGs, since surgical procedures were generally perceived as more 'standardised' and therefore potentially easier to cost. Since then, the scope of the NRCE has been expanded to include all medical HRGs and, more recently, other specialist and support services.

One initial aim of this study was to examine whether the compilation and use of NRCE data is more problematic in regard to medical (as compared to surgical) areas of healthcare activity. Some interview evidence did reflect perceptions that medical HRGs are more difficult to cost. For example:

"Surgery typically follows a fairly predictable pattern of investigate, diagnose, operate, rehabilitate – where necessary – and home. In medicine, the actual diagnosis may be very complex and there may be multiple diagnoses."

(Interview: Finance Director, a South East NHS Trust, September 2000)

"In surgery it is easier to get the information; it is more routine. The medical HRGs are broader, reflecting that conditions and the people are more variable. So you can produce an average HRG cost in medicine, but it is an average that does not really exist."

(Interview: Cost Accountant, a South East NHS Trust, July 2000)

Yet, published NRCE data continues to point to wide variations in both medical and surgical HRG costs. To illustrate, summary statistics for two HRGs – one surgical and one medical – are shown in Table 2.2. These examples are selected because they have featured in published reference cost documents as illustrative of the large and erratic levels of variability in reported unit costs.

Table 2.2 Illustrative Medical and Surgical HRGs

	1997/98	1998/99	1999/00	2000/01	2001/02
Surgical HRG H02 (primary hip replacement – elective inpatients)					
average HRG cost	£3,678	£3,755	£3,899	£4,179	£4,356
range of HRG costs	£1,834 to £6,494	£213 to £19,960	£480 to £9,337	£566 to £12,907	£2,076 to £8,150
% variation	254%	9270%	1845%	2180%	293%
Medical HRG D15 (bronchopneumonia – non-elective)					
average HRG cost	n/a*	£1,211	£1,287	£1,988	£2,584
range of HRG cost	n/a	£96 to £13,443	£79 to £30,702	£80 to £8,814	£218 to £11,743
% variation	n/a	13903%	38763%	10918%	5287%

Compiled from data in: DoH (1998b); DoH (1999c); DoH (2000b); DoH (2001b); DoH (2002a)

* Note: medical HRG reference costs did not appear in the 1997/98 NRCE.

The NHS Executive attempted to explain the cost variation for the medical HRG D15 (bronchopneumonia) as follows:

“Costs can differ due to the different drug regimes required because of the severity of the condition when the patient is admitted, and due to the length of time in hospital” (DoH, 1999c, p.15).

While this explanation points to the likelihood of large HRG cost variations due to inherent case-mix differences, it does not identify the extent to which ‘inefficiency’ might contribute to the very large (13,903%) cost range that year. Especially when the aim of reference cost comparisons is to highlight differences in efficiency. Also, while the problem of cost variability and interpretation appears particularly pronounced in newly collected medical HRGs (such as HRG D15 above), it appears that problems in pinpointing efficiency differences span both medical and surgical areas of healthcare provision. The remainder of this report focuses, therefore, on more fundamental costing issues that impact on the usefulness of the NRCE across all its dimensions.

2.3 Factors impacting on cost variability

At the outset of this research, the authors predicted that cost variability was due to an uncertain combination of differences in: cost efficiency, cost allocation procedures and case-mix complexities. It was proposed that, in order to use reference cost data to identify efficiencies, the impact of cost allocation procedures and case-mix complexities should be assessed. However in the course of the research it became clear that cost variability was more complex than first thought.

This on-going research has pinpointed four sets of issues that impact on cost variability: costing approaches; clinical activities; information quality and efficiency. Within these broad groupings there were a number of contributory factors (see below). If reference cost data is to be used to identify efficiency differences between providers, then the impact of the first three sets of factors must be identified (and, if possible, minimised). When a proposal for this research was put forward it was not clear that issues pertaining to information quality were impacting on reported cost variability. Hence, the information in this report should be read in conjunction with the results of a forthcoming follow-up study on the coding of clinical activity (referred to in Chapter One). The factors contributing to cost variability are summarised below and then discussed in some detail in the sections that follow.

Differences in costing approaches:

- Variations in cost allocation practices
- Differences in the way in which costed ‘care profiles’ (or ‘bottom-up’ costings) are produced.

Variations in underlying clinical activities:

- Variations in case-mix between Trusts that are not taken into account within HRG measures
- Variations in length of stay (LOS) between Trusts, and its impact on excess bed-day costs (where LOS reflects case-mix).

Issues of information quality:

- Differences in the counting of activity (FCEs)
- Differences in clinical coding practices
- Variations in the data collection capacity of Trusts’ information systems.

Efficiency differences:

- Differences in the per unit cost of resources used between Trusts (i.e. direct costs such as salaries & wages, consumables etc.)
- Differences in running costs for hospital facilities (i.e. fixed, infrastructure costs and overheads)
- Variations in the clinical practices that drive cost.

2.3.1 Cost allocation—standardising the approach has produced more variation

It is not easy to standardise costing practices for activities as complex as health. One difficulty lies in cost allocation approaches, and it is not a new problem. Prior to the 1998 introduction of the NRCE, hospitals had produced full-cost HRG data for pricing purposes within the then quasi-competitive funding regime, yet commentators noted that these full-cost prices were “neither reasonable measures of resource consumption nor permitted meaningful comparisons between alternative providers” (Ellwood, 1999; p.8)³.

One problem at that time was that NHS Trusts costed their HRGs based on budgeted costs, allowing for a level of subjectivity in cost estimates. Since 1998, Trusts have been required to use retrospective, actual cost information and engage in a “continuous reconciliation process at all stages of the costing process” (DoH, 1999b; p.8) to match actual costs with published accounting statements. Also, considerable flexibility existed in the cost allocation approaches used prior to the introduction of the NRCE. Since healthcare costs inherently include a high proportion of indirect and overhead costs (Ellwood, 1996b), problems ensued in defining full costs on a consistent basis (Ellwood, 1996a and 1999; Jones, 1998).

³ See Ellwood (1996a & 1996b) and Jones (1999) for more on NHS costing developments prior to the NRCE.

The issue of cost allocation was brought to the fore with the introduction of the NRCE and its corresponding requirement for increased standardisation in costing procedures across all NHS Trusts. An existing NHS "Costing for Contracting Manual" (DoH, 1994) was used as the basis for compiling cost data for the first 1997/98 NRCE, but was soon replaced by "The New NHS Costing Manual" (DoH, 1999b) in an attempt to standardise procedures. As noted in the foreword to the new document: "We need an approach to costing that both retains the flexibility to meet local needs, but ensures sufficient consistency across all NHS Trusts to allow robust comparisons.... Building on best practice and drawing on the lessons learnt from the first Reference Cost exercise, [this new costing manual] introduces a more standardised approach to the treatment of costs and activity and through this seeks to improve comparability in cost information..." (DoH, 1999b, p. 2).

However, the expectation that a more standardised approach would reduce cost variability, (as the opportunity for using differing cost allocation methods was removed), was not met in actual cost results. Variability increased in the reported 1999 figures and has shown little sign of reduction since (see Chapter Four for interview data on this).

2.3.2 Costed care profiles or "bottom-up" costings

It is impossible to measure the actual cost of every procedure performed in a hospital. Therefore, "costed care profiles" identify a standard per unit (or per FCE – "finished consultant episode")⁴ cost for a healthcare procedure. There are usually several procedures grouped together within any one HRG code, so an HRG reference cost comprises a weighted average of the procedure costs (i.e. costed care profiles) within that HRG category. Table 2.3 shows how one Trust calculates an HRG cost from the costs of its composite procedures.

Table 2.3: Calculating an HRG unit cost from the composite procedure costs

HRG HO2	FCEs (Elect. IP)	Procedure cost £	Total cost £
Procedure: H02/D/W371	356	2,573.40	916,130
Procedure: H02/D/W381	42	2,620.25	110,051
Procedure: H02/D/W391	46	2,409.59	110,841
Procedure: H02/D/W461	1	3,384.70	3,385
Procedure: H02/D/W471	1	3,459.31	3,459
TOTALS	446		1,143,866
Unit HRG cost as shown in Reference Costs			2,564.72

Source: a Trust's Finance Department NRCE working papers, October 2000.

In constructing each costed care profile, any identifiable direct cost is traced to procedures (for example the cost of expensive prostheses), while other costs are pooled and apportioned to procedures based on the consumption of cost driving activities (e.g. length of stay). The more sophisticated the "bottom-up" costing approach, the more an HRG (reference) cost can be thought of as reflecting direct cost causality, rather than an arbitrary process of cost allocation.

Ultimately, the total expenditure represented across all of a Trust's HRGs must be reconciled to the total cost reported in the Trust's final accounts⁵ (DoH, 2001a). However, the apportionment of expenditure across HRGs can differ markedly between Trusts. Table 2.4 shows the difference in approach evident in two Trusts' costed care profiles for the same procedure. Although Trust 2 appears to use a greater number of cost pools, several have "length of stay" (LOS) as their cost driver, so are effectively one cost pool in terms of how they are apportioned. Trust 2 also includes expensive prosthesis costs in "theatre time", rather than tracing them directly to the procedure as happens in Trust 1's costing system. The assumed costs per unit of cost driver and consumptions of cost driving activities differ between the Trusts, and this impacts on cost apportionment (see Section 3 below for a further discussion of LOS effects in particular). And, while Trust 2 does attempt to apportion pathology and physiotherapy costs on the basis of resources (time) consumed, it also uses a catch-all category of "other", allocated somewhat arbitrarily on an LOS basis.

The comparison shown in Table 2.4 suggests that differences in care profiles could contribute significantly to the 10.2% difference in the unit cost for procedure HO2/W371 in these two Trusts. Yet, once aggregated into HRG categories, such calculative differences are masked, making it difficult to assess the impact of costing differences on the NRCE data published and compared between Trusts.

⁴ An FCE is "an episode where the patient has completed a period of care under a consultant and is either discharged or transferred to another consultant" (NHS Confederation, 1999, p.49).

⁵ Final accounts figures used for reconciliation purposes include: full operating expenses, the revenue consequences of capital, allowable costs of reorganisation, profit/loss on disposal of fixed assets, and financing costs (DoH, 2001a, p.3).

Table 2.4: Costed care profiles for procedure W371 within HRG HO2

Trust 1				
Cost Pool	Cost driver	Units of cost driver consumed	Cost/unit £	Cost per FCE £
Ward costs	Length of stay	8.75 days	102.81	899.59
Theatre costs	Average theatre time	135 minutes	5.24	707.40
Prostheses	Direct prosthesis cost	1	1050.00	1050.00
Radiology	Average cost per hour	0.5 hours	105.28	52.64
Admission costs	Number of admissions	1	15.00	15.00
Total cost per FCE (patient episode)				£2,724.63
Trust 2				
Ward costs	Length of stay	8.84 days	137.05	1,211.51
Theatre costs	Average theatre time	2.5 hours	286.7	716.76
Pathology	Weighted average cost	0.5	202.04	101.02
Radiology	Length of stay	8.84 days	3.66	32.32
Physiotherapy	Average hours	4.5	16.32	73.46
Occ. Therapy	Length of stay	8.84 days	4.52	39.99
Cardiomeasure	Length of stay	8.84 days	0.17	1.51
Others	Length of stay	8.84 days	33.41	295.35
Total cost per FCE (patient episode)				£2,471.92

Source: Trusts' Finance Department NRCE working papers, October and November 2000.

Reference cost variability is affected by two factors related to costing approaches: variations in cost allocation practices (anticipated by the authors), and differences in the way in which "costed care profiles" (or "bottom-up costings") are produced (discovered by the authors during the course of the research). Despite efforts to standardise costing practices across all NHS Trusts, some variation clearly remains.

2.3.3 Casemix

Since HRGs comprise a number of separate procedures grouped together, Trusts may differ in the nature and complexity of the activity 'case-mix' reflected within their NRCE data. Within many HRG groups, there may be variations between Trusts in the proportion of different procedures. (See for example Table 2.5 below, which shows one procedure making up 77%, 80% or 90% of an HRG activity within three different Trusts.) Or, even within a procedure, Trusts may experience different case-mix characteristics. For example, a specialist Trust or teaching hospital may take on more complex cases than those dealt with by a general district hospital within the same procedure code and/or HRG. This feeds through directly to reported reference costs, as illustrated by a Finance Director of one specialist paediatric Trust who noted that "we are very high cost with everything grouped into a very few HRGs". Aside from specialist referrals, inherent characteristics of a Trust's own local population (e.g. social deprivation and/or demographic characteristics) can impact on case-mix at even non-specialist hospitals.

2.3.4 Variations in length of stay

Documentary evidence from NHS Trusts revealed that length of stay [LOS] can vary significantly between Trusts, not just within HRG categories, but even for individual procedures within an HRG. For example, Table 2.5 shows a comparison of 1999/2000 activity data from three of the studied Trusts, for procedure W371 within HRG category H02 (Primary Hip Replacement)⁶.

Table 2.5: LOS data for procedure W371 within HRG H02 (Primary Hip Replacement)

	Trust 1	Trust 2	Trust 3
Number of FCEs for procedure code W371	356	157	103
% of H02 activity made up of procedure W371	80%	77%	90%
Average length of stay for Elective (waiting list) inpatients	8.84 days	9.84 days	8.75 days
Average length of stay for non-Elective (emergency) inpatients	11.89 days	12.73 days	13.43 days

Source: data compiled from Trusts' Finance Department NRCE working papers, September 2000.

In all three of these Trusts, procedure W371 represented the majority of activity within HRG code H02. All of these patients are recorded as having received similar treatments that are expected to consume similar resources. Therefore, there is no obvious reason why the average patient length of stay (LOS) should vary between these Trusts from 8.75 days to 9.84 days for elective inpatients (a 12.5% variation), and from 11.89 days to 13.43 days for emergency inpatients (a 12.9% variation).

It may be that the complexity of type W371 hip replacements performed by the higher LOS Trusts is somehow greater, leading to longer patient recovery times. Or, it may be that clinicians' discharge decisions are impacting on the LOS and the procedure cost within the three Trusts. It is impossible to determine the reason for these differences in LOS (and corresponding cost) based on NRCE data alone, so interpretation of the relative "efficiency" of these three Trusts is problematic.

For the purposes of compiling NRCE cost data, maximum lengths of stay are identified for each HRG category. Any bed-days above and beyond this "trimpoint" are shown and costed separately in NRCE data as "excess bed days". The 1999 reference cost publication noted:

"Although by their nature these "excess bed days" are exceptional, they are important in considering performance. NHS Trusts and commissioners will want to examine the impact that these exceptional areas have. In particular they may consider: the proportion of bed days and costs that exceed the trimpoint, particularly where this exceeds 10% of total HRG costs; whether this is more or less than expected; whether this reflects the difficulty and complexity of cases; variations in clinical practice; or the effectiveness of whole system working and the interface with social care."
(DoH, 1999c, p.7)

As noted here, trimpoints come into effect only in cases where LOS significantly exceeds normal expectation, and would not eliminate LOS variability at the level observed in Table 2.5, for example. The national trimpoint for HRG H02 is 22 days (DoH, 2000; Annex 3), so all three Trusts shown in Table 2.5 are well within this limit for procedure W371. The cost variability caused by their different lengths of stay would therefore be reflected in their reference cost for HRG H02. However, even taking into account the "exceptional" nature of excess bed days occurring beyond established trimpoints, they are a significant feature of NRCE information. The 1999 reference cost publication (DoH 1999c) reveals that 27% of Trusts had excess bed day costs exceeding 10% of their total cost, in some cases by as much as 20-30%.

The DoH (1999c, p.7) notes that variations in LOS may have a variety of causes. The time a patient spends in a hospital bed is usually related to the severity of their condition or the complexity of their treatment. So, as the quote above acknowledges, varying lengths of stay may be a function of a Trust's case-mix and, understandably, clinicians do not always accept the suggestion that patient LOS can be 'managed' as a means of improving cost efficiency.

⁶ Only 3 of the studied Trusts had 1999/2000 NRCE data available at the time of collecting this information.

2.3.5 The counting of clinical activity

Whatever the historical or accidental causes of these differences, it is clear that Trusts vary in the number of FCEs they recognise per average patient admission. Statistics generated by the National Casemix Office (NCMO, 2000) show average FCEs: admissions ratios ranging from 1.0 up to 1.30 for large, apparently comparable Trusts. Table 2.6 illustrates selected results for the six Trusts forming the focus of this research. It reveals an almost 9% difference in activity counting that would have impacted on NRCE data.

Table 2.6 Average ratio of FCEs to admissions for the six studied Trusts

	Total FCEs	Total admissions	FCE: admissions ratio
1	39,283	38,651	1.016
2	56,035	53,842	1.041
3	38,422	36,355	1.057
4	81,216	76,787	1.058
5	22,162	20,832	1.064
6	53,876	48,649	1.107
	% variation		8.96%

Such variations between Trusts in FCE counting practices mean that some degree of variation in NRCE data may reflect denominator activity rather than cost efficiency. Trusts' overall index (NRCI) scores, and their National Schedule of Reference Costs (NSRC) results for individual HRGs, would be affected by differences in recorded activity levels. Another factor noted in interviews as impacting on individual HRG costs is the way in which activity is coded to procedure and HRG categories. This is discussed next.

2.3.6 The coding of clinical activity

Each FCE recorded in a Trust must be coded to its relevant procedure code. This task is undertaken by a Trust's 'clinical coders' who draw their information either from patient summary sheets completed by clinicians, or directly from patient notes. Since procedure codes form the foundation of HRGs, the reliability of NRCE data depends upon the accuracy of clinical coding in correctly identifying the composition of healthcare activities performed by a Trust.

Concerns over the reliability of clinical coding appear to be supported by results from a recently instituted examination for coders set by the Institute of Health Records & Information Management. This examination, consisting of a practical paper and a theory paper, is intended to assess coders' ability to code fairly straightforward cases. Although coders must have a minimum of two years' coding experience before taking this examination, failure rates to date have been high. Candidates must achieve a score of 85% in order to pass; only 50% of candidates have achieved this⁷. The coding examination is set only once a year and candidates who fail must wait three years before retaking the examination. In the meantime, they can continue to work as hospital coders. The implication of the poor examination pass rate is that inconsistency in clinical coding may have a significant impact on apparent variability in NRCE data.

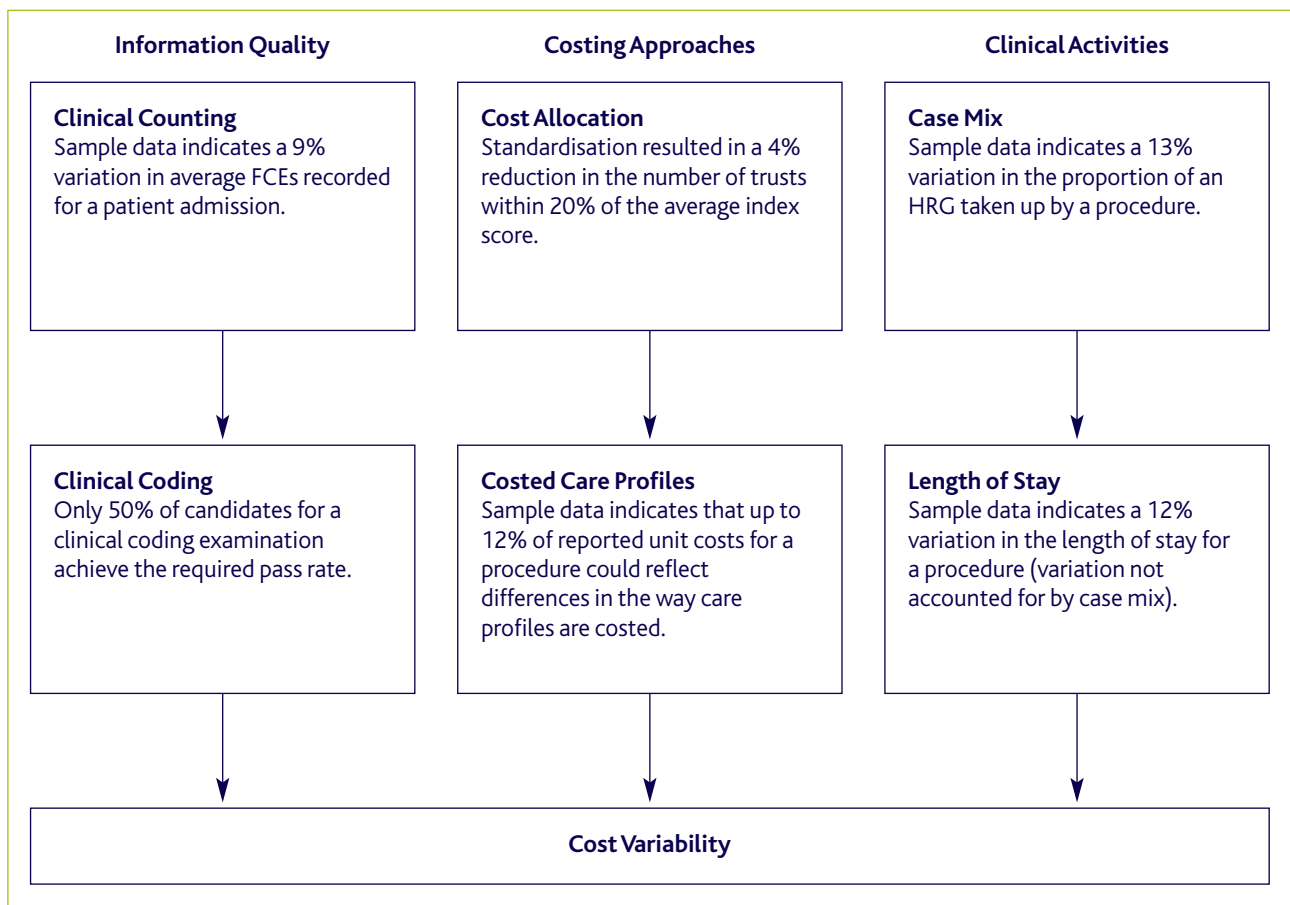
2.3.7 Information systems

Trust accountants draw on diverse information systems throughout their organisation to compile the data necessary for reference costing. In the first instance, they draw on the Trust's general ledger accounting system to identify the high-level aggregate costs that are to be reflected within HRGs. Then information on cost driving activities such as admissions, theatre time, days of bed-stay, diagnostic tests, pharmacy prescriptions and the use of prostheses must be gathered from hospital information systems. This research revealed a surprising lack of consistency in the capacity of Trusts' information systems to furnish timely and relevant information for reference costing (see Section 5.8). Since the NRCE aims to produce comparable and consistent cost data across NHS Trusts, the apparent diversity in the information systems informing this process is a cause for concern. And, given the substantial investment that would be required to standardise and improve NHS information systems, it is an issue that seems likely to contribute to variability in NRCE results for some time to come.

⁷ This 50% figures is based on interviews with clinical coders carried out in 2001 and 2002 and refers to outcomes in the first two or three years of the exam being held.

2.4 Summary

The factors contributing to cost variability have proved to be both more diverse and more complex than anticipated. Moreover, so far as the prime focus of the study- cost allocation procedures- is concerned the impact of standardisation has been counter-intuitive, tighter rules have resulted in greater reported cost variability. Consequently it has not yet been possible to fully quantify the impact of the various factors. However some preliminary indications are given in the diagram below. These initial findings will be supplemented further once the results of the follow-up study into clinical coding become available.



This diagram indicates the complexity of the factors impacting on cost variability. Survey evidence of the assessments made by key participants in the compilation of reference cost data also points to this complexity. The survey also provided confirming evidence that each of the factors above had a significant impact (i.e. that there is no very clear ranking in terms of the relative importance of these factors).

Three distinct sources of cost variability are shown above. Differences in costing approach; variation in clinical activity and the issue of information quality. Within each of these three sources, the amount of variability introduced by the two factors in each case is likely to be cumulative, e.g. diversity in cost allocation will affect costed care profiles, but costed care profiles introduce another independent source of cost variability. For issues of information quality, again the impact is likely to be cumulative, but further evidence will be available for this source of variability after the follow-up study is complete.

3. Outline of the National Reference Costing Exercise

3.1 Introduction

The 1997-elected "New Labour" government, in undertaking to create a "New NHS", sought to make NHS activity transparent and to improve accountability for expenditure (Department of Health [DoH], 1997). The National Reference Costing exercise (NRCE) was introduced in 1998 by the NHS Executive and formed part of this drive to create a "New NHS".

The NRCE imposes a requirement on all English NHS Acute Hospital Trusts⁸ to report their costs, on a consistent basis, for a comprehensive range of healthcare activities. These activities are categorised within Healthcare Resource Groups (HRGs), the costs of which are calculated retrospectively based on actual costs incurred by Trusts (DoH, 1997b). The NHS Executive's Financial Development Branch prescribes costing procedures for NHS accountants (DoH, 1999b), in an effort to ensure consistency in the compilation of NRCE data (Appendix 1 shows the costing process). The HRG costs for all Trusts are then published, along with indices that rank Trusts on the basis of their relative "cost efficiency".

As the "cost objects" within NHS Trusts, HRG categories are central to the production of NRCE data. Before considering the aims of the NRCE, it is useful to reflect on how HRGs have been developed and used as a basis for producing the unit cost information that forms the basis of the NRCE.

3.2 Healthcare Resource Groups (HRGs)

NHS Healthcare Resource Groups (HRGs) are a variation of Diagnostic Related Groups (DRGs), developed in the USA for pricing healthcare services. The NHS Executive describes HRGs as follows: "HRGs are nationally defined, by the National Casemix Office⁹, and group together treatments that are clinically similar, consume similar quantities of resources and are likely to be similar in cost." (DoH, 1998a, p.4). Each HRG combines a number of different clinical procedures. Patient episodes are coded to these procedure categories by clinical coders working within Trusts, following international guidelines (the International Classification of Diseases [ICD-10]) and a national coding system (the Procedure Classification of the Office of Population Censuses and Surveys [OPCS 4]).

At the introduction of the NRCE, the NHS Executive explained why reference costs would use HRGs as a basis for reporting and comparing healthcare costs: "Costs will be influenced by the type of patient treated and the nature of the treatment given. For this reason ... [the NCRE] is based on Health Resource Groups (HRGs). These give a national standard framework for adjusting for differences in case-mix – defined by clinicians not accountants ..." (DoH, 1998b, p.3; emphasis added)

Clinicians played a key role in setting up the HRG classification system in the UK. They contributed to developmental studies in the early 1990s in which they advised on how special case work might be divided into treatment groupings, (or 'conditions'), to sensibly represent the main categories of clinical work. These categories then formed the basis for HRGs. There was an expectation that the involvement of clinicians would ensure that healthcare professionals would view HRGs as a legitimate and meaningful way of recording clinical activity (Jones, 1998). There is evidence the system has indeed gained considerable acceptance (NCMO 1997a and 1997b).

The use of HRGs as a basis for costing is not new. Prior to the introduction of the NRCE, NHS Acute Hospital Trusts were already experienced in using HRG costing as a basis for price-setting within the previous competitive, market-based NHS framework (Lapsley, 1994; Ellwood, 1996a, 1996b & 1999; Jones, 1999). However, since 1998, the inception of the NRCE has developed costed HRGs as a basis for benchmarking between different hospitals.

The scope and detail of costed HRG data presented as reference costs has been expanding, with the range of services for which reference costs must be reported is growing each year (see DoH, 2002a; p.2). In some areas, such as community and mental health, reference costs are extending even beyond existing HRG categories, making them relatively uncharted territory in costing terms. It is intended that by 2004 the NRCE will provide comprehensive cost data across all non-primary health care activities within any mode of service delivery (e.g. elective and emergency inpatients, day cases, outpatients, critical care, accident and emergency, community care) (Interview: NHS Executive, April 2000). The NRCE will then constitute the largest cost information resource ever made available to support NHS cost management and decision-making.

3.3 Aims of the NRCE

The collection and publication of comprehensive healthcare costs in the NRCE had several aims. A consultation document preceding the introduction of the NRCE made clear that reference costs were intended to make the relative cost efficiency of Trusts visible and, hence, bring them to account: "Reference costs will be used to itemise the unit cost of individual treatments across the NHS. By requiring NHS Trusts to publish and benchmark their costs on the same basis Health Authorities, Primary Care Groups [the healthcare purchasers] and the NHS Executive will be given a strong lever with which to tackle inefficiency and differential performance." (DoH, 1998a, p.1). By ensuring accountability for the use of resources, the NHS Executive would be better equipped to inform decision-making for the public health sector.

⁸ To date the NRCE has concentrated mainly on acute hospital Trusts. Although there is currently no plan to include primary care within the NRCE, the collection of cost data is being extended to include Trusts engaged in community care and mental health services.

⁹ The National Casemix Office has since been re-named the Casemix Programme.

Along with this public accountability and monitoring role, an internal management potential was anticipated for published reference costs. Within Trusts, NRCE data was expected to inform benchmarking, and to support cost management by providing NHS Trusts with “the opportunity to identify cost differences and ... understand the reasons behind them” (DoH, 1998b, p.1). It was also expected that the sharing of cost information would help NHS managers and clinicians to work together to identify best practice and reduce “variations in efficiency”, thereby improving “fairness” across the NHS to the benefit of patients (DoH, 1998b, p.1). Outside Trusts, NRCE data was expected to be useful to healthcare commissioners, informing their long-term service agreements with Trusts.

Several forms of NRCE output are produced to meet the aims of interested parties. These outputs are summarised below.

3.4 Outputs of the NRCE

The NHS Executive publishes three information sets from its collection of NRCE data:

- i. The National Schedule of Reference Costs (NSRC),
- ii. The National Reference Cost Index (NRCI), and
- iii. Individual Trust HRG costs.

In addition a CD-ROM contains reference costs for every HRG in every Trust. This allows Trusts and other users to produce customised analyses and reports to suit specific information needs. As well as giving a visible quantification to the range of NHS cost variability, the NSRC and NRCI are designed to facilitate Trust benchmarking (DoH, 1998a, p.8). Nineteen Trust ‘clusters’ are also identified (DoH, 1998a pp. 11-20), so that Trusts operating in similar environments, with a similar case-mix, can benchmark against each other.

The most used information sets are the NSRC and the NRCI. [A compilation of NSRC and NRCI summary statistics, derived from DoH and NHS Executive sources, is presented in Tables 2.1 and 2.2.] The NSRC shows, for each HRG at each point of delivery: the lowest and highest cost, the average cost, and the inter-quartile range. The NRCI is the output most focused on in the media, by politicians and by NHS managers. It presents a single figure for each NHS Trust that “compares the actual cost for its case-mix with the same case-mix calculated using national average costs” (DoH, 1998b, p.15). An index score of 100 is interpreted as ‘average’ cost performance, whereas scores above or below 100 suggest above or below average cost performance respectively, e.g. a score of 102 indicates costs that are above the average whereas a score of 98 may indicate a more efficient hospital performance.

The NHS Executive claims that this index measure will give purchasers of healthcare an indication of the overall technical efficiency of a Trust (DoH, 1998a). However, aside from concerns about interpreting cost variability within NRCE results, the use of NRCI results is complicated by the existence of multiple index sets. The 2000 reference cost publication (DoH, 2000b), for example, presents three different “National Reference Costs Index” versions in its Appendices 2A, 2C and 3:

- NRCI using ‘trimmed’ data¹⁰ and adjusted by a Market Forces Factor (to account for regional cost differences amongst hospitals)
- NRCI using ‘untrimmed’ data (i.e. including all bed days and associated costs)
- NRCI results prior to any Market Forces Factor adjustment (i.e. an unadjusted index).

In addition, Appendix 2B shows sub-index rankings for elective, non-elective and ‘other’ categories of health care activity. Within each sub-index, Trusts may score quite differently to the overall rankings achieved in the composite indices listed above.

The question is then, which index gives the best comparison of Trusts’ relative cost efficiency? In its guidance notes on interpreting the NRCI, the NHS Executive’s Financial Development Branch advises that the Index based on trimmed data “attempts to give a like for like comparison” across Trusts with different casemix profiles (DoH, 2000b, p.20). The trimmed Index seems, therefore, to be the best comparator. However, it is also noted that: “using trimmed data alone as a measure of cost efficiency can be misleading” (DoH, 2000b, p.20), suggesting that untrimmed data should also be considered (but how?). Although beyond the scope of this study, the problem of comparing hospitals is further complicated by the existence of other efficiency indices outside the reference costing exercise, such as a variety of “casemix cost indices” (see Dawson and Street, 2000, p.59). A hospital may appear relatively inefficient on one index but relatively efficient on another – so which measure is correct?

The outputs of the NRC (and in particular the Index) are not straightforward to interpret and use, therefore. In its effort to provide ‘fair’ representations of relative performance across a number of perspectives, the NRCE has rejected the simplicity of a single (though inevitably flawed) index of performance in favour of a set of four alternative indices. Users of NRCE information must make their own judgements about which index provides the best information to meet their decision needs.

¹⁰ To avoid cost distortions due to unusually high cost cases, HRG costs are calculated using ‘trimmed’ data. That is, the excess bed-days and associated costs attached to unusually long-stay patient episodes are truncated at nationally established ‘upper trimpoints’ (DoH, 2000b, p.19). Excess bed-days are then costed separately. See Sections 2.3.4 and 5.3.2 for a further discussion of this issue.

4. Research Method

4.1 Introduction

The methods used for this research reflect the aim of ascertaining the nature and impact of those factors impacting on reference cost variability. Six English NHS Trusts were selected as research sites. These included: large teaching hospitals, non-teaching metropolitan hospitals and non-metropolitan hospitals serving more disparate, rural populations. The six sites were spread around England, one in each of the North West, Trent, South West and London regions, and two in the South East. The aim was to study costing practices in Trusts with different operating environments that may impact upon their reference costs, although the choice of Trust sites also reflected contacts that facilitated good access. Various sources of documentary and empirical evidence were obtained from these Trusts, as outlined below.

As discussed in Chapter Two, the potential sources of cost variability within reference costs proved to be greater than originally envisaged. Once this was realised, a survey of all NHS Trusts was undertaken covering key personnel responsible for the compilation of the reference costs, (finance directors and cost accountants), to gather their views on the factors that impacted on reference cost variability. This was done to provide some indication of the significance of each factor and to confirm the importance of issues relating to data capture (the counting of FCEs, coding of clinical activity and quality of information systems). The significance of these issues will be explored in the follow-up study – “Clinical activity data as a source of reported healthcare cost variability”.

4.2 Documentary evidence

Documentary evidence was used to establish the aims and outputs of the NRCE and to examine the processes by which reference cost data is compiled within Trusts. Some documents used were publicly available, (most published by the Department of Health) others were provided by NHS Executive staff or by NHS Trust accountants and managers. Documents drawn on included:

- Official publications, circulars and papers produced by the Department of Health, NHS Executive, NHS Regional Offices, the Healthcare Financial Management Association (HFMA) and the Case-mix Programme (formerly the National Casemix Office, or NCMO).
- Available published reference cost data.
- Documents and working papers produced in the costing divisions of the six studied Trusts.

4.3 Interviews

Interviews formed the primary means of first, exploring the processes by which NRCE data is compiled and used, and second, identifying the factors that contribute to the apparent variability in reference costs between Trusts. Interviews were conducted with a range of NHS actors involved in the compilation, distribution, interpretation, use and management of reference cost information:

- personnel at the NHS Executive Financial Management Branch involved in setting up the NRCE and with preparing relevant materials and directives
- finance and commissioning personnel in selected regional Health Authorities
- clinical coding professionals involved in coding training and examination
- a senior financial analyst in a large NHS Executive Regional Office
- personnel at a private benchmarking agency (CHKS Ltd.) used within the NHS
- personnel at all six of the NHS Trust sites.

Since NRCE data is produced by accountants within NHS Trusts, interviews with Trust personnel were a particularly important source of evidence for this study and a range of personnel was interviewed within each of the six NHS Trusts:

- Management accountants involved in compiling reference costs
- The finance director
- Two clinical directors (from one surgical and one medical speciality)
- Information management personnel and clinical coders involved in producing patient activity data.

The management accountants and finance directors were interviewed with the dual aims of determining the processes they followed in compiling reference cost data, and to gather their views on cost variability as reflected in NRCE outputs. Clinical Directors in both surgical and medical areas contributed their views on the nature of differing clinical procedures and their corresponding resource consumption and cost patterns, as well as commenting on their experiences and uses of cost data. Clinical coders commented mainly on their role in classifying activity data.

The majority of interviews were carried out between July 1999 and October 2000. Some further interviews took place in late 2001 and early 2002. Interviews ranged from one to two hours in duration and were semi-structured in nature. All conversations were tape-recorded and later transcribed. This report draws on quotations from NHS actors to inform the examination of healthcare cost variability, in order to preserve confidentiality only job titles and regions are indicated.

4.4 Survey of NHS Trusts

Interview evidence was used to identify a list of possible factors contributing to reference cost variability. The extent to which each of these factors was thought to impact upon NRCE results was then examined using a questionnaire survey (see Chapter 6).

The questionnaire (see Appendix 3) was administered in October 2000. It was mailed to the finance directors in 228 NHS Trusts whose cost data had been included in the 1999 NRCE (DoH, 1999c, pp. 24-31)¹¹. Two copies of the questionnaire were included, with instructions that the finance director complete the blue copy, while the yellow copy was to be completed by the cost accountant most involved in compiling reference cost data for the Trust. Table 4.1 below shows summary statistics for the questionnaire responses.

Table 4.1: NHS Trust survey response data

	Number	Percentage
Trusts surveyed	228	
Trusts responding	96	42%
Total responses received (FDs and CAs)	151	
Responses from FDs	73	48%
Responses from CAs	78	52%
Trusts where:		
Both the FD and CA responded	53	55%
Only the FD responded	19	20%
Only the CA responded	24	25%

Note: FD = Finance Director; CA = Cost Accountant

The survey evidence provided a broad view of the relative impact of various factors on reference cost variability, from the perspective of finance directors and cost accountants in NHS Trusts. The results of this survey are drawn on in the discussion presented in Chapter Six.

¹¹ Although the NHS Executive lists 241 Trusts in the 1999 NRCE, a database of current Trusts and their addresses (provided by the NHS Executive in October 2000) could be matched with only 228 of those Trusts.

5. Interview Results on Reference Cost Variability

The findings presented in this chapter are structured in accordance with the research questions identified in Chapter One and reflect interview data gathered in the course of the study. The focus of this chapter is to determine whether unexplained variability in NRCE data reduced the usefulness of the data for benchmarking, cost management and decision-making.

5.1 Benchmarking, cost management and decision making

As illustrated in Table 2.1, there has been a large degree of variability in the NRCE results in 1998, 1999 and 2000. This was true of both the Index (NRCI) and of the NSRC where some individual HRGs revealed variations of substantial proportions (see Table 2.2). Some Trusts have found themselves falling under the political and media spotlight as a result of their NRCI ranking, with cost variability emerging as a key focus in how Trusts' NRCE results are interpreted.

5.1.1 "Naming and shaming" – Unacceptable reference cost variability

A Trust's position on the NRCI is an important issue in terms of (i) accountability to the NHS Executive and to the government, (ii) public perceptions of the Trust's efficiency, and (iii) access to future funding. The high profile of the reference cost exercise and the scrutiny to which reference cost data is subject are both evident in the following quote:

"This information is going to be quoted by the Prime Minister in Parliament, it's going to be used to make allocation adjustments in the future, it's going to be used as part of the monitoring of services in national frameworks..."

(Interview: NHS Executive, April 2000)

Where a Trust's results reflect a wide deviation from average NHS results, public explanations are demanded. The following quotes illustrate:

"We get the general public ringing up with 'My wife had a hip operation cancelled', and 'Why does it cost this much at my local Trust and this much elsewhere?'"

(Interview: NHS Executive, May 2000)

"As a regional office, we pick out the ones [Trusts] that are sort of at the top or the bottom of the league table – the index – and prepare our regional executive. We know the press will be onto us asking questions, so we need to dig a bit deeper and find out what's going on and try to come up with a few excuses, for want of a better word, to give to the press."

(Interview: Senior Financial Analyst, NHS Executive Regional Office, July 2000)

A news article entitled 'List of shame to feature NHS Trust costs' (The Financial Times, 12/6/98), referred to the new reference cost indices as "league tables of efficiency" which would lead to "the controversial naming and shaming of under achievers...". The focus placed clearly on apparent cost variability. Perceptions within government have been similar. In the same Financial Times article (12/6/98), after the 1998 NRCE results were published, the Health Minister of the time was reported as noting that a "hip replacement on the NHS costs £2000 in some areas but more than £8000 in others". He went on to state that:

"There are currently some *unacceptable* variations between hospitals in the cost of treatments.... These new measures [published NRCE results] will iron them [cost variations] out and get better value for money for patients."

(Financial Times, 12/6/98; emphasis added)

In line with this concern to reduce cost variability, the NHS Executive advises that "individual NHS Trusts should consider their position on the Index [NRCI] and discuss with their peers reasons for differences and the scope this may offer for efficiency savings" (DoH, 1998b, p.18). It is clear from such statements that Trusts are expected to manage their costs in an effort to reduce cost variability, and to achieve NRCE results that fall within a defined and 'acceptable' range.

5.1.2 Concerns about interpreting cost variability

Findings from this study suggest that most Trust actors are concerned to make the most of NRCE information for benchmarking and cost management purposes. There is a recognised need for information sharing in the NHS, and interview evidence revealed a measure of guarded optimism about the potential future role of reference costs information. For example:

"I would like to use reference costs more to understand the differences between hospitals. I would like to think of them as true costs, done the best that you can, and then try to understand why is it still so different between one Trust and another."

(Interview: Cost Accountant, a Trent NHS Trust, June 2000)

But, to what extent do NHS Trust actors find reference cost information 'true', credible and relevant for benchmarking?

Interview evidence revealed that, while Trusts are expected to use NRCE information to highlight cost inefficiencies, concerns exist about the efficacy of using reference costs for this purpose. Many NHS actors are unsure as to whether cost variability highlighted in the NRCE and the NSRC really does reflect inefficiency. One finance director notes:

"At the heart of it [the NRCE], is the assumption that there is undesirable inefficiency that needs to be removed. I am sure every organisation has undesirable inefficiency, but the question is how useful are they [reference costs] for finding it?"

(Interview: Finance Director, a South West NHS Trust, December 1999)

Uncertainty about how apparent cost variability might be interpreted stems from concerns about the reliability of the NRCE data itself. The use of NRCE results for benchmarking and cost management is made problematic by concerns amongst managers, accountants and clinicians alike that the cost figures are not sufficiently robust to merit serious comparison. In particular, the use of NRCE results as "health league tables" to identify inefficient Trusts has been branded as misleading by senior NHS managers (Jones, 2000) and by clinicians:

"You still see in the papers comments that in some hospitals a procedure is 10 times more expensive than in other hospitals, which is clearly not true. Some of the figures that appear are just ridiculous, and the sad thing is that they are taken semi-seriously in the articles."

(Interview: Clinical Director, a South West NHS Trust, May 2000)

Interview evidence revealed several key reasons why NHS actors doubt the reliability of NRCE data and are concerned about focusing on reference cost variability as a basis for cost control. All of these reasons pertain to differences in the way that NRCE data is compiled within Trusts, which lead to perceptions that the cost information is inconsistent and lacks comparability between Trusts. As an interviewee from the NHS Executive noted:

"Until they [Trusts] get the process right ... you're not comparing like with like."

(Interview: Senior Financial Analyst, NHS Executive Regional Office, July 2000)

Interview evidence revealed concerns about how clinical activity is measured and coded, about inherent differences in casemix, and about the variety of ways in which cost allocations are carried out. The findings of this study are supported by a recent NHS survey of current use of NRCE information (NHS Executive and HFMA, 2000). In this report, a discussion of "barriers to the use of reference costs" noted that "24.7% [of NHS respondents] commented on data quality issues and in particular data integrity, accuracy, reliability, scope and inconsistency" (p.10).

Such concerns amongst users of NRCE data suggest that uncertainty about the causes of cost variability is indeed a barrier to the use of NRCE data for its intended aims. Trusts feel justified in attributing the variations revealed by benchmarking to problems in compiling NRCE data, and find it difficult to interpret cost comparisons as useful indicators of efficiency differences. The factors contributing to cost variability need to be better understood therefore, before meaningful interpretations of cost data can be used to inform NHS efficiency initiatives. The remainder of this chapter considers these factors and their impact on NRCE data.

5.2 Variations in costing approaches

As outlined in Section 2.3.1 there was an expectation that tightening the guidelines on cost allocation would result in more robust costs that, in turn, would reduce reported cost variability. In interviews, the author of the new costing manual confirmed that changes to costing guidelines were expected to improve the reliability of NRCE data, noting:

"One of the criticisms the first year round was that we didn't have a standard cost methodology. Since then I've been very strict about the costing guidance.... If you've got consistency of approach, at least in the way they're treating things, then you've got more robust costs at the end of it."

(Interview: NHS Executive, May 2000).

However, the effect of these changes, as reflected in the 1999 NRCE results, was quite different to expectations:

"I wrote a new costing manual, which went out last year, and everybody said 'well that's bound to reduce the variations in cost'. Well actually it didn't, it increased the variation in cost! I think the reason it [the cost data] was so compact before was because people were making it compact – they could play the game from the previous system. Now there's less scope for playing games with the figures."

(Interview: NHS Executive, April 2000)

This NHS Executive actor suggests that greater standardisation of costing practices has reduced the potential for 'game playing', thus leading to a more realistic picture of efficiency differences. This picture seems to reveal high levels of variability in the 'real' cost of Trusts' healthcare activities. Yet, Trust accountants generally did not agree that costing requirements were now systematic. The costing guidelines are perceived as still allowing room for inconsistent interpretation, particularly in relation to how indirect and overhead costs are defined and then apportioned down to HRG level.

5.2.1 The allocation of indirect and overhead costs

On the allocation of indirect and overhead costs, a cost accountant noted:

"There is a lack of regulations of how costs should be allocated, as only a minimum standard is required."
(Questionnaire comment: an NHS Trust cost accountant, November 2000)

The effect of this "lack of regulation" is that some NHS personnel feel that game playing with cost allocation still makes comparisons of NRCE data unreliable. A finance director illustrates this view:

"If we knew that a hip joint replacement at the Trust next door was £4,000 against £4,500 for us, what we wouldn't know was whether that was genuinely cost based. It could be because they wanted to look cheap so they would get more hip activity to do next year, because they had increased their number of orthopaedic consultants, for example. They could have hidden a degree of their hips cost in general surgery, which is going to come walking through the door anyway."
(Interview: Finance Director, a South East NHS Trust, September 2000)

To date, there has been little monitoring of the processes by which reference costs are compiled. A senior NHS Executive manager notes the following in relation to cost allocation procedures:

"We've said that there is a minimum standard in the costing manual regarding which costs should be treated as direct. ... but some of this has never been audited. That's one of the things that bothers me.... There's work that isn't getting done properly. They do the work, they put it in the system, they churn it out to us, and nobody checks it."
(Interview: NHS Executive, May 2000)

The fact that costing processes may in fact differ between Trusts is illustrated in a quote from a Trust accountant. When asked to comment on the accuracy of a diagram intended to represent prescribed HRG cost allocation procedures (Appendix 1), his response was:

"The diagram looks fine, but it is slightly more complex than we tend to actually do in practice – it looks more like the method described in the Costing Manual!"
(Correspondence with the Head of Costing; a South East NHS Trust, August 2000)

5.2.2 Costed care profiles

As well as pointing to differences in overhead allocation approaches, Trust interviewees identified a further important influence on the way in which HRGs are costed. This is the creation of "costed care profiles", also known as "bottom-up costing" (see also Section 2.3.2).

As one interviewee noted:

"Even within the manual there is scope for interpretation.... It just gives a window of opportunity to do things your own way. Then, in the outcomes in the reference cost exercise, are you comparing efficiency in costs or are you comparing differences in the way you have got to the costs?"
(Interview: Cost Accountant, a South West NHS Trust, December 1999)

Yet in the opinion of some respondents, work on these "costed care profiles" or direct costs, followed by comparisons between Trusts on a direct cost basis, would be the best way of improving the usefulness of reference costs.

"It needs to be broken down between direct and indirect because clearly, although scope for changes in direct costs may be limited, that's where there is the most scope. Indirect costs such as building etc. you can't do anything about year on year- although you might have plans in place to change things over a five or ten year period ... Split the reference costs between direct and indirect, then you might see some benefit occurring."
(Interview: Personnel 4 at a Private Sector Benchmarking Agency, April 2002)

5.3 Variations in underlying activities

The development of HRG categories was intended to take account of the complex nature of clinical activities, while at the same time allowing them to be usefully categorised. However, interview evidence revealed two related concerns about the limitations of costed HRGs as a basis for evaluating the efficiency of healthcare activities: the inability of HRG categories to adequately reflect differences in casemix, and problems with interpreting variations in patient length of stay.

5.3.1 Casemix variations

On casemix variations a finance director notes:

"The complexity of procedures is not measured in HRGs. For example, complex hip revisions undertaken at [our Trust] are referred by other orthopaedic surgeons across the country because they are too complex to be dealt with in a local district general hospital."
(Questionnaire comment: an NHS Trust Finance Director, November 2000)

Also demographic variations impact on case mix in ways that HRGs do not fully reflect:

"All our old people are extremely old and amongst our young people, well there is a lot of social deprivation and drugs. Our patients may take longer to recover perhaps, on average. That results in higher costs. And, for example, our oral surgery is difficult because there is not an infrastructure here. In other areas, there are a good number of dentists that do a lot of the oral surgery. That just doesn't exist here [so] we are doing lots of things that other places aren't doing. That is going to be very difficult to adjust, and I would imagine intuitively that it's affecting our reference costs."

(Interview: Clinical Director, a South East NHS Trust, September 2000)

The classification of patient episodes within HRGs can also be a subjective exercise. First, it relies on the clinician's judgement of the nature and complexity of the case. This is not necessarily straightforward or systematic, as one clinician indicated:

"Think of a procedure as a product – a car for example. You can call a car a "car", and it goes into one category [HRG], or you can call it "a four-wheeled automotive vehicle for carrying 5 passengers" and it would go in another category. It's all a question of how you label things. I can think of one operation we do that could go into 4 different HRGs, depending on how complex it's judged to be at the time, and how it's categorised.... I have a problem with the idea that everything we do can be neatly categorised, with costs attached to it all. It's too complex for that."

(Interview: Clinical Director, a South West NHS Trust, May 2000)

Cases are then coded into HRGs by a Trust's clinical coders, who must themselves make interpretations of patient notes (see also Section 2.3.6). Overall, the characterisation of healthcare activity into costed HRGs appears to be a potential source of considerable variation in NRCE data.

5.3.2 Variations in length of stay

Related to case complexity is the issue of variable lengths of stay. One clinical director noted:

"It's difficult to improve on average length of stay. Just from your experience of the speciality, you know that when you start pressing it below a certain level then ... patients will be coming back and it creates complications."

(Interview: Clinical Director, a South East NHS Trust, September 2000)

However, the reference cost publication notes that "variations in clinical practice" may contribute to excess bed days, suggesting that failure to discharge patients at the appropriate 'normal' time constitutes "inefficient" and costly clinical practice (this issue is discussed further in Section 4.4).

The complexity of what drives LOS makes it a sensitive issue. Any interpretation of the extent and variability of excess bed day costs must be informed by a sound knowledge of a Trust's casemix position. All of this means that costs for one Trust cannot easily be interpreted alongside those for other Trusts, therefore reducing the transparency and comparability of NRCE data. Interpretation of cost variability for control and decision-making purposes is made problematic indeed.

In summary, two activity-related factors emerged as having a potentially significant impact on reference cost variability. They are variations in casemix and differences in length of stay. Both of these factors are complex to characterise and manage. Both are perceived as obstacles to the use of NRCE data for identifying 'inefficiencies' that might be managed and controlled.

5.4 Efficiency differences

The factors discussed in Sections 4.2 and 4.3 make it hard to assess the extent to which NRCE cost variability reflects differential efficiency. Yet, efficiency improvement is the main aim of the NRCE, and interview evidence suggested that NHS actors recognise a number of efficiency dimensions as influencing reference costs.

5.4.1 Inherent cost differences

The most obvious aspect of determining cost efficiency is to assess the costs incurred by a Trust in running its facilities and providing healthcare to its patients. NHS actors noted that substantive differences do exist in the costs incurred by different Trusts. In particular, the age, sophistication and location of a Trust's facilities have a substantial influence on fixed costs such as capital charges and depreciation. One clinical director expressed his frustration at the distorting effect he considered such costs to have on reference cost results:

"We are a new hospital. The capital cost of that hospital is added to our patient care costs. This automatically means we are 10 percent more expensive. Why the hell is that included in the reference costs? Why do we have to pay for the fabric of the building? We could have a really crap Victorian hospital that patients loathe, and have cockroaches on the floor, and our reference costs would be 10 percent less for exactly what we do now. Where is the logic in that?"

(Interview: Clinical Director, a South East NHS Trust, September 2000)

Fixed costs are not the only contentious issue. Some direct costs, in particular labour costs, are geographically dissimilar, with London and the South East generally incurring higher costs than other Trusts. In compiling the NRCE index, the NHS Executive has attempted to allow for these inherent cost differences, by adjusting Trusts' index ratings using a "market forces factor" to "eliminate the effect of unavoidable cost differences due to different geographical locations" (DoH, 1999c, p.19). However, it is not clear that this adjustment is effective in eliminating "unavoidable cost differences" from NRCE data. One interviewee noted:

"There is some allowance made for the fact that we're in London, but it's not enough. Our property capital values are astronomical, our staff costs are high, and I don't think the adjustment really reflects it fully."

(Interview: Deputy Finance Director, a London Trust, November 1999)

Also, a cost accountant from a North West Trust noted that, although the 'market forces factor' recognises high costs in the South East of England, it ignores similar cost issues elsewhere:

"Recruitment 'blackspot' areas such as the North West carry excessive agency [i.e. short term staff] costs, so we end up looking expensive."

(Questionnaire comment: an NHS Trust cost accountant, November 2000)

The fact that such inherent cost differences exist, and are so difficult to adjust for, suggests that they must impact on apparent reference cost variability. The important issue here is whether such inherent cost differences can be considered as indicative of relative efficiency. In the long-term, it might be conceivable that NHS Trusts could rationalise their services or relocate to more cost-effective locations where possible. But the potential for reducing many costs in the short-term is clearly limited. Insofar as such inherent cost differences are impacting on reference cost variability, the usefulness of NRCE data for pinpointing and controlling inefficiency is limited.

5.4.2 Variations in clinical practice

Clinical practices drive many of the direct costs of healthcare activities. Each time a clinician decides to order a blood test or an X-ray, prescribe drugs or keep a patient in hospital, for example, it impacts on costs. Different clinicians may, of course, have different working practices that in turn impact on cost. As one clinician noted:

"While many of the consultants working in the NHS are extremely efficient people, that's not true of all of us, of course. I'd say maybe 20 percent are not working as efficiently as you would expect your average doctor to do."

(Interview: Clinical Director, a South East NHS Trust, September 2000)

One clinical decision that has come under the spotlight as an important, and potentially manageable, driver of costs is the time patients spend in hospital. As noted in Section 2.3.4 variations in patient length of stay are, in large part, driven by casemix issues, but may also reflect differences in the 'efficiency' of clinical decision making. Interview evidence suggested that NHS actors recognise that opportunities exist for improving efficiency by reviewing discharge practices, as the following example illustrates:

"... orthopaedics was looking really expensive. They boiled it down to one consultant. It turned out he did his ward rounds before the physio[therapist] on a Friday afternoon ...then he wouldn't discharge his patients until he knew they'd seen the physio. Every one of his patients had a 3 day longer length of stay, because none of them were discharged until Monday morning!"

(Interview: NHS Executive, [formerly a Trust accountant], May 2000)

An aim of the NRCE is to highlight instances where Trusts incur abnormally high costs due to such differences in clinical practice, thereby encouraging NHS managers and clinicians to work together to review practices and generate efficiency gains. However, the problem lies in differentiating between variations in practice that are inefficient and costly from those that may be innovative, effective and desirable. Many cost-driving decisions in healthcare are taken on the grounds of clinical quality and are therefore not readily amenable to control measures. For example, one finance director noted that clinicians in his own Trust deliberately incurred above average surgical prosthesis costs in order to assure appropriate clinical outcomes:

"We use individually manufactured prostheses in our more complex cases. These can cost more than the average HRG cost for that procedure when carried out elsewhere."

(Questionnaire comment: an NHS Trust Finance Director, November 2000)

This finance director understands how and why the Trusts' reference cost results are affected by this decision. But, the clinical imperative behind selecting high cost prostheses would not be as apparent to other users of NRCE data, who might then draw inappropriate cost efficiency comparisons between Trusts.

5.4.3 Controllable and non-controllable costs

Although interview evidence showed that NHS managers and clinicians are concerned to control costs, the NRCE does not assist them to distinguish between those costs that are, and are not, amenable to control. Previous studies have noted that many healthcare costs are fixed and/or non-discretionary (Ellwood, 1996a), and most overheads lie beyond the control of the clinicians who are thought to drive healthcare costs (Jones, 1998). A clinical director recounted his own experiences of trying to control costs by reviewing clinical practice:

"We went through the budget line by line and marked the things we can influence to some extent... Our drug spending, accident and emergency admissions... operations that could be done as day cases... But on the other hand I can't affect agency [nursing] costs... I can't directly affect the management costs, the costs of the rebuild etc. There's a lot I can't influence."

(Interview: Clinical Director, a South West NHS Trust, May 2000)

5.4.4 Lack of standards

Another perceived difficulty is the lack of a clear standard for cost efficiency. The NRCE encourages Trusts to focus on comparative cost results, with cost variability seen as the signal of 'abnormal' performance. Yet Trusts remain unsure as to what level of HRG cost or NRCI (index) ranking is 'good enough'. This problem is confounded by their own and the NHS Executive's recognition that cost efficiency is not itself an indicator of good performance, but needs to be interpreted in the context of quality indicators and knowledge of local circumstances. A finance director notes:

"There's no external standard. All one's got is this benchmark, and its biggest failing is it's not clear what the acceptable clinical standard is, to measure it against."

(Interview: Finance Director, a South West NHS Hospital Trust, July 2000)

Without clear indicators of clinical performance, Trust actors find it difficult to interpret whether reference cost differentials indicate poor efficiency that requires correction, or are justified on other grounds, such as quality of care. A cost accountant explains how his Trust's efforts to enhance patients' care experiences by reducing their length of stay may have an adverse effect on reported cost efficiency:

"Last year we came in at 98...our sister Trust down the road came in at 89, so we suddenly seem to be very, very inefficient. But, we do run very efficiently ... we've got very high bed utilisation, we don't have lots of spare theatre sessions lying around. But it's almost as if we have to pay a lot of money to be as efficient as we are. We spend money on our patients in order to keep them to a short length of stay."

(Interview: Head of Costing, a South West NHS Trust, July 2000)

The point here is that efficiency can be interpreted differently. The cost accountant recognises that the NRCI gauges efficiency only in terms of cost minimisation. However, he suggests that other, non-financial efficiency measures (bed occupancy, theatre utilisation and patient length of stay) may be equally valid and important, and may in fact be more closely related to achieving clinical quality than is cost efficiency itself.

Both inherent cost differences and variations in clinical practice emerged as key 'efficiency' issues central to healthcare cost management. Yet as noted, several conflicting factors act to mask the extent to which cost variability indicates real differences in efficiency. The absence of accepted standards of efficiency and lack of control over many costs mean that NHS actors are often unsure how they can reasonably manage and reduce costs. The interpretation of what is 'efficient' healthcare practice, and where it lies reflected in NRCE data, is clearly problematic.

5.5 Issues of information quality

Although not fully anticipated at the outset of this research information quality emerged as a key issue in compiling NRCE data within NHS Trusts. Interviewees perceived three main aspects of information quality as impacting on the reliability and comparability of reference cost data:

- counting of clinical activity
- coding of patient episodes
- data collection capacity of Trusts' information systems.

5.5.1 Counting clinical activity

Reference costs are the unit cost of a “finished consultant episode” (FCE), i.e. an episode of patient care, occurring within a given healthcare category (HRG). Determining the level of clinical activity within each HRG category is therefore central to the calculation of NRCE data.

Interview evidence revealed that many NHS actors: clinicians, managers and accountants – felt that unsystematic approaches to counting clinical activity presented a significant problem in ensuring the comparability of NRCE data between Trusts. The FCE measure focuses on the number of consultant episodes that occur, rather than counting patient admissions. Depending on the nature and configuration of the services they offer, Trusts may differ in the way in which a patient is dealt with during their time in hospital, as the following interview quote illustrates:

“For example, an elderly patient may go from the medical ward to an elderly ward. In some places this counts as 2 FCEs, because [the patient] now comes under a different consultant. In other Trusts, it might just count as one FCE. Then, if the patient goes into rehab [rehabilitation], they may go to another provider [i.e. outside the Trust], so there would be just 1 or 2 FCEs recorded in the Trust. But if there are rehab facilities in the same Trust, it would be three moves within one Trust. Some people count that as 1 FCE, some as 3 FCEs. It goes back to historic ways of counting and how you define an FCE as a transfer of clinical responsibility from one consultant to another.”
(Interview: NHS Executive, April 2000)

In other instances, NHS actors suspect that variations in how FCEs are counted are due to errors or misunderstandings, rather than being simply a function of the Trusts’ admission and consultant transfer practices. The following quote illustrates:

“When mothers were giving birth, some Trusts were counting the mother as 1 FCE and the baby as another. We were saying ‘no, there’s only 1 FCE – the mother’.... Do they think, if there were twins, that would that be 3 FCEs?”
(Interview: NHS Executive, May 2000)

5.5.2 Coding patient episodes

Interview evidence revealed that clinical coding is not a straightforward activity, and that a number of concerns exist regarding coding accuracy and consistency within Trusts. The following quotes exemplify the views of several interviewees, who expressed concerns about coding accuracy:

“You get really odd things. I think last year we had an HRG relating specifically to people over 65 (the elderly), coded to some paediatric specialty which is obviously wrong.”
(Interview: Cost Accountant, a Trent NHS Trust, June 2000)

“We found that [one Trust’s] maternity unit had an awful lot of people over the age of 75 so we knew there was a problem. And the number of men that go in for gynaecology...”
(Interview: Financial Performance Manager, a Trent Health Authority, June 2000)

There is significant potential for inaccurate or inconsistent coding to reduce the reliability and comparability of NRCE data. Managers, finance directors and cost accountants noted in interviews the complete reliance of the NRCE on accurate clinical coding, yet recognised that coding differences may vary widely, distorting Trusts’ comparative results. The following quotes illustrate frequently raised concerns:

“I think the biggest influence by far is the difference in counting and coding of activity.... Examples have been put to me about areas that, if we don’t code as accurately as possible, we are going to shoot ourselves in the foot on reference costs. But, we don’t spend a lot of time trying to code to get a result – we code for what we think is right. So if other people are doing it differently, then I am sure that will explain some of the variation in our results.”
(Interview: Finance Director, a South East NHS Trust, September 2000)

“The biggest variation you will find is in coding practice ... Before you put any cost on it [an HRG] you’ve got differences in coding ... so if you actually want sophisticated comparisons across Trusts, it’s a problem – the clinical activity is coded differently.”
(Interview: Finance Director, a South West NHS Trust, December 1999)

“You could give the same set of notes for ten patients to five different clinical coders, and I’d guarantee that you wouldn’t get the same coding results from any of them.”
(Interview: Chief Executive, a North West Health Authority, August 2000)

"I don't know if it's 30% or 50 % of the problem [cost variability] but it's something of that order, is purely capturing through the clinical codes what is happening to that patient. Particularly in the medical specialities where one hospital may code a simple diagnosis for a complex problem to another who may be recognising three or four diagnoses for the same condition- that can hoist an HRG through the roof."

(Interview: Personnel 4 at a Private Sector Benchmarking Agency, April 2002)

As noted earlier (Section 2.3.6; p.18), the potential for errors to be made by even experienced coders has been confirmed by low pass rates in a recently instituted examination (set by the Institute of Health Records & Information Management) aimed at assuring minimum coding performance standards. Yet, despite recognised difficulties in achieving consistent and accurate clinical coding, the problem seems unlikely to be resolved in the short term at least. Salaries for coding staff are low and, since no pay improvement is attached to passing the coding examination, there is only a limited incentive for coders to participate in this exercise.

The Trusts now advertise coding posts as suitable for individuals with the coding qualification, or willing to take the examination. Initially, however, the situation was such that there were insufficient numbers of personnel available to undertake the required coding work. Although many regional centres now offer two-week basic training programmes, the uptake from the Trusts is variable, with much clinical coding training continuing to take place "on site" (Interview: Clinical Coding Trainer: A London Health Authority, February 2002). Overall, coders are left feeling that hospitals don't rate their role or contribution highly enough (Interview: Clinical Coding Trainer: A London Health Authority, February 2002). All of this points to the likelihood of problems with the quality of information that forms the basis for HRG categorisation and costing. This is a worldwide issue; the British Institute of Health Records and Information Management is in contact with the World Health Organisation (WHO) over the international problems attached to the coding of hospital activity.

5.5.3 Information systems

In addition to concerns about the counting and coding of clinical activity, interview evidence revealed reservations about the ability of Trust systems to provide adequate and systematic information to inform the compilation of NRCE data.

NHS accountants rely on the measurement of cost-driving activities in order to make the cost apportionments necessary for determining HRG costs. Some of these cost-driving activities are closely related to clinical practices, as noted in Section 4.4.2, so the input of clinicians is important to the collection of costing data. However, some interviewees noted difficulties in getting required information from clinicians with little interest in reference costs:

"They [clinicians] are not the slightest bit interested in reference costs, generally speaking.... They're concerned, naturally enough, with doing the best for their patients. It's not foremost in their minds to go and tell the finance department they're doing it so we can look good on the reference costs."

(Interview: Finance Director, a South West NHS Trust, July 2000)

"The doctors get on with treating the patients, and everyone else deals with the HRGs. We don't go and see doctors, we don't talk to doctors, we have no contact with doctors at all with regard to setting up the reference costs. And, they don't want to see us."

(Interview: Head of Costing, a South West NHS Trust, July 2000)

A minority of clinicians has even refused to participate in information gathering required for the NRCE, resulting in tense relationships with NHS accountants and managers. For example:

"[One Clinical Director] is on record as telling our business managers to 'go away', to put it politely. He said 'you've come and told me what I've got to do, I understand what I've got to do, your job is now finished, go away. We're not doing it.' And that's for mandatory data collection in the NHS."

(Interview: Head of Costing, a South West NHS Trust, July 2000)

Not all data gathering relies on direct contact with clinicians, however. Differences in information systems could be noted in comments made by accountants in the six studied Trusts. Compare the following two quotes, for example:

"An information system that allowed us to link things like pathology tests, diagnostic tests, physiotherapy and drug regimes back to individual FCEs would undoubtedly make the data more accurate. This is not currently possible for us... [and] the average length of time in theatre for an HRG cannot be calculated exactly, as theatre information systems are unreliable..."

(Interview: Cost accountant, a South East NHS Trust, July 2000)

"Our theatre hours are actual averages taken from the theatre system."

(Interview: Cost accountant, a Trent NHS Trust, September 2000)

When finance directors and cost accountants were asked in a questionnaire to rank the significance of various factors thought to contribute to reference cost variability (see the next chapter), the lack of standardised Trust information systems was the issue most often eliciting voluntary comments. For example:

"Different software packages have an effect. In particular, the inability to retrieve accurate information (e.g. theatre hours by HRG), can have a significant impact on reference costs."

(Questionnaire comment: an NHS Trust cost accountant, November 2000)

"Unless a standard, specifically designed computer programme is used by all Trusts, which has a clear structure and detailed instructions on allocation methods etc., reference costs will never be reconcilable."

(Questionnaire comment: an NHS Trust cost accountant, November 2000)

The interview data gathered from the six case study sites (and reported in this chapter) demonstrated a number of concerns on reference cost variability. In view of the diversity and complexity of the issues raised in the case studies it was decided to undertake a survey of the factors contributing to reference cost variability. The survey was designed to produce a ranking of the factors impacting on cost variability by key players in compilation of the reference costs and, therefore, to guide future research undertaken by the authors in the course of this project. This survey covered all Trusts participating in the reference cost initiative and is reported on in the next chapter.

6. Survey Results on Reference Cost Variability

6.1 Factors perceived as impacting on reference cost variability

As noted in both in the previous chapter and Chapter Two, documentary and interview evidence suggested ten key factors that are perceived by NHS personnel as contributing to reference cost variability. To re-iterate, these factors were:

Differences in costing approaches:

- Variations in cost allocation practices **(3)**
- Differences in how costed 'care profiles' (or 'bottom-up' costings) are produced **(4)**

Variations in underlying clinical activities:

- Variations in case-mix between Trusts that are not taken into account within HRG measures **(9)**
- Variations in length of stay (and its impact on excess bed-day costs) between Trusts **(10)**

Efficiency differences:

- Differences in the per unit cost of resources used between Trusts (i.e. direct costs such as salaries and wages, consumables etc.) **(6)**
- Differences in hospital running costs (i.e. fixed, infrastructure costs and overheads) **(7)**
- Variations in the clinical practices that drive cost **(5)**

Issues of information quality:

- Differences in clinical coding practices **(1)**
- Differences in the counting of activity (FCEs) **(2)**
- Variations in the data collection capacity of Trusts' information systems **(8)**

A survey questionnaire, mailed to all NHS Trusts, presented these 10 factors in no particular order (the bolded figures above indicate 'factor numbers' as shown on the questionnaire response sheet). Respondents were asked to indicate for each factor:

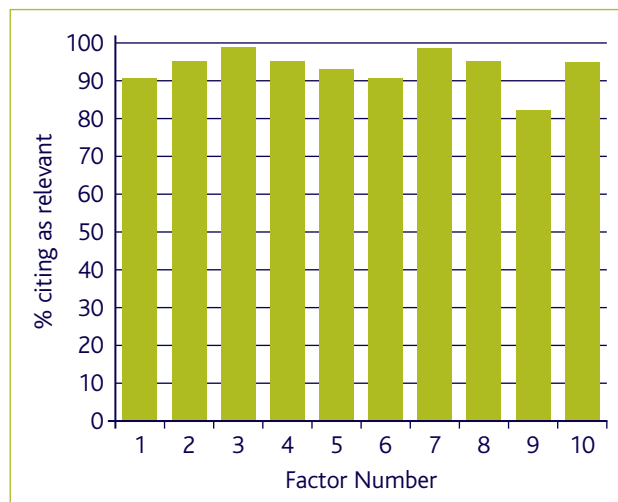
1. Whether they considered the factor to impact on the determination of reference costs, and
2. Whether they ranked the factor in the "top 5" most influential factors and if so, in what order.

Appendix 3 shows the questionnaire response sheet. Responses were received from 42% (96) of the Trusts surveyed, indicating that the survey results offer a good reflection of views across the NHS Trusts involved in the NRCE.

6.2 Factors perceived as impacting on NRCE results

Figure 6.1 below shows that all 10 factors in the questionnaire were widely perceived as impacting on reference cost results.

Figure 6.1 Percentage of respondents citing each factor as impacting on reference cost results



The most cited factor was "variations in cost allocation practices" (Factor 3), while the only factor to be cited by fewer than 90% of respondents was "variations in case-mix between Trusts that are not taken into account within HRG measures" (Factor 8). These results are perhaps not surprising, given that both the finance director and the cost accountant are likely to have good knowledge of the problems faced in cost allocation. The issue of HRG categorisation problems emerged mostly in interviews with clinical directors and clinical managers, so might be expected to be less significant in the eyes of the survey respondents.

Respondents were also given the opportunity to identify any "other factors" relevant to determining reference costs, which were not listed on the questionnaire. Few respondents identified additional factors, and those that were identified were cited only once or twice. For this reason they were not considered sufficiently significant to figure in this study.

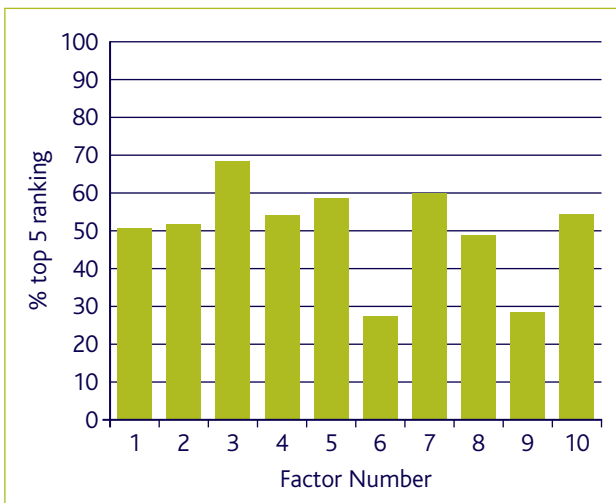
Overall, the results as shown in Figure 6.1 confirm that these 10 factors are widely viewed as shaping NRCE results, by those NHS actors most involved in compiling reference cost data (finance directors and cost accountants).

6.3 Ranking the "top 5" factors

Appendix 4 presents a breakdown of the rankings awarded to each factor in terms of its impact on reference cost results. Figures 6.2 and 6.3 below present an overview of the key results.

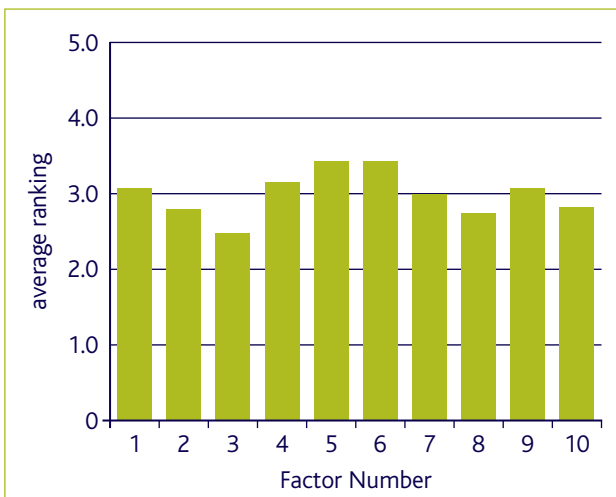
Figure 6.2 shows that "differences in cost allocation practices" (3) was most often ranked in the "top 5", in terms of its influence on reference cost results. This factor was followed closely by "differences in fixed running costs for hospital facilities" and "variations in the clinical practices that drive costs" (7) and (5) respectively.

Figure 6.2 Percentage of respondents ranking each factor in their "top 5"



(Note: 1 is the highest possible ranking; 5 is the lowest possible ranking)

Figure 6.3 average ranking awarded to each factor (across all respondents ranking the factor in their "top five")



There was little to distinguish between factors 1, 2, 4, 8 and 10, all of which were rated "top 5" by between 46% and 52% of respondents. The factors least often rated "top 5" were "variations in case-mix between Trusts that are not taken into account within HRG measures" and "differences in the per unit cost of resources used between Trusts (i.e. direct costs)" (9) and (6) respectively.

Figure 6.3 shows that, given the rating awarded to each factor when it appeared in the "top 5", there was little to differentiate the perceived importance of the 10 factors. All of the factors scored an average ranking between 2.5 and 3.5. The two factors achieving the highest average importance ranking (i.e. lowest average score) were "variations in cost allocation practice" and "differences in the counting of activity (FCEs)" (3) and (2). The factors with the lowest average importance ranking (i.e. highest average score) were (5) and (6) ("variations in the clinical practices that drive costs" and "differences in the per unit cost of resources used between Trusts (i.e. direct costs)").

Overall however, no clear differentiation emerges in the average ranking scores, suggesting that the frequency of "top 5" ranking alone provides a reasonable indicator of the relative perceived importance of the 10 factors.

The results presented in Figure 6.2 and Figure 6.3 are based on all responses received from finance directors and cost accountants. The results therefore include duplicate responses from the 53 Trusts where both the finance director and the cost accountant replied to this survey. A comparison of responses received from the finance director and the cost accountant within each of these 53 Trusts revealed that in no instance were the same 5 factors identified and/or ranked in the same order by both people (see Appendix 5). This suggests that responses received represented the views of individuals, rather than of Trusts per se, and that equal weighting can be given to every response as an independent view from an NHS actor close to reference costing activities.

6.4 Interpreting the relative impact on cost variability

The results of the survey confirm that, from the perspective of those most involved in compiling NRCE data, all 10 factors listed in the questionnaire are perceived as highly significant in shaping reference cost results. The most useful basis for differentiating the perceived relative impact of these factors appears to be the frequency with which they appear in respondents' "top 5" choice of "factors having the most impact on reference costs". On this basis, the order of perceived importance is:

1. Variations in cost allocation practices [most important] **(C)**
2. Differences in running costs for hospital facilities (i.e. fixed, infrastructure costs and overheads) **(E)**
3. Variations in the clinical practices that drive cost **(E)**
4. Variations in length of stay (and its impact on excess bed-day costs) between Trusts **(CA)**
5. Differences in the way in which costed 'care profiles' (or 'bottom-up' costings) are produced **(C)**
6. Differences in the counting of activity (FCEs) **(IQ)**
7. Differences in clinical coding practices **(IQ)**
8. Variations in the data collection capacity of Trusts' information systems **(IQ)**
9. Variations in case-mix between Trusts not taken into account within HRG measures **(CA)**
10. Differences in the per unit cost of resources used between Trusts (i.e. direct costs such as salaries & wages, consumables etc.) [least important] **(E)**

Where **(C)** indicates factors related to costing approaches, **(CA)** indicates factors related to clinical activities, **(E)** indicates factors related to efficiency, and **(IQ)** indicates factors related to information quality.

It should be remembered that these results reflect the perspective of finance directors and cost accountants only. Clinicians, for example, may have had different views. They may have perceived actors such as differences in casemix complexity as more influential on reference costs than the factors ranked as more important by finance personnel. However, these findings reveal an interesting perspective from those NHS actors who are closest to the compilation of NRCE data. In their overall view, while efficiency differences are an important determinant of reference cost variability, (particularly in regard to fixed costs and the clinical activities that drive costs), these efficiency differences are perceived to be substantially masked by differences in costing approaches. Variations in information quality (counting and coding practices, and information system capabilities) are also perceived as having a significant impact on apparent reference cost variability. The quantified evidence reported in Chapter Two showed that there are many significant factors involved in cost variability, with no obvious rank order. The findings of this survey strongly reinforce this conclusion.

7 Discussion and Concluding Comments

7.1 Efficiency improvements and resource allocation

The NHS Executive has stated that they will use NRCE results to set differential targets for efficiency improvements in Trusts (DoH, 1999c; SERO, 2000), operationalised via Trusts' service agreements with their local Health Authorities. Newspaper reports have cited the government's intent that:

"Hospitals performing better than the benchmark are likely to be allowed to use their savings for patient services. But those delivering treatment above the benchmark levels will be set efficiency targets to reduce costs".

(The Financial Times, 12/6/98)

Trusts are now acutely aware that reference cost variability sends messages about efficiency and that resource allocation will, in the future, be driven by such messages, i.e. that more money will be available to hospitals that can demonstrate efficiency in cost terms.

Also, reference costs are included as an indicator within the NHS Performance Assessment Framework (DoH, 1999a). Recent Government initiatives to establish 'Foundation Trusts' have been based on a star-rating system that draws on PAF indicators. These Foundation Trusts are to be given autonomy in deciding their own clinical and financial priorities, with an expectation that "radically different health services" will result (Alan Milburn in: BBC News, 22/5/02). Although this appears to demonstrate a link between NRCE results and changes in health care delivery, what remains unclear is the weighting placed on NRCE data as part of this star-rating system. Of the 28 performance indicators identified, 9 relate to clinical effectiveness and outcomes, 8 to the patient/carer experience and 7 to Trust capacity and capability. Only four measures relate to efficiency and, of these, only the 'reference cost measure' focuses on financial efficiency¹².

Aside from the unclear role of reference costs within the PAF and consequent Trust ratings, the use of NRCE information for public and governmental monitoring of healthcare expenditure has, to date, appeared ad hoc. While health ministers on the one hand use reference cost results to point to "unacceptable variations" in costs, they are circumspect in noting that efficiency results must be interpreted in the context of other performance measures, measures which are not yet fully in place (see Section 7.6 below). Despite the substantial cost burden imposed on Trusts and the NHS Executive in recording and collecting NRCE data, its interpretation for decision-making and the holding accountable of NHS managers for cost efficiency, remain problematic.

7.2 The usefulness of the NRCE to date

Despite these problems, NHS actors recognise a need for comparative cost information. Clinicians and managers alike have noted their desire to use cost information for benchmarking and highlighting potential cost savings. Health Authorities want some means of comparing the efficiency of the Trusts from whom they commission services. The government wants improved accountability for health expenditure, and sees cost visibility as an important element in achieving this control.

Regarding its contribution to these aims, the NRCE has been acknowledged by the NHS Executive (DoH, 2000b) and by managers in Trusts and Health Authorities as a work in progress. It continues to be refined and extended to capture a greater proportion of hospital costs and to improve the quality and use of the data produced (DoH, 2000b, p.6). As users of NRCE data gain experience in interpreting the different indices produced (see Section 3.4), this database of comparative cost data has the potential to provide a useful resource for Trusts in benchmarking their relative positions and identifying cost efficiency trends over time. For now, however, the findings of this study suggest that a broad range of NHS actors harbour reservations about the current usefulness of the NRCE.

Concerns about the veracity of reference cost data undermine the confidence of NHS managers, accountants and clinicians in using this information for benchmarking, cost management and reviewing service efficiency. This study has demonstrated the true complexity of the factors impacting on reference cost variability. At present, and in the light of these findings, users' scepticism looks justified. Even when Trust actors attempt to draw on NRCE information to examine issues of efficiency, the fully absorbed unit costs produced in the NRCE do not allow them to focus on those costs that may be controllable. Hence the scope for clinicians and managers, as key decision makers in health, to control costs through using reference costs is limited.

At the NHS Executive level, it is acknowledged that problems remain in standardising the procedures for compiling reference costs (in particular, the results of standardising cost allocation practices were counter-intuitive – tighter prescriptive rules produced more cost variability). The NHS Executive is also aware of the difficulties for users in making sensible interpretations of the comparative cost data produced. Health Authorities, while finding NRCE data a useful "weapon" in negotiating service agreements, recognise that the cost figures may contain errors and have struggled to translate NRCE results into meaningful targets for Trust efficiency gains (Waite, 2000).

In summary, while published NRCE results do provide a useful starting point for further discussion on cost efficiency and benchmarking, difficulties in using reference cost information at both Trust and Health Authority level have left many NHS actors uncomfortable with whole-heartedly embracing the NRCE.

¹² The other efficiency indicators are: day case rate, length of stay and missed outpatient appointments.

7.3 The way forward for the NRCE

7.3.1 Improving the rigour of the information

This study has highlighted a number of issues that will be critical in developing the NRCE so that it might better serve its espoused aims and meet the expectations of its NHS users. First, if it is to gain the confidence and support of NHS actors, reference cost data must be perceived as robust. Two factors are critical here.

First, the process by which reference cost data is compiled needs to be further standardised (despite the somewhat surprising consequences of the 1999 standardisation). Based on a 1993 study, Ellwood (1996a, p.40) observed that the NHS Executive was apparently prepared to accept that "consistency can be sacrificed for greater accuracy". Several years later, and given that (i) the NHS costing manual has undergone revisions to improve its clarity and (ii) Trusts have now gained experience in costing to NRCE requirements, there should be fewer reasons why both accuracy and consistency cannot be attained. Trust accountants should now be in a better position to achieve consistency in their cost classifications (noted as problematic by Ellwood, 1996a), and to follow systematic cost allocation steps.

Interview evidence from this study suggested that greater prescription and standardisation of guidelines for reference costing would help to achieve this improvement. The view amongst NHS cost accountants is that consistent policy and practice are needed across all Trusts, in place of the current minimum standards, which allow for varied practice beyond prescribed minimums. Ongoing revisions to costing guidance, aimed at moving all Trusts to the level of 'best practice' rather than imposing base-line requirements, will assist the elimination of variety in cost allocation approaches. As the process of determining a suitable template for costing standardisation continues, NHS accountants should be encouraged to share their experiences of costing for the NRCE and provide constructive feedback to the NHS Executive.

From the NHS Executive's perspective, improved monitoring of Trusts' costing activities would increase confidence in the comparability of published reference costs. A more stringent application of the audit function to confirm, not just the financial accounts, but also the methodologies and practices of reference costing, would help to identify inconsistent practices that may undermine the comparability and usefulness of NRCE data.

This study has highlighted the issues of data capture and information quality. Attention must also be directed towards the counting and coding of clinical data before there can be confidence that information is being compiled on a comparable basis across Trusts (the follow-up CIMA study by the authors, will examine this issue further). It should also be recognised that HRGs do not fully eliminate differences in casemix and length of stay between Trusts and that not all of these differences flow from "inefficient" clinical practices.

7.3.2 Improving the relevance of the information

There are signs that NHS actors are seeking ways of using NRCE information more fruitfully. A recent survey indicates that over 90% of respondents considered reference costs potentially useful across a range of service and business processes, and 70% of respondents planned to develop their use of reference costs (NHS Executive and Healthcare Financial Management Association, 2000). It is clear to NHS actors that reference costs have the potential to inform benchmarking but it is becoming more apparent that NRCE information can also promote the formation of networks within the NHS by facilitating communication between health providers and commissioners, and between managers and clinicians. Indeed, a recent NHS Executive presentation on potential uses for reference cost information implored Trust managers and accountants to "do some benchmarking – get out of your office!" (SERO, 2000). Reference costs are also thought to give a voice to healthcare professionals in making visible their views, efforts, frustrations and performance.

7.4 Guidance on the uses of the NRCE

Along with addressing issues related to the rigour of reference cost data, NHS actors require guidance on how to identify and exploit its potential uses. Extracting the usefulness of cost information for benchmarking is not itself without cost. Attention to benchmarking, and efforts to reconcile anomalies identified, will require substantial time and effort from NHS staff (Jones, 1998). Trusts require information systems, staff and networking support if they are to maximise the benefits of having comparative NHS cost information.

The meaningful interpretation and use of NRCE outputs requires a consultative approach, with clinicians central to the process. Although the intention of the NRCE has been to attach systematically derived costs to HRGs, translating this information into healthcare planning and management requires looking behind those costs to reveal the activities they represent. This study has revealed instances of apparently poor communication between Trust managers, clinicians and accountants, and between Trusts, Health Authorities and the NHS Executive. Without clear and effective channels of communication, cost figures are just 'black boxes', while the issues driving the figures remain opaque.

7.5 Identifying relevant standards

It will also be important to reflect on where benchmarking 'standards' lie. This study revealed that NHS actors are unclear as to what constitutes acceptable cost efficiency. Lack of clarity could be addressed by the formalisation of NHS benchmarking around carefully identified comparable 'clusters'. This cluster approach is encouraged in existing NHS Executive publications (DoH, 1998a), but has not yet been employed within any structured framework. Also, further consideration should be given to identifying NRCE target outcomes for Trusts or clusters of Trusts, rather than having a moving, 'default' target of the 100% index average – NHS managers recognise that being average does not necessarily indicate good performance. Targets would best be articulated as ranges rather than absolute measures, to allow for some inherent variability in approach.

7.6 A broader framework for the NRCE

Roles for cost efficiency information must be considered within the broader government objectives for the "New NHS". Indeed, it was never the government's intention that reference costs were to be used as a free standing performance measure. "The New NHS Performance Assessment Framework" (DoH, 1999a) makes it clear that performance measurement should be centred around six key areas (or "high level indicators"): health improvement, fair access, effective delivery of health care, efficiency, patient and carer experience, and health outcomes. In addition, any assessment of efficiency must be made in the context of ensuring effectiveness, the latter being determined in the light of the standardised service delivery guidelines outlined in recently developed National Service Frameworks for health care delivery¹³.

To date, however, health performance indicators have been published in a fairly ad hoc way, and clinical quality indicators have been slow in arriving. While reference costs have been published since November 1998, it was only in June 1999 that the first set of clinical indicator targets was even decided upon (Appleby and Harrison, 1999). As a result, reference cost results have often had to be interpreted in isolation of any corresponding measure of clinical quality, to the frustration of many NHS actors. Until their role and impact within the Performance Assessment Framework is clarified, reference costs seem destined to lack credibility as a means of holding NHS Trusts accountable for their cost efficiency.

7.7 Concluding comments

The NHS Executive acknowledges that actions taken within the NHS will be directly affected by how performance is measured. It is important, therefore, that performance measurement approaches are aligned to overall NHS goals and objectives (DoH, 1998a). One key objective is to achieve improved accountability for public health expenditure; this can only happen when the framework for accountability is clear.

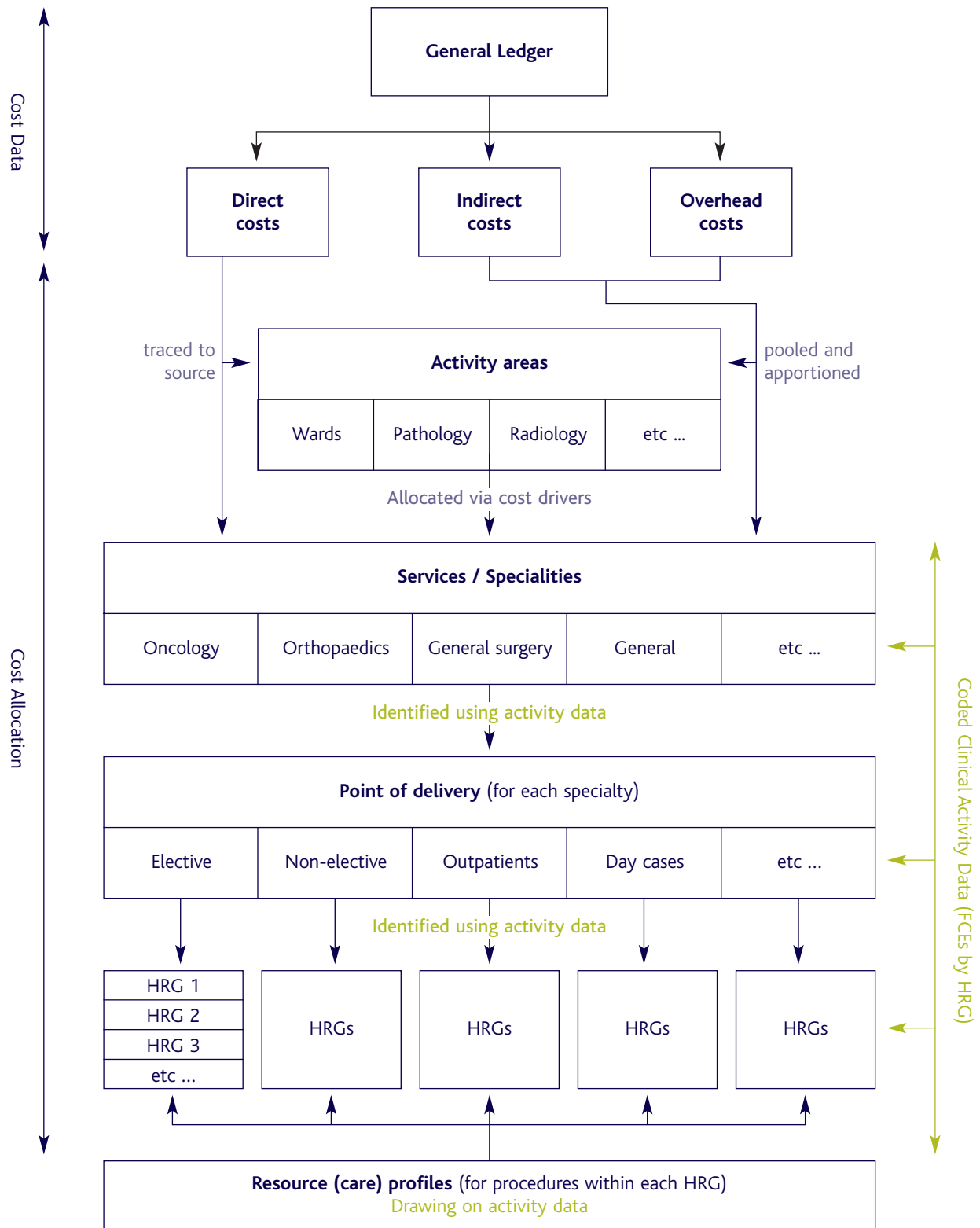
At present it is difficult to identify who is, and should be, accountable for cost efficiency outcomes in Trusts, and who is responsible for making the NRCE work. The cost data assembled for the NRCE suffers from various problems of inconsistency, unreliability and incomparability. Although the NHS Executive aspires to eliminate these problems, it is not clear that they can be avoided, since the outcomes of any costing system are shaped by incorrigible issues of data capture, data quality and cost apportionment. For all these reasons, the potential for the NRCE to support accountability, efficiency management and standard pricing imperatives currently appears limited.

Finally, an important question remains as to how cost efficiency measures are to be balanced against indicators of quality and service performance as a basis for evaluating the effectiveness of health care delivery. The NRCE could be considered one of the more quantifiable and objective indicators of NHS performance, yet so far it has experienced measurement and interpretation problems. This may not bode well for future efforts to implement the Performance Assessment Framework and balance a range of quite different (and sometimes conflicting) measures of health care performance within an overall context of financial constraint.

¹³ Currently there are National Service Frameworks for mental health services (September 1999), coronary heart disease (March 2000), care of the elderly (March 2001) and diabetes services (December 2001). Several others are in development.

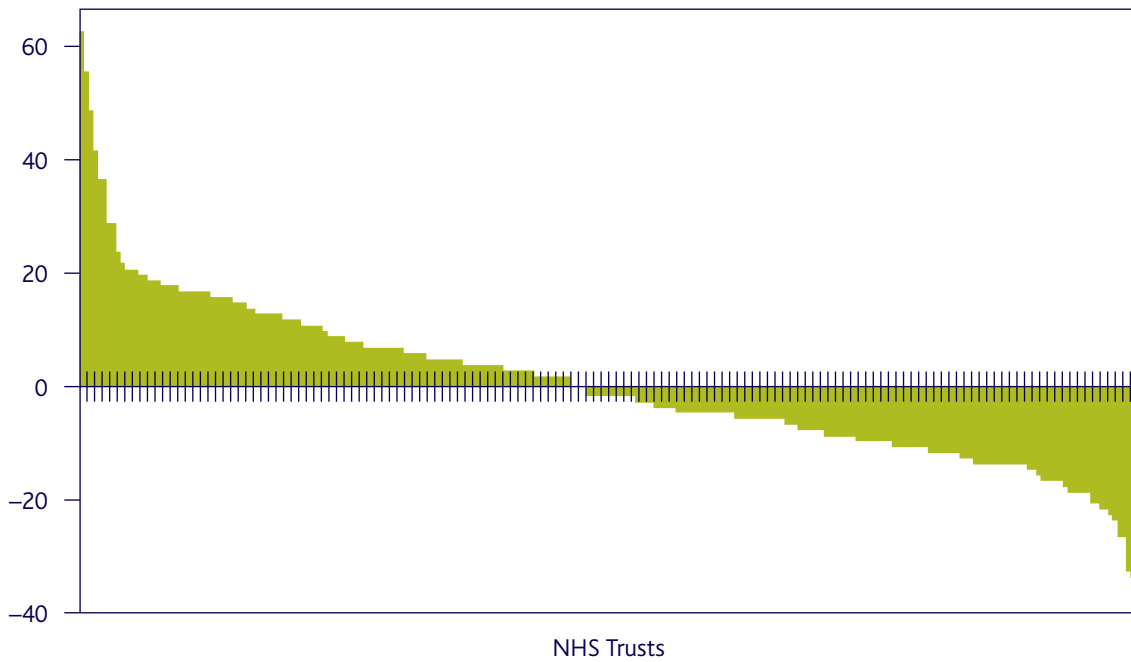
Appendices

Appendix 1: HRG costing procedures for the NRCE

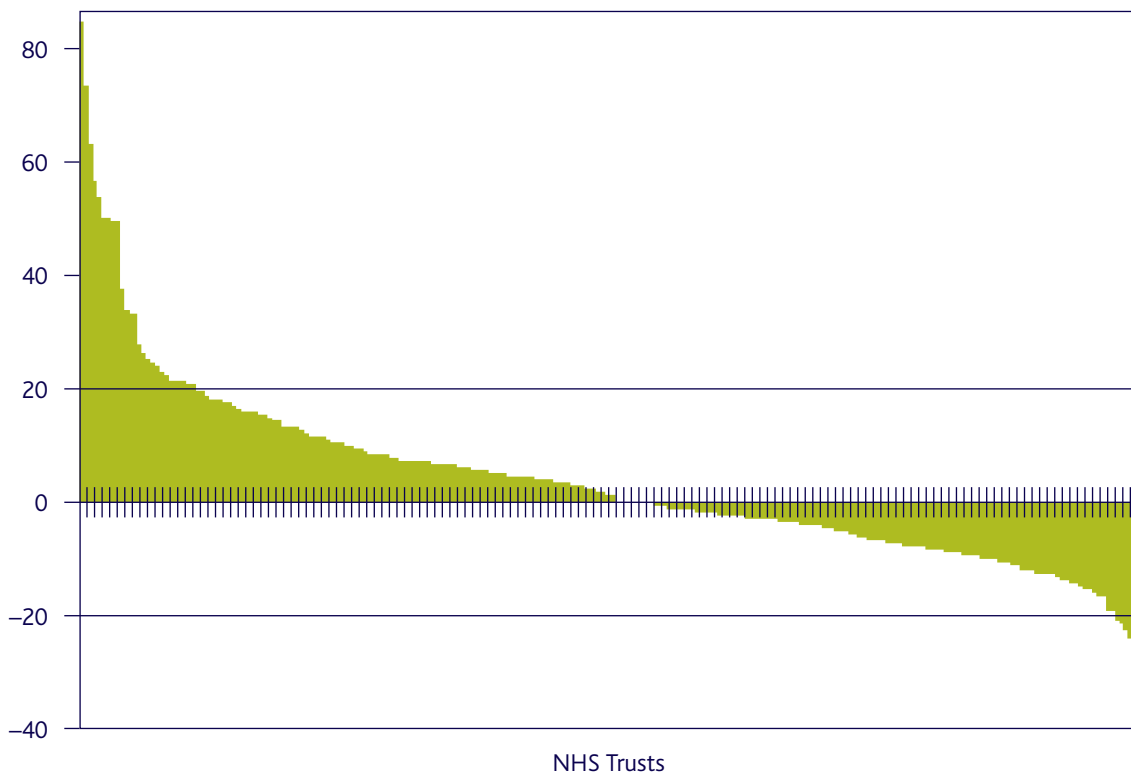


Appendix 2: The ranges of NRCI results for 1998, 1999

1998 National Reference Cost Index
Distribution of NHS Trust Scores around 100 – Trimmed Data

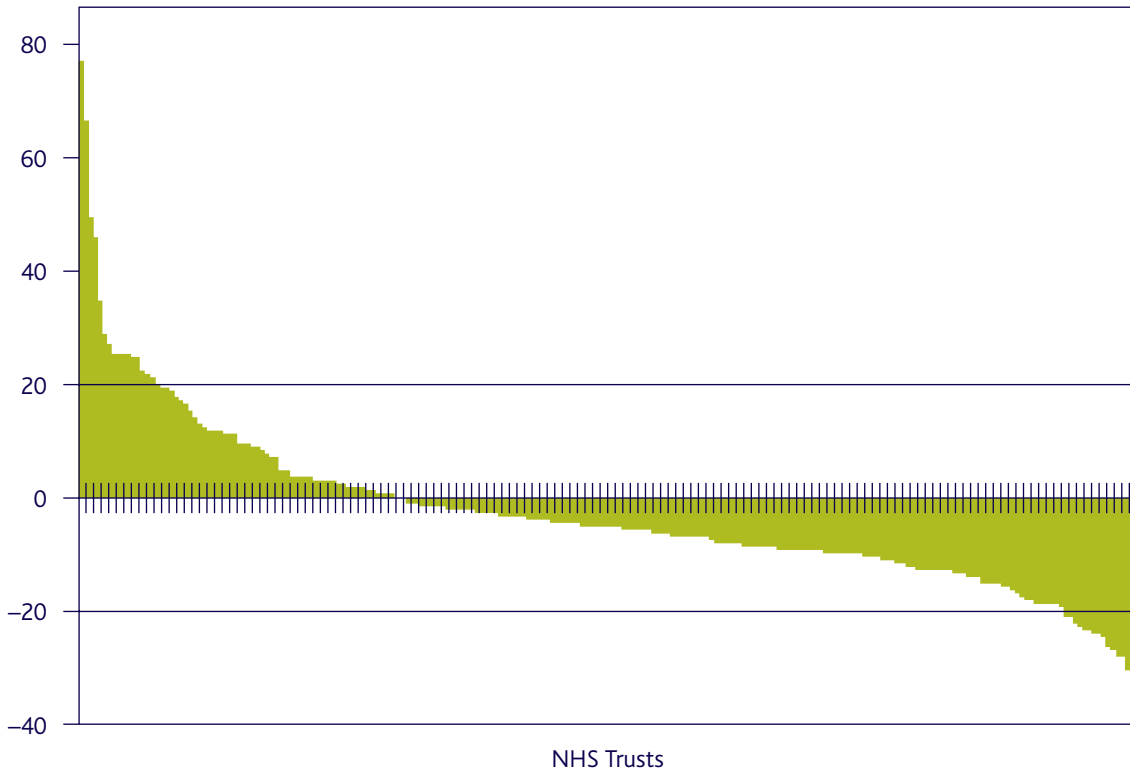


1999 National Reference Cost Index
Distribution of NHS Trust Scores around 100 – Trimmed Data

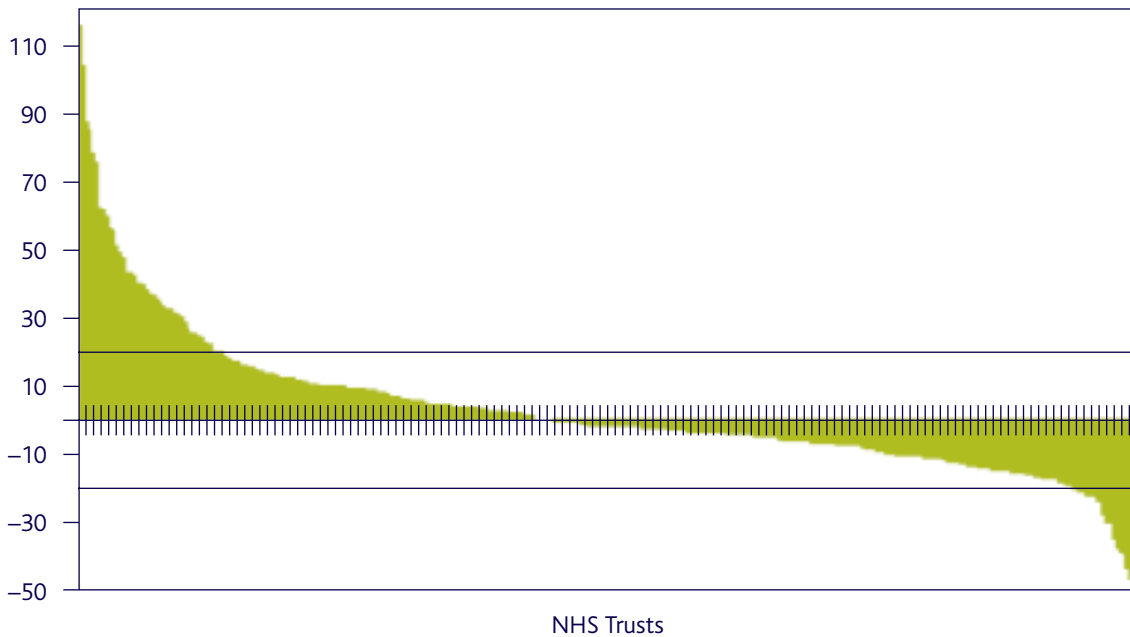


Appendix 2: The ranges of NRCI results for 2000, 2001

2000 National Reference Cost Index
Distribution of NHS Trust Scores around 100 – Trimmed Data

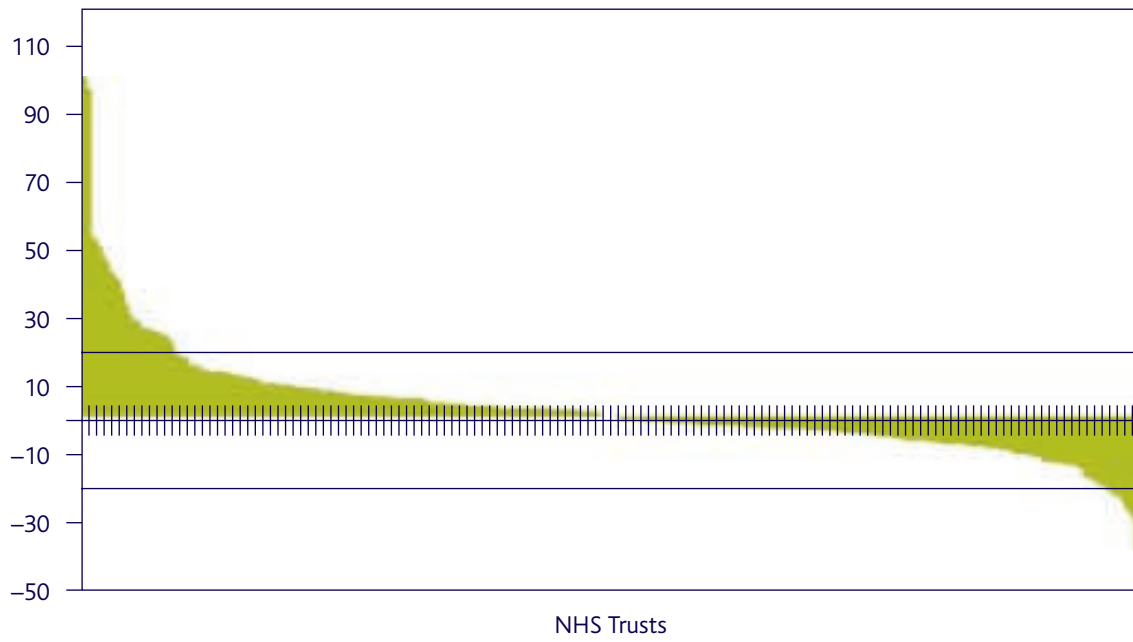


2001 National Reference Cost Index
Distribution of NHS Trust Scores around 100 – Trimmed Data



Appendix 2: The ranges of NRCI results for 2002

2002 National Reference Cost Index
 Distribution of NHS Trust Scores around 100 – Trimmed Data



Sources: DoH, 1998b, p.18; DoH, 1999c, p.20; DoH 2000b, p.20; DoH 2001b, p.19 and DoH, 2002a, p.22.

Appendix 3: Questionnaire response sheet

Instructions

Please look at the list of factors below, and:

- In Column 1, tick all of those factors that you believe may impact on the calculation of reference costs. Place a **cross** beside factors that you consider have no significant effect on reference costs. If you are not familiar with a factor or its effect, indicate that you 'do not know' by placing a **question mark** in Column 1.
- In Column 2, assign rankings to the five most significant factors. Please award a ranking of '1' to the factor you believe to have most impact on reference costs, descending to '5' for the fifth most significant factor. If you feel unable to identify or differentiate as many as five significant factors, then please just rank as many as you factors, then please just rank as many as you can.

	Column 1 Impacts on reference costs? (✓, X or ?)	Column 2 Top 5 factors ranking (score 1 to 5)
1. Differences in clinical coding practices	<input type="checkbox"/>	<input type="checkbox"/>
2. Differences in the counting of activity (FCEs)	<input type="checkbox"/>	<input type="checkbox"/>
3. Variations in cost allocation practices	<input type="checkbox"/>	<input type="checkbox"/>
4. Differences in the way in which costed 'care profiles' (or 'bottom-up' costings) are produced	<input type="checkbox"/>	<input type="checkbox"/>
5. Variations in the clinical practices that drive costs	<input type="checkbox"/>	<input type="checkbox"/>
6. Differences in the per unit cost of resources used between Trusts (e.g. salaries & wages, consumables)	<input type="checkbox"/>	<input type="checkbox"/>
7. Differences in running costs for hospital facilities (i.e. fixed, infrastructure costs)	<input type="checkbox"/>	<input type="checkbox"/>
8. Variations in the data collection capacity of Trusts' information systems	<input type="checkbox"/>	<input type="checkbox"/>
9. Variations in case-mix between Trusts that are not taken into account within HRG measures	<input type="checkbox"/>	<input type="checkbox"/>
10. Variations in length of stay (and its impact on excess bed-day costs) between Trusts	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 4: Rankings awarded to factors contributing to reference cost variability

Factor number	% respondents ranking it in top 5	Frequency of ranking					Average ranking
		1st place	2nd place	3rd place	4th place	5th place	
1	50.35	9	16	17	17	13	3.125
2	51.05	18	18	17	12	8	2.644
3	67.13	31	18	18	19	10	2.573
4	53.85	11	15	16	15	20	3.234
5	58.04	9	12	21	17	24	3.422
6	26.57	7	5	3	11	12	3.421
7	60.14	14	19	12	19	22	3.186
8	48.95	18	15	15	13	9	2.714
9	27.97	10	5	6	10	9	3.075
10	54.55	18	18	20	8	14	2.769

Appendix 5: Comparison of factor rankings awarded by finance directors and cost accountants from the same NHS Trusts

Trust	Ranking given to each factor (F)									
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10
1	2	3						1	4	5
	2	3	4	5				1		
2	3			1		4	4			2
	5	2					4	3		1
3			4	3	1				5	2
		5				2	4		3	1
4	1	4	2		3		5			
	5				1	2	3		4	
5		2	5		3		1	4		
		3			5		2	1		4
6			1	3		5	2	4		
			1	2	5		4	3		
7				4	5		3	2		1
			2		3	4		1		5
8		1	2		5	3	4			
		1	2		5		3			4
9	5		1	2	3		4			
	2		1	3			4			5
10										
	1	2		4		5				3
11	4	2	5	1				3		
	4		2	3				1	5	
12	3	4			5		1			2
	2	1	3	4			5			
13			1	2	5		4			3
	2				3			4	5	1
14	2		4		1		5			3
	5		1		3			4		2
15		1	4		2		5			3
			1					3		2
16			1		4	5	3		2	
17	5	2	3	4			1			
		4		3	5		2			1
18	3	1	5		4		2			
		4			3		5	1		2
19	4	1	3	5				2		
	5	1	2	4				3		
20	4		2	1				3		5
			3	1	2		5	4		

Trust	Ranking given to each factor (F)									
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10
21	1		4		2		3			5
	1		3	5	4		2			
22			1		5		4	3		2
	3	3	5	2	1					
23	3	2		4	5			1		
	3	1	2							
24	4	5			1		2			3
				1	5			2	3	4
25	2		5				3		1	4
	5	2			4			1	3	
26	2	3	4					1		5
		3	4	5				2		1
27		5	4		3		2			1
		5	4		3		1			2
28			2		5	4	3			1
			1	2			4	5		3
29	2				4			1	5	3
	2			4	3			1		5
30				5	4	1	2			3
				5	4	1	2			3
31	2	1			3		4	5		
	3	1			4		5	2		
32	5		2				1	5	3	4
	3	4	5		4			1		
33					2	5	4		3	1
		2	4		3		1			5
34		2	1		4			2	5	
		2	1		5			3	4	
35			1	4	5		2	3		
			1	3	2	4	5			
36	4		1	3	5		2			
			4	2	5	3	1			
37	3		2					1	4	5
	3	1		2		4			5	
38		2	1	5			3			4
			4	5				1	2	3
39	4				5	2	1			3
	3				4	5	2			1
40	4		5	3			2			1
	4	1			2		5			3

Appendix 5: continued

Trust	Ranking given to each factor (F)									
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10
41										
42	4	5				1	2			3
43		3	2		4	5	1			
		4		1		5		2		3
44			3	2	4	5			1	
			4	1	3		5		2	
45			5	1	3			4		2
				2	3		5	4		1
46			3	4			2	5		1
			3	5			2	4		1
47			3	5		1	1		4	
			3			1	2	5	4	
48	3	5	1	4				2		
			4	3	2	5	1			
49	3	2	1				4		5	
	3		1	4	2		5			
50	2	1						3	4	5
	5	1	3	2				4		
51	4		2	1			5			3
			5	5	3	2	1			3
52	5	1		4				2		3
	4	3	1				2			5
53		5			3		2		4	1
	3	2	1				4	5		

Notes on Appendix 5:

- (i) The first line for each Trust indicates rankings awarded by the finance director.
The second line for each Trust indicates rankings awarded by the cost accountant.
- (ii) Where lines are left blank, no ranking was made.
- (iii) Some respondents ranked fewer than 5 factors.
- (iv) Some respondents ranked factors equally (e.g. 3rd equal, whereupon no 4th ranking then shown).

Glossary of acronyms

DoH	Department of Health (U.K.)
DRG	diagnostic related group
FCE	finished consultant episode
HFMA	Healthcare Financial Management Association
HRG	healthcare resource group
LOS	length of stay (in hospital)
NCMO	National Casemix Office (now the Case Mix Programme)
NHS	National Health Service (U.K.)
NRCE	national reference costing exercise
NRCI	national reference costs index
NSRC	national schedule of reference costs
SERO	South East Regional Office of the NHS Executive

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