National Audit Office

Department of Health

The procurement of consumables by NHS acute and Foundation trusts

Methodology

JANUARY 2011

Contents

Design and Production by NAO Communications
DP Ref: 009418-002

Methodology

Introduction

1 This document accompanies *The procurement of consumables by NHS acute and Foundation trusts*, a report published by the Comptroller and Auditor General in January 2011. It adds further detail to the description of the methodology which is included in the main report as an appendix.

2 Our methodology consisted of seven main elements:

- Quantitative analysis of the purchasing patterns of 61 acute trusts from purchase order data.
- Quantitative analysis of trust financial accounts for the financial years 2008-09 and 2009-10 and analysis of more detailed NHS Trust Financial Returns expenditure data for 2009-10.
- A census of all NHS hospital trusts to gather data on trusts' approaches to procurement and views on aspects such as the Collaborative Procurement Hubs and NHS Supply Chain (we received 160 responses, a 97 per cent response rate).
- Analysis of contract notices published in the Official Journal of the European Union (OJEU) by trusts, Collaborative Procurement Hubs and NHS Supply Chain.
- Interviews with seven key suppliers, focusing on their strategies for selling to the NHS, pricing strategies and price variations for selected products.
- Interviews and data-gathering with a range of other stakeholders.
- Review of a range of relevant documentation.

3 We undertook our fieldwork during April to August 2010.

Quantitative analysis of trusts' procurement data

Data

4 We worked with consultants from @UK plc to carry out a detailed examination of the purchasing patterns of 61 NHS acute and Foundation Trusts. @UK has extensive experience of working with individual trusts on the efficiency of their procurement spend in order to identify opportunities to reduce spend.

5 @UK holds data from 61 acute and Foundation Trusts due to the work it has been commissioned to carry out on behalf of NHS Shared Business Services – a joint venture between the Department of Health and Steria, which provides 'back office' services such as finance and accounting, to the NHS – and two procurement hubs (London Procurement Programme and Healthcare Purchasing Consortium). This data consists of all purchase orders raised by trusts over a twelve month period and a download from their accounts payable system of total non-pay spend. The data includes around 9 million separate transactions. NHS Supply Chain also provided data for these trusts for 2009-10. @UK uses its in-house artificial intelligence system to classify every purchase order line raised by the trust in a twelve month period to a unique product code. This system also extracts information on supplier, cost, date and quantity ordered.

Calculating savings

6 @UK applied a series of algorithms to the data which analysed each individual purchase order line to calculate potential savings. This allowed them to calculate, for each trust and in total, the savings which could have been delivered if the same quantity of identical products had been purchased, but at cheaper prices if these were available at the time of purchase.

7 @UK used three different tests to establish whether a better price for each transaction was available, for products showing price variation. The three tests were:

- **Benchmarking – comparing prices across all trusts in the dataset, during three month periods.** The potential saving for each transaction was calculated as the difference between the purchase order line price and the benchmark price, multiplied by the quantity purchased in each transaction. The benchmark price was the median of the three month average unit prices achieved for each product by each trust. If fewer than three trusts bought the product then the benchmark price was set instead at the median of the purchase order line unit prices in the same three month window. No benchmark price was set where there was a large

variance on the unit prices; specifically, where the average unit price over the three month window was more than 1.5 times the minimum price.

- **Variance – comparing prices paid by each individual trust, in different transactions, for the same product, over a period of 12 months.** Savings were calculated by multiplying the difference between the actual price paid and the lowest price paid by the quantity ordered on the purchase order line.
- **Contract – comparing prices paid to those available at the time of purchase via contracts which the trust could have used.** If a lower price was available for the product (for example through a contract operated by the local Hub), the saving was calculated by multiplying the difference between the price paid and the contract price by the total quantity ordered.

Savings identified

8 From the tests above, the results which yielded the greatest saving for each transaction were summed to produce the overall savings figure. A total of £33 million in potential savings was found to be available to trusts, simply by buying the same volume and type of product at the best price which was available at the time of purchase.

9 This Figure of £33 million is 3.3 per cent of the £1 billion spent on products within the scope of our analysis by trusts in our sample. Since we estimate that all trusts spent £4.6 billion on consumables in 2009-10 (see accounts data below), then if these savings were replicated across all NHS acute and Foundation Trusts, a total of £150 million, an average of around £900,000 per trust, would have been saved.

Extrapolation

10 Our sample of 61 trusts is reasonably representative of the entire population of trusts in terms of income, expenditure and type of trust, so it was reasonable to extrapolate the savings identified to the entire population as discussed above. There was no significant difference between our sample and the rest of the population in terms of 2009-10 income and expenditure on supplies and services. As the table below (**Figure 1** overleaf) illustrates, the @UK sample is very similar to the general population in terms of the distribution of different type of trust. The definitions of the types of trust are those used by the NHS Information Centre.

11 The @UK sample does, however, under-represent Foundation Trusts; only 30 per cent of the sample are Foundation Trusts compared to 50 per cent of the general population. However, the level of savings a trust could have generated does not appear to be linked to its Foundation Trust status, so we do not believe that this under representation has a significant impact on our estimate of the overall level of savings.

Figure 1
@UK sample of 61 trusts compared to all 165 NHS hospital trusts

Type of trust	@UK sample (number)	All hospital trusts (number)	@UK sample (%)	All hospital trusts (%)
Acute large	15	39	24.6	23.6
Acute medium	11	38	18.0	23.0
Acute small	13	37	21.3	22.4
Acute multi-service	2	4	3.3	2.4
Acute specialist	8	20	13.1	12.1
Acute teaching	12	27	19.7	16.4
	61	165	100	100

Source: National Audit Office analysis

12 The nature of the sample also presents a potential risk of under-estimating potential savings in the whole population of trusts. The sample is based on trusts which use back-office services provided by NHS Shared Business Services, which may possibly be an indicator of greater than average focus on financial and administrative efficiency, hence more limited scope than average for securing savings. Without detailed transaction data from the remaining trusts it is impossible to test this hypothesis.

Other analysis

13 As well as forming the basis for our estimate of potential savings available to trusts, as outlined above, the dataset allows other analyses of trusts' spending, at the supplier, product class and individual product level. For example, in our report we discuss:

- the level of price variation for some high volume products;
- the potential savings available through making the most efficient use of discounts available from bulk purchasing; and
- estimates of the reduction in administration costs which might be available by reducing the number of purchase orders per product.

Limitations

14 While this dataset is the best available to our knowledge, there are some important factors to bear in mind when considering these figures:

- The dataset covers less than half of all hospital trusts in England.
- The analysis looks only at procurement activity via purchase orders. This means any consumables which were procured outside trusts' purchase order system do not feature in our analysis of price variation or potential savings. However, while around two thirds of trusts' non-pay expenditure is not conducted via purchase orders, there is tentative evidence that a high proportion of the transactions within the scope of this report, i.e. purchases of consumables, are made via purchase orders.
- We have a 12-month snapshot of transaction data for each trust, although this is not the same 12-month period for all of them. The earliest snapshot we have ends March 2008, whilst the most recent ends December 2009. All data provided by NHS Supply Chain is for the financial year 2009-10. However, as savings are calculated on the basis of prices available at the point of sale, the total savings figure should not be affected by the fact that the datasets do not overlap perfectly.
- For six trusts, transaction data was only available for transactions with NHS Supply Chain, not for other procurement routes.
- For eight trusts, accounts payable data was not available.

15 These limitations do not materially affect the overall message of this analysis, that trusts could achieve significant levels of savings without changing the volume or range of products they purchase and additional savings could be achieved by taking advantage of the savings available through bulk purchasing and rationalising the range of products bought.

Quantitative analysis of trusts' accounts data

16 We estimated the total spend on consumables by all NHS hospital trusts in England in 2009-10 to be £4.6 billion. This is based on a detailed analysis of the accounts of the 83 trusts which had not achieved Foundation Trust status at the start of 2009-10 and extrapolation across the entire population.

17 The amount spent on certain categories of non-capital items for trusts which have not achieved Foundation Trust status is submitted to the Department as part of an annual return. This is known as the NHS Trust Financial Return on expenditure data (TFR-3). (See **Figure 2**). Although Foundation Trusts do not complete this return we can access their total non-pay expenditure from their annual accounts. If we assume that Foundation Trusts spend the same proportion of their non-pay expenditure on consumables, then we can estimate total spend on the products within the scope of our analysis for all trusts.

18 Of the 166 acute trusts in England in 2009-10:

- 83 (50 per cent) were Foundation Trusts;
- 77 (45 per cent) had not achieved Foundation Trust status; and
- 6 (4 per cent) became Foundation Trusts in the course of the year.

19 Non-pay expenditure by non-Foundation trusts (including those which converted to Foundation Trusts in year) made up 51 per cent of all non-pay expenditure. In 2009-10 non-Foundation Trusts' non-pay expenditure was £9.4 billion, while Foundation Trusts spent £9.0 billion. Hence we multiply non-Foundation trusts' spend on each category by a factor of 1.96 to reach an estimate of overall expenditure by category.

Figure 2
Estimate of NHS hospital trusts' spend on consumables in 2009-10

Products in scope	Non-Foundation trust spend (£m)	Estimate of total spend (scaled up to take account of Foundation Trusts) (£m)
Medical & surgical equipment (purchase)	1,128	2,212
Laboratory equipment (purchase)	251	493
Appliances	244	479
Other clinical supplies	237	464
Provisions and kitchen	82	160
Dressings	80	156
Printing and Stationery	74	146
Other categories	229	448
Total	**2,325**	**4,560**

NOTES

1 The categories 'medical and surgical equipment' and 'laboratory equipment' refer to product purchases only and exclude the costs of maintenance of this equipment, which is classified separately in trust accounts. The figures exclude the costs of capital items.

2 'Other categories' includes a number of small spending categories (2 per cent or less) such as laundry and cleaning equipment, bedding and linen, and uniforms and clothing.

Source: National Audit Office analysis of Department of Health data

Trust census

20 We carried out a census of all hospital trusts (Foundation and non Foundation) in England. At the time of the census, May 2010, there were 165 trusts. We designed and refined the census through consultation with NHS procurement experts and piloting with three trusts. The main purpose of the census was to gain the trusts' perspective on consumable procurement, and their views of Collaborative Procurement Hubs and NHS Supply Chain. The census helped us to build an understanding of trusts' procurement capabilities, how they collaborate with each other and how they view collaborative procurement.

21 We distributed the census by email, with a web link to our census, to the chief executives of all NHS hospital trusts. The chief executive was asked to pass the census to the manager or director responsible for overseeing trust procurement. We provided a user name and password to enable each trust to access the census, and to enable chief executive review of the answers before the census return was submitted.

22 We received responses from 160 of 165 trusts (97 per cent); most were complete but a small number of respondents did not answer all the questions.

Supplier interviews

23 The study team interviewed seven major suppliers to the NHS, to gather the supplier perspective on NHS procurement and to deepen our understanding of the study issues, in particular the variations in price which we observed for a large number of products. The companies interviewed were 3M, Johnson & Johnson, Covidien, Boston Scientific, Medtronic, GE Healthcare and Stryker. These were selected based on recommendations from our consultants @UK and the industry trade body, the Association of British Healthcare Industries (ABHI).

24 The interviewees were not a statistically representative sample, which would not be possible to achieve given the large number of suppliers to the NHS and the limitations of time and team resources. The interviews were intended to provide qualitative and illustrative data; we did not attempt to extrapolate broad conclusions from them but used them to identify and explore the factors which may lie behind the patterns we observed in our quantitative analyses.

25 The interview questions covered three areas: strategies for selling to the NHS; pricing strategies (in general) and a detailed discussion of pricing data obtained from our quantitative work. Interviewees were provided with data on price variations for six of their products.

Contract notices published in the Official Journal of the European Union

26 We commissioned the procurement consultancy BIP Solutions to gather and analyse data on the number and type of contract notices published in the Official Journal of the European Union. This data was obtained from the Tenders Electronic Daily (TED) online database which holds details of all such notices.

27 This data showed that 378 separate notices were issued by trusts, Hubs and NHS Supply Chain for 'medical consumables' in the financial year 2009-2010. Work by the NHS National Procurement Council estimates the cost of running a tender in the Journal to range from £37,000 for a basic requirement, to £221,000 for very complex tenders. We therefore estimate the total cost of these tenders to be £14-84 million.

Stakeholder interviews and data-gathering

28 We undertook semi-structured interviews with representatives of:

- the Department of Health, which is responsible for NHS funding, NHS procurement policy, and the QIPP improvement programme;
- the Office of Government Commerce (an independent office of HM Treasury, established to help government deliver best value from its spending);
- Buying Solutions, the national procurement partner for all UK public services;
- NHS Supply Chain, which was formed from the NHS Logistics Authority and is operated by the private distribution company DHL on behalf of the NHS Business Services Authority;
- NHS Business Services Authority, which oversees the NHS Supply Chain contract;
- NHS Shared Business Services, which provides 'back office' functions such as finance to some NHS trusts;
- the industry trade body, the Association of British Healthcare Industries (ABHI);
- three acute trusts;
- five Collaborative Procurement Hubs; and
- two Strategic Health Authorities.

29 We also sent all nine Collaborative Procurement Hubs a short email questionnaire, to obtain information on their organisation structures and activities. The questionnaire asked about membership, staffing, the range of services provided, savings achieved, future plans, and requested examples of successful procurement projects. We received responses from all the Collaborative Procurement Hubs.

Document review

30 We reviewed relevant documents, including key procurement policy documents, national procurement strategies, reviews of NHS procurement and Collaborative Procurement Hub business plans. This enabled us to develop our understanding of the procurement landscape and allowed triangulation with data collected from our visits, the census of trusts and our quantitative analyses. Key sources included:

- *Strategic Review of the Collaborative Procurement Hub Programme*, Ernst and Young, February 2008.
- *Procurement Capability Review of the Department of Health and the NHS*, carried out by the Office of Government Commerce in November 2008.
- *Department of Health Procurement Capability Report Improvement Plan*, November 2008.
- *Necessity – not nicety: A new commercial operating model for the NHS and Department of Health*, Department of Health, May 2009.
- *Commercial skills for the NHS*, Department of Health, March 2010.
- *The NHS Quality, Innovation, Productivity and Prevention Challenge: an introduction for clinicians*, Department of Health, March 2010.