Patients' and health-care professionals' awareness of cost: a multicentre survey

Delivering cost-effective health care within the constraints of public funding is the goal of the NHS. In this study 248 health-care professionals and patients across six different hospitals were surveyed to ascertain their cost awareness. Cost awareness was poor across all groups.

The real term cost of delivering health care by NHS UK has increased by 4% for every year since its conception in 1948 (Harker, 2012). The total budget for NHS England was £96 billion in 2013–14 (NHS England, 2013). The importance of health care, and in particular the financial implications of maintaining a world-class service (Davis et al, 2014), is mirrored by the importance the NHS was given in the recent UK general election.

Commissioning of health-care services, and therefore the allocation of money, has recently changed in keeping with the Health and Social Care Act 2012. A new body, NHS England, allocates money for specialist services and primary care. Clinical commissioning groups, largely led by GPs, allocate money locally for acute services and community care.

Although the budgets are set by commissioning groups, a significant proportion of actual spending decisions occur at the frontline. It is estimated that doctors are responsible, either directly or indirectly, for spending 50–75% of the health-care budget (Barclay et al, 1995). Since health-care professionals play such a crucial role in ultimately spending the budget, it would be interesting to see whether these professionals have knowledge of the cost associated with their decision making or daily practice. Furthermore, considering the political significance currently given to spending, ring-fencing and outsourcing in the NHS it would be equally interesting to gauge the public's conceptions of health-care cost.

Considering the huge budgets and constant pressure on cost saving, there are few studies of cost perception among health-care professionals (Ryan et al, 1990; Barclay et al, 1995; Ballard et al, 2008; Tiong et al, 2011; Okike et al, 2014). The studies available have solely focussed on doctors and perception of consumable cost.

In the current study, the authors developed a questionnaire that set out to establish the cost awareness among a variety of health-care professionals and patients. They surveyed doctors, nurses, allied health-care professionals, managers, medical students and patients across six different hospitals to ascertain their cost awareness. They were particularly interested in costs associated with general surgery. The hypothesis was that cost awareness would increase with seniority (from medical student to consultant) and involvement in service development and would be better among health-care professionals compared to patients. This is the first study of its kind to include a variety of health-care professionals as well as patients and to assess both consumables and services.

Materials and methods

A questionnaire was developed that asked medical professionals to estimate the cost of common consumables and services (*Table 1*). In addition questions were asked about waste, what was felt to be contributing most to this wastefulness and whether knowing costs would potentially change their practice. A similar questionnaire was used for patients. The questionnaire given to patients used different terminology or explanatory phrases to ensure they would understand the question posed. Furthermore, the patient questionnaire omitted questions on 'group and save' and the cost of 'a deep clean of theatres' on the grounds that these items were deemed too technical even if explained in lay terms.

Responses were collected in written form over a 6-month period (September 2014–March 2015) in six different hospitals in five cities in the south east. The timeframe was 6 months to permit an adequate response rate in all hospitals. Individuals were approached directly (convenience

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sampling) in a variety of clinical settings (outpatients, theatre, the ward, morbidity and mortality or multidisciplinary meetings and during teaching sessions) and asked to complete the survey anonymously. Permission was asked to use the anonymous answers in future publications. The correct values were provided to the participants after completion. Since questionnaires were almost entirely completed face-to-face, return rates were >95%.

Costs were chosen after discussion between the authors. In terms of the consumables, the rationale was that they are all common items used in general surgery that cover a range of costs. The costs of services were again chosen because they are comprehensible and represent a wide range of cost within general surgery.

The true value for each item was established using the British National Formulary (Joint Formulary Committee, 2015), searches on the King's Fund website (www.kingsfund.org.uk) and local costs taken from Buckinghamshire Healthcare NHS Trust (*Table 1*). The authors recognize that items such as cannulae are purchased in bulk and differ in size; as a result the cost is variable. However, this is a relatively small price range. Drugs were costed according to generic prices.

The authors surveyed consultants, doctors excluding consultants, nurses, allied health-care professionals, managers, medical students and patients. The distinction between consultants and all other doctors was made on the grounds that the former have practiced for more than 10 years and are commonly more involved in management and service development. Allied health-care professionals included health-care assistants, medical secretaries, nurse practitioners, radiographers, physiotherapists and occupational therapists.

All data were collated using Microsoft Excel. The mean was calculated for each group and data were plotted as a percentage of the real price to permit easy visualization of the variability between groups. One hundred per cent was the true value.

Table 1. Actual cost

	Cost (£)	
Consumables	Single use surgical gown	3
	1 litre bag of Hartmann's	4.20
	One unit of blood	123
	A cannula	0.60
	80 mg Gentamicin	1.50
Services	Computed tomography abdomen and pelvis with intravenous contrast	129
	Deep clean of theatres after infected case	33
	Gross annual income of foundation year 1 doctor (unbanded)	21862
	Gross annual income of a band 5 nurse (first year)	21176
	Approximate wage bill for a medium-sized hospital	200 million
	A 'group and save'	13.40
	A single night stay on a standard surgical ward	275
	Cost to run an emergency theatre per hour	2000
	Typical total cost for an admission for laparoscopic appendicectomy for uncomplicated appendicitis	3098

Table 2. Mean percentage of actual value for consumables, services and combined for each cohort (true price is 100% of cost)

Cohort	Mean % of consumable costs	Mean % of service costs	Mean % of all actual cost
Consultants	664	213	374
Doctors (excluding consultants)	655	200	362
Nurses	1717	369	851
Allied health-care professionals	985	223	496
Managers	1929	337	906
Medical students	582	192	332
Patients	37 864	668	16 167

Results

A total of 248 responses was obtained. Of these, 51 respondents were patients, 27 were consultants, 64 were doctors (excluding consultants), 33 were nurses, 21 were allied health-care professionals, 37 were medical students and 12 were managers. The age range of the professionals was 21–64 years of age and for patients was 18–83 years of age.

The cost of consumables was overestimated by all groups (*Table 2*). The only exception was the cost of a unit of blood, which was underestimated by medical students, allied health-care professionals and managers. Patients over-estimated the cost of all consumables by a far greater margin than health-care professionals.

The estimates of the cost of services were closer to the true values (*Table 2*). In particular, perception of wages for first year doctors and nurses were accurate (range 87–112% and 103–139% respectively). The total cost for an admission for uncomplicated appendicitis was underestimated by five of the seven groups – only consultants and medical students overestimated the cost. The most obvious deviation from the real value was the estimation of the total wage bill of a medium-sized hospital, which was underestimated by all groups (range 7–67%).

The second part of the questionnaire focussed on waste of resources and potential change in practice. Patients were not asked whether knowing the cost would change their

Table 3. Answers to the question: 'Do you think we are wasteful?'

Group	Yes (%)	No (%)	No answer (%)
Consultants	85	8	7
Doctors (excluding consultants)	94	6	0
Nurses	91	3	6
Allied health-care professionals	66	29	5
Managers	92	8	0
Medical students	92	8	0
Patients	49	33	28

Table 4. Answers to the question: 'Where do you think the greatest waste is?'

Group	Commonest answer
Consultants	Length of stay
Doctors (excluding consultants)	Unnecessary admissions
Nurses	Medicines and consumables
Allied health-care professionals	Agency staff and paperwork
Managers	Unnecessary investigations
Medical students	Disposables
Patients	Management

Table 5. Answers to the question: 'If you knew the cost of health care would it change your practice?'

Group	Yes (%)	No (%)	No answer (%)
Consultants	67	26	7
Doctors (excluding consultants)	70	29	1
Nurses	55	36	9
Allied health-care professionals	62	24	14
Managers	58	34	8
Medical students	68	29	3

practice. Among health-care professionals, the majority of each group felt they were wasteful with resources in the NHS. Of note, 90% of all doctors believed they were wasteful (*Table 3*). Once again, patients' responses were distinctly different – 'only' 49% said yes when asked if they believed we were wasteful in the NHS. Individuals were asked where they felt the greatest waste was. As this was an open question without a binary answer the spread of responses was much greater. Overall the response rate was around 50% for all groups. *Table 4* summarizes the commonest answer per group.

The final question was only posed to health-care professionals and asked whether they would change their practice if they knew the cost of health care. The majority of all groups answered yes to this question (*Table 5*).

Discussion

This is the first study that looks at perception of health-care cost among both health-care professionals and patients, assessing both consumables and services. Overall the findings suggest that both health-care professionals and patients overestimate the cost of delivering health care. In particular, the cost of consumables was grossly overestimated by all groups. The extent to which patients overestimated cost was striking.

A previous study on the awareness of the cost of drugs among GPs has shown that low cost items are commonly overestimated and high cost items often underestimated (Ryan et al, 1990). In keeping with this observation, the total wage bill was underestimated by all groups. The reasons for this are likely to be twofold. An average district general hospital employs 5000 members of staff; the authors propose that most health-care professionals and patients are unaware of this and therefore estimating the total wage bill is difficult. The second reason is one of large numbers (Murray, 2013): although there is limited research in this area, it has been shown that people have difficulty in visualizing numbers in the range between 1 million and 1 trillion (Landy et al, 2011).

The perceived area of waste was variable between the groups. It was striking that each group considered the greatest waste to be directly associated with their activity, although external input was a common denominator in that activity. For example, nurses administer drugs prescribed by doctors and feel the greatest waste is in medication. Consultants make discharge decisions although these are hampered by, for example, delayed packages of care in the community. Lastly managers ultimately hold the purse strings, yet feel the waste is caused by doctors ordering unnecessary investigations. The authors can conclude that not a single group of professionals has a global view of waste and appear to put the blame for waste on a different group, yet in combination these groups would cover most areas of waste within the NHS. Maybe introducing a 'multidisciplinary approach' to cost awareness and therefore waste reduction is the answer to the necessary savings proposed by politicians.

The finding that 64% of health-care professionals felt they would change their practice if they knew the cost of health care is interesting. Of course, the observation that this cohort grossly over-estimated the cost of many items within health care puts this statement into some degree of doubt. It is also worth noting that in an increasingly litigious working environment idealistic practice based on clinical acumen alone

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may, unfortunately, not always prevail and increasingly scans are used for the worried well (O’Dowd, 2015), although the cost of this practice is estimated at 1–2% of the total costs of all scans (Hermer and Brody, 2010).

During the data collection it was apparent that nearly all participants enjoyed answering the questions. All were keen to have the answers and took pride in getting close (or not so close) to the actual answer. This suggests to the authors that health-care professionals are keen to know what things cost and engaging them in the process of considering cost is likely to be beneficial.

Ultimately health-care professionals of all specialties and grades have a responsibility for spending the budget wisely. It seems strange that health-care professionals are asked to spend money on a daily basis without knowing the cost of anything. Even more remarkable is the ease with which this money is spent in the context of the gross overestimation that has become apparent in this survey. This could, perhaps, be explained with reference to the ideas of Kurunmaki and Miller (2008) about medical, hospital accountancy and health economics (represented by doctors/nurses, hospital/trust management, and NHS England/National Institute for Health and Care Excellence level) having different accounting ‘entities’ and different modalities for confronting cost.

On a national scale, the issue is some kind of quantification of overall utility, on the hospital management scale the pressure is related to accounting for cost, and for clinicians the issue is, at any given moment, usually health. Where you are situated in terms of thinking about or working with these accounting entities might also affect why you spend what you spend despite overestimating ‘cost’. This whole question may get hidden when the ‘market value’ of goods is taken as an indication of ‘cost’, without considering the accounting logic or framework in which those costs are usually managed.

Overall, medical students’ estimates were closest to the actual costs. This observation implies that years of exposure to medical practice does not improve one’s understanding of cost. This could be construed to reflect poorly on those that set budgets and allocate money. It could be argued that they have a responsibility to educate frontline staff about cost in an effort to spend the finite money available effectively. As a matter of fact, many trusts have started showing the cost of blood tests or radiological investigation when requests are submitted. The digital revolution, which the NHS is still struggling to embrace, is the perfect opportunity to educate staff on cost. The counter argument is that we should all be practicing evidence-based medicine and cost is only a small part of that practice.

Although this is the largest and most comprehensive study of its kind there are certain limitations that need to be considered. First, the group sizes are not large enough to make any statistical assessment of the multivariate questions that were posed in the survey. In particular only 12 managers were included in the study. Although all grades of managers were represented, clearly this is still a relatively small sample. Second, the costs were randomly selected to represent common items and services familiar to all health-care professionals within a general surgical setting, but may introduce an unintentional bias not controlled for here. Although ‘seniority’ was established by asking participants to disclose their grade, all consultants were pooled. This therefore does not distinguish between the vast experiential difference within the consultant body. However, the authors feel that a significant component of the ‘learning curve’ takes place in the first 10 years of practice.

Conclusions

This study suggests that both medical professionals and patients have a poor understanding of the cost associated with delivering surgical care. Consumables, in particular, are vastly overestimated. The fact that a large majority of professionals feel they are wasteful in the NHS and would be prepared to change their practice if they were made more aware of cost should be interpreted as a positive phenomenon to those proposing ‘efficiency savings’. **BJHM**

Conflict of interest: none.

KEY POINTS

- Both patients and health-care professionals are poorly aware of cost associated with providing health care.
- Cost awareness is poorest among patients.
- Among health-care professionals, seniority does not appear to affect cost awareness.
- The majority of health-care professionals state they would change their practice if they were more aware of cost.
- Individuals’ perception of where resources were potentially wasted was highly job specific.

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