2013-04-01

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10.1177/1355819612473453
Journal of Health Services Research & Policy
SAGE Publications

Journal of Health Services Research & Policy
18(2) 83–89

DOI: 10.1177/1355819612473453
jhsrp.rsmjournals.com
SAGE

Managing a sustainable, low carbon supply chain in the English National Health Service: The views of senior managers

Jane Grose[1] and Janet Richardson[2]

Abstract

Objectives: In an effort to reduce costs and respond to climate change, health care providers (Trusts) in England have started to change how they purchase goods and services. Many factors, both internal and external, affect the supply chain. Our aim was to identify those factors, so as to maintain future supply and business continuity in health and social care.

Methods: Qualitative interviews with 20 senior managers from private and public sector health service providers and social care providers in south west England. Interviews were recorded, transcribed and thematically analysed.

Results: There were four areas of concern: contradictions with government legislation which caused confusion about how best to deliver sustainable solutions; procurement was unclear and created multiple approaches to purchasing bulk items at low cost; internal organizational systems needed to be reconsidered to embed sustainability; and embedding sustainability requires a review of organizational systems. There are examples of sustainability solutions throughout the National Health Service (NHS) but the response continues to be patchy. More research is needed into why some Trusts and some staff do not recognize the benefits of a core approach or find the systems unable to respond.

Conclusions: The NHS is one of the major purchasers of goods and services in England and is therefore in an excellent position to encourage sustainable resource management, manufacturing, use and disposal.

Keywords

procurement, resource management, sustainability

Introduction

Increasingly, health and social care will need to be delivered in ways that are both financially and environmentally sustainable.[1] For example, the UK National Health Service (NHS) has a major impact on the environment, with a carbon footprint in 2012 of around 19.7 million tonnes of CO_2 emissions, 65% of which relate to goods and services that the NHS procures.[2] National carbon reduction targets require the NHS, as a significant contributor, to take appropriate action particularly in its procurement practices. A related challenge is the increasing energy costs, due to fossil fuel depletion,[3] that is likely to inflate the price of a range of goods and services required for health care. The potential global scarcity of raw materials threatens the future availability of many goods. Political unrest and distance travelled for both manufactured goods and components threatens sustainable supply chains.[4]

Efforts to reduce carbon emissions from manufacturing and distribution are receiving much attention. In 2008, a group of countries (including the UK) sponsored by the United Nations (UN) agreed to support public procurement programmes to improve the uptake of sustainable products and services.[5] This was followed by initiatives within both the UK Department for the Environment, Food and Rural Affairs[6] and the Department of Health (DH) to establish guidelines and principles to encourage changes in sourcing and purchasing.[7] These include the responsibility to procure

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from sustainable sources, minimize pollution, ensure minimum labour standards and seek efficiency and innovation to achieve sustainable solutions.

However, the NHS is subject to external pressures which affect the sourcing, manufacturing and transport of the goods it buys.[1] Many commercial organizations are involved in the supply chain, each of which have their own financial pressures and policies, which may or may not be founded on using sustainable materials or reducing carbon emissions in manufacturing processes. Identifying the stages in the supply chain to address these issues involves understanding current systems and legislative pressure to change manufacturing and waste management behaviour.[3] NHS organizations could, for example, insist on a reduction in packaging by developing specific criteria. Choosing only those manufacturers that comply would provide an incentive to meet the criteria.[8]

Supply chains

Adverse environmental and social impacts can occur at any stage in a supply chain.[9] For these to be addressed, there needs to be awareness and commitment to change in companies involved in the provision of goods and services.[10] Once commitment has been achieved, measures can be put in place to mitigate against some of the detrimental effects. At each stage of a supply chain (Figure 1), there can be benefits for the environment and for health and wellbeing, provided suppliers and customers work together (Table 1).

Procurement in health services

Considering the diversity of the work undertaken by health care providers, a uniform approach to sustainable procurement would be difficult.[2] Furthermore, local solutions are essential, using national guidance and recognizing the external factors in the supply chain. Health care providers can work with local suppliers using local knowledge and embedding sustainability in all purchasing decisions.[10]

The task of embedding sustainability into health care procurement could be seen to be overwhelming. There are many factors to consider; for example, whether to focus on all products or to focus only on those which are most expensive or have the highest carbon load, or are transported the longest distances. Concentrating on high cost products alone or the largest suppliers can be counterproductive as low cost items can also have major environmental impacts. For example, maceratable pulp bowls used in a variety of ways on hospital wards are high volume, low cost, with low CO_2 emissions in their production but the required macerators generate considerable energy costs.

Enthusiasm for change will be generated if government guidance is associated with recognition that sustainability can improve the quality of care and reduce costs.[7] A report by RAND identified 'working across existing organizational boundaries' as essential if cost savings in procurement were to be achieved.[11] This was strongly supported by NHS leaders. Sustainability also involves manufacturers and health care staff.

An understanding of the issues is the first step in developing sustainable procurement. Figure 2 shows the development of a business case at every stage of which there needs to be reflection and consideration of factors external to the organization.[12] Our aim was to explore the attitudes of senior staff to sustainability in health and social care services and to understand local issues at each stage of procurement.

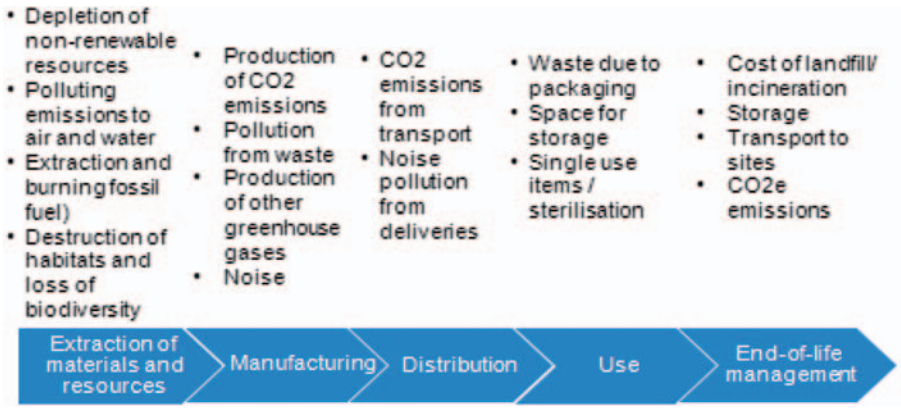

Figure 1. Adverse environmental and social impacts in a supply chain. Adapted from: I&DeA National procurement strategy: Sustainability for Local Government 2003 [8], www.local.gov.uk.

Methods

We conducted 20 qualitative interviews with senior staff from private and public sector providers of health care and from social care providers in south west England. The research took place between April and June 2011.The study settings included a private hospital, an NHS hospital, care homes offering residential and day care for the elderly, the Environment Agency, the Health Protection Agency, public health, transport and the local authority. We interviewed staff outside the NHS to investigate if and how organizations collaborated to create sustainable systems.

The semi-structured interviews, using a topic guide, took place in venues and at times negotiated with and convenient for the participants. Interviews lasted for up to one hour.

Table 1. Benefits of a sustainable supply chain.

Supply chain activity	Potential benefit
Extraction of minerals and resources	Purchasing organizations have the ability to require sustainable standards of mineral mining by not choosing the cheapest but choosing the most environmentally supportive products. Reducing pollution from manufacturing process improves the health of the workers and the surrounding area, water, air and environment. Early assessment of scarcity of rare metals by both suppliers and purchasers will enable alternatives to be found or increase re-manufacturing.
Manufacturing	CO_2 emissions reduced by both harnessing them to create energy could lead to cost savings and lower emission levels, recycling or re-use of waste.
Distribution	Buying local reduces transport requirements and therefore noise pollution, reducing packaging increases space on transporters and therefore fewer journeys.
Use	Reduce packaging, reuse or recycling of packaging, improve sterilization and re-use or re-manufacture single use items.
End-of-life management	Review waste policies and reduce waste, for example use cardboard compactors. This will lead to an improved working environment and more space for clinical care.

Interviews were digitally recorded and transcribed verbatim. Thematic analysis[13] was used to inductively develop codes and themes. Data extraction, coding and analysis were cross checked independently by two researchers. The development of a thematic framework allowed the mapping of themes and subthemes. Initial coding was discussed by members of the research team. The findings reported in this paper focus on issues relating to procurement. Other findings are reported elsewhere and concentrate on sustainable waste management.[3]

Results and discussion

Senior managers were keen to make sustainability a central focus of procurement but reported that internal systems to enable them to do this were not well coordinated and external pressures exist over which they have no control. Participants reported having to adapt (sometimes conflicting) legislation to the local situation. For example, infection control which requires items to be for single use only can conflict with waste management policies which attempt to reduce, re-use and recycle. Participants also suggested that organizational processes were often not consistent with working practices that attempted to embed sustainable solutions in purchasing throughout organizations. These issues, if left unaddressed, will eventually stifle health and social care organizations already struggling with economic pressures, inadequate buildings and pressures on space. Although the participants reported obstacles to sustainable procurement, they were also very willing

Figure 2. The procurement cycle. Adapted from: I&DeA National procurement strategy: Sustainability for Local Government 2003 [8], www.local.gov.uk.

and keen to provide suggestions and solutions. One participant suggested the need for a multidisciplinary approach:

> *[for sustainable procurement] . . . you would have procurement committees and procurement leads, and within that you would have representation from your health and safety people and your infection prevention people and your waste disposal people. . . . there's a lot of purchasing going on . . . without consideration of how we're going to decontaminate or how we're going to manage this. . . . So a tighter control right at the beginning of the process is really important. Buying the right thing at the right time so that the processing can be followed and it can be safe for patients.*

Health and social care workers are in a key position to both inform and lead sustainable procurement.[8] They know what works at the local level, have clear ideas about how systems can be better managed and are keen to be involved in finding solutions. Why is this not happening? Participants described how the sheer size of the NHS makes coordinated approaches difficult to introduce and maintain, and that they often felt powerless to make a significant difference in influencing procurement decisions:

> *If you are in an organisation, in a large organisation, . . . your ability to influence reduction through procurement is almost nil. . . . The bigger the organisation, the harder that is to feed through unless you've got very, very good systems. So I think in large organisations people can be isolated from seeing the bigger picture and being able to do that.*

The participants, whilst recognizing some of the barriers lay within the NHS, recognized there were pressures from outside over which they felt they had little control.

External pressures in the supply chain

Participants described the importance of knowing the provenance of the items they purchased and how having some sense of sustainable sourcing could have a positive effect on organizational culture:

> *So it's not just once we've got it, it's what do we buy, why are we buying this and is this the best product for us in the medium/long-term, will this last longer? And so on. So it has to come into the overall ethos of the organisation.*

Working with suppliers is of primary importance in maintaining choice whilst encouraging the use of sustainable raw materials and manufacturing processes.[14] Purchasing only what is needed could lead to difficulties if unexpected demands occur (winter flu, multiple accidents) which require stock to be available for immediate use. However, if supply chains are flexible and manufacturers are kept informed, many of these issues can be addressed. One respondent described how she had developed a patient-based ordering system for drugs and medical consumables, but she recognized that it was not always sufficiently flexible:

> *'This is how we order, and this is how we reduce the amount of stock that we have.' And we do a monthly audit so we can make sure that that's maintained. And we're not perfect because [we are] always finding something that we've managed to overstock.*

Once a product is made, how it is packaged and transported can have implications for both its carbon footprint and how goods are processed through the organization. The participants described packaging as a major issue in providing safe and efficient health care. Both private and third sector providers were struggling with the amount of cardboard that had to be dealt with on a daily basis. The NHS Trust had purchased a compactor and sold on the compacted cardboard, but the high cost was considered prohibitive by smaller providers of health care. The decision to purchase a compactor should also take into account loss of space at ward level. At one site, space that could have been used for patient care was being used for storage of waste packaging. Although compacting takes place away from clinical areas, more trips to collect the cardboard from wards are possible because of the increased space available at the storage site. Compacted cardboard also take up less space on waste lorries allowing fewer trips to the recycling depot, resulting in potential carbon savings. Furthermore, the cost of compactors can be assessed against a possible revenue stream if paper and cardboard are compacted on behalf of other organizations. One respondent suggested:

> *Because there's pressures to reduce transport which means, you know, in health care cramming more waste onto a truck with less packaging and so the risks go up. So you get checks and pressures from one direction can cause fallouts at the other end, somewhere else. So it's a bit like squeezing a tube of toothpaste.*

Some organizations reported working with local suppliers to take cardboard and other recyclable packaging back to the manufacturer as a method of reducing on-site waste. Other organizations were considering how to negotiate with manufacturers about the re-use of single use items and/or the life span of items they currently

sterilized between each use. The data suggest that manufacturers' guidance on re-use is confusing and it therefore seems this would be a valuable area for consultation between manufacturers and end users:

> *How long do you keep on reusing a piece of equipment? How do you know, for example, if the manufacturer says, 'This can have ten autoclaves and it would still be fine'? It's the nitty-gritty of how do you build in a process or a system that enables you to actually facilitate that process. To know, OK, this is on its last recycling, its last reprocessing, or whatever you wanna call it – decontamination, so that after this it gets thrown away. When you get down to that level there's an awful lot of nitty-gritty stuff to be explored isn't there?*

Internal systems

There was a difference between the approaches of public and of private health care providers towards purchasing decisions and the quantity of items purchased. Private providers were more conscious of costs and kept a tighter rein on ordering:

> *We have [an external reviewer] quality support I think they're called, and they come and do an audit every so many months in every home, and they check if we're holding too much stock.*

Public and private providers have approached supply, purchasing and storage in different ways. Private providers are often smaller organizations providing planned surgery, so are able to have greater control on buying only what is needed. They can use patient-based ordering systems, ordering only what is needed to treat or care for individual patients, and these appear to be more efficient. In contrast, NHS Trusts have to be prepared for emergencies and hold a larger stock. However, internal systems for both public and private providers have similar goals, having a centrally based store from where clinical staff can be sure they will have the items they need. The two key components of an efficient system are availability and staff confidence in the system. Without these, staff tend to stockpile in clinical areas.

The issues of where to purchase goods, how to store them and how to dispose of them are multiple and sometimes contradictory. On the one hand, purchasing from a range of providers introduces competition which can drive quality.[1] However, cheaper commodities bought from distant suppliers incur extra transport costs and increase carbon emissions. In a study of hospital food chains in Wales, Sonnino and McWilliam[15] suggested that buying local food to reduce food miles does not take into account the pressure on local resources such as soil and water, which an increase in local production might create. Buying locally increases local traffic because of the need for multiple visits to hospitals to enable fresh produce to be cooked for patients.

> *. . . when I first came here a lot of the food was bought pre-packaged, pre-frozen, pre-prepared, pre-whatever. That's no longer the case. We buy virtually everything in fresh and it's made on the premises. We haven't reduced the budget, but we've reduced the spend on food. And you would imagine it would be more expensive, but it hasn't worked out that way. So it can be done. So I was quite pleased with that.*

End of life management

Some participants made a clear link between procurement and waste management, recognizing that waste was the end product of procurement:

> *But recycling costs money, recycling costs energy. Recycling has an effect on the planet, therefore if you don't create that waste in the first place you've got a big saving.*

Disposing of waste is expensive and can have adverse consequences on the environment as waste dumps produce both methane and CO_2. Many participants purchased waste disposal services from companies that either took all waste and sorted it off site before disposing of it or transported pre-sorted waste to landfill or incineration. The possibility of recycling some of this waste was discussed and a few organizations had methods for doing this, such as electronic alerts to staff when furniture was available for purchase. However, none of the participants reported an organization wide strategy or focus on the possibility of recycling before considering disposal.

Measuring success

If procurement is to have sustainability at its core, more evidence is required about different aspects of the supply chain in terms of the economic, social and environmental impacts of the processes involved:

> *And I think maybe it's time we kind of said, 'Well actually what do we want to know? We're doing all this stuff, but what impact is it having?' And that might be something we need to think about building into the work we're going to do.*

A review by Seuring and Muller[16] attempted to understand the opportunities and limitations in developing

sustainable supply chains. They recognized the need to take a broader view of impact than concentrating on the direct journey from resource to disposal. Without this, they felt that sustainable solutions in one area might inhibit sustainable change in another.

The need for measurements is paramount in order to assess progress towards a more holistic approach to supply chain management which will involve appraisal of impact at each stage to inform change in the next. This issue was raised by several of the participants although when questioned about possible tools to achieve this there were no examples forthcoming. The importance of measuring evidence of success was underlined in a King' Fund report that states that without measurement, it 'will not be possible to embed sustainability within routine management targets'.[1] The authors suggest a range of measures should be used to assess damaging activity and to enable comparisons across sectors.

Multiple approaches have been made to measure the effects of supply chains. Presley et al.[17] argue that many of the measurement and evaluation tools currently available are not sufficiently holistic. They recognize the value of a balanced scorecard approach, a tool used widely in the NHS to include the actions of people and processes, but suggest it falls short because it does not include wider social implications.[18] Other models include a social aspect but do not sufficiently measure financial impacts.[19] Thatcher and Sharp's[20] tool to measure the local economic benefit of a food programme provided data which have breadth and depth and allows local attitudes and values to be taken into consideration. Whilst their results raise issues about buying locally, the paucity of local data raises questions about the value of their findings.

WRAP, whose aim is to achieve zero waste, has developed a methodology 'for quantifying the environmental and economic impacts of reuse'.[21] Their assessment tool measures the impact of activity using several climate and supply chain indicators. It highlights the complexity of trying to measure the impact of individual products, particularly where there is sparse data available. Their methodology and tool provides valuable data which can be used to provide a business case for the reuse of items but it does not measure social impact.

The issues related to accurate assessment and measurement of each stage in a supply chain are complex. There is a need to provide information about whether the supply chain is functioning sustainably or not. A holistic approach that includes the economic, social and environmental aspects of the supply chain and also is sufficiently robust to be applied to the organization's operational development is needed.

Conclusion

The Department of Health in England recognizes that sustainable procurement is a fundamental requirement.[22] The NHS is one of the leading purchasers of goods and services and is in a prime position to encourage sustainable procurement. Senior managers are keen to make sustainability a central focus of procurement but are aware that internal systems are not well coordinated and are compromised by external pressures over which they have no control. There are multiple government[15,7] and non-governmental[21] organizations developing recommendations which will help develop a more coordinated approach, yet response to these recommendations is currently patchy. Research is required to understand the current obstacles to introducing sustainable systems for procuring goods and services and to put in place systems to ensure continued supply of those items at risk of future limited availability.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sector.

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