WIN WIN: SAVING COST AND CARBON – SUSTAINABLE WASTE MANAGEMENT IN HEALTHCARE
EXECUTIVE SUMMARY

‘Climate change presents the biggest single threat to health in the 21st Century’\(^1\). At the same time, the NHS is under real financial pressures and healthcare managers increasingly have to make pragmatic decisions about the use of resources to save money. However, dealing with climate change doesn’t have to be an additional cost. Sustainable Waste Management is one area where changing practice can both reduce costs\(^2\) (in fact it has the potential to develop an income stream) and also reduce climate change. This report describes one stage of a waste management research programme, using in-depth interviews with a cross section of 20 members of staff across public and private institutions managing healthcare waste. The recommendations, generated from the staff interviewed, provide both operational and strategic ideas for change. Involving staff in the process of change uses their expertise to identify areas where cost savings can be made and can help to ensure that changes are successful.
The NHS produces an average of 250,000 tonnes of waste a year and disposal of this waste costs in excess of £71m. Finding innovative ways of reducing the amount of waste produced could substantially reduce this cost. Furthermore, recycling all paper, cardboard and newspapers produced by the NHS in England and Wales could save up to 42,000 tonnes of CO₂. The Department of Health states that “in order to protect the environment, measures such as prevention, minimisation and recycling should be explored”. There is therefore a need to understand the drivers that create waste, its management and its disposal. Whole system analysis provides an opportunity to understand these processes and can identify areas where cost savings can be made. Behaviour change methodology offers opportunities to understand how individuals segregate and dispose of waste. If these two approaches are to offer cost savings they are dependent on clear, accurate and focussed evidence of the present attitudes, knowledge and practices of people at all levels working within the NHS today.

Researchers from the Sustainability, Society and Health Research Group (SSHG) within the Faculty of Health, Education and Society at Plymouth University are carrying out a programme of research which will lead to an understanding of current practices, and the pressures associated with sustainable management of waste. Based on data from interviews with staff involved in healthcare waste management, we have developed a whole systems pathway, which identifies key drivers and trigger points for change interventions.

Pertinent to considerations of how behaviour change can be achieved, is the recognition that the environment in which healthcare staff work is time pressured and space limited. Furthermore, infection control procedures often take precedence over waste segregation. The data generated through the interviews provides valuable insights into how systems can be redesigned to ease transit of waste and reduce overall waste, with the potential of reducing costs. This approach could provide a model for other large organisations.

This report forms part of the New Horizons series which offers a range of reports on topics which will be useful to healthcare staff, academics and community organisations working on sustainability issues.
INTRODUCTION

Many NHS Trusts recognise that investing in sustainability is a solution to financial burdens rather than another pressure\(^5\). As the NHS produces an average of 250,000 tonnes of waste a year at a cost of some £71+ million\(^3\), there is a need to find innovative and sustainable ways of reducing the amount of waste produced and reduce this cost. Both strategic vision and individual commitment are required in order to achieve this. As the largest employer in the UK, the NHS is in a prime position to lead the way towards a sustainable future, and act as a test bed for evidence-based organisational change.

Understanding organisational systems and observing individual behaviours are an important starting point in addressing waste segregation and limiting incineration costs.
Whole systems analysis is a method by which interacting elements in a process are pinpointed and investigated in detail in order to reduce their complexity. Performance bottlenecks are addressed and solutions developed. The solutions relate to the whole system so that a successful adaptation in one part of the process does not negatively affect another. This method is ideal for studying waste reduction, beginning at source, by reducing the need for products and packaging in the first instance. It offers opportunities to consider how products may be re-used and recycled, and it includes the transportation and disposal of waste. Outcomes of more effective and efficient waste management will reduce energy use, costs, and carbon emissions, as well as waste going to landfill.

A literature review carried out by researchers from the Sustainability, Society and Health Research Group (SSHG) within the Faculty of Health, Education and Society at Plymouth found that most behaviour change approaches to managing healthcare waste worked used direct (individual) and indirect (systems) strategies to influence behaviours. Strategies focused on, for example, aspects of purchasing or waste segregation. The review found that organisational and behaviour change approaches have great potential for optimising waste management in healthcare contexts. However only a fraction of the articles reviewed provided an evaluation of the strategies that were implemented. This suggests that further research is needed to understand attitudes and behaviour in order to develop effective interventions that can be implemented and tested in a range of healthcare settings.

This report describes the results and conclusions of in-depth interviews with a cross section of staff across public and private institutions managing health care waste. The researchers asked ‘Is the application of a sustainable reduce, re-use and recycle philosophy in the management of healthcare waste feasible?’ The interviewer invited stakeholders who are responsible for the safe management of healthcare waste in the South West of England to take part in qualitative interviews. The purpose was to gain an understanding of their attitudes, behaviour, knowledge and practice regarding healthcare waste. The sample needed to reflect both a horizontal cross section of senior managers across public and private institutions managing health care waste and the staff who handle healthcare waste on a daily basis. Therefore a mixture of purposive (choosing appropriate individuals who will provide information to meet the aims of the research) and snowball sampling (asking those purposively sampled to suggest others who might be provide specific information) was used to recruit participants.

Twenty participants were included in the study from the following organisations:
- Royal Cornwall Hospitals Trust
- Cornwall Care
- Duchy Hospital
- Health Protection Agency
- Environment Agency
- Cornwall County Council
- NHS Cornwall and Isles of Scilly Primary Care Trust

The participants included senior waste managers, senior nursing and care staff and porters in charge of waste collection and disposal.
Three themes were developed during the analysis of the data [1] systems; [2] behaviour and attitudes; [3] ideas for change. The themes mirror the priorities for review identified in the NHS SDU report *Sustainability in the NHS: Health Check 2012* around culture and organisation: infrastructural changes and ensuring sustainable pathways and models of care; and working with other groups and organisations to achieve more sustainable results."
THEME ONE: SYSTEMS

The first theme related to how systems within health provider organisations limit or facilitate the management of healthcare waste. There was evidence that in some areas the management of healthcare waste could be better facilitated by introducing effective strategies to improve both segregation and disposal. There appeared to be a lack of consistency between the national guidance and local practice. Some staff reported that they were frustrated when trying to dispose of clinical waste, particularly because definitions of what constitutes clinical waste appeared to vary.

The problems with definition led people to develop their own ways of doing things at ward or unit level which sometimes created confusion. Across one healthcare provider, individual units managed waste in different ways. This created difficulties for, portering staff removing the rubbish. The porters had to ‘learn on the job’ the different approaches across the hospital. The complexity of appropriate waste separation and disposal was increased with the size of the organisation. For example a large healthcare provider appeared to have greater problems with local interpretation of guidelines than smaller providers where information about ‘the way things are done around here’ could be more easily passed around.

Those providers that had sustainability as a core strategy for their organisation and consequently had a team to support individual staff, and provide training, report having made substantial financial savings over time (for example, £170,000 per annum)

In these organisations, effective and efficient waste segregation was rewarded and staff could phone the Environment Team at any time to ask about specific items appropriate disposal.

Staff motivation to see waste management as a key task appeared to be related to good training and support. Training was perceived to be ‘good’ if following the sessions, staff knew how to put training into practice. The appropriateness of the trainers and the style of delivery affected how the courses were perceived and seemed crucial to staff attending and seeing the process as relevant. Different training methods were provided as examples, some of which were online, others delivered as a full day requiring attendance. Some staff suggested that trainers could be out of touch with the realities of the pressures at ward level. Furthermore, staff reported finding it difficult to allocate time in a busy day to complete the online courses. For others, training consisted of being given a leaflet once a year, and some staff received no training at all.

I think having a clear definition of what clinical waste is would help … It [the guidelines] would say things like, bodily fluids from a non-infective patient, but how do you know somebody is noninfective?

The good Trusts are very good but there is a gap, there are those Trusts that monitor legislation and appliance across everything, not just environment, and you’ll see them moving with the times. And there are those that are probably still back in the days of Crown immunity and what we’re seeing is the gap between the good ones and the bad ones opening up.
Sometimes new employees shadowed existing staff, and as a consequence could pick up bad habits. Overall it was clear that where there was well-focussed, relevant training and on-going support, staff were more likely to respond positively and adapt their behaviour appropriately. Conversely where training was perceived to be substandard or absent staff had to learn by doing.

**Green Champions**
As a response to the need for a central focus on ‘green issues’ the majority of organisations had elected ‘Green Champions’. This role was loosely interpreted across all sectors and there were varying opinions about who these people should be and how best they a) should give advice and information and b) what level of staff should take on this role. Some interviewees said that Green Champions should have sufficient seniority to be respected, they should be well informed and have the ability to penalise poor practice. Others felt that the Green Champion could be ‘anybody’ provided their approach was facilitative rather than disciplinarian.

**Space/location/buildings**
A key finding was the issue of space for appropriate segregation and recycling. Space, in most of the institutions that took part, was limited and this meant that choices needed to be made about placement of bins and priorities for recycling. The space problems related to the age and design of the buildings, the degree to which infection control was an issue (for example in high dependency areas looking after vulnerable patients), and patient-related privacy and confidentiality.

... the waste management training they get is a leaflet basically, I can’t remember if I read mine this year, probably not but I don’t remember what it said if I did. 14:535

... invariably [Green Champions] have to be senior, but it has to be seen as a valuable job. And the seniority has to carry some clout ... too often, ... it’s passed down to a fairly, middle or lower rank of manager/officer. 3:410

Location of bins could also be problematic. For example if clinical waste bins are placed near to hand wash basins then paper towels will inevitably be put in them. With limited space, and the need to maintain a clean environment for vulnerable patients, sometimes choices had to be made between infection control and the reduction of clinical waste - to the detriment of waste segregation.

Location of bins was also an issue for health care providers serving the needs of people who were residents in care homes for the elderly. The need to make the environment homely took priority over the guidelines on the placement of bins. The ethos of the care homes was one focussed on providing love and care. Staff were encouraged to avoid using rubber gloves and aprons as this created barriers between residents and their carers. Where gloves and aprons were clinically necessary, these were removed and disposed of away from resident areas. Adaptation of guidelines and flexibility of interpretation to improve patient experience appeared to be an essential facet of care. Whilst this pragmatic approach seems appropriate it can lead to disagreement and conflict when practice is audited by infection control staff.

It’s very hard to put systems in place in a lot of areas because we don’t have the room. There’s not room for what there is at the moment. 8:377
Fundamentally I mean it’s good for the finances, it’s good for the planet, it’s good from the energy point of view. And it’s good for people to take personal responsibility for what they’re doing. 4:241

Reduce Re-use Recycle (the three R’s)
The three R’s message appeared to be well interpreted across all interviewees particularly with the addition of a fourth R, re-investment prior to ‘Reduce’. A very common view was that it was ‘just good housekeeping’ and had been a way of life since childhood. Re-investment of recycled materials means they can be used as income generators. There was concern, however, that currently many recycled products are less attractive, and more expensive than their non-recyclable equivalents.

Since the major health scares surrounding Creutzfeld Jakob Disease (CJD) and the Human Immunodeficiency Virus (HIV) manufacturers of medical equipment have developed many single use items used to collect patient body fluids. The debate around whether items designated by manufacturers as single use can be cleaned and used again caused significant anxiety amongst some interviewees. If manufacturers’ guidelines to throw away instruments were not being followed, health service managers were anxious about the possibility of litigation in a case of post-operative infection. Whilst there was awareness amongst clinical staff that there were many items which could easily be cleaned and re-used, there needs to be clear rationales developed for manufacturers to change current practice.

Reinvest – you have to sort of drive a bit of demand for recycled materials and then people will start to recycle a bit more 11:547

... the medical legal ramifications ... reusing those, is something we would need to explore probably at a corporate level ... Because of the courts having a bit of a field day with it, you know, 9:367

Recycling systems across the organisations involved in the study varied. In the Environment Agency, as one would expect, well developed systems were in place. Recycling was not so easily achieved in healthcare provider organisations. For example, several interviewees reported that the current systems for replacing or providing furniture for new offices did not allow the use of recycled items, and there were instances where furniture was sent to landfill. The reason given for this was there was no one person who had the role of organising a recycling system for items other than paper. This suggests that a general recycling system was a low priority.

Costs
Inevitably, with NHS budgets under pressure and the need to relate activity to costs in both private or public health care, keeping costs down was a priority for managers. Private providers had more accurate information about activity costs in relation to waste than did NHS care providers. Some NHS providers appeared to be concerned about reducing the amount of waste they sent to landfill, but were not aware of alternatives. The NHS Confederation report (2010) stated that ‘sustainability accounting, like financial accounting, requires day-to-day oversight by a technically skilled executive’. With basic activity costing still not well developed in all sectors, the need to develop expertise in sustainability accounting is vital. The cost of landfill will keep increasing and this may eventually force Trusts to recycle more. In addition national pressures on price in relation to depleted oil reserves may lead to oil based products becoming too expensive. The knock on cost of buying these expensive items will mean that Trusts will have to find alternatives or further prioritise the kind of care they can afford to provide.
Procurement and packaging
At the ‘reduce’ end of the cycle, sustainable procurement provides an opportunity to reduce costs and CO₂ emissions as well as ensure a sustainable supply of products.

However, in some instances, the current procurement processes with lists of preferred providers (or choosing the cheapest), appeared to preclude local suppliers. Ward based ordering had been reviewed in some areas; systems were in place to ensure that store cupboards were not filled with items which might go out of date quickly. Changing the minds of some staff from a ‘siege mentality’ which required ‘just in case’ ordering to that of ‘only what is required’ ordering was a challenge. It was suggested that this would require both training and a cultural shift.

Excessive packaging is a major contributor to the production of excess waste. Change is needed at the design stage on how to wrap and package single items. There was concern expressed by interviewees about the separate packaging of a variety of items, for example retractable needles used for taking blood specimens. Each item had its own information sheet describing how the item is used. Purchasers identified the need to work with manufacturers to reduce packaging, create more reuse items and reduce the number of lorries transporting goods. However, one waste manager explained that, in reality, manufacturers themselves were often tied to European legislation about the safety of goods in transit. Removing packaging before items get to ward level could reduce the amount of cardboard needing to be disposed of in clinical areas.

... unless we start to get a handle on the sensitivity to things like the oil price ...we’re going to suddenly find ourselves in the situation where last year we did ten operations, this year we can only afford to do eight operations because the cost of products that we’re using in that arena have gone up so much. 18:208
Transport
The large volume of different kinds of waste meant there were multiple lorries leaving healthcare sites. Organisations struggled with the different tensions of working within national guidelines for safe removal, and local pressures such as the need to keep costs down and work within budgets. For example interviewees described that if they put the waste bags directly on to the disposal lorry, this increased likelihood of injuring the handlers. Putting the bags into crates first, protected staff but meant that fewer bags could be transported at one time. Once on the lorry, the paucity of appropriate sites for incineration of clinical waste, and the lack of availability of sufficient landfill, meant that lorries had to travel long distances, increasing CO₂ emissions and traffic congestion.

Licencing of equipment (renting machines with a maintenance contract or buying machines and insuring them through the manufacturer) is regarded as a money generator for companies which make incineration equipment. Some interviewees felt that licencing encouraged built in obsolescence and consequently kept a replacement market functioning. Being knowledgeable about how the market functioned helped to negotiate price. With most health service managers burdened with multiple priorities, having a deep understanding of how markets operate is not always possible.

Licencing contracts were seen as necessary but not always sufficient to meet individual need. All the organisations in the study were in some way tied into contracts with private waste companies. In some instances there were multiple contracts for different forms of waste, increasing traffic to and from the sites.

Because there’s pressures to reduce transport which means, you know, in healthcare cramming more waste onto a truck with less packaging and so the risks go up. 5:210

... as much as you’d like to get rid of the waste, you know, in a more effective way for the environment, you can’t because ... somebody has to dispose of it for you, you have to pay for that service. And there’s no other way of getting rid of that at the moment. 19:386
But in the main people would like to do it, and would like it to be done as an organisation. They are keen to do it. They don’t want to make too much effort. They want it to be easy to do, you know. So they would be happy to do it if it was dead simple and they didn’t have to make too much effort.

8:189

**THEME 2: BEHAVIOUR AND ATTITUDES**

Theme two represents results from specific questions about individual and cultural attitudes to the three R’s and to climate change and sustainability. Following questions about attitudes, interviewees were then asked about the behaviour relating to the attitudes expressed.

Data from the interviews suggests that those who recycle at home were more likely to do so at work, providing it is made easy for them. However there were specific issues relating to the management of pressures within the healthcare system. For example, interviewees described large amounts of information and conflicting guidance in some health provider organisations. The perception was that this left staff feeling overwhelmed by the task of segregating individual items into colour coded bins. Those who were charged with monitoring the management of healthcare waste were frustrated by the negative attitudes of some staff, but they also recognised that making item segregation easy would support and enable staff to change attitudes and behaviour. This concept of ‘making it easy’ meant that segregation and disposal should be automatic. There should be no need to examine posters or try to decipher labelling staff should be guided instantly to the most appropriate waste bag. Personal motivation to see item segregation as important related directly to easing pressures on space to segregate appropriately, time to do so and the efficient, and frequent removal of waste bags and cardboard from clinical areas.

**Attitudes to climate change and sustainability**

The majority of comments related to the possibility of using the sustainability agenda to encourage cost savings. The interviewees were all involved, to a greater or lesser degree in healthcare waste management. The responses to questions about the definitions of climate change and the difference between climate change and sustainability were related to training and experience in climate change research, and how individual interviewees understood sustainable behaviour in relation to their own behaviour. When people had particular training or expertise in environmental science they described climate change and sustainability as separate but related concerns.

Yet some healthcare senior managers, with a special responsibility for waste management, were not so clear about the reality of climate change. They described feeling that the climate change debate was flawed saying ‘there has always been climate change’; ‘It’s a normal process of evolution which some people might over emphasise’. Others felt that individuals were more motivated by the concept of sustainability, because its effects are more immediate.

**What is clinical, what is infected linen and what is just, can go in the normal white bag and be disposed of? People can’t cope with it ... you’re just so busy you haven’t got time to think, does this go in the orange bag or the yellow bag or the black bag? I don’t care actually, I just need to get rid of it.** 14:188

**How can you see wildlife and habitat destroyed without it making you feel emotionally. And the same when I see floods and I see human beings being swept away. Emotionally I am completely affected and distraught.** 7:480
Having explored the attitudes to the three R’s and to climate change and sustainability we were interested in understanding how these attitudes might affect the behaviour of healthcare staff.

**Behaviour**

Despite efforts made in some health service provider systems to make item segregation easy, and manage the disposal of healthcare waste effectively, the procedures were not always followed. Motivating staff through providing information about how climate change will affect us, the effects of rising CO₂ levels etc., was seen as too far removed from the pressures of their everyday problems. Data from the interviews showed the everyday concerns of healthcare staff were more likely to relate to the piles of unnecessary cardboard from packaging, and how this reduced space in which to work. This, coupled with the increasing throughput of patients in an environment that was constantly threatened by hospital acquired infections, meant that the focus for behaviour change needed to be system reorganisation. Working to alleviate these problems is more likely to motivate staff to change.

The data showed that there were concerns about the definition of clinical waste and whether the items chosen to be clinical waste at ward level were appropriate. There are Government guidelines, and within those guidelines clear definitions of which items should be considered clinical waste. However the reality of working in clinical areas which were not fit for purpose meant the guidelines were seen as not fit for practice. The two requirements of any behaviour change intervention are motivation to change and a culture which enables the change. The majority of interviewees providing direct patient care were motivated to change but unable to given that their primary concern was always patient safety and maintaining a high standard of care.

In terms of carbon and sustainability the biggest challenge, I think, that we have, is behavioural change and that’s when you look at the subsections of the sustainability and carbon agenda in which waste sits, behavioural change is, you know, the key part of any initiative to make more efficient use of resources really.
**THEME 3: IDEAS FOR CHANGE**

The final theme was developed from questions about what needed to change in order to reduce waste, segregate it more efficiently and dispose of it without harm to the environment. We asked interviewees for ideas for change and from this we developed a list of questions about manufacturing, packaging and procurement. Given that healthcare staff felt they had multiple pressures to deal with at ward level, their concern was that sustainable behaviours and cost reduction activities might be focussed initially at the manufacturing, packaging and procurement stage. Once items were manufactured, it was suggested, they should have the least amount of packaging possible and once used they should be removed as quickly and efficiently as possible. Interviewees felt that if these issues were dealt with, then behaviour change interventions might only be necessary in relation to ward based segregation.

Staff had many good ideas about how systems could function better but felt that they were not always heard. There was a deep understanding of the rising costs of healthcare and the relationship between sustainable procurement, use and disposal in reducing those costs.
The advice provided to healthcare providers on recycling of waste needs review to take into account of the pressures at clinical level;

2. When working with frontline staff, and waste container manufacturers, more innovative methods of segregation need to be developed which require little effort or space but enable staff to manage waste effectively;

3. Ordering of products needs further rationalisation so that ordering ‘what is needed’ rather than ‘just in case’ becomes the norm;

4. Mutually beneficial relationships need to be developed with local manufacturers to reduce packaging and develop some re-use items;

5. The source of raw materials for manufacture should be focused on sustainable products, only using what is necessary for the product;

6. Transport throughout production and delivery should be focused on minimizing trips, and sourcing products closer to home;

7. Better networking and collaboration between infection control and waste management, at both policy and practice levels, would enable waste to be managed and patients to be protected.

8. There is a need for a flow of information from staff to Government especially those who have the power to change legislation. This will enable constant evaluation of the systems in place to manage waste.

9. In order to achieve sharing of information there needs to be local collaboration across organisations based on enabling the three R’s to become embedded into organisation’s practice.

10. Government and healthcare waste managers need to listen to frontline staff (especially nursing and portering staff) about what is and what is not possible.

The following recommendations for ideas for change were made by the interviewees:
SUMMARY

Healthcare managers increasingly have to make pragmatic decisions about the use of resources to save money and to develop sustainable solutions for how those resources are handled. Waste is one area where changing practice can both reduce costs, and has the potential to develop an income stream by recycling or reusing materials which are currently sent to landfill or incinerated. This study aimed to investigate the attitudes, beliefs and knowledge which could contribute to a reduce, re-use and recycle approach to healthcare waste management in the NHS.

The purpose of this investigation was to develop an understanding of the behaviours, benefits and bottlenecks within health care and health advice provider organisations which disable or enable a reduction in healthcare waste. Without this understanding attempts to reduce costs of waste may be silo driven and single focused. A whole systems investigation, using the knowledge and attitudes of those with direct experience of healthcare waste, has provided evidence of where a broader focus of change needs to be targeted.

The results identify a complex pathway of confounding factors which prevent a streamlined approach to waste management. It is clear from the results of the study that it is not simply an issue of individual members of staff putting non-infectious items in clinical waste bags which causes an unnecessary increase in the amount of clinical waste being removed. The interviewees in this study described a systemic failure based on a lack of coordination and understanding of the issues, which starts at the legislation stage, infiltrates the manufacture and procurement of materials and products, and, eventually stifles a health service provider organisation already struggling with economic pressures, inadequate buildings, and pressures on space.

The main focus for healthcare workers is high quality patient care. At the same time they are conscious of the need to protect patients from the possibly of hospital borne infections. The tensions amongst the constant pressure to reduce costs, the need to provide high quality care and reduce infection and the demands made to reduce the amount of clinical waste produced will inevitably, and rightly, favour the patient.

We have created a pathway to identify bottlenecks and ideas for action. The pathway begins with national and local legislation and guidance and ends with the individual. Diagram 1 represents the pathway based on the findings of this study.
Legislation and Guidance
Government and non-governmental organisations have developed a range of guidelines and policies to both tackle climate change and create a more sustainable health service. There are many organisations working to audit and monitor how this legislation is put into place and financial savings because of these changes have been significant. However local interpretation of the guidelines sometimes leads to confusion because of tensions between waste management and infection control and ward level interpretation of guidelines to address these two priorities.

Procurement
Collaboration with local manufacturers could enhance local purchasing and create possibilities for the development of more re-use items and improved sterilisation techniques. Staff working at ward level are often better informed about cheaper options which work better. However the systems for changing procurement guidelines and recycling existing materials are not always flexible enough to facilitate local purchasing or re-use.

Systems in the organisation
In some cases private and public organisations are working together in some small ways. The majority of organisations have issues with space management, even in office based rather than health care institutions. There are difficulties in providing clear up-to-date information which is relevant and delivered in a form that is appropriate to the needs of different groups, and, issues with the location of bins and the removal of waste. In this study, where organisations worked together there was improved coordination of waste management and clearer information provided. Networking across different provider organisations to share resources such as cardboard compactors has benefits economically and in terms of economies of scale.

The individual
Individuals will change behaviour when it is easy for them to do so. This is possible when the environment in which they work facilitates the easy management and removal of waste. Although it has been shown that people who recycle at home are more likely to recycle at work, this is only possible if the environment is sufficiently well designed to enable waste segregation. Organisational culture often determines how people behave and in organisations where sustainable issues were embedded into policy and practice adopting a philosophy of reduce, reuse, recycle was easy.

What this study adds is an in depth understanding of the problems and difficulties created by the systems that are designed to help dispose of healthcare waste effectively and efficiently. All the participants were aware of how savings could be made and systems could improve and their recommendations are reported here. What is needed now is to:

- maintain a whole systems approach to evidence collection;
- develop increasing expertise in sustainable accounting in relation to waste by improving the evidence base of the environmental costs of procurement, use and disposal of materials;
- change attitudes and practices by focussing on the work environment, improving space to carry out clinical duties, changing from ‘just in case’ to ‘what is needed’ ordering and a reduction in packaging coming on to wards and units;
- concentrating on what is possible and cost efficient in the current climate; and,
- listening to staff as part of the design phase of any intervention.
Acknowledgements
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We would like to thank all the organisations who took part in this study for their involvement and continuing interest. We are grateful to the Institute Sustainability Solutions Research (ISSR) for including this report in their Horizons series and for supporting our research.
References


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