



Greening healthcare: systematic implementation of environmental programmes in a university teaching hospital



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ABSTRACT

The provision of healthcare creates significant environmental impacts, and their mitigation is being attempted in a variety of ways which vary from nation to nation in line with differing policy priorities and resource availability. The environmental performance of hospitals has been enhanced through, for example, green building, waste and energy management, and product design. However, unpredictable occupant behaviour, new research outcomes and evolving best practice requires healthcare to react and respond in an ever challenging and changing environment, and clearly there is no one set of actions appropriate in all jurisdictions. Many authors have pointed up negative environmental impacts caused by healthcare, but these studies have focused on particular aspects of mitigation in isolation, and are for this reason not optimal. Here it is argued that tackling impact mitigation through a whole system approach is likely to be more effective. To illustrate what this approach might entail in practice, an evaluation of a systematic implementation of impact mitigation in Ireland's largest teaching hospital, Cork University Hospital is presented. This approach brings together voluntary initiatives in particular those emanating from governmental and non-governmental organisations, peer supports and the adaptation of programmes designed originally for environmental education purposes. Specific measures and initiatives are described, and analysis of results and planned future actions provides a basis for evaluation of successes achieved in achieving mitigation objectives. A crucial attribute of this approach is that it retains its flexibility and connectivity through time, thereby ensuring continual responsiveness to evolving regulation and best practice in green healthcare. It is demonstrated that implementation in Cork resulted both in mitigation of existing impacts, but also a commitment to continual improvement. For such a systems approach to be widely adopted, the healthcare sector needs both leadership from regulators and stakeholders, and strong supports. In Cork it was found that environmental education programmes, especially action and reward based programmes, as utilised by the campus's academic affiliates in particular University College Cork, were especially effective as a framework to address sustainability challenges and should be developed further. However, within healthcare implementation of environmental initiatives must prioritise patient safety. This approach has now been adopted for delivery across the health services sector in Ireland.

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1. Introduction

Incorporation of sustainable development (SD) into all higher education facilities presents significant challenges such as:

Abbreviations: CUH, Cork University Hospital; EPA, Environmental Protection Agency; EPA-GHCP, Environmental Protection Agency Green Healthcare Programme; GCP, Green-Campus Programme; GGHN, Global Green and Healthy Hospitals Network; HSE, Health Service Executive; NGO, Non-Governmental Organisation; PSEEP, Public Sector Energy Efficiency Programme; SD, Sustainable Development; SEAI, Sustainable Energy Authority of Ireland; SHESG, Sustainable Healthcare Environment Steering Group; UCC, University College Cork; UK NHS, UK National Health Service.

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strengthening SD competencies, facilitating multi-stakeholder dialogue between organisations and individuals, consistency and rigour of methods, ensuring relevance, benchmarks and quality, systemic approaches and promotion of campus sustainability (Leal Filho et al., 2015). Evidence of campus' engagement in sustainability initiatives is growing, some elect for public commitments to act on sustainability through peer agreements and declarations (Lozano et al., 2013), peer support networks have been established e.g. Environmental Association for Universities and Colleges in the UK, whilst more engage in metrics and rankings (Lauder et al., 2015). Prior to the emergence of green rankings, concerns had been expressed regarding the use of cross institutional comparison assessment tools, noting that the more useful tools "reflect the

transition in thought from environmental management to management for sustainability” (Shriberg, 2002) and more recently calls have been made for means to recognise campus community participation in assessment tools (Disterheft et al., 2015) and the significance of human factors, empowerment and communication in delivering change (Verhulst and Lambrechts, 2015). Systematic approaches are required to green campuses; they are complex ecosystems comprising many independent components and successful evolution necessitates consideration of all of these components (Koester et al., 2006). Some best practice guidance on greening education is available through international peer reviewed literature and support organisations, yet there is also a need to “better link commitment and implementation through holistic SD approaches”. Grass root, student led initiatives on campus sites have proven effective (Mason et al., 2003; Reidy et al., 2015) as recognition grows that key life events such as starting university, changing employment, becoming a parent etc. present opportunities to influence behaviour and induce sustainable consumption patterns in creative ways (DEFRA, 2011; Ongondo and Williams, 2011).

Healthcare, in particular hospitals and teaching hospitals are major contributors to environmental pollution contributing pathological, pharmaceutical, chemical, radioactive, health risk and other wastes (World Health Organization, 2014). Retrofits of facilities with new technologies and new-build greener hospitals have yielded positive results (Thiel et al., 2014). However due to economic constraints, refurbishments, new builds and technologies cannot be solely relied on to deliver required environmental improvements (Huesemann, 2011), and existing facilities must act. There is a growing body of research comparing reusable and single use medical instruments (Campion et al., 2015; Sørensen and Wenzel, 2014), water conservation and wastewater treatment (Faezipour and Ferreira, 2014; Verlicchi et al., 2010), energy efficiency (Teke and Timur, 2014), and the impacts of food choice, preparation and wastage (Sonnino and McWilliam, 2011; Vidal et al., 2015) in hospitals. Waste management, including hazardous waste management continues to feature in sustainable healthcare research (Gavilán-García et al., 2015; Saad, 2013; Xin, 2015). This is hardly surprising, since Harhay et al. (2009) reported that approximately 50% of the world’s population are likely to face public health, occupational, and environmental risks due to inadequate public healthcare waste management.

It is argued that greening healthcare has largely relied on self-policing based on an assumed knowledge base among healthcare professionals, which in practice may be absent (McDiarmid, 2006). Whilst some have called for clearer regulation (McDiarmid, 2006; Vatovec et al., 2013) the main thrust of regulation in healthcare focuses on product development and manufacture as distinct from procurement, distribution, use, and decommission. Best practice guidance on sustainable healthcare tends to come from international bodies such as the World Health Organisation and Healthcare Without Harm; however ultimate realisation of measures is dependent on facilities, national regulations, and local supports. Recently the UK NHS has undertaken the development of sustainability indicators (NHS England, 2015), ultimately stakeholder behaviour contributes to the environmental performance of an organisation, especially in terms of waste management for which regulations are in place in most countries (Porter-O’Grady and Malloch, 2010). Opportunities present that do not deliver direct financial benefits or contribute to legislative compliance, yet make a meaningful contribution to the environment and society, for example, prioritising preventative care where fewer health interventions ultimately reduce associated environmental impacts (Weisz et al., 2011). In a comprehensive review of environmental sustainability in hospitals, McGain and Naylor (2014) identified a

need for additional information to guide decision-making, and better inter-disciplinary coordination in research, to deliver more sustainable healthcare.

To help fill this gap, this paper is structured around a case study of Cork University Hospital, Ireland (CUH) and aims to explain and evaluate a systems based action framework designed to create synergies between both regulatory requirements and voluntary initiatives, supported by government agencies and NGOs, so as to best meet environmental impact mitigation objectives. The framework and actions are presented in relation to energy and waste management. Initiatives within an environmental education programme, previously successfully adopted by educational institutions, to illustrate and evaluate examples of technical and support measures adopted in CUH are evaluated. Nascent work on water conservation, sustainable travel, biodiversity enhancement and developing wider visions and actions for sustainable healthcare within CUH are discussed. While other healthcare institutions in Ireland and elsewhere may be expected to have different priorities, the authors believe that the framework is sufficiently flexible to accommodate this and will have wide application, and offer reasons why this should be so.

2. Material and methods

This research was facilitated through the active participation of CUH, which had selected as a policy priority the enhancement of environmental management. The hospital sought external expertise in implementation of environmental initiatives and was advised to establish a representative environmental committee, which included an author of this paper (YRF). The research team had full access to allow both input into the approach to be adopted by CUH, and also allow evidence based evaluation of the effects of policy and action effectiveness. CUH decided to apply for accreditation under the Green-Campus Programme (GCP) (EnviroCentre, 2014) and the research team acted as advisors in successfully achieving this. Data sources included, pre-programme implementation screening, policy implementation reports required within Green-Campus applications, and published descriptions of policy outcomes from CUH, the National Health Sustainability Office, the Irish Environmental Protection Agency (EPA) and the Sustainable Energy Authority of Ireland (SEAI). This paper is structured so as to reflect the Seven Steps of the GCP, namely establishing an environmental committee, conducting an environmental review, developing an action plan, monitoring and evaluation (using sustainability indicators), informing and involving, linking to learning on campus and developing a green charter (to ensure continuity).

2.1. The study site

CUH is the largest teaching hospital and only Level 1 trauma centre in Ireland, containing >40 medical and surgical specialities. Whole time equivalent staff and student numbers totals 3297 and 408 respectively. During 2013 the hospital catered for 234,752 patient bed days, 166,103 outpatient attendances and 15,983 births. The hospital contains 18 buildings with a total floor area of 96,720 m². As with all Irish hospitals, government austerity policy in recent years has resulted in a tightening in budgets and reductions in staff numbers. The hospital’s main academic affiliation lies with UCC, a campus making sustained efforts toward SD and engagement in diverse SD initiatives e.g. GCP and 2nd placed in UI Green Metric 2014 (Lauder et al., 2015; UCC Green Campus, 2015). The sites are not co-located and do not share facilities, other management or budgets. UCC have 11 affiliated teaching hospitals (UCC School of Medicine, 2015), in addition students present in

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