

Sustainable Healthcare

A path to sustainability

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Abstract

Sustainable healthcare is becoming an increasingly prominent issue as the aspects and impacts of healthcare activities are acknowledged and discovered. However, 'sustainable healthcare' is a debatable concept, without consensus and used in a variety of ways by many organizations. This research project lays a foundation for working consistently with the concept. Traditional and modern performance measurements are combined to form the basis of a framework that supports criteria for levels in reaching sustainable healthcare. The concept of stakeholder theory and engagement further supports the formation of the framework with levels of stakeholder involvement and thus quality of action. Literature reviews and leaders from the sustainable healthcare field provided information that contributed to the organization of sustainability levels and hierarchy of criteria. Analysis and careful consideration of information provided by these sources aided in the creation of a guideline for a path to 'sustainable healthcare' and clarifies how healthcare facilities might operationalise the 'sustainable healthcare' concept.

Keywords: Sustainable healthcare, hospitals, performance measurements

Executive Summary

Sustainable healthcare is a burgeoning concept that is gaining momentum as environmental, social, and economic aspects are becoming linked to healthcare activities. Research continues to uncover the relationship between health and environment, and as industry as a whole as reacted to accepting responsibilities and taking action, the healthcare sector will need to do the same.

However, a consensus of what ‘sustainable healthcare’ means does not exist. Likewise, as of today no definitive universal framework or guideline exists for healthcare to achieve sustainability. Thus the word ‘sustainability’ is used under varying contexts in healthcare, creating confusion for managers and organizations. For healthcare organizations to progress towards sustainability in order to contribute to ‘sustainable development’ as international organizations and governments have called on various sectors to do, there must be a path on which to work.

Thus performance measurements, guidelines, the opinions of leaders in the field, stakeholder theory and engagement, literature, and current practice are examined in an effort to create a logical path to ‘sustainable healthcare’ based on describing the quality, engagement, action, behavior and performance measurements necessary to achieving ‘sustainable healthcare’. The path splits into three Levels, including Level 1 a ‘basic’ level, Level 2, which is considered ‘norm’ and Level 3 the ‘eco-social’ level describing the highest level of sustainability. The environmental, social, and economic issues relating to healthcare and its sustainability potential are addressed to accentuate the value of what is included in these Levels.

The three Levels are described with the appropriate criteria based on examination of the above-mentioned sources, providing a framework and consensus for healthcare facilities so they might begin to operationalise the concept of sustainability. A review of the framework and general results conclude in a proposed definition of ‘sustainable healthcare’: “a system balanced on sound environmental, social, and economic approaches that eliminate negative social, environmental, and economic impacts while providing a service that prevents or ends environmental and human illness; continually working to maintain human and environmental health, while empowering, promoting, and preserving environmental and social quality for the sake of Earth, and present and future generations.”

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Abbreviations

CSR: Corporate Social Responsibility

EMP: Environmental Management Program

EMS: Environmental Management System

EPA: The US Environmental Protection Agency

GHG: Greenhouse Gas

GRI: Global Reporting Initiative

HCWH: Health Care Without Harm

LCA: Lifecycle Assessment

PBT: Persistent Bioaccumulative pollutant

TBL: Triple Bottom Line

TQEM: Total Quality Environmental Management

TQM: Total Quality Management

WHO: The World Health Organization

1 Introduction

1.1 Background

Healthcare organizations have complex internal and external roles; they have responsibilities to society, with a priority on quality patient care, yet also function as a business with inputs and outputs operating similarly to large-scale factories. Healthcare represents an enormous sector of society, economically, socially and environmentally. In 2011, healthcare accounted for 17.2% of GDP in the US and is expected to grow to 19.8% by 2020 (McCanne, 2011) (Kinney, 2011). In 2009, healthcare expenditure represented 9.8% of GDP in the UK and 10% of GDP in Sweden (OECD, 2011). Healthcare in the United States employs 4.1 million plus people and NHS employs 1.43 million people (NHS, 2011) (Hall, n.d.). The massive role healthcare has in the economy is also reflected in subsequent resource use, which is needed to keep a system, that operates 24 hours a day, 7 days a week, in constant progression.

In order to fulfill priorities and institutional goals, healthcare consumes large amounts of resources to meet the needs of external and internal standards. In England, the healthcare sector accounts for 5% of the country's GHG emissions (Bettley & Burnley, 2011). Healthcare centers in the US generate an approximately combined 5 million tons of waste per year and spend USD 8.3 billion on energy alone per year. Various aspects of operations like chemical usage, waste management, and material procurement have been criticized as contributing to pollution and impeding quality public health (Hall, n.d.). Healthcare facilities can also endanger worker and patient health; psychological, psychological and physical health risks are higher than in other fields (Sadler et al., 2011). As expected, healthcare organizations have many environmental aspects that can directly or indirectly affect the community and region in which they reside, and these are expanding globally (as seen in Figure 1-1).

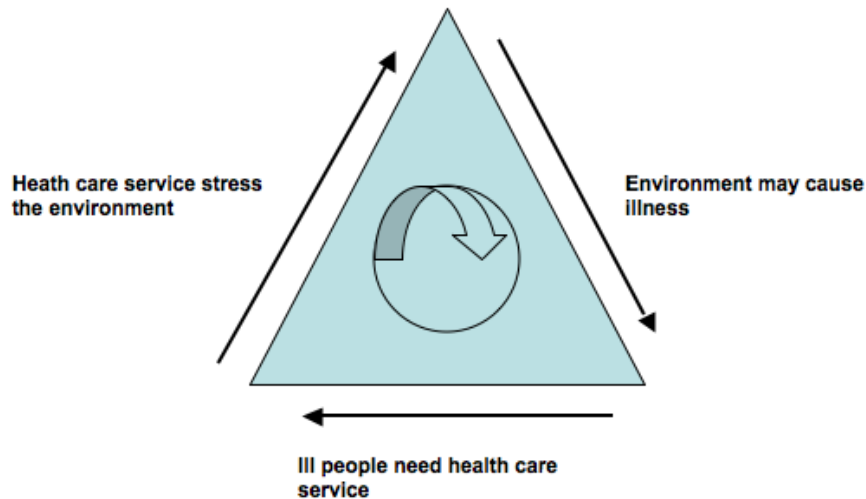


Figure 1-1 'The cyclic behavior of healthcare action and reaction'

Source: (Pelikan & Schmied, n.d.)

Hospitals are a unique business, they must follow specific performance standards to achieve quality needed for their type of service, yet are also held to social expectations beyond a typical business due to the type of service they provide (M., Bhutta, Personal communication, March 21, 2012). Ironically, these additional expectations do not always support or require more rigorous social or environmental standards. While performance standards and regulations regarding operations, social and environmental aspects have become increasingly stringent for industry; the health care sector has largely been left to its own (S. Gild, Personal Communication, January 3, 2011) Within the past decade health care leaders and advocates have acknowledged this issue, bringing to light the health care sector's environmental and social impacts, and the potential to bolster society, preserve the environment, and contribute to sustainable development (Hampton, 2012).

Sustainability issues are being prioritized with every passing year; corporations, non-profits, venture capital, and governments are increasingly becoming involved in sustainable development efforts with acknowledgment of our ecological decline (Hannon & Callaghan, 2011). "Sustainable" in the context of this research shall follow the Bruntland report, with the definition of the "ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (Kates et al., 2005).

Health care's role in society is changing, similarly to how the trend for industry is to now include social responsibility into their environmental policy and mission. Environmental and social regulation is becoming stricter as information is communicated more easily in this social technology era, forcing politicians and governments to react to changing norms. Most industries now have environmental policies and management programs and are subjected to more scrutiny by the public and government than ever before. As the public becomes more aware of health care environmental and social aspects, the expectations for health care operation and management will change, thus health care's role will expand, as industry has,

into a more social and environmentally aware one.

Hospitals are expected to follow environmental regulations as enacted by national or regional law in order to maintain accreditation by the Joint Commission. Good environmental practices regarding waste management, operations, and occupational health and safety in hospitals are accepted as the norm, yet the facility's directors or managers ultimately decide the degree to which a hospital operates beyond compliance (Groene & Garcia-Barvero, 2005). In recent years awareness regarding resource intense activities has increased, leading to changes in operations and in some cases adaptation of ISO 14001 standards. One example is in Nordic health care centers, which must be ISO 14001 certified as ruled by regional government. Yet many environmental and social actions that could be grouped as 'sustainable' are voluntary and not expected by the public, government or any certification body.

1.2 Problem

Sustainable development is a leading issue with the European Commission, United Nations and World Health Organization (WHO), which are supporting initiatives to integrate sustainable concepts into various sectors of society. In 2002, WHO declared it was absolutely necessary for health professionals to aid in sustainable development (WHO, 2012b). Since the 1990s, the "consideration of health in the wider context of sustainable development has been regularly discussed and called for within public health or health promotion literature (e. g., McMichael 2006, Brown et al. 2005, Dooris 1999, Hancock 1996, Labonté 1991)" (Weiz et al., 2011). Many types of beyond-compliance environmental guidelines like environmental management programs, cleaner production, leaner operations, and ISO 14001 are tools able to be used as a means of attaining what literature calls 'sustainability.' Health care centers deemed 'sustainable' either by themselves or by an outside party like an NGO, typically have not implemented the same sustainability criteria in an effort to reach sustainability as defined by the Bruntland report, nor have the same weighted environmental aspects or impacts. Sustainable development itself is still undefined, despite the vast amounts of literature attempting to do so: between 1974 and 1992, 70 different definitions of sustainable development appeared in literature and the amount of literature devoted to the subject has continued to increase (Linsey, 2010) (Kates et al., 2005). Clarification of a scientific approach of sustainability or 'greening' has been called for since the early 1990s (Welford, 1995). The consensus is that the topic of environmental sustainability is becoming mainstream, as it is sweeping every industry, yet the "diffusion and popularity of the term sustainability with relatively little corresponding rigorous and grounded conceptualization may have created confusion over the basic concepts of sustainability, and produced a 'sustainability fog' for business"... Hannon and Callaghan argue that instead we need more formal, rigorous, and focused research and education that will both push organizational leaders to go further with sustainable practices, and give them a solid ground from which to work" (2011). Additionally, "integrated approaches to sustainability that attempt to give equal consideration to all three sustainability dimensions are underrepresented" (Weiz et al., 2011).

Likewise, a universal framework listing steps absolutely necessary to becoming or working towards a sustainable health care center does not exist, nor does literature containing the elements of a genuine 'sustainable health care.' Calls for 'greener' healthcare and hospitals has elevated as environmental impacts have been assessed and documented (HCWH, 2011). Numerous organizations like Practice Green Health, Health care Without Harm, Center for

Health Design, a coalition of US healthcare system's Healthier Hospitals initiative, the European Union's environmental, social, and public health initiatives, the US Environmental Protection Agency's Partnership for Sustainable Healthcare, WHO, and the UK's National Health System (NHS) all provide concepts, principles, and guidelines for helping health care attain 'greener' or more environmentally and socially friendly operations and management. However, when viewed in the context of work towards sustainability, the wide array of advice, guidelines and information has led to confusion, not only in the research world, but also for management of health care centers attempting to implement a sustainable health care system (A. Leetz, Personal communication, March 21, 2012) (M. Bhutta, Personal communication, March 21 2012). Authors have "argued that a deep, rigorous, and integrated understanding of sustainability is needed at the managerial level for organizations to achieve sustainability" (Hannon & Callaghan, 2011). Hannon & Callaghan (2011) further explain that businesses tend to express sustainability through focusing on environmental aspects of sustainability with social aspects of sustainability rarely mentioned, and that a social vision of sustainability should not emerge "organically from the ranks who have to carry it out," but instead "need more formal, rigorous, and focused research and education that will both push organizational leaders to go further with sustainability practices, and give them a solid grounding from which to work" (Hannon & Callaghan, 2011).

Accordingly, in recent business ethics research, Corporate Social Responsibility (CSR) has become a priority issue with international bodies like the European Commission pushing CSR components that encourage voluntary engagement with society by taking on additional responsibilities beyond ethical expectations (Abländer, 2011) (Anderson & Larsen, 2009). Increased usage of CSR, and creation of Global Reporting Initiative (GRI), ISO 14001 and ISO 26000, reflect corporate and stakeholders heightened interests and prioritization of sustainability issues that are not only environmental, but are also social (Roca & Searcy, 2012). In fact, GRI was created in response to the need of a guideline for implementing CSR (Hedberg & Malmberg, 2003).

It is clear that the concept of sustainability for business now includes both environmental and social aspects. Health care has performance, environmental, operational and management standards like any industry. Subsequently, sustainability in health care will need to have similar 'sustainability' characteristics, as it is public service that operates as a business whether or not it is private or public. Historically healthcare has had community outreach programs and a wider interaction in social aspects. Sustainability continues to grow as a prominent issue, and as natural progression the healthcare sector will need to react as other industries as a whole have done. This issue has not gone unnoticed as the American Hospital Association (AHA) president stated that in order to achieve the AHA vision of society, it must be through sustainable operations, which is consistent with its mission (Lazano, 2008). It is in the interest of all health care centers, governments, NGOs and the public for health care to reach a sustainable operation or system, as it will support both public health and environmental initiatives globally.

It is understood the healthcare sector must undergo a change towards sustainable healthcare, but it is unclear what this means or how to do it. Thus the author will undertake a study to answer the following research questions and perform the following tasks:

I. How can healthcare institutions operationalise the concept of ‘sustainability’?

1. Describe how the concept of ‘sustainability’ be given meaning for the healthcare sector?
2. Delineate steps that healthcare institutions can take.
 - a. Propose a structured framework for operationalising the sustainable healthcare concept.

II. How can healthcare institutions build an understanding and a framework for sustainability?

1. Delineate where ‘sustainable healthcare’ needed and by whom.
2. Outline how ‘sustainable healthcare’ is defined.
 - a. Delineate key parameters within the concept of ‘sustainable healthcare’
3. Develop a framework working towards how ‘sustainable healthcare’ is prioritized or ranked by difficulty or degree of ambition.
 - a. Define differing levels of performance or aspiration within the sustainable healthcare concept.

In arriving with a conclusion, the **objective** is to provide a logical framework for the levels to sustainable healthcare, and based on this study determine what sustainable healthcare means. With these findings the author’s **goal** is to provide healthcare organizations and professionals alike a basis for envisioning or pursuing sustainable healthcare in their own facility.

1.3 Scope

The author plans to provide a framework derived from existing literature and management concepts and guidelines that would provide a guide leading to what ‘sustainable health care’ might mean based on paths health care centers have already begun to take and what sustainability literature describes as sustainable. The author shall discern what criteria and elements make up the levels of this path using themes from popular environmental management frameworks as a guide for this exploration, like ISO standards and various environment management systems. Sustainable business management systems will aid as models in this guide as well as health care centers that have plans for sustainable operations. Additionally, the focus will include developed county’s sustainable health care criteria, focusing on Sweden, UK, and the USA, without touching on issues that are specific to developing country’s health care aspects. The emphasis will be on Nordic health care centers, using them as a ‘norm’ or baseline of study due to caliber and advancement of their sustainability efforts already in place, which appears to be a consensus (M. Bhutta, Personal communication, March 21, 2012) (A. Leetz, Personal communication, March 21, 2012).

1.4 Limitations

Laws, regulations, national and international agreements will not be analyzed in regards to its role in sustainable healthcare; it will be assumed that as a certified healthcare center, these basic environmental, ethical, and performance requirements are fulfilled and do not need to be mentioned or incorporated into the path of 'sustainable health care.' Therefore all mentioned about ethics will be considered a discussion about ethics beyond law or ethical norms.

Some literature included may have an older publication dates due to the limited amount of information available specifically pertaining to sustainable healthcare or the characteristic of being broad enough to be utilized in terms of healthcare. For example, Welford (1995) provides forwarding thinking ideas and thoughts that are still pertinent today in dealing with sustainability ideas. For the sake of time restraints and vast amounts of literature on 'sustainability' and 'sustainable development' the Bruntland Report, Millennium Development Goals and the Five Capitals Model were chosen as a more definitive concept of 'sustainability' for the basis of determining a meaning for 'sustainable healthcare'. Furthermore, the number of people directly related in the field of sustainable healthcare is limited; the information derived from 'leaders' in the field is opinion based, as sustainable healthcare is a newly minted idea and concept. Thus not all 'leaders' spoken with work within 'sustainable healthcare' alone, but have some sort of involvement with it on various levels. Interviews were not conducted in a 'survey' manner, as to encourage free discussion in order to delineate what issues were most important to each individual based on their circumstance and level of involvement in sustainable healthcare. The levels delineated in this thesis are not meant to directly outline a specific step-by-step process of achieving sustainable healthcare, as every situation is unique and requires a path catered to that circumstance. It therefore should be considered a general path to sustainable healthcare that is applicable to all health care centers. Additionally, the criteria and elements of this path are not exhaustive; there will always be opinions and literature that cannot be accounted for.

1.5 Methods

The path to 'sustainable health care' begins with an extensive literature review of white, grey and peer-reviewed scientific literature, non-profit sustainable health care websites, reports and government websites. Sources were suggested or mentioned through personal communication with leaders in the field. Third party sources like NGOs or sustainable healthcare consultant firms provided many resources, as they are the current leaders for many healthcare organizations in relation to sustainable healthcare. Sources containing information on current healthcare initiatives, goals, current guidelines and issues, relevant problems and solutions, case studies, and evidence of performance measurements and stakeholder theory and engagement were all criteria sought out. TEM Foundation provided contact information for many of people known for activism in the sustainable healthcare field. A wide range of leaders were included for expression of complete views, including environmental representatives from two large healthcare organizations, one physician active in sustainable healthcare initiatives, sustainable healthcare NGO leaders, and representatives of Swedish regional environmental departments who are in charge of many environmental initiatives within healthcare facilities. All communication was conducted in an informal manner, using a phone or email, allowing leaders in the field to express opinion on current practice and future outlook, for the purpose of leading the author to new search terms or links to new sources, not exhaustive conclusions (See Appendix IV for list of 'leaders' and information). The author also attended a PCV-free blood bag conference to understand

conflicting views of certain sustainable healthcare issues and meet several contacts. Once topics were identified from various sources, they were further analyzed or researched, leading to more questions and thus the cyclic operation of seeking out more information. Search terms include ‘sustainable health care,’ ‘CSR,’ ‘CSR and industry,’ ‘GRI and industry,’ ‘what is sustainability?,’ ISO 26000 and health care, and ‘health care quality.’ Interviews conducted with different NGOs and environmental managers in Nordic health care facilities contribute to ideas of what is ‘current’.

The author shall discern the difference between ‘healthcare’ and ‘hospitals,’ and definition of ‘sustainability’ including what sustainability means in other sectors, and describe characteristics of what sustainability might mean in healthcare in Chapter 2. Subsequently, well known environmental management frameworks and certification standards shall be used and discussed in terms of a foundation to build the levels for the path to sustainable health care in Chapter 3. Auditing techniques, stakeholder theory and ‘levels of engagement’ in management practice will support the discussion in Chapter 3 and subsequently support the Levels description in Chapter 6. In Chapter 4 a small literature case study compilation will provide insight to the variability in what ‘sustainable healthcare’ means for numerous facilities and what this contributes to its true meaning. Interviews will help to validate this process and contribute to overall knowledge for deriving the appropriate levels and characteristics of this path. Chapter 5 will discuss current environmental, social, and economic healthcare issues to underline the value of the Levels described in Chapter 6. In Chapter 6 sustainable health care criteria will fit into each level and category to build a conceptualization of what sustainable health care might mean.

2 Sustainability and Healthcare

2.1 Hospital versus Healthcare: what is the difference?

Hospitals are defined as “an institution providing medical treatment and nursing for sick and injured people, while ‘healthcare’ is defined by the Oxford dictionary as the “organized provision of medical care to individuals or a community.” The main difference between ‘healthcare’ and ‘hospitals’ is that healthcare does not have to be one single institution; it could be a cluster of medical care facilities, caring for sick or injured but also caring for the healthy. Healthcare in itself describes a wide range of care, from dentistry to emergency care, to dermatology. From this it is inferred healthcare umbrellas ‘hospitals’ in that hospitals provide ‘healthcare,’ but ‘healthcare’ is not limited to a single institution caring for the ill. ‘Healthcare’ consists of clinics, hospitals, purchasers of healthcare services, and pharmaceutical facilities, all of which can be public or private (EU, 2009). ‘Health’ as defined by the WHO, is the “state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (EU, 2009). According to WHO, a health system consists of “all organizations, people and actions whose primary intent is to promote, restore or maintain health” (EU, 2009). WHO considers a ‘good health system’ to be one that:

- 1) delivers effective, safe, quality service, when and where as needed with minimum resource waste;
- 2) a healthy workforce with responsive, fair and efficient work ethics;
- 3) a well functioning information system with supporting management, leadership and governance;
- 4) equitable access to essential medical products;
- 5) good and efficient health financing system;
- 6) strategic leadership and stewardship supplying based on accountability.

(EU, 2009)

2.2 Definition of sustainability

Sustainable development was first coined within the Bruntland Report, highlighting environmental protection and development. A key element to be ‘sustained’ is ‘life support systems’ which are defined as “nature or environment as a set of resources and service for the utilitarian life support of human kind” (Leiserowitz et al., 2006). Sustainability has many benefits, as described in the Five Capitals Model, which is described as consideration of wider environmental and social issues that will result in enhancing the parameters listed below (Porritt, 2005).

1. Natural Capital: Natural resources needed by the organization for products and services.
2. Human Capital: The health, knowledge, skills intellectual ability, motivation of people that contribute to a healthier workforce and service.

3. Social Capital: The value of human relationships, partnerships and communication within activities and economic outputs of an organization.

4. Manufactured Capital: The infrastructure owned by the organization that harbors productivity and efficiency.

5. Financial Capital: The organization's assets that can be owned or traded, representing the longevity and success of an organization.

(Forum for the Future, n.d.) (Porritts, 2005).

From this model, one can deduce that as well as social and environmental improvements, and economic benefits like cost-savings, sustainable healthcare will result in positive externalities that will contribute to sustainable development and healthy progress (Forum for the Future, n.d.) Harlem Bruntland “summarizes the Bruntland Report by stating that ‘ultimately the whole report is about health’ implying that health is vital to sustainability (Weisz et al., 2011).“Sustainability is an anthropocentric notion: it means that human-induced changes in ecosystems must not threaten the exchange processes between society and its natural environment in ways that affect society’s survival or well-being” (Weisz et al., 2011). In Table 2-1, the elements that are to be sustained are as mentioned:

Table 2-1 What should be sustained in speaking of sustainability’

Nature	Life Support	Community
Earth	Ecosystem Services	Cultures
Biodiversity	Resources	Groups
Ecosystems	Environment	Places

Source: (Leiserowitz et al., 2006)

Furthermore, sustainability has morphed into a concept that values nature for its intrinsic value and has taken on social qualities, like well-being, regionality, and community ties, and other characteristics as seen in the Millennium Development goals, of which 191 UN member states have agreed to try and achieve by 2015:

- 1) Eradication of extreme poverty
- 2) Achieve universal primary education
- 3) Promote gender equality and empower women
- 4) Reduce child mortality
- 5) Improve maternal health
- 6) Combat HIV/ AIDS, malaria, and other diseases

- 7) Ensure environmental sustainability
- 8) Develop a global partnership for development

(WHO, 2012a)

The Brundtland Report, Millennium Development Goals and the Five Capitals Model provide a through concept of what 'sustainability' means. It is only practical that in order to reach these goals quality environmental and human health are necessary, as they are seen here to be a foundation for sustainability.

2.3 Sustainable Healthcare: what does it mean?

ANH (Alliance for Natural Health) first defined sustainable healthcare for its readers in the journal *Nutrition Practitioner* in 2006:

"A complex system of interacting approaches to the restoration, management and optimisation of human health that has an ecological base, that is environmentally, economically and socially viable indefinitely, that functions harmoniously both with the human body and the non-human environment, and which does not result in unfair or disproportionate impacts on any significant contributory element of the healthcare system" (Alliance for Natural Health, 2008).

However, there is no unanimous definition that has been agreed upon. A purported 'sustainable hospital' or 'ecologically sustainable hospitals' practices 'sustainable healthcare,' which is also called 'greener healthcare' in various literature without differentiation between words and their meaning (HCWH, 2011). While there is no universal definition, framework or implementation for sustainable healthcare, they all have similar components.

A typical 'greener' hospital would have an Environmental Management System (EMS) in place to measure energy, water, resource use input and outputs in order to make environmental goals reality (ESC, 2007). Certification is not mandatory but a framework mimicking ISO 14001 is perceived as part of 'sustainable' hospital (HCWH, 2011).

Waste reduction, avoidance and disposal, water and energy management, air emissions monitoring and reduction, environmentally preferable purchasing, reducing toxic and carcinogenic chemical and material usage, greener cleaning, upgrading equipment to higher efficiency are all characteristics of sustainable hospitals (ESC, 2007). Outside of operations, it includes supporting ecologically sound food systems and providing healthy nutrition for patients and staff, designing energy efficient and healthy buildings, renovating or building LEED certified facilities, considering the Persistent Bioaccumulative Toxic (PBT) of medicines used and their impact on the environment, as well as their contribution to the sustainability of the society in which they reside (HCWH, 2011). While this mostly addresses operations, in considering sustainable healthcare, one must include dependency on ecosystems for human health, ecological prevention over treatment, considering environmental costs in evaluation of therapies, the Hippocratic Oath of 'do no harm,' justice and equality, and long-term human health (Jameton & McGuire, 2002).

3 Building a sustainable healthcare framework

While the definition of sustainability differs widely, core principles derived from these concepts by Lindsey (2010) are: 1) improved sustainability through reducing wastefulness 2) improving quality improves sustainability and 3) sustainability is best achieved through implementing better systems. Sustainability in healthcare requires balance of patient needs, economic concerns and environmental costs (Jameton & McGuire, 2002). Each of these criteria fit into the ‘triple bottom line’ as described by Elkington (1997), describing economic, environment and social performance measures that must be accounted for.

Traditional healthcare is patient-centered and focused on internal aspects, which may or may not include community, but commonly excludes environmental aspects from the definition of ‘community’ (Jameton & McGuire, 2002). Healthcare organizations are involved in treatment of disease and perhaps have the mindset of being part of the solution and not necessarily part of the problem (Jameton & McGuire, 2002). Additionally, the idea of the largest impacts stemming from important and complicated sources diverts from reality in that the largest environmental costs tend to accumulate from mundane, routine activities (Jameton & McGuire, 2002). These traditional views can possibly impede the path to sustainable health care, thus should be recognized.

Performance measuring has proved to be the best route to managing environmental and social aspects while providing quality service. Other industries have used it for decades to comply with regulations and legislation, and are now using them to embrace sustainability in response to competitive pressures, marketing advantage, legal obligations, investor demands and internal ethical values reflecting society’s changing values (Bettley & Burnley, 2011). Management design has strong influence on the amount of resources consumed, decisions and activities that drive operation, thus if ‘sustainability’ is to be achieved, management must use strategies reflective of a sustainable system (Bettley & Burnley, 2011). Reasons sustainability should be integrated with management systems are as follows:

- 1) Many decisions influencing sustainability are long-term strategies, and must be considered with other performance objectives.
- 2) Similarly to how ‘quality’ concerns are imbedded within a management system, so must sustainability in order to weigh decisions against other factors and involves all stakeholders.
- 3) An integrated management system reduces administrative overhead and confusion.
- 4) Allows issues to be solved at the appropriate level (i.e. procurement, operations, waste).

(Bettley & Burnley, 2011).

3.1 Performance Measuring

Organizational performance measurements have evolved from shareholder values, to stakeholder values, to the introduction of ‘triple bottom line’ in the late 1990s, and towards sustainability as seen today (Hubbard, 2009). In business, sustainability means meeting present stakeholders needs without impeding the ability of future generation stakeholders to meet their needs (Hubbard, 2009). However, many organizations see sustainability as a compliance issue, a situation to reduce inefficiencies, or as an economic issue devoid of the

environment (Hubbard, 2009). As of 2005, it was estimated that more than 60 standards exist that a business could try to implement for sustainability efforts, and as of today there are likely more (Hubbard, 2009).

Like businesses, healthcare has quality issues that need to be addressed while providing care, enhancing health, maintaining an affordable cost and remaining competitive (Dahlgaard et al., 2012). Health care facilities have recognized the ability of quality management systems, environmental management systems and certification standards to aid in implementing quality operations and management and sustainability measures, and have begun to incorporate them into their system, though no standard is specifically available for health care's unique situation (Dahlgaard et al., 2012) (Heuvel et al., 2005). In a survey of NHS managers, the most needed changes for long-term sustainability are: 'working with other groups/ organizations, 'changes to pathways and models of care,' and the need to improve awareness and understanding of sustainability throughout organizations and embed the practice as other issues gain priority in regards to cost-savings (Ling et al., 2012). Therefore performance standards are beginning to be implemented to integrate sustainability criteria into the organization (Ling et al., 2012).

However, Waage (2003) states that those designing sustainable systems or products are "unclear about what sustainability principles, strategies and approaches and tools to use at what points in time." In order to help differentiate the quality of different existing performance measurements in how they can be used for sustainability management, they shall be split into three levels as designated by the author and other literature sources based on their descriptions in literature in comparison to sustainability literature.

3.1.1 Sustainable healthcare in terms of performance measurement

Each level is ascribed performance standards and described in relation to what sustainable management may mean based on sustainability definitions and descriptions. Each level described here corresponds with the healthcare 'sustainability levels' that will be described later in the document; therefore the levels of sustainability will have correlating management standards. Each listed performance measurement in the table below (Table 3-1) will be briefly described in the following pages.

Table 3-1 'Discussed performance measurements for each level'

3.1.1.1 Level 1: "Basic"
1. Code of Conduct
2. Total Quality Management
3. Environmental Management
4. ISO 90001
5. Integrated Environmental Management
3.1.1.2 Level 2: "Norm"
1. Sustainability Reporting
2. ISO 14001
3. Integration of Environmental Management Standards
4. Triple Bottom Line
5. Corporate Social Responsibility
3.1.1.3 Level 3: "Eco-social"
1. Health Promoting Hospitals
2. ISO 260000
3. Global Reporting Initiative

Compilation by (Mary Ellen F. Smith, 2012)

3.1.1.1 Level 1 "Basic"

In Level 1 the types of performance measurements are basic, focused on environmental aspects and improving quality in order to adhere to compliance level or make modest achievements beyond. These measurements might be included in the first Level of sustainable healthcare or have equivalent criteria. In Level 1 it is assumed compliance has been reached and these management tools are used to maintain and create new initiatives. The types of programs ascribed to healthcare management in Level 1 are described here:

1. Code of Conduct

Codes of conduct are typically defined within an organization or constructed by agencies, without being enforced, are not found to be helpful for encouraging good business practice or increasing value (Welford, 1995). The earliest example of code of conduct with guidelines industry wide was the Responsible Care Program¹, which including sharing information on safety and health, environmental protection spending, waste and emissions, waste disposal records, energy consumption and all complaints (Welford, 1995). These are essential and reflective of a proper environmental management program.

2. Total Quality Environmental Management

In Total Quality Environmental Management (TQEM) environmental defects are treated as quality defects (Welford, 1995). Employee involvement and participation are vital to a TQEM system, thus training is important although employees are not democratically involved in decision-making processes (Welford, 1995). The system is a long-term process, meaning that continuous review is necessary to move towards a 'zero pollution, zero defects' goal (Welford, 1995). While social aspects are present, customer satisfaction is a priority and therefore making environmental aspects less so when making business decisions.

Best practices for Total Quality Management (TQM) specifically for healthcare require top-management commitment, teamwork and participation, process management, customer focus and satisfaction, resource management, organizational behavior and culture, continuous improvement, training and education (Talib et al., 2011). The desired results of implementing TQM in a healthcare setting are patient satisfaction, improved quality of care, and reduced operating costs (Talib et al., 2011). As mentioned, the goals of TQM are not to directly achieve environmental improvements, yet it can be an indirect affect.

3. Environmental Management

Environmental management is now one traditional approach to management (Welford, 1995). Three attributes of an Environmental Management System (EMS) are:

- 1) Comprehensiveness; implementation and all parts of the organization should be involved
- 2) The system and procedure must be understood by everyone
- 3) The system must open to review, continuous cycle of improvement, aim of zero negative impact, and should have top-down and bottom-up approach.

(Welford, 1995)

A basic management system of an organization includes mandatory components in regards to the environment, of which are: a policy; internal audit; recognized aspects and impacts; legal requirements; objectives and targets; a working Environmental Management Program (EMP); implementation and operation; competence, training and awareness; communication, documentation; control of documents; operational control; emergency preparedness; monitoring and measuring; compliance evaluation; records of non-conformity, corrective

¹ Development of the Responsible Care Program was in reaction to the Bhopal disaster of 1984.

action and preventative action; internal audit; and management review. The concept is to voluntarily keep the public informed of the organization's environmental actions, not to confirm legal compliance, which is already assumed, nor to obtain best practice or performance, but to exhibit existing operation and management behavior in regard to the environment and efforts of continual improvement (Welford, 1995). An EMS is important for healthcare operations because it helps the healthcare center keep track of hazardous, non-hazardous waste, air emissions, wastewater, air, soil pollution, which will be helpful as they must comply with growing number of regulations (WU, n.d.)

However, the typical EMP does not contain principles of sustainable development, and “is about a shallow form of environmentalism which accepts a mechanistic paradigm and tends to endorse the ideology of economic growth...this tends to reinforce the status quo and offers little guidance for sustainable future” (Welford, 1995).

4. ISO 9001

ISO 9001 is an international quality standard that can be used for nearly any organization (Heuvel et al., 2005). It requires internal and external audits and process documentation like patient satisfaction surveys, complaints, accidents, and quality measurements (Heuvel et al., 2005). It has also been applied to healthcare setting, resulting in improved patient orientation, optimized service, and continuous improvement (Heuvel et al., 2005) (Kreisberg, 2005). Stricter standards like ISO 19001 are helpful to healthcare organizations in that it bureaucratizes documentation and increases organization of healthcare reporting, which tends to already have high a level of registration and documentation requirements (Heuvel et al., 2005). Integrating ISO 19001 standards have proven successful, with research supporting that accredited hospitals are generally 65-76 percent prepared at the start, implying the ease of integration of ISO 19001 or incorporation of similar guidelines (Kreisberg, 2005).

5. Integrated Environmental Management

‘Integration’ means that the environment is considered in any business decision and the organization has a program that supports this process (Winter, 1995). An Integrated Environmental Management System (IEMS) according to the US Environmental Protection Agency (EPA) is to “integrate environmental concerns into daily business activities to reduce environmental impacts, manage risk, follow product and process responsibility and integrate environmental worker safety and health requirements” (EPA, 2012). This system works above compliance in that it encourages the organization to identify and compare alternatives to operations or materials that cause environmental impacts (EPA, 2012). The performance cost along with the integration of environmental aspects into business decisions is meant to promote competitiveness along with improved environmental performance (EPA, 2012). It essentially contains a similar format to the traditional EMS, but incorporates an ‘environmental mindset’ into the framework of the organization thus the environment is considered more often in various operation, management and business decisions. The IEMS also contains budding Corporate Social Responsibility (CSR) aspects with a focus on external relations like marketing and public relations issues and incorporation of environmental aspects into facilities management that affects employee experience (Winter, 1995). Additionally, it includes staff motivation, training, working conditions, and counseling as criteria to be included in reporting, suggesting the importance of awareness and reporting of a firm’s social characteristics (Winter, 1995).

3.1.1.2 Level 2 “Norm”

1. Sustainability Reporting

Sustainability reporting can have various titles, such as ‘Corporate sustainability reporting,’ ‘Environmental management system,’ ‘corporate citizenship,’ ‘CSR,’ ‘Environmental Health System (EHS),’ ‘Sustainable Environmental Auditing (SEA),’ and ‘Triple Bottom Line’ (TBL). Accordingly, the contents of these reports is as varied as the titles, yet typically contain qualitative and quantitative information on how the company has improved “its economic, environmental and social effectiveness and efficiency in the reporting period and integrate these aspects in a sustainability management system” (Daub, 2004).

Management for sustainability reporting is more proactive than traditional management systems, and requires a more holistic view of social, economic and environmental aspects (Welford, 1995). Three approaches in eco-management that differ from traditional methods are a dynamic assessment, use of Life Cycle Assessments (LCA) and the emphasis of protecting biodiversity and the environment (Welford, 1995). The World Business Council for Sustainable Development (WBCSD) stated that sustainability reporting specifically includes social and environmental activities that should be reported to external and internal stakeholders (Daub, 2004). Sustainability reporting essentially is comprised of the traditional annual, environmental, and social report though the degree to which each of these themes is represented varies (Daub, 2004). For example, a study on the auto industry uncovered 585 indicators of sustainability, 42% of which were economically linked, 33% environmental and 25% social (Roca & Searcy, 2012). The Global Reporting Initiative (GRI) was created and released in 1999 in response to the confusion of what a sustainability report should contain (Hedberg & Malmborg, 2003). Yet overall organizations who audit for sustainability “should be committed to integrating environmental performance to wider issues of global ecology and make specific reference to the concepts associated with sustainable development (Welford, 1995).

2. ISO 14001

In response to concerns of poor environmental performance and eco-efficiency, ISO 14001 was established as an international standard for environmental management for organizations of all sizes. It is based off the idea that a “structural approach is needed because belief based on ‘gut feel’ does not address real issues but promotes a ‘green’ feel... which is not justified” (Whitelaw, 1997). The framework provides a logical and objective approach, versus a *subjective* approach that traditional EMS use (Whitelaw, 1997). Not only is the approach different, but ISO 14001 standard expands the organization’s ‘sphere of influence,’ defining environmental impacts not only in a direct sense, but also as “any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s activities, products or services,” meaning that what is included in the report has expanded beyond the internal and directly external (Whitelaw, 1997). Additionally, standardization allows organizations to benchmark and improve more efficiently and continuously.

3. Integration of Environmental Management Standards

Integration of the ISO 14001 standard with other management systems supports a more comprehensive approach to management. Two outcomes of integrating standards are reduced business costs and added value and reduced risks to business viability (Whitelaw, 1997). ISO 19001 is a tool for tracking service quality, ISO 14001 helps reduce

environmental risks and improves environmental management and the Occupational Health and Safety (OHSAS 18001) manages injury risks to personnel (Whitelaw, 1997).

4. Triple Bottom Line (TBL)

After Stakeholder theory became further adopted by organizations, TBL emerged as a new tool based partially on stakeholder theory, measuring performance in relation to stakeholders who have both an indirect and direct relationship to the firm (Hubbard, 2009). TBL has additional social and environmental measures, which include the firm and its supplier's impact on community and environmental impacts due to resource use and waste production and disposal (Hubbard, 2009). However, TBL does not have a common criterion of measurement though it does include economic, environmental and social themes under which criteria are measured (Slaper, 2011). The general framework provides flexibility for its applicability, but is challenging to assign the appropriate criteria for each theme based on the firm's aspects (Slaper, 2011).

5. Corporate Social Responsibility (CSR)

Companies use corporate social responsibility reporting (CSR) as a means of informing themselves and other stakeholders of their social and environmental impacts (Bouten et al., 2011). It is defined by the World Business Council for Sustainable Development as “the continuing commitment of business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large” (Bettley & Burnley, 2011). The reports include social aspects of labor practices and decent work; further examining employment practice, employee/employer relations, occupational health and safety, training and education, diversity and opportunity, employee satisfaction, and compliance (Bouten et al., 2011). While no specific definition of CSR or what criteria need to be met exists, three views exist: minimalistic view, communitarian view and universal view (Andriof, 2001). However, CSR dubbed comprehensive should, for example, include these information types: vision and goals, management approach, and performance indicators (Bouten et al., 2011). CSR encompasses the environment, workplace, community and marketplace (Andriof, 2001) It requires a shift in thinking and ‘new beliefs’ which include:

- 1) Employee productivity increases when they are empowered and have a healthy workplace environment and good life balance.
- 2) Organizations have long-term functionality when the community they reside in is healthy, has adequate education and health, jobs opportunities and economic activity
- 3) Organizations respectful of the environment have reduced waste, higher quality service, and customer loyalty.
- 4) Organizations must think long-term in respect to operations versus short-term to ensure longevity
- 5) Reputation is becoming more important than price. (Andriof, 2001).

Overall, corporate responsibility is about making a difference through partnership, empowering employees and stakeholders in creating strategies for improvement, transparency, accountability, sharing of responsibility, inclusively, prosperity, triple bottom

line, 'long-termism,' communication among stakeholders, engagement with the community, government and individual, and dialogue internally and externally (Andriof, 2001, 61) It is about businesses taking on broader social responsibility for the benefit of the company and society as a whole (Andriof, 2001). However one must keep in mind, as acknowledged in earlier environment and sustainability work that "one of the key problems that has arisen is that by adopting a quality-driven environmental management system approach, firms believe that they are adopting principles of sustainable development. They seem to be of the view that environmental improvement equates to sustainable development" (Welford, 1995).

3.1.1.3 Level 3 "Eco-social"

A key difference in the aforementioned standards, methods and guidelines used on the 'path to sustainability' vs. 'being sustainable' is the inherent culture change that occurs within the organization, which includes all staff and personnel, and radiates out into daily work, business decisions and actions of the organization. These sustainable habits take affect on the local community and all those directly and indirectly involved within the organization's large sphere of influence. Commitment to sustainability should be embedded and unquestioned within the organization. Behavior already reflects the recognition of the interconnectedness of problems, a shift of valuing objects to relationships, a shift from views parts to viewing issues as a whole; a shift to partnership; a shift from structure to process; a shift from individualism to integration; and a shift from growth to sustainability (Welford, 1995). Additionally, a key component of eco-social level, already budding in other performance measurement guidelines, is transparency, which continues to heighten in this level.

1. Health Promoting Hospitals (HPH)

The WHO has recognized that the traditional approach health care management, through quality management, is a standard that improves service but does not attend to health promotion activities that benefit long-term health, much like quality management does not attend to environmental impacts (Groene & Garcia-Barvero, 2005). Thus in response, WHO created the Health Promoting Hospitals program (HPH) that defines health promotion as 'the process of enabling people to increase control over, and to improve, their health... understood as the absence of disease and positive health, and both are understood in relation to body, mind and social status (Groene & Garcia-Barvero, 2005). In this perspective, it is made clear that health is promoted by protection and self-management through education (Groene & Garcia-Barvero, 2005). The empowerment of health promotion that WHO calls for is defined as "participatory, holistic, intersectoral, equitable, sustainable, and multistrategy" (Groene & Garcia-Barvero, 2005). The patient oriented strategies include self-maintenance promotion and participation, through defining the quality of care by clinical outcome, quality of life, patient satisfaction and health literacy (Groene & Garcia-Barvero, 2005). By promoting lifestyle development, education, participation in care and development of care, the social aspect of holistic health care is lifted to priority. HPH also promotes these criteria for health care staff and community, bringing the full social spectrum of health care aspects to light. The HPH program accentuates the growing acknowledgement and awareness of social aspects needing to be incorporated into facilities heavily involved in health. It is no longer adequate to have solely environmental programs, now a more holistic role must be taken in order to satisfy the changing norms of what responsibility should be for health care centers. WHO advises these criteria to be integrated and implemented into the organization, much like an EMP.

2. ISO 260000

ISO 26000 “provides guidance on the underlying principles of social responsibility, recognizing social responsibility and engaging stakeholders, the core subjects and issues pertaining to social responsibility and on ways to integrate socially responsibility behavior into the organization” (ISO 26000, 2010). ISO 26000 is not to be used as management system standards, it is meant to assist organization in integrating SR, contributing to sustainable development and to encourage beyond compliance (ISO 26000, 2010). The core subjects are human rights, labor practices, environment, fair operating practices, consumer issues, community involvement and development (ISO 26000, 2010).

Social responsibility (SR) awareness is increasing due to globalization and its consequences, the global nature of environment and health issues and the increasing norm of ‘right to know’ which is being increasingly integrated into legislation. International agreements and declarations, like the Rio declaration on environment and development, the Johannesburg declaration on sustainable development, the Millennium Development Goals, ILO Declaration of fundamental principles and rights at work, all share SR principles that reflect the priority that SR is now receiving, meaning it is now expected for any organization that can to participate. The main principles of ISO 26000 are accountability, transparency, ethical behavior, respect for stakeholders, rule of law, human rights and international norms of behavior (ISO 26000, 2010). The standard reflects a position that in an ever increasingly diverse and global world, social aspects reflect more heavily on the quality, service, efficiency, ethics, environmental and economic aspects of an organization than ever before.

3. Global Reporting Initiative (GRI)

GRI was developed as guidelines for sustainability reporting, created by researchers, industry and consultants. The content of a GRI report should include indicators that reflect the organization’s economic, environmental, and social impacts that may be of interest to the stakeholders (GRI, 2011). These should be both internal and external, reflecting what is pertinent to the organization’s mission and strategy, social expectation, and upstream and downstream affects (GRI, 2011). ‘Significant impacts’ are those that have established concern from leaders (GRI, 2011).

According to GRI (2011), “sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development.” Furthermore, “a sustainability report should provide a balanced and reasonable representation of the sustainability performance of a reporting organization—including both positive and negative contributions”. The report can be used to benchmark to laws, norms and codes, demonstrate the organization’s sustainability approach, and compare performance with other organizations” (GRI Online, 2011). The guidelines are compatible with ISO 14001 and help incorporate TBL into the management systems as well as creating transparency, improving stakeholders’ relations (Hedberg & Malmborg, 2003).

Currently, it is the dominant framework used in public and non-profit agencies for SR, and is intended for use by any organization, of any size, sector or location (GRI, 2011) (Durnay et al., 2010). GRI’s definition of sustainability is ‘to meet the needs of the present without compromising the ability of future generations to meet their own needs (GRI, 2011) (Durnay et al., 2010). GRI approach to reporting is 1) organizational performance 2) public policies and implementation measures 3) context or state of the environment (Durnay et al., 2010).

Organizations are expected to weigh social, environmental and firm aspects and develop in a ‘sustainability narrative’ in an ‘informed way,’ which should ultimately lead to transparency (GRI, 2011) (Durnay et al., 2010).

3.2 Levels of auditing

Welford, (1995) “Levels of Auditing Techniques” (Table 3-2) additionally support the framework of these levels. The lowest level represents compliance auditing in which organizations simply follow regulations and legislations and follow voluntary standards. Systems auditing is Level 2 with the use and implementation of an EMS with self-prescribed targets and objectives (Welford, 1995). Level 3 continues with ‘environmental auditing’, which includes health and safety, employee and community protection (Welford, 1995). Level 4 is ecologically based, with LCA founded assessments, measurement of indirect ecological impacts and the recognition of the need to live in harmony with nature (Welford, 1995). Finally, Level 5 is described as ‘dynamic’ and is ‘auditing for sustainability’ including equity, equality, protection of indigenous communities, use of a social and ethical balance sheet and a holistic approach to operations and management (Welford, 1995).

Table 3-2 ‘Levels of Auditing’

Levels of Auditing	Auditing Level Description
1	Compliance
2	Use of EMS
3	Environmental Auditing
4	Ecological auditing
5	Auditing for sustainability

Source: (Welford, 1995)

Level 5 addresses the problem of when “firms adopt a quality-driven environmental system they tend to believe that are adopting principles of sustainable development” (Welford, 1995). In using sustainable auditing, organizations should include the real cost of non-renewable resources and challenge themselves to prioritize actions in ecological terms versus management terms (Welford, 1995). Additionally, EMS “should be seen as a vehicle which drives environmental improvement and not the measure of success themselves” (Welford, 1995). In conclusion, ‘Sustainable auditing’ is a measure that fits into the criteria of ‘sustainable health care,’ though it is an addition and not an ends, like the holistic approach needed for this type of auditing, a holistic approach is needed for a progression into sustainable health care.

3.3 Stakeholder theory and sustainable healthcare

Although there are over 55 definitions of ‘stakeholder,’ the most applicable one today is “any group or individual who is affected by the achievement of the organizations objectives” (Friedman, 2006). In stakeholder theory the main objective of an organization is to pursue their stakeholders’ interests in a fair and equitable manner within the bounds of law and ethics (Friedman, 2006). In understanding what an organization’s stakeholder may be, the views can be narrow or normative, though most literature describing ‘sustainable’ situations or development would have a combination of both narrow and normative characteristics, each weighted in a similar fashion and each considered with the other in mind. Normative views of stakeholder may be considered non-traditional and include non-human entities like ecosystems, consideration of future generations, and the ‘common good’ (Friedman, 2006).

Stakeholder theory is pertinent to health care today; governments and NGOs are pressing organizations and businesses to adhere to both social and environmental legal requirements and emphasize pollution prevention. The boundaries for whom or what is included as stakeholder for a health care organization is expanding; they are increasingly challenged to include the environment, community, and future generations, beyond traditional stakeholder views of simply including the employees, stockholders and management. Organizations under public scrutiny tend to partner with NGOs, set realistic targets for change and implement them (Emerald Group, 2008). The range of influence is growing as service providers put more pressure on suppliers to provide material under sound conditions, as the general trend is growing environmental and social awareness (Emerald Group, 2008).

The diversity of modern day stakeholders implies the level of engagement and management may be increasingly complex. The ladder of stakeholder engagement in *Figure 3-3* (Friedman, 2006) outlines the levels of engagement a management can choose to have, along with corresponding “sustainable healthcare” levels. Similarly to how an EMS services no purpose if acknowledged without having been incorporated or implemented, reorganization of stakeholder groups without their participation does not carry the caliber of effort that is expected.

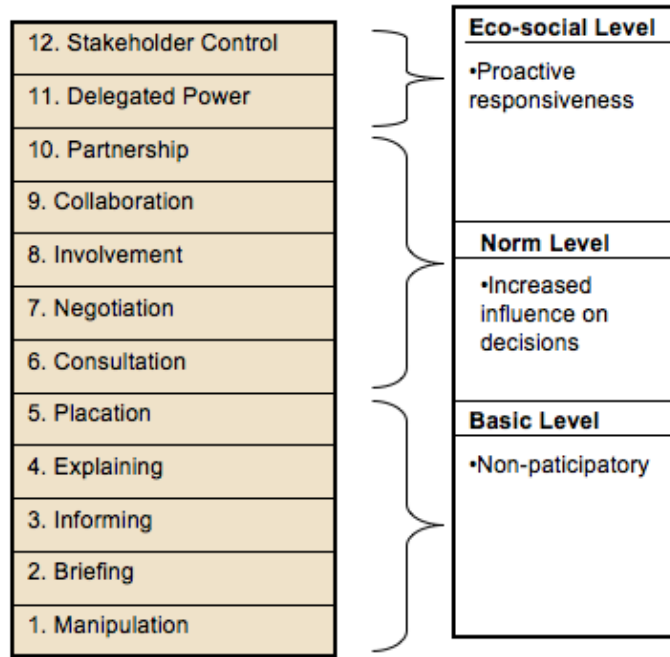


Figure 3-1 'Levels of Stakeholder Engagement'

Source: (Friedman, 2006)

The levels of stakeholder engagement can be applied to the afore mentioned management standards:

1. Levels one through five would be considered under “Basic Level” in that the level of engagement is non-participatory, mostly consisting of one-way dialogue or dialogue without the assurance opinions will be heard and used (Friedman, 2006). The management approach aligning with this would tend to be traditional, using the ‘top-down’ approach to management (Friedman, 2006). While all stakeholders are technically included, as in TQM and standard EMS, the level to which opinions are integrated into actions is not as democratic. This would be considered a basic level of engagement, meaning that any criteria that falls under this category suffers from the lack of genuine stakeholder engagement.

2. Levels six through ten most heavily reflect “Norm Level” in that these levels of engagement can be seen in TBL, GRI, ISO 26000, HPH and some sustainability reports. In these levels surveys represent a higher level of engagement and serious feedback (Friedman, 2006). In order to properly use any of the previously mentioned standards sufficient understanding of stakeholders’ needs and desires is necessary. Negotiation occurs before decisions are made and involvement is genuine, beyond the typical ‘round table’ stakeholder discussion (Friedman, 2006). Collaboration involves alliances among stakeholders, in the form of projects ending as mutually beneficial (Friedman, 2006). Partnerships among stakeholders are emphasized in GRI and ISO 26000, thus values and norms are shared, and more various stakeholders have more power in decision making within the organization (Friedman, 2006).

These types of interactions represent a healthy social and environmentally based operational organization that in order for TBL and GRI to serve their derived purpose, management

must reflect this behavior for the standards to work properly. While this is inherent and obvious in reading each standard, it is vital to understand the difference in traditional stakeholder engagement versus quality stakeholder engagement, similarly to how levels of health care sustainability that will be described in this paper hold different levels of quality, which many not be explicitly or specifically addressed.

3. Levels eleven through twelve represent a rare level of engagement; in these levels stakeholders are directly represented in steering committees and are afforded the right to govern on behalf of their stakeholder genre, meaning that decision-making is balanced among all stakeholders with all views represented (Friedman, 2006). This would be considered the highest quality of stakeholder engagement, which is most alike ISO 26000 guidelines and would most firmly relate to the 'Eco-social Level' or beyond on the path to sustainability. While this sort of engagement may not be necessary for a sustainable system, the attitude that supports this type of engagement is. The integration, implementation, directness, and impact stakeholders derive from this position means that they gain full responsibility, respect, and are valued as a vital appendage to the full function of an organization in motion.

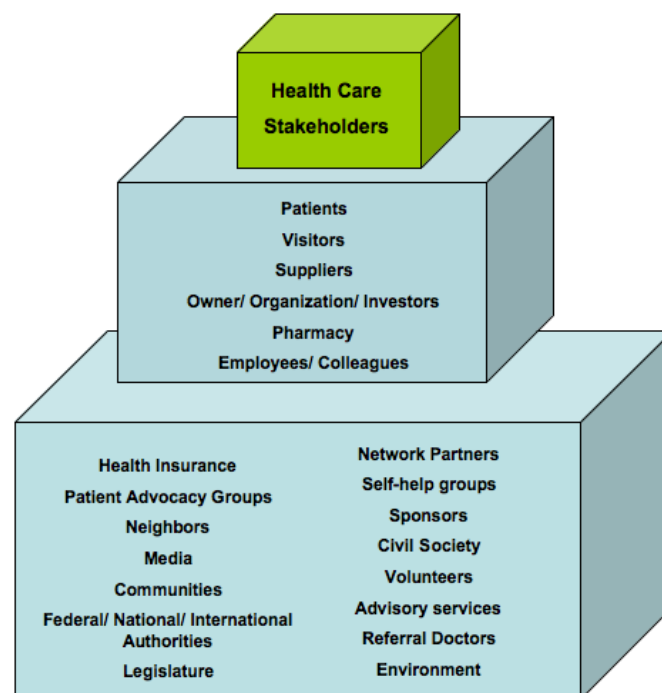


Figure 3-2 'Healthcare Stakeholders'

Source: Information from (WU, n.d.) and (Friedman, 2006), graphic (Mary Ellen F. Smith, 2012)

3.4 Employee engagement in sustainable healthcare

While much of stakeholder engagement is implemented in management systems, a degree of independence allows stakeholder engagement to thrive (Gerwig, 2012). While traditional engagement is created in a top-down approach, a higher form of engagement occurs when

the interactions are given flexibility (Gerwig, 2012). For example, such successes have been seen in creating 'green teams,' which are groups of employees who are interested in actively participating in the organization's sustainability efforts, but on their own accord (Gerwig, 2012). While the issues to undertake are normally up to the team, trends include improving internal operations, reducing personal footprint, engaging customers in their practice and incorporating organizational goals (Gerwig, 2012). In these efforts, CSR overlaps with environmental stakeholder initiatives. These teams not only build culture into the organization, they also educate and bring awareness to other stakeholders, participation in activism which tends to influence political decisions, and heighten the organizations social and environmental efforts (Gerwig, 2012). Activities can include such items as campaigns, community gardens, customer engagement and events, and recycling, all of which can be communicated throughout the organization and help new partnership to flourish with teams from other organizations (Gerwig, 2012). This is one example of what can unfold from creativity in management practice and how it can support the organization's social and environmental sustainability efforts.

3.5 Through Operations and Management

Any health care center aiming to become sustainable needs to have achieved Level 1 and Level 2 of implementing social and environmental standards, which meet the criteria listed in Table 3-5 (See in attached separate document). While ISO 26000 is currently the most thorough guideline to achieving Level 3 status, a combination and consideration of these guidelines is the most through option for complete operations and management.

However, the overarching value of these standards besides the criteria is the management methodology, which can also be applied to other areas, like stakeholder management or green procurement. In any successful program, department, or team in charge of a certain aspects or area in creating a sustainable healthcare facility, a basic framework of management derived from ISO, GRI and others can be used as it has been used for decades in environmental quality systems and occupational health and safety.

The first steps are to determine the elements or aspects within this system and where the organization's sphere of influence lays. It then requires a policy with devotion to continuous improvement, identification of targets and objectives, implementation and operation review, monitoring and corrective action (WU, n.d.). While these actions satisfy Level 1 and fall under Level 2, these basic management practices do not satisfy Level 3 criteria.

3.6 Sustainable Management Practice

As seen, stakeholders and performance technique require a certain level of quality to obtain 'sustainable' characteristics. Subsequently, management practice must too reflect optimal stakeholder engagement and performance. In order to implement both, management must have the ability to set targets, meet them, and make continuous improvements through time. Beyond basic environmental management actions, management should engage in benchmarking, have a clear understanding of baseline practice, excellent communication with employees and other stakeholders, partnerships with other organizations, and strong leadership.

An ecologically and socially conscious manager is one that includes quality, creativity, humanness, profitability, continuity, loyalty, innovation, cooperation and communication

into daily practice (Winter, 1995). As with stakeholder interaction and implementation of improvements, management must have a proactive role always seeking inefficiency, inadequacies, and aspects able to be improved (Winter, 1995). These actions and attitudes reflect not only a beyond compliance attitude, but a beyond 'beyond compliance' attitude of which neither is seen as sufficient. Environmental and social aspects should be at the forefront of decisions without the drudge of deciding they should be priority. A fully integrated environmental and socially conscious management has a system in which employing environmental and social thought is necessary for the system to be functional and with innovation, improvements and development always in motion.

In a sustainable level, all stakeholders in the organization should reconsider the role and responsibilities they will take on to implement a sustainable system. Each stakeholder should consider his role in international treaties, agendas and initiatives that support sustainable development. WHO, Agenda 21 and the United Nations all have reports outlining for-profit and non-profit businesses role in sustainable development and how they should participate and interact in this system for the future. Countless institutions and governmental organizations call for sustainability efforts from all sectors of society to work towards a common goal. They highlight the importance of holistic perspective, posterity, quality, partnership and advocating for change as aspects needed for a sustainable approach. Although there are hundreds of reports on sustainability on what it means and how to implement it, the underlying aspects are found in GRI, ISO 26000 and international agreement and initiatives. Subsequently, health care must also follow this path for a sustainable practice if it is to be mainstream. Each health care center is fundamentally different as any business is, so the prescribed change cannot be standardized but level of effort and the quality of effort can. There is a difference between complying and creating initiative, as there is a difference between creating initiatives and advocating, and implementing versus continually improving. These are the fundamental aspects of management, yet a sustainable system is one that continuously strives for distinct superiority in all aspects.

Health care centers have already begun greening programs and many have environmental programs. What is lacking is the holistic approach and system wide sustainability excellence. As Welford (1995) concluded, sustainability in one aspect does not mean sustainability in all aspects. Therefore institutions should not call themselves sustainable until they have truly reached this standing. The levels of sustainability have already been discussed in terms of management systems in a healthcare context, and now they shall be discussed in terms of healthcare aspects.

4 Healthcare practice

4.1 Changes in healthcare practice

Healthcare facilities have undergone changes as sustainable development issues have become more prominent in all sectors of society (Sadler et al., 2011). The Ottawa Charter recognizes the need for “peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice and equity” as “fundamental conditions and resources for health” (Sadler et al., 2011). This represents environmental, social and economic dimensions that are necessary for a sustainable healthcare system, but also as implied here are necessary for health – a central priority for healthcare organizations.

4.2 Current ‘sustainable healthcare’ practice

Healthcare trends include increased interest in ‘lean healthcare’ mechanisms to reduce cost (Bettley & Burnley, 2011). Health systems in the United States began incorporating sustainability measures into their facilities and operations for many reasons, most commonly being the cost-savings from implementing sustainable measures like improving lighting, energy efficiency appliances, insulation, and going paperless, save health care centers millions of dollars a year (Bettley & Burnley, 2011). US hospitals use more than 8 % of the nation’s energy, with more GHG emissions than most commercial buildings, meaning that going after ‘the low hanging fruit’ like efficiency improvements in energy and water tend to be the first step from a business stand point (Healthier Hospitals Initiative, n.d.) It is well known that the health care industry is faced with rising costs, lower reimbursements, an aging population and severely outdated facilities (NHS, 2009). With rising energy costs security risks dealing with stability of service and availability of resources will become an issue. Thus actions beyond efficiency are beginning to be taken as precautionary measures to safeguard service and the community.

In the mid-1990s there were over 400 medical waste incinerators in the US, which have since been closed by the EPA due to concerns over dioxin and mercury emissions (Kaplan et al., 2009). In the last 12 years, more than 5 000 US hospitals have eliminated mercury from healthcare (Kaplan et al., 2009). Trends reflect this type of management and operational behavior; many healthcare centers are making ‘greener’ decisions and taking up programs or incorporating ‘healthy hospital’ guidelines into their existing EMS.

A number of cases are listed in Table 4-1 (see in attached separate document) showing the areas in which health care centers are currently working to become ‘greener’ or more sustainable. Many health care centers partner with NGOs like Practice Greenhealth and Healthcare Without Harm, using their guidelines that aid managers in identifying areas of concern as published by leaders. While these guidelines are not strict in the sense of demanding adherence to certain reductions or benchmarks, they are similar to other guidelines like GRI, in that they recommend areas to make continuous improvements upon, which can be seen in Table 4-1 (See in attached separate document). In comparing these healthcare centers, it is important to note information displayed in the table is not compiled for judgment or ranking centers against one another, and that the criteria listed may not be current, exhaustive or completely thorough; it is meant to be seen as a broad comparison and representation of where the most ‘sustainable’ activity exists.

In viewing Table 4-1 (see in attached separate document), a pattern arises reflective of management system history, which emphasizes environmental initiatives (Friedman, 2006). This is logical due to tighter regulations, cost reduction efforts and the general publicity surrounding environmental issues. Some of the criteria for examining these health care centers overlaps, and deciding on what specific initiatives belong under which marker is a judgment call made by the author in this thesis. This table is representative of the types of projects health care centers are choosing to take on, and as seen they are diverse with some doing more, other less, and more heavily weighted in one category than the other. The burgeoning social aspects are beginning to become more prominent, and as more organizations begin using updated CSR techniques and GRI, social aspects will become as heavily weighted as in the environmental section.

A problem that should be addressed is that most health care centers have an environmental management department, strictly in charge of environmental aspects or a 'procurement team,' yet a 'social department' is uncommon, therefore social aspects healthcare centers are participating in are more difficult to seek out and measure as they are integrated into the fabric of various departments and teams. For example, a marketing department working on community outreach, or a human relations department that provides educational opportunities for employees would fall under social criteria, yet to reference these aspects would be difficult, as they do not fall under a specific uniform social department. This highlights the fact that health care centers very well may be doing more than being given credit for.

Yet, superior quality social responsibility is the reorganization and the poignant decision to participate in it, as discussed in GRI guidelines. In order to promote, infiltrate and implement social (and environmental) principles and practices, organizations must be aware of their activities and decisions in a broader context. Without this knowledge the quality of environmental and social practices cannot be accounted for, measured, or understood, therefore the level of effort is unknown and thus may not be of high quality, or sustainable.

4.3 A glimpse at current 'sustainable' healthcare practice

Healthcare trends leaning towards sustainability are 1) the growth of evidence-based design 2) the safety/ quality revolution 3) pay for performance and increased consumer transparency 4) sustainability and green design (Sadler et al., 2011). More than 500 hospitals have been accredited by the Center for Evidence based Design, which has not only improved management but also human resources, supply chain, safety and quality and conservation (Sadler et al., 2011). Additionally, the new pay-for-performance approach being up taken by the US Medicare system means that certain preventable errors will not be paid for, meaning that designs to prevent harm will become ever more important in a healthcare setting and undoubtedly transparency will lead to increased customer awareness (Sadler et al., 2011). When it comes to sustainability, the easiest and most apparent improvement is the reduction of energy use through increased energy efficiency technology or auditing for cuts and improvement of air quality (Sadler et al., 2011).

The 2008 member survey for Practice Greenhealth on sustainable practices stated that 55.8% healthcare center members use the Green Guide for Healthcare, 47.5% implemented environmentally preferred purchasing program, and 39% implemented a medical (pharmaceutical) waste reduction program (Johnson, 2010). This includes hospitals located in 40 US states, England, and Canada. To date, 97% of US hospitals registered in Practice Greenhealth have implemented a mercury reduction/ elimination program, 72% of hospitals

have replaced mercury-containing devices and 80% of hospitals have implemented a waste reduction policy for all waste types (GGHC, 2008) The Canadian Nurses Association is supporting sustainability initiatives in Canadian healthcare system by proposing information sharing among professional groups, supporting education initiatives, and encouraging research on sustainable health care (CNA, 2008). Trends support sustainable healthcare activities, as seen in these select country examples:

4.3.1 The United States

Maryland's health care sector banded together to create the Taking Toxics out of Maryland program, which entails the elimination of toxic pesticide use for pest (varmint) control (Maryland Beyond Pesticides Network, 2003). In a survey they identified 19 pesticides inside facilities, of which 11 are linked to cancer, 10 are associated with neurological effects, 10 are associated with reproductive effects, 5 cause birth defects or developmental effects, 12 are sensitizers or irritant, 8 cause liver or kidney damage, and 4 are suspected endocrine disruptors (Maryland Beyond Pesticides Network, 2003). Of the hospitals listed as participants, 80% were reliant on pesticides and are in agreement on an initiative to reduce chemicals usage through various measures, such as structural repairs (Maryland Beyond Pesticides Network, 2003).

Kaiser Permanente:

"We aspire to provide health services in a manner that protects and enhances the environment and the health of communities now and for future generations."

(Kaiser Permanente, 2012)

Kaiser Permanente is an example of a large health care organization creating a program to reach sustainability goals that work beyond the 'norm.' After conducting in-depth research into public perceptions of health and healthcare they created a program called 'Thrive' which is committed to 'total health.' This involves a food policy, promoting healthy food, health and wellness, like yoga and tai chi, mindfulness, and stress reduction. Twenty-five facilities have farmers markets on-campus and they implemented a 'healthy-eating active living' program, contributing millions of dollars in funding to community health programs (Anath, 2010). They have increased online health tools and boosted communication and clinical care delivery, after concluding from their research service and relationships were most important for customers, next to cleanliness and convenience (Anath, 2010). Nature views, reduction of chemicals and green operations are just a few of the

aspects of their 'Thrive' program (Anath, 2010). These efforts initially started as 'improved care' efforts and in part a business action to improve service. Yet, these efforts are activities that inherently contribute in creating sustainable healthcare, increasing their competitive edge and improving care through improving social and environmental aspects that contribute to sustainable development. Their actions have not got unnoticed; in 2010 Kaiser Permanente was named Fast Company's most innovative company of the year (Anath, 2010).

St. Mary's Hospital Medical Center believes in "reverence for earth" which is "critical for long-term health" (Hamilton, 2012). They formed a 'green team' in 1996 and have since been working to improve environmental efforts. In 2007 they reached a recycling rate of 40% and have a policy of openness to partner with anyone who expresses the desire to (Hamilton, 2012). Many environmental efforts naturally incorporated social aspects, forming a community relation staff as environmental efforts extended from employees to the community. Boulder Community Hospital formed environmental principles, including waste reduction, waste disposal, recycling, toxic emissions, alternative transport, recycle/ reusable products, water conservation and disclosure (Hamilton, 2012). This resulted in 136 077 kg of

recycled material a year and a savings of USD 200 000 a year in surgical units among other outcomes (Hamilton, 2012).

Common threads running through these examples, and of those listed in Table 4-1 (see in attached separate document), are the self-education and research these health centers committed to in order to take appropriate initiatives and environmental actions that further spurred community involvement. This exemplifies how social and environmental efforts are complementary and strengthening both processes. These examples also display the variety in effort and how the capacity to run such programs is derived internally and radiates outwards versus a forced implementation of change. The path to sustainable healthcare is varied and many health care centers will take different steps, yet they all have a common goal of continuous self-education and improvement, which ultimately will allow them to achieve movement through the levels to a 'sustainable' status. However it is important to note that sustainability is not a static status, it evolves much like everything else as technology improves and research uncovers new evidence and possibilities, thus sustainability is not an ends met but continuous action in the highest 'level' and superiority possible.

4.3.2 The United Kingdom

NHS must reduce its carbon footprint of 18 million tons of carbon dioxide per year by 10% from 2007 levels in order to meet the Climate Change Act target of 26% reduction by 2020 (NHS, 2009). In these efforts they are attempting to reduce travel, transport, water use and waste reduction. Additionally, they encourage their workforce to participate in partnership and networks in order to reduce their impacts (NHS, 2009). In order to support sustainable development they devised a plan focusing on creating sustainable energy and carbon management, local procurement and food, water conservation, waste management, low carbon travel and transport, design green environment, organizational and workforce development, government and finance supporting these measures (NHS, 2009). Simple actions such as changing tap water types, offering patient and employee travel buses, using cloth diapers in maternity wards, using video conferencing and monitoring waste helped contribute to their carbon reduction, while characteristics that aid in reducing their impacts are continuous research, auditing, and creativity (NHS, 2009).

In 2012 NHS' summary of progress included 1% reduction in carbon emissions from building use, carbon intensity of 2010 reduced to one third of 1990 level, contributed to research and development within the field, a sustainability reporting framework, 74% of NHS organizations with a sustainability plan in place, increased renewable energy use, publicized impact of 'tele-health,' a hospital refurbishment research plan in place, increased use of combined heat and power plants, developed procurement best practice tools, and shared many resources with the public (NHS, 2012).

NHS (UK):

“‘Sustainable Healthcare’ means meeting the needs of our patients today, while ensuring we have a service fit for tomorrow and beyond.”

-R. Hunt, NHS Sustainable Development Unit (R. Hunt, Personal communication, March 19, 2012)

In sampling case studies from the Centre for Sustainable Healthcare 'Mapping Greener Healthcare', in viewing over 10 healthcare centers themes present were:

- Recycling water from dialysis unit
- Conserving water in haemodialysis

- Solar panels for domestic hot water
- Smarter driving initiatives
- Sustainable development plan
- Primary energy reduction
- Heat recovery and water use reduction
- Video conferencing
- Carbon management plan
- Recycling
- Environmental Policy statement
- Travel survey to research ways to reduce travel
- Sustainable procurement
- Reduced paper use
- Environmental awareness training
- Carbon survey and benchmarking

(Center for Sustainable Healthcare, 2012).

These are representative of UK healthcare center initiatives, but with some having one and

Germany:

- Germany encourages more sustainable building through design, procurement, and certification.
- Thirty German hospitals have received BUND label of ‘energy saving hospital’ requiring at least 25% reduction in carbon dioxide, below average energy benchmark consumption ratios and an energy management program.
- Certification only lasts five years before it must reach new standards to be renewed. (Bettley & Burnley, 2011)

others have five, meaning that not only are the level of efforts extremely varied, the commitment, integration, and actual implementation of initiatives are unknown. When an ‘energy’ initiative exists, this can mean turning the lights off on a regular basis, outfitting with solar panels or buying 100% renewable energy. Each healthcare center may be working on all of the main categories of sustainable healthcare (energy, water, waste reduction) but as seen here, the quality, number, and implementation of projects can be of endless combination. Simple nouns and adjectives can be interpreted a multitude of ways, the same way ‘green travel initiative’ may only mean encouraging staff to bike to work or ‘recycling initiative’ as only setting up recycling bins in office areas. Likewise, currently a ‘greener healthcare center’ can have any one initiative in any combination or lack thereof. Swedish healthcare

suffers from similar word confusion, yet they are also known as having implemented more stringent environmental requirements decades ago, resulting in having reached environmental goals now just being embarked upon by healthcare centers elsewhere, as seen in the following examples. (M. Bhutta, A. Leetz, D. Eriksson, Personal communication, March 21 2012).

4.3.3 Sweden

The Skåne University hospital was awarded ISO 14001 certification in 2009, as well as the other nine in the region, and currently buy 100% renewable energy (Environmental Link Skåne, 2010).The hospital itself is deemed a ‘smart building,’ with toxic materials being phased out and using instead, for example, phthalate-free gloves, infusion, transfusion and nutrition tubes and eliminating use of nitrous oxide. Waste streams were examined to provide smarter solutions for reducing waste,

Region Skåne’s Vision:

"Where everyone should be able to lead a good life in a healthy environment."

(Region Skåne, n.d.).

like unnecessary use of hospital gowns and deciding to centralize waste to reduce traffic and thus air pollution (Skåne University Hospital, n.d.). They also installed equipment to destroy released excess nitrous oxide that must be used in the maternity ward, as it is 320 times more potent than carbon dioxide in its polluting behavior (Environmental Link Skåne, 2010). The hospital also subsidized staff with money to invest in modes of healthier transportation like bikes, raincoats and train passes (Skåne University Hospital, n.d.). In 2000, Skåne's dental services received ISO 14001 certification and eco-driving courses were offered, while in 2004 the chemical and waste minimization plan was implemented, like the start of water analysis for pharmaceutical residues at Malmö University Hospital (NHS, 2012).

In the Sweden's capital, Stockholm, Karolinska University Hospital's environmental goals for 2012-2016 include:

<p>“Stockholm County Council provides health and medical care, dental care and public transport that safeguards the health of its inhabitants and provides them with a good living environment. The County Council also contributes to sustainable development in the Stockholm region and helps to preserve its rich environment.”</p> <p>(Stockholm County Council, n.d).</p>	<ol style="list-style-type: none"> 1) Reduce select hazardous drugs, optimizing antibiotic use, 2) 5% reduction in chemotherapy and drug contaminate wastes, 3) Reduce toxic substances by 70%, 4) Reduce PVC and phthalate used in products by 20%, 5) Reduce select single-use products by 20%, increase the sorting rate by 30% 6) Reduce GHG emissions by 30% and 7) Reduce energy use for heating cooling and electricity by 10%
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(Karolinska Environmental Department, 2012)

Stockholm county has a comprehensive phase-out list of environmental and hazardous chemicals rated by toxicity to humans, the environment and inhabitants that healthcare centers use (Stockholm County Council, n.d). Waste waters are tested for pharmaceutical residuals and physicians are trained in which medical products are environmentally friendly, providing a “Wise List” rating drugs environmentally friendly qualities (Stockholm County Council, n.d). Region Skåne, Stockholm county and Västra Götaland Region are responsible for procurement of 55% of all healthcare products in Sweden, and recently implement a common code of conduct required at the time of contract signing, with a goal of also “contributing to more long-term social and humanitarian efforts” (Region Skåne, n.d.). Products delivered to the regions “must be manufactured in conditions in accordance with: ILO eight fundamental conventions: numbers 29, 87, 98, 100, 105,111, 138 and 182; UN Convention on the Rights of the Child, article 32; all work-related health and safety legislation in the manufacturing country; the labor law, including legislation on minimum wage and the relevant social security insurance in the manufacturing country” (Region Skåne, n.d.). Additionally, eco-cycle product purchases are prioritized, while purchasing goods on the phase-out list ceased in 2011(Region Skåne, n.d.). Partnerships are emphasized, requiring an external collaboration on a project to seek a solution for an environmental program. For example, Stockholm County created the first green ambulance in partnership with Ambulanssjukvården i Storstockholm AB [Ambulance Healthcare Greater Stockholm AB],

with phthalate-free wall coverings, LED lights, hazardous substance free, PVC-free cables and flooring and biogas powered (Stockholm County Council, n.d).

In viewing Table 4-2 (See attached in separate document), different initiatives or goals implemented system-wide begin to show the seemingly minuet differences between these

<p>Scotland</p> <ul style="list-style-type: none">• The National Health Service has targets to de-carbonize the electricity grid by 2030.• Carbon dioxide and energy performance reports must be included in quarterly performance indicators.• Eleven hospitals have biomass boiler plans. <p>(Bettley & Burnley, 2011)</p>

major healthcare organizations. It is difficult to compare any healthcare organization across country lines, especially with large organizations like NHS and Kaiser Permanente that have many healthcare facilities in their organization, and different management hierarchy for some facilities based on specific circumstance, creating diverse situations that complicate implementing system-wide sustainability initiatives. Each healthcare organization's efforts go beyond the initiatives listed in Table 4-2, but due to the intricacy of the organization many initiatives are not implemented system wide, which explains the variety and quality of sustainability efforts among and within healthcare centers. In Sweden's case the 'low-hanging-fruits' were met over a decade ago, therefore any carbon, energy, water reductions are much more costly and difficult than healthcare centers just beginning, explaining the disparities in carbon and

energy reduction goals between these three organizations in Table 4-2 (D. Eriksson, Personal communication, March 21 2012). Ranking healthcare centers is complicated due to differences in applicable national and international regulations, whether the healthcare center is public or private, and its location. All have and continue to have an effect on determining a healthcare center's sustainability level and what it is capable of achieving within the foreseeable future. The variance in quality, approach, implementation and initiatives among healthcare organizations, even in the same country, further facilitate the need to differentiate what is nearer to sustainability and what is not.

5 Issues in healthcare

5.1 Energy consumption

In the US average energy consumption for hospitals is approximately 600 kWh/ m², 200 kWh/ m² in Sweden, and in the UK nearly 300 kWh/m² (WU, n.d.). NHS generates 18 million tons of carbon dioxide per year, 22% is from energy use, 18% travel and 60% procurement (WU, n.d.). GHG emissions from energy use contributes to increased infectious diseases, leads to higher levels of some air pollutants and will have a greater impact on the already vulnerable, whether through exists health problems or geography (WHO, 2008). This implies the health sectors energy use directly undermines the health of the society they serve.

5.2 Water consumption

There is general consensus that water conservation is important due to the forecast of limited water supply in the future (UN, 2011a). Healthcare facilities use large quantities of water for daily operation, thus their water use affects the quantity available for the community and future communities. For example, hospitals in the US on average use 363 -682 liters of water per bed per day; while on average German hospitals use 363-736 liters of water per bed per day (WU, n.d.). Water use is a fundamental aspect in health care settings; it is used for sterilization, autoclaves, medical processes, ventilation and air conditioning, while the amount used tends to be based on number of patients, facility size, and number of beds, service type and age of the facility (WU, n.d.).

5.3 Waste

Solid waste from healthcare centers has the largest impact on the environment; hospitals in the United States generate some 2 MT of waste each year (Gerwig, 2012). The consequences of such large amounts of waste are air, land and water pollution resulting in cancer and reproductive disorders from released toxins from incinerators and chemical leakage from landfills. Air emissions from both landfills and incineration contribute to global warming and overall increase in health hazards (Gerwig, 2012). The largest percentage of healthcare waste is mistakenly marked 'household waste' as opposed to 'hazardous waste' which needs to be handled differently than municipal waste (WU, n.d.). For example, in 1991 France created 105 000 tons of hazardous waste and 595 000 tons of non-hazardous waste, while Germany created 33 000 tons of hazardous waste and 59 000 tons of non-hazardous waste; unfortunately most regulations require hazardous waste to be incinerated which releases dioxins and mercury into the atmosphere (WU, n.d.).

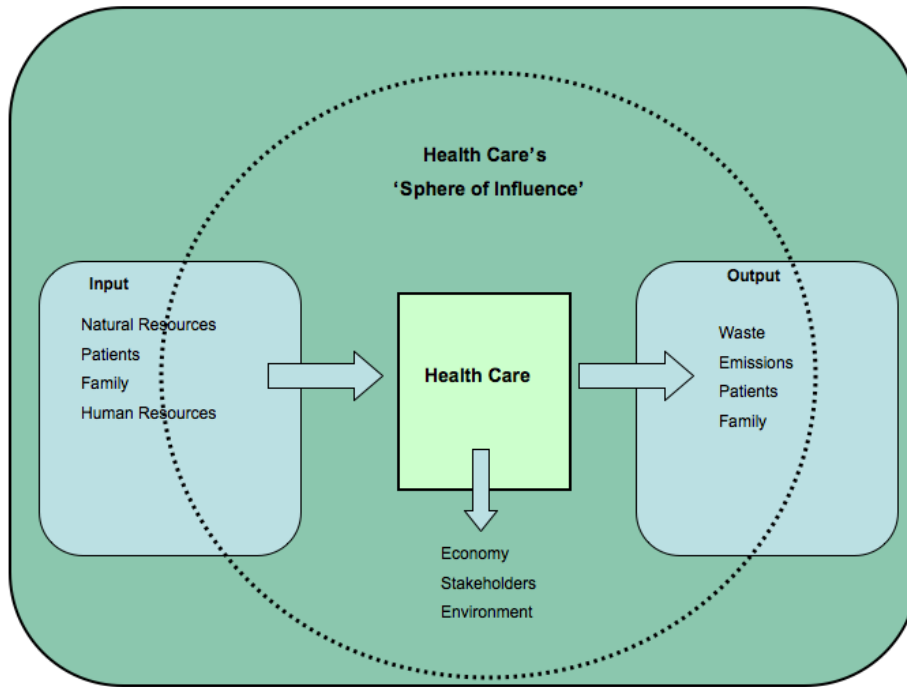


Figure 5-1 'Healthcare's sphere of influence'

Source: (Mary Ellen F. Smith, 2012)

5.4 Unique areas of concern for Healthcare

Healthcare facilities have a large sphere of influence that includes social, environmental and economic negative and positive influences. The balance of input and outputs greatly affects the size of the sphere, and thus areas of concern for a healthcare organization (see Figure 5-1).

5.4.1 Environmental

5.4.1.1 Hazardous Substances

Hazardous substances are used daily in health care settings, some of which may be halogenated and non-halogenated organic compounds, strong acids and bases, pharmaceuticals, disinfectants, carcinogenic, mutagenic or development or reproductive toxins (WU, n.d.). Heavy metals, peroxides, perchloric acids, perborates, hazardous cultures, ethidium bromide, radioactive substances, varnishes, bleaching agents, sterilization gas, anesthesia gases, flame retardants and formaldehyde are a few of the chemicals used in today's healthcare sector (WU, n.d.). Hazardous chemicals are also ubiquitously found in other materials like furniture, flooring, medical devices, wall paint, carpet, varmint control and different building components that can contribute to the overall load of toxicity already found in healthcare settings (WU, n.d.).

5.4.1.2 Toxic materials in hospital equipment

Toxic chemicals in materials like operational equipment, computers, paint and upholstery, is gaining the attention of the public and healthcare alike. As more evidence surfaces that chemicals found in a wide array of products relates to health problems, healthcare organizations will need to examine what products are used in their facilities that are potentially toxic. For example, PVC is a typical plastic found in hospital equipment, yet it is beginning to be recognized as material that should be replaced due to its toxicity (HCWH, 2011). Production of PVC requires large amounts of chlorine, which in turn requires huge amounts of electricity (HCWH, 2011). The components of PVC are vinyl chloride monomer (VCM) and ethylene dichloride (EDC) (HCWH, 2011). VCM is a carcinogen and EDC is a neurotoxin, that when produced releases dioxin (HCWH, 2011). This means the communities surrounding the factory are susceptible to increased cancer rates (HCWH, 2011). Additionally, because PVC breaks down in sunlight, heavy metals like Cadmium are used to stabilize the plastic (HCWH, 2011). DEHP is used to soften PVC for other equipment like IV bags and is a phthalate that tends to leach out of medical devices and cause reproductive toxicity (HCWH, 2011).

In the EU, DEHP is classified toxic; however medical devices containing DEHP are not subject to this rule (HCWH, 2011). Germany, USA and South Korea have regulatory measures to phase-out DEHP urging healthcare providers to use alternative products for vulnerable patients (HCWH, 2011). Additionally flame-retardants added to a number of medical devices and furniture, leach and bio accumulate in children and breast milk (HCWH, 2011).

Healthcare centers are expected to be clean and sanitary, thus the amount of chemicals used contributes to the load of chemicals patients and staffs are exposed to. Chemical cleaners reduce indoor air quality, and some contain persistent bioaccumulate toxins (PBTs) that contribute to environmental pollution during production, use, and disposal (HCWH, 2011). Overuse of clean agents containing Trilosan has created instances of antibiotic resistance, which in recent years has captured public attention and consequently helped reduce its use (HCWH, 2011).

Overuse of chemicals is a health problem; the load of chemicals in daily life contributes to disease, interfere with sexual development, disrupt hormones, and can cause cancer (HCWH, 2011). Extremely vulnerable patients in a hospital with depressed immune systems are more likely to be detrimentally effected by excess chemical exposure through contact or poor indoor air quality. Research suggests that staff workplace exposures to a variety of hazardous substances on a daily basis also contribute to disease, asthma, and certain cancers (HCWH, 2011).

5.4.1.3 Buildings

According to the Environmental Protection Agency (EPA) and the Science Advisory Board (SAB) indoor air pollution is in the 'top five' environmental health risks to public health, as people on average spend 90% of time indoors (2011). Buildings are composed of over 75% polyvinyl chloride (PVC) (EPA, 2011). Materials like PVC, used as building components, can impact human health during construction, during building lifetime in daily operation, and disposal of building materials (EPA, 2011). Building components like carpeting, upholstery, and manufactured woods products emit volatile organic compounds (VOCs), like formaldehyde (HCWH, 2000). VOCs have been attributed to asthma, reproductive and development disorders and some cancers (HCWH, 2000). Thus indoor air quality can affect

both patients and staff by contributing to the load of chemicals already in existence and result in poor indoor air quality that leads to health issues.

5.4.1.4 Food

As food related diseases like obesity and diabetes increase, they contribute to the already burdened health care system (Shapouri & Rosen, 2001). Four of the six leading causes of death in the US are caused by poor nutrition (Shapouri & Rosen, 2001). Many food systems not only contribute to poor human health but also have dire environmental impacts on all aspects of ecosystems (UN, 2011b). These impacts can occur in the community and beyond due to the current global food distribution system, which tends to negatively affect far-away agriculture systems, both economically and environmentally (Shapouri & Rosen, 2001). Healthcare centers have the opportunity to take a role in preventative solutions for public health issues as well as change how food is produced and distributed in the community.

5.4.1.5 Procurement

The health care sector uses vast amounts of material everyday, which is sourced from all over the world. The supply chain can be seemingly endless, therefore choosing sources is an important task as its impacts can have negative consequences. In fact, 60% of NHS' carbon footprint is due to procurement alone (NHS, 2009). Most medical material is normally one-time use like gloves and masks, and older or out-dated equipment is thrown into landfills. If health care facilities source food from all over the world, their carbon footprint expands, and likewise if products packaged in excess material, requiring dumping into landfills or incineration, further contributing to air pollution through transport and disposal. Many waste streams exist, thus there are many ways to reduce water, energy, and resource use through following green procurement guidelines.

In most developed countries hazardous waste management systems have strict requirements as given by the state, as well as by the health care facility itself. An EMS system helps the facility keep track of purchasing, storage, management, operations, handling, emergency instructions, substance description and proper disposal (WU, n.d.). Thus an EMS is a standard occupational health and safety system that is usually (or should be) implemented in any certified health care center.

Yet, there are also actions beyond an EMS that health care centers can use to limit the risk associated with such heavy chemical usage. Preventative measures can be taken to minimize hazardous substances used to begin with, through green chemical purchasing, choosing less hazardous alternative or altogether phasing out chemical use. Waste management criteria includes: 1) Avoidance 2) Re-use 3) Recycling and 4) Proper disposal (WU, n.d.). In order to reduce chemical usage, health care facilities must examine the products used, where they are handled, how they are disposed and the potential affects they could have on surroundings. Then they can take actions to reduce, eliminate, or replace the chemical.

5.4.1.6 Pharmaceuticals

There are a number of issues in the area of pharmacy, beyond prescriptions and medication disposal, which include purchasing foods that contain or use antibiotics. Mass amounts of medicine end up in wastewater and eventually into aquatic systems that disturb aquatic life and ecosystems as well as contribute to health issues for humans. Over 100 medicines or their metabolites have been recorded in water both in Europe and in the US (Skåne

University Hospital, n.d.) (Kaplan et al., 2009). Standard water treatment does not remove these contaminants from drinking water, thus these compounds are spread into other water bodies (Kaplan et al., 2009). Some medications are PBT (persistent bio-accumulate and toxic) meaning they do not break down easily compared to other compounds and are further carried through the water system potentially harming life. Many of these compounds are endocrine disruptors, effecting development and interrupting hormone balance in humans, animals and reptiles (Kaplan et al., 2009). Antibiotics in the waterways disrupt ecosystems and microorganisms cycle, which effects can move up the food chain (Kaplan et al., 2009). The difficulty of these situations lies in the complex waste stream in which pharmaceuticals flow; through preparation, unused prescriptions, spills, or discontinued and outdated medications (Kaplan et al., 2009).

5.4.1.7 Waste Management

Due to the volume of inputs, waste management plays a vital role in the flux of material coming from health care. Sustainable waste management systems include traditional waste management criteria, but also include efforts to reduce the production of waste (especially hazardous waste) altogether. Buying environmentally friendly products, moving paper documents online, separating waste for reuse or recycling and constant evaluation of waste content, aids in achieving sustainable waste management.

5.4.1.8 Air Emissions

Besides emissions from energy use and other GHG emissions from various chemicals, a major concern is indoor air quality in healthcare centers. Operating suites require heating, ventilation, HVAC installations, safe and health indoor air quality, and aseptic conditions (Dascalaji et al., 2008). Chemicals found in operating rooms are waste medical anesthesia gases, like nitrous oxide, sterilizing chemicals, and aerosols (Dascalaji et al., 2008). If indoor air quality is not monitored, without proper maintenance on equipment, patients and staff alike can be exposed to excess and unhealthy levels of anesthesia gases and other typical chemicals found in operating room suites, like formaldehyde (Dascalaji et al., 2008).

5.4.2 Economic

Sustainable healthcare contributes to sustainable development, thus aids in meeting the needs of future generations in both an environmental, social and economic way. As mentioned earlier, health epidemics like obesity, diabetes, and a large aging demographic is expected to burden the healthcare system. Preventative care, a major aspect in sustainable healthcare will aid in releasing the healthcare sector from future burdens.

The business case for sustainable healthcare is not just about energy and water savings, greener facilities tend to improve patient outcomes by decreasing length of stay and reduced occupational risks like tuberculin conversion, generally result in better patient outcomes and patient safety, and less injury and infection (Practice Greenhealth, n.d.). Sustainable healthcare centers tend to have competitive advantage in recruitment and staff retention rate, improved capacity and smaller facility requirements, and have better public image (Pelikan & Schmied, n.d.) (Practice Greenhealth, n.d.). Additionally, cost-savings using reduced life-cycle costs consideration and integrated 'sustainable' and 'smart' designs result in better function at a lower cost ((Practice Greenhealth, n.d.). Creating a healthier work and service environment also provides savings in incalculable value, preventing disease or injury from exposures leading to long-term negative health effects. There are many cost-savings benefits to reducing

energy, water, general consumption and creating leaner operation, however “calculating value gained from health spending is, in any case, notoriously difficult... healthcare is an ‘intermediate good’—its value is not intrinsic. Its real value depends on the impact that the healthcare has on the health and wellbeing of beneficiaries” (Practice Greenhealth, n.d.). Although cost structures exist to aid organizations with these issues, it will continue to be an area in which healthcare organizations need to work.

5.4.3 Social

5.4.3.1 Patients

Patients will also begin to demand sustainable hospitals as knowledge and issues become publicized. Patients are expecting to receive more personalized care, and in an information age the demands are expected to grow (CABE, 2009). Currently, hospitals are ranked according to the success of patient care, which means that reputation determines competitiveness (Sehgal, 2010). With over 5 000 registered hospitals in the US, competition is fierce and reputation is important. Though reputation is ranked on specialty, the success of specialty is determined by setting, mortality ratio, patient safety index, number of discharges, number of key technologies and patient services (Sehgal, 2010).

Research has shown that patients are discharged at a faster rate in a ‘greener’ building design (Ulrich et al. 2004). More daylight streaming into patient rooms has positive effect on both patients and nurses well-being, as well as the benefit of energy saving and its subsequent benefits for patients (Ulrich et al. 2004). Research has shown that doctor and nurse behaviors and attitudes are perceived by patients when deciding on a hospital; because health and attitude are greatly effected by workplace environment, it is essential that hospitals create a safe, comforting and pleasant environment for staff if they desire to deliver good quality patient care and remain competitive (Kirdar, 2007). While green buildings are helpful in the aesthetics and perceived ‘green’ quality, they are only one component of a sustainable hospital. LEED accreditation has proved not effective enough in protect environmental and human health, which has been acknowledged by the U.S. Green Building Council (Fischer, 2010). Sustainable approaches at all aspects are needed for maximum benefits in dealing with patient health and satisfaction (Fischer, 2010).

5.4.3.2 Employees

Staff expectations are expected to change much like patients’ and the public. Growing concerns for a workplace that facilitates wellbeing, is as much beneficial for the healthcare organization as it is the employee. A healthy and safe workplace environment has proven to improve staff retention and work time productivity, studies even suggest that in a ‘greener’ work environment there less ‘sick days’ taken (CABE, 2009).

5.4.3.3 Public opinion

As issues revolving around sustainable hospitals come to light, the public will become more interested in the environmental aspects and impacts on the environment and human health. In 2001, when the Institute for Medicine issued a report saying the US health system was unsafe, inefficient, and lacked patient focus in safety and quality, transformations were set off around the US (Johnson, 2010). In October of 2010, 55 US hospitals joined the Greening OR Initiative and in 2009, and 35 hospitals in New York pledged to reduce their green house

gas emissions by 30% over a ten-year period (Green Biz News, 2010) (Sulzberger, 2009). Clearly, hospital administrations are taking notice of information and green trends. The amount of water, energy, and resources that are allocated to hospitals and services on a daily basis means impacts cannot go unnoticed for long. When energy prices rise and water becomes scarce, hospitals will need to consider more responsible consumption (UN, 2011). The load of air emissions from hospital energy use contributes to health problems, chronic disease, and polluted ecosystems. The communities in which hospitals reside will begin to demand more environmental responsible behavior and make those desires clear through choosing to use health centers devoted to sustainable operations.

5.4.3.4 Hospitals as role models

Hospitals are not factories, but they are a business. Their role in society is one with a long respectful history, with unique services impacting the lives of people globally. Not only are they treated differently by the federal and national governments, but they are also treated differently by society (M. Bhutta, March 21, 2012) (S. Gild, personal communication, January 3, 2012). The governmental and social pressures are not as clearly defined as in the case of hotels, factories and other businesses, and they are given somewhat lower environmental expectations (S. Gild, personal communication, January 3, 2012). Yet research is increasingly supporting and clarifying the environmental- health link, and in order to fulfill their purpose they must adapt to remain true to their mission of human health (ESC, 2007) (Frumkin, 2003).

5.5 Social changes

The healthcare system will be burdened by ageing society and lifestyle choices that continue to increase costs (EU, 2009). Elder people now make up most of the population in countries like the US and UK; in 2007, 9.8 million people in the UK were aged over 65 and by 2032 this number will raise to 16.1 million (CABE, 2009). Caused by a combination of higher survival rates and the 'baby boomer' demographic, this means designing systems to prevent illness will become more important to avert an overcrowded and burdened healthcare system (CABE, 2009). Society as a whole is gaining a greater understanding of environmental factors that influence health, like nutrition, exercise, and pollutants (CABE, 2009). Likewise, views of disease are changing with genetics research shedding light on our predispositions for certain diseases, giving time for preventative actions to take place. Modifications of our surroundings and lifestyle give would-be future patients the chance to take corrective action.

Patient empowerment and responsibility will be increasingly promoted, with organizations perhaps choosing to monitor health services and trends of people taking ownership of their health. Patients are becoming 'consumer patients,' seeking out highest quality care at affordable price which has led to increased 'health tourism' (EU, 2009).

5.6 Addressing Ethics

Justice and sustainability require that health care services be equally distributed on a global scale, given that affordability and availability of care are considered a basic human right. The EU Charter of Fundamental Rights states "everyone has the right of access to preventative healthcare and the right to benefit from medical treatment under the conditions established by national laws and practices. A high level of human protection shall be ensured in the definition and implementation of all Union policies and activities" (Jameton & Pierce, 2001).

Balance is needed between three major ethical dilemmas of: “the individual versus the whole, sustainability versus social justice, and sustainability versus health” (Jameton & Pierce, 2001).

A valid ethical concern is if reduced consumption will impede health services, however evidence exists “that good public health can be maintained on minimal resources when these resources are appropriately directed at basic public health infrastructures such as clean air and water, sanitation, education and stable food supplies,” which are goals of sustainable healthcare (Jameton & Pierce, 2001).

5.7 Evidence-based design: an emerging concept

There is growing evidence that aesthetics are important for the healing process (WHO, 2012b). Thus hospital or clinic design can be as vital as the service. Patients who have windows have shorter hospital stays, and indoor plants create a pleasing environment and also naturally clean the indoor air and decrease noise (CABE, 2009). Color, art, and noise levels have been discovered as having a profound affect on the healing process for patients and also support the emotional wellbeing of staff (WHO, 2012b). Natural light increases productivity, alertness, health and safety of patients and staff (CABE, 2009). Access to nature also effects the recovery process of patients; in a study conducted by NHS, 79% patients felt more relaxed and calmer after spending time in a garden, stating trees, plants, nature, smell, fresh air and privacy contributed to these positive feelings (CABE, 2009). The evidence supports a proverb stating, “Where the sun does not enter, the doctor does.”

6 Levels of Sustainable Healthcare

“Another way of defining sustainable is in what it specifically seeks to achieve.” (Kates et al., 2005)

The 3 sustainable healthcare Levels include Level 1, the basic quality and criteria describing most sustainable healthcare situations today, provides the base, while Level 2 provides a ‘norm’, the stricter sustainability potential reached using current guidelines and standards, and Level 3, describing the proposed highest sustainable healthcare level attainable, which all encompass categories that form a framework to sustainable healthcare. Each category has been allocated different aspects that have a concrete or measurable function. It is important to note that the author could not include all options for implementation because the possibilities for environmental and social activities are endless and many categories overlap thus it would become redundant. The categories have general criteria that are characteristic of that particular category; the choice has been taken to emphasize the attitude, behavior, level of action, quality, involvement, and founding values of the actions for each category in each of the three levels. Many categories are very much intertwined, but in order to be as thorough as possible, repetitiveness will occur in order to discern subtleties. Some category aspects are threaded through each level, for example recycling, yet the levels are differentiated by the core reasoning, decision making process, attitude, goals, intentions and the role in ‘wholeness’ needed to reach sustainability. Management plays a vital role in this process, which is why ‘Levels’ are matched to management frameworks that reflect the quality required for the specified level. Therefore the specified management framework for each level means their elements are required in every aspect of the level even though this may not be made explicit. The purpose of the levels is to describe the path to sustainable healthcare matching it to tangible management frameworks mirroring *quality* of the actions attempting to be described: (See corresponding Figure in Appendix I)

6.1 Level 1 “Basic”

Level 1 can be used to describe healthcare facilities that have begun to embark of environmental improvements through the use of TQM, EMP, and IEMS in managing their environmental affairs and aspects. As described earlier, these are not vigorous standards that require institutions to comply with specific standards; they only provide a framework to provide a means of reaching goals and targets set by the institution itself. Under all these standards compliance with basic regulation and legislation is already assumed to be met, although the frameworks do provide some type of guideline to reaching compliance, their intended use is to help remain on a compliance path. The motive behind these standards can vary between a business cost-savings approach to one more environmentally minded in efforts like understanding input and output flows in order to set targets and reach goals. Internal and external audits, reviews, documentation, procedures, quality records, policy statements and records should exist as well as an idea of the type of environmental aspects and impacts the institution has. These can range from water quality, air emissions, noise, waste, energy, material resources, and transport to packaging, product disposal, public and staff health and safety (Rothery, 1995). The traditional issues involved in environmental management standards are:

- Air emissions
- Discharges to water
- Water supply and sewage treatment
- Waste

- Nuisances
- Noise
- Odors
- Radiation
- Amenity Trees and wildlife
- Urban renewal
- Physical planning
- Environmental impact assessment
- Packaging
- Materials use
- Energy use
- Product use, disposal
- Public safety
- Staff health and safety (Rothery, 1995).

In areas of ‘sustainability’ or sustainability plans, key words are *promotion* and *encouragement* of such ‘sustainable’ or ‘green’ activities. While various initiatives have been implemented actions regarding them may have not taken place or are in the beginning stages of doing so. In Level 1 most effort is funneled into internal research and developing guidelines that address specific issues within the organization mostly having to do with environmental aspects. Sustainability plans tend to use general terms in order to expand the umbrella under which ‘greener’ efforts fall in order to include all types of facilities as each are in different beginning stages of ‘greening.’ Actual implementation and progress may fall on the lower spectrum in regards to the levels explained here. Additionally, because the management frameworks used do not require certification, comparatively the stringency of reaching goals and targets is lax due to lack of external pressure; therefore specific targets and objectives beyond regulatory compliance may not exist.

A1. Waste Management

In Level 1 waste management is already at compliance level, this level describes more environmentally geared efforts like starting recycling programs and setting goals to reduce waste generation; having an EMS or similar guideline means that an environmental review has already taken place. Through auditing the institution understands its waste streams and will take steps to reduce these impacts through reducing, reusing and recycling. Recycling bins would be made available in public and office areas.

B1. Toxic Materials

Healthcare centers in Level 1 may want to reduce the amount of toxic materials entering and leaving their system, so they may choose more environmentally friendly materials and phase out mercury containing devices.

C1. Safer Chemical Use

A healthcare center in Level 1 might recognize the large amounts of toxic chemicals used for cleaning and sterilization of facilities. To reduce these amounts, they might opt for ‘greener chemicals’ to limit the amount of environmentally harmful chemicals used in the facilities and prevent this load from reaching wastewater and ecosystems.

D1. Healthy Food

Healthcare centers would recognize that nutritious, organic or locally procured foods are important for the health of patients and employees alike and make effort to include a portion of food sources under these standards. Food waste would be composted or given back to community farmers and the cafeteria would also create a plan to reduce food and food packaging waste, for instances banning Styrofoam™ containers or buying environmentally preferable products.

E1. Green Building

Efforts for 'greener' buildings would begin at choosing automated light and door systems, energy efficient bulbs and other appliances like water-conserving faucets and toilets. Building would involve reused or recycled materials, renovating the HVAC system, using more localized hot water boilers, providing bike racks and open green spaces for employees and patients. Other simple options are artwork and interior details that contribute to a more comfortable indoor environment.

F1. Climate, Water and Energy

The environment is the base in Level 1 thus aspects dealing with emissions, waste, energy and water have precedence. Water conservation would begin at 'low-hanging-fruit' fixes with choosing environmentally friendly appliances for restrooms, laundry facilities, and patient and operating facilities. Likewise energy and thus carbon footprints would be reduced by providing alternative transport for employees, reducing the number of garbage pickup times, reducing travel, automatically turning computers off at night, setting a response time for water leakages, and generally taking the 'efficiency' route or option. Carbon footprint reduction is a major issue thus research of various activities and aspects take precedent over other tasks.

G1. Green Purchasing

Green purchasing would falls under other categories in Level 1, with green procurement existing as choosing 'greener' chemicals, some environmentally preferable products, avoiding purchase of bottled water, choosing some locally sourced or organic produce and building equipment, and working with suppliers to receive 'reduced packaged' goods. The LCA of major inputs could be examined to determine where carbon flow and release exists.

H1. Pharmaceuticals

In order to reduce the amount of pharmaceuticals in wastewater and thus contaminating drinking water and ecosystems, level 1 would include initiatives such as medication 'take back' events or programs would aid in reduce unused or outdated medications from patients. Additionally, a facility-wide method for disposing pharmaceuticals properly would be implemented and followed by nurses and staff.

I1. Environmental Responsible Healthcare

Community

In this level the community would be supported by existing environmental activities like prescription 'take back' programs and healthy food and nutrition initiatives. The immediate environment would be protected by reduced resource consumption and waste production on behalf of the healthcare center, presenting a healthier environment.

Patients

Patients would be provided a healthier environment from the healthcare center's carbon reduction efforts. Having used more environmentally friendly modes of transportation to and from the hospital patients also support environmental initiatives.

Employees

Employees would have greater involvement in this Level, with frameworks that support feedback and support workers' rights to health and safety. They too would benefit from higher quality food, air quality and reduced chemical usage. More environmental friendly products ensure healthier workplace and frameworks reduce occupational risks and hazards. Employees could become involved by participating in implemented projects like taking public transportation or bicycling to work. The healthcare center could participate in this by providing information boards for public transportation, bike racks and programs for carpooling.

Supply Chain

More environmentally friendly purchasing behavior would require healthcare centers to have relationships with suppliers and take actions to reduce packaging. It might not be about buying the cheapest product any longer, but the product that meets more environmentally sound criteria, thus healthcare centers may have a 'green purchasing list' or 'phase out' list.

Stewardship

Environmental stewardship is laid out through initiatives involving educating the community, and patients and employees in choosing healthier and locally sourced, organic food options, the environment and educating them on the waste stream of their prescriptions.

Ethics

A healthcare center in Level 1 would follow normal ethical behavior in regards to their environmental aspects, but they would also recognize a greater importance of beyond compliance behavior in regards to their environmental impacts. This encourages them to implement changes to reduce their carbon footprint and waste generation, water and energy use, and to protect their community through these measures.

Environmental Aspects

All of the environmental aspects of the facilities will have been documented, monitored, reviewed and solutions implemented for continual improvements.

J1. Economic Responsible Healthcare

Community

Economic responsible healthcare in Level 1 is one that economically supports the community by providing fair employment opportunities, training for unemployed, safe environment and provide additional services that contribute to community health that may indirectly affect the local economy. Programs like local procurement for food or other materials, which can be environmentally friendly, also support the economy by keeping cash flow more localized.

Patients

Economic responsible health care in regards to patients means providing a service that is affordable, allowing patients of any background, class or income to receive the service needed to improve and protect health.

Employees

Employees should be paid a fair income in regards to cost of living in the region and given equally opportunity. Additionally, they could provide salary conversion tax incentive for bike purchases and provide 'health fairs' where employees could receive free health screenings.

Supply Chain

Materials should be sourced from local regions to not only improve business of the community but also diminish the carbon footprint associated with the supply chain. Cost versus environmental impacts should be carefully weighed.

Partnership

Hospitals should partnership with other organizations or suppliers to support environmental efforts while promoting business.

K1. Social

Community

Community health education, involvement in environmental actives, and environmental education are a few examples of how healthcare organizations are involved in this level.

Patients

Efforts to provide preventative care education to patients, surveying their experience, taking into account criticisms and making improvements for a more comfortable, effective, quality care are related to socially responsible healthcare in Level 1.

Employees

Employees are viewed as stakeholders in this level, and their opinions in making decisions are considered important.

Supply Chain

Where possible reduced carbon footprint products are sourced ensuring a healthy environment for both the community and the community in which products are made and resources are extracted.

L1. Communication

In this level information is shared internally and externally through sustainability reports like EMS or CSR. A measure of transparency exists in regards to environmental aspects and impacts, allowing the public, competitors, employees and other stakeholders to gain access this knowledge.

In conclusion, Level 1 is a basic level that is easier to achieve, as seen from the advancement of Swedish healthcare facilities, beyond this level. It is a platform from which to work, and sets the stage for increasingly vigorous change and action. Level 1, though the lowest level, is vital before reaching Level 2, and when completed is advancement within itself. The goal is to bring all criteria to the same quality and standard before moving on to the next Level, which will now be described.

6.2 Level 2: “Norm”

In moving on to Level 2 all aspects of Level 1 must be completed, even if a health care center excels in one aspect, the goal is to excel in all, therefore the second level cannot be reached if one or more aspect falls below Level 2. Level 2 is considered ‘norm’ based on Swedish environmental standards that are currently implemented in healthcare settings. The purpose is to make changes that improve overall standings; if one aspect is behind the effort must be focused lifting it to match the others, ensuring that even the unpleasant and difficult parts of Level 1 are worked out before allowing energy to be placed in moving forward to Level 2. It must be emphasized that all the aspects in Level 1 and the criteria mentioned for them are inherently in Level 2 but will not be rewritten. Level 2 builds upon Level 1, thus Level 2 addresses the areas needed for achieving specifically Level 2 status. Level 2 is differentiated between Level 1 in several ways:

- 1) Level 1 has more environmental emphasis while Level 2 is both environmentally emphasized and includes CSR aspects.
- 2) Level 2 requires management and existing programs to be more proactive in seeking out improvement projects, meaning a higher quality of involvement than traditional practice. This includes increased and improved research, analysis and subsequent development into topics that will be described below.
- 3) Level 2 follows stricter guidelines, like ISO 14001 or equivalent.
- 4) Inclusions of CSR in Level 2 mean more stakeholders are involved in various aspects of creating and maintaining sustainable healthcare.

Level 2 includes standards similar or equivalent to ISO 14001, therefore in addition to other issues mentioned in Level 1 under a traditional EMP, these issues are included but not limited to:

- Effluent/ water quality
- Groundwater
- Waste minimization
- Energy and water conservation
- Environmental probity of procured materials
- Environmental probity of supplier's activities
- Transport²

(Rothery, 1995)

Level 2 also contains CSR aspects, meaning in addition to environmental measurements, social aspects and how they relate to service and environment are included. Examples of these are:

- Employee injury frequency rate
- Number of employees trained
- Customer complaints
- Shareholder equity
- Employee turnover rate
- Improved economic development
- Wages and benefits

(Linsey, 2010)

As mentioned previously, CSR definitions and conceptualization differ widely and are implemented in various ways among organizations. CSR hold aspects of stakeholder theory, but tend not to describe optimal performance or how reorganization of impacts influences decisions. Generally CSR activities are voluntary and provide some structure for behavior change. Ingredients of CSR are integrity, soundness, partnership, wholeness and honesty and well as greater accountability, transparency and dialogue with stakeholders (Andriof, 2001). All of these characteristics apply to different categories in Level 2.

A2. Waste Management

Waste management in Level 2 focuses on waste reduction through purchasing reduced packaged materials and implementing an efficient and smart recycling and reuse system. Goods purchased should be strategically selected so that a product is chosen for its quality aiding in the retention and lifetime of the product.

B2. Toxic Materials

Health care centers may begin addresses use of 'potentially' toxic materials, materials not specifically deemed toxic if used following their instructions, but that have scientific literature supporting their potential harmful affects. This would be similar to using precautionary principle, which is already recognized in EU policy. They would also choose to phase out use of these materials or shun them from the facility altogether for the operating room, furnishings, carpeting, patient rooms and other medical equipment. An example of this might be use of PVC, which has received publicity for its toxic effects in especially vulnerable people. It is found in blood bags, carpeting, piping and other building materials. Other

² Following the classification of Rothery (1995)

examples are phthalates, parabens, nitrous oxide, DEHP, formaldehyde, certain flame-retardants, chlorinated plastics, fragrances, and pesticides, among others. At this level the healthcare facility must identify all potentially toxic and toxic materials to find a means of reducing, eliminating or replacing it by creating a phase-out list and corresponding objectives and goals to reduce bought or existing hazardous or potentially hazardous chemicals. A key element would be proactive behavior in seeking out alternatives and identifying and rating all chemicals according to environmental and health impacts.

C2. Safer Chemical Use

Safer chemical use would be phasing out potentially harmful and harmful chemicals. Finding ways to avoid the need of these chemicals, using more environmentally friendly and healthier chemicals and ensuring proper use and disposal is vital. Special attention would be given to potential allergens to ensure an indoor climate that is allergy free for all patients and staff. This would include built environment, from soaps and linens, down to details like allergy-free fillers used in medications. An examination of the health care center should be performed to identify where improvements can be made in regards to chemical use and strive for continuous improvement.

D2. Healthy Food

Healthcare centers would implement goals for a high percentage of organic, fair-trade or low carbon produce, absent of processed and controversial ingredients, and aim to reduce the amount of processed ingredients to a minimum. This would include contentious food storage containers, like BPA lined cans, and require focus on whole foods for optimum health. Food waste would be converted to biogas and be used to fuel transportation fleets and all food containers should be 100% biodegradable to close the food system loop for the center. Healthy food education and cooking classes for staff and patients are examples the foodservice's proactive role which reaches beyond the cafeteria.

E2. Green Building

Green buildings in Level 2 would require LEED certification, the Green Building Standard or something equivalent. In this scenario, healthcare buildings would be renovated or build to these standards. Additional examples are low VOC paint, where water-based paints are not an option, carpeting and furniture and a renovated HVAC system. Beyond efficiency design also is given greater importance in this level, for example designing 'smart buildings' that have air-locked corridors to abate infection risks, circular buildings so that inner rooms receive light, healing interior designs and private outdoor green space for patients and family. Overall efforts are geared in an environmental and social way that optimizes patient care by building an environment that is a healing space.

F2. Climate, Water and Energy

In addition to criteria in Level 1, management would begin taking more proactive measures to reduce water and energy use through renovations and replacing out-dated energy intense equipment with energy efficient ones. Audits should be examined to determine extraneous energy and water use, and examine operation procedures to understand the actions of use. Facilities should cease using potable water for cleaning other unnecessary uses, monitor wastewater chemistry and pH and continually strive for reduction. Healthcare centers should offset energy use by buying into renewable energy to become 100% renewable. Other means

are by examining a more efficient method of energy production like a biogas plant using waste, considering combined heat and power, and thinking about efficient ways to produce steam and heat in a closed loop system to become self-sufficient. They should continue to research and strive to include more efficient measures into procedures and operations. Additionally, employees should be informed of these efforts and educated how to implement and monitor these aspects themselves.

G2. Green Purchasing

Environmentally friendly products would take precedence over other choices especially frequently used and replaced products like gloves, smocks, masks and bed linens. In addition to environmentally friendly products, healthcare centers would begin to expand their sphere of influence to include first tier suppliers, examining their operations to ensure that their purchasing power is not indirectly contributing to environmental or social degradation. Purchases are now based off 'greenness,' socially responsibility, reduced packaging and ethics. While in Level 1 environmental impacts were emphasized, social aspects are now included, along with the actions of their suppliers. This requires management taking an active role in seeking out quality suppliers, creating partnerships, investigating alternative products and creating a procurement code of conduct.

H2. Pharmaceuticals

To further reduce pharmaceutical load on the environment and wasted medication, the healthcare facilities would directly educate employees and patients of pharmaceutical impacts on the environment and subsequently health. This program would also *encourage* doctors to prescribe 'greener' medication and make the patient aware of the options by providing a list or manual of alternatives, like Sweden's 'Wise List' of medication environmental impact ratings. Additionally, wastewater would be monitored for levels of pharmaceuticals and goals or objectives would be created to continually reduce levels.

I2. Environmental Responsible Healthcare

Community

Community is more fundamental to activities is Level 2, thus they would participate more in the healthcare's decision making process, as this is central to CSR. The healthcare center would be responsible for providing public education for preventative health, environmental education and have voluntary information flowing to the community about activities and provide real transparency about all environmental and social impacts. Traditional philanthropy has played a role in CSR, but in this situation healthcare providers would participate in community functions that support a healthier environment and actively identifying potential risks or problems caused by healthcare activities.

Patients

Patients are included as stakeholders in this level, thus their feedback of experience of service, environment and quality are used in making decisions of environmentally related aspects. Patients would be provided outdoor areas and soothing spaces outside their room. Single-bed patient rooms with non-toxic materials like paints, linens, furniture all ensure a healthy environment, which is an example of change to promote health and wellbeing through all means possible.

Employees

In this level employees are granted the same amount of involvement and attention as the community and patients. Employee centered relations and decisions would provide feedback to implement changes that lead to a healthier and more comfortable work environment. An example may be setting up a 'green team' and allow them to take on their own projects with issues within the healthcare center. By surveying employee satisfaction, other aspects like wages, workplace, and experience are also surveyed. The mantra is higher quality employee environment means healthy and satisfied employees, thus better quality service for patients.

Supply Chain

Managers of procurement would need to investigate first tier suppliers to ensure a quality, ethically and environmentally sound product.

Stewardship

Level 2 stewardship is taken on with a more proactive and participatory role of the healthcare center. They choose to lead by example in the way they integrate environmental and socially responsible aspects into daily activities and decisions.

Ethics

In Level 2 additional ethical consideration is given in a social and environmental aspect by taking a deeper look into practices companies they do business with in order to ensure they support companies that share similar ethical values. This supports and strengthens healthcare's overall environmental and social mission.

Environmental Aspects

Healthcare centers would choose to continually seek out environmental aspects and following typical EMS process, continue to monitor and improve.

J2. Economic Responsible Healthcare

Community

Aspects of CSR complete the characteristics for community in economically responsible healthcare. Using CSR in the healthcare organization would mean supporting the community's economy through hiring locals, procuring from local companies when suitable, protecting natural resources that community relies on, fair hiring, and financing community programs. Level 2 is differentiated in that it is more proactive, engaged and involvement with the community's economic aspects. Partnerships with external business to find solutions to environmental and social issues further supports local economy, such as the case with the development of Stockholm Council's first eco-ambulance.

Patients

Healthcare centers could be actively involved with patient associations, improving partnerships to increase the quality and effectiveness of preventative care.

Employees

The quality of employee management should continually be monitored to maintain quality standards, involving fair hiring, discharge, wages and benefits.

Supply Chain

Fair and ethical business practices should be considered as well as the environmental and social activities of those whom the healthcare center has business relations with.

Partnership

Partnerships with local business are preferred and aiding suppliers in improving business environmental and social standards would also improve partnerships.

K2. Social

Community

CSR is heavily implemented in this stage, thus the sphere of who constitutes 'community' has also expanded. Like Sweden's Code of Conduct for procurement, they protect the health of workers that supply products by adhering to a contract requiring inspections. The immediate community is increasingly involved in this level, partnering with businesses. Transparency is a key element, with all environmental and social impacts accounted for, members of the community have more opportunities to voice opinion and create a healthier environment, ecologically and socially.

Patients

Important decisions are made including patient experience and feedback. More efforts towards preventative health programs, like providing 'preventative health consultations,' nutrition and exercise programs. More options in regards to patient care outside the healthcare center, like access to online material regarding their condition or online consultations would provide better communication and distance care.

Employees

Employees are viewed as stakeholders in this level, and their opinions in making decisions are considered important and rightfully considered. Human rights, ethical management, proper training, transparency, and education of their right to a healthy workplace, life balance and wellbeing are all examples of criteria for socially responsible behavior in relation to employees. The sphere of who is regarded as an employee has expanded; now including suppliers in relation to how products are manufactured and supplied. ILO eight fundamental conventions – numbers 29, 87, 98, 100, 105, 111, 138 and 182, UN Convention on the Rights of the Child, article 32, all work-related health and safety legislation in the manufacturing country; and the labor law must all be considered in employee relations.

Supply Chain

Procurement is commonly more than 50% of an organization's carbon footprint, therefore focusing on sourcing locally and developing a smart procedure for supply transport is vital.

Examining the lifecycle of commonly used products and finding a means of closing the cycle or reducing environmental and health impacts, creating partnerships with suppliers to develop technique to reducing packaging and create smarter methods of manufacturing and supply are priorities in this level.

L2. Communication

Transparency, honesty, openness, and morality all describe the level of communication in this level. Communication is beyond the level of compliance for ISO14001, and consists of actively gaining the attention of the community, employees and patients through training, newsletters, ‘teams,’ lectures, and workshops to confirm that knowledge of activities, decisions, impacts and goals are understood or met.

In conclusion, Level 2 is more socially and environmentally conscious than Level 1, and includes increasingly rigorous implementation plans and quality actions that lead to positive results. In moving on to Level 3, the courses of action require excellence, perseverance, change in behavior and engagement beyond that of Level 2.

6.3 Level 3 Eco-social

Level 3 builds upon Level 1 and 2, and represents the highest level of quality in regards to sustainability using the tools and technology that exist today. It is therefore a reasonable level to achieve, though challenging. The main guidelines for Level 3 are GRI, ISO 26000 and standards from Health Promoting Hospitals. Level 3 increasingly focuses on social responsibility and has outstanding environmental management. The ‘sphere of influence’ of this Level is beyond merely traditional; it represents the transcendence of attitudes towards the environment, supply chain, and employees to one of holistic perspective. The view that progress cannot be made without progress in every aspect assures high caliber of operation and quality that services not only the patients, but also the community, employees, environment and web of influence. In this case, a healthy organization is one optimizing patient and employee environment while practicing conservation to protect health and secure health for future generations to fulfill the meaning of ‘sustainability’ as defined by the Bruntland report. Environmental and social impacts should be minimal or closed loop, with a “holistic approach that is evolutionary, integrated and proactive” (Welford, 1995).

ISO 26000 is the overarching guideline for this level, as seen in Table 3-5. There are complementary guidelines and standards like the Health Promoting Agenda, GRI, and ‘Green Health Guide’ which also contain specialized aspects important to sustainable healthcare. However, ISO 260000 covers each general aspect and is therefore a relatively comprehensive guide to use in achieving ‘sustainability.’ Prioritized aspects of ISO 26000 incorporated at this stage include continuous learning, transparency, partnership, stakeholder engagement, promotion of social responsibility, communication, training, awareness, continuity, participation, balanced authority (ISO 26000, 2010). Yet, it is important to recognize and implied by reaching this stage, that a management system is the vehicle that “drives environmental improvement and not measure of success” (Welford, 1995).

The concept of social responsibility has extended into the realm of preventative care, meaning that before a person becomes a patient, healthcare organizations treat them like one. Increased prioritization of preventative care techniques, similar to the WHO’s Health Promoting Hospital Agenda, highlights the importance of disease prevention for staff, community and patients. As a member of the Health Promoting network, healthcare centers

aim to improve the relationship between organization and service, community and the environment, and patient, relatives, and staff satisfaction (WHO, 2007). Key components are the supply of clear information for the patient regarding disease, health promoting activities, and documentation that health goals have been achieved. The agenda also promotes a healthy workplace, which enhances disease prevention. Health promotion should be a key component of sustainable healthcare, in that it represents an underserved area in care today. While disease prevention “measures not only to prevent the occurrence of disease, such as risk factor reduction, but also to arrest its progress and reduce its consequences once established,” ‘health promotion’ is “the process of enabling people to increase control over, and improve, their health” (WHO, 2007). Health promotion focuses on patients and their relatives, with special focus on vulnerable groups, hospital staff, the community population and the environment (WHO, 2007). Healthcare centers using health promotion would aim at understanding the circumstances shaping behavior to design interventions that cater to the individual, taking into account the relationship between social environment and personal factors (WHO, 2007). Health promotion, as defined by WHO, would be included in any ‘sustainable’ healthcare center, as it incorporates social responsibility, preventative care and ‘health empowerment’.

The new paradigm for sustainable healthcare is one linking behavior and environmentally oriented approaches to community health. Research suggests the relationship between food related and environmental allergens with mood, environment and stress, and stimuli with depression (Stokols, 1992). There are “environmental leverage points” for enhancing personal and community wellbeing, which can be achieved through environmental restructuring of community health promotion to include one that strives for a ‘healing environment’ for and sick and for the currently healthy. Care oriented in this direction would eliminate health disparities, provide and promote healthy and safe community environments, mental and emotional wellbeing, and other preventative services.

‘Integrative healthcare’ is also a concept relating to sustainable healthcare in Level 3 and Health Promotion; it focuses on “optimizing effectiveness, safety, costs, and social and economic impacts of prospective, personalized, patient-centered, comprehensive and holistic healthcare” (Deng et al., 2010). While it can also be described in terms of ‘alternative medicine’ it is described here as “healthcare providers working together to provide patient care” (Deng et al., 2010). Similarly to how ‘evidence based design’ fits into sustainable healthcare and is now being implemented by a number of healthcare centers, as shown in earlier examples, components of integrative healthcare are also important, without discussing methods of care. Team-oriented practice constitutes a key element in integrative healthcare, which includes consultations from one practitioner to another, independent healthcare practitioners working in a common setting, practitioners collaborating by sharing information and advice, coordination of formalized communication, and integrative interdisciplinary blends of care which includes goals of treating the ‘whole person’ (Deng et al., 2010). Many of the concepts in integrative healthcare are applicable to standards already used currently in trying to achieve ‘sustainability;’ it contains similar ideas of ‘healing environments’ but amplifies what is considered ‘norm’ today. Openness, transparency, partnership and communication are threaded through integrative healthcare, which are also the flagships of sustainable healthcare.

The Vienna Declaration about environmental sustainability standards for health services include:

- 1) Integration of strict ecological standards in delivery services and products.

- 2) Use of biodegradable products and whenever possible without a loss in quality or safety.
- 3) Use of biologically produced and fair-trade food (at least 30% overall expenditures on food.)
- 4) Use renewable energy
- 5) Decrease of resource use and increased efficiency.
- 6) Substitution of 'one-way' products for recyclable materials.
- 7) Construction and renovation of buildings without using toxic and environmentally unsound materials.
- 8) Maintenance of green areas space using ecological techniques.
- 9) Provide information for staff, patients and the public about environmental actions
- 10) Development of environmental policy, implementing an environmental program with targets and tools, and use of an EMS. (Pelikan & Schmied, n.d.)

'Sustainability values' at this level are "appropriateness, efficiency, equity, effectiveness, acceptability, accessibility, affordability" assures actions are of sufficient quality. (Olsen, 1998). As described in stakeholder engagement, sustainable healthcare "requires the participation of diverse stakeholders and perspectives, with the idea of "reconciling different and sometimes opposing values and goals towards a new synthesis and subsequent coordination of mutual action to achieve multiple values simultaneously and even synergistically" (Kates et al., 2005). It requires developing and implementing better systems that reduce wastefulness through improved quality of products, processes and systems (Groene & Garcia-Barvero, 2005). A sustainable healthcare center is one that does not defer or externalize problems, but thoroughly understands its own aspects and impacts, and has used all means possible to diminish negative consequences of activity while seeking to increase positive impacts (Sadler et al., 2011). Lastly, "sustainable healthcare is not intended to replace existing approaches and delivery systems for healthcare." "Encouraging a paradigm shift that requires all forms of healthcare to be bound by principles of sustainability is one of the surest means of providing a level playing field for all healthcare modalities" (ANH, 2008). Adopting sustainable healthcare will naturally promote preventative approaches to care, based on the intrinsic compatibility with biological systems (ANH, 2008).

Criteria that meets 'sustainable healthcare' according to present day opinions has been discussed, as well as management systems and stakeholder engagements required at Level 3. Building upon Level 1 and 2, elements included specifically for Level 3 will now be examined:

A3. Waste Management

Waste management in Level 3 is centralized on diminishing amount of material used and purchasing goods based on their 'reusability', 'recycleability' and environmentally friendliness. LCAs on goods would aid in the process of picking the best materials to reach a 'closed-loop' system. Improved handling of goods, analysis of methodology of various use, smart

separation and environmental and socially conscious disposal should help in creating the optimal waste management system that technology and current knowledge can achieve.

B3. Toxic Materials

Healthcare centers would have completely phased out purchasing and use of toxic or potentially toxic materials found in building materials, equipment, electronic devices, textiles, furniture, flooring, soaps, fragrance, among others. A team or department would be in charge of investigating new products purchased for environmentally and health friendly characteristics or lack thereof. Their responsibility would also include a continual log of materials in current use, investigation of even more environmentally friendly alternative products and seeking new studies in regards to materials to maintain a toxic-free healthcare facility. Any toxic or potentially toxic materials would be disposed of in the most environmentally conscious, efficient, and tech-savvy fashion.

C3. Safer Chemical Use

The healthcare facility would be allergen-free in every aspect, from building material to laundry detergent. Harmful, toxic, hazardous or carcinogenic chemicals would be completely phased out, and replaced with more environmentally friendly alternatives unless the chemical is vital to an operation or therapy process. Nonetheless, every procedure will have been examined for efficiency, handling and proper disposal. All cleaning procedures will be environmentally conscious, with limited chemical use when possible. Continuous research supports long-term efforts to reduce chemical use, as well as seeking alternatives, and more efficient handling methods to diminish unnecessary usage.

D3. Healthy Food

The healthcare center would seek the most environmentally means of food procurement for their circumstance, which is to be determined by researching, striking a balance between organic food, local food, fair-trade ingredients and carbon footprint but aiming for a combination of 100% organic and local. All food would be made in-house, based on highly nutritious ingredients. A program providing special meals/ diets for certain illnesses would be available to aid or speed recovery time. No storage containers or to-go packaging would be made of potentially harmful plastics. Biodegradable containers are available but given out on a limited basis.

E3. Green Building

In addition to LEED certification, or something similar, the focus is on quality and specialized characteristics that aid in creating a healing environment for both patients, family and staff. Elements that might be included are: an electronic intensive care unit to monitor conditions of multiple patients, healing art, positive distraction measures, healing gardens, family space, respite areas, staff gym, areas close to patients rooms for consultations (Sadler et al., 2011). Additional components might be green roofing or sound insulation. Family rooms attached to patient rooms, desks designed to prevent workplace injuries and other space elements that provide a sense of well-being and comfort are the goals for the immediate living and working environment.

F3. Climate, Water and Energy

While having a zero impact is difficult in terms of energy and water use, purchasing renewable energy or carbon offsets are a means of reaching the 'sustainable' level. Ultimately, all energy use in forms of electricity and heating would come from renewables, transport running on biogas or some form of alternative fuel, and water use would be as efficient as possible. A means of reaching 'zero-impact' is through green procurement, purchasing energy and water efficient equipment and technology, buying renewable power and making an effort to close the energy and water loops based on the specific situation of the healthcare center. All actions in regards to energy and water, low carbon footprints, and emissions are of high quality, thorough, conscientious, continuous, creative, and diligent. A team or department devoted to this effort is absolutely necessary and the participation of staff and patients in this effort is vital for its success and authenticity.

G3. Green Purchasing

Procurement of environmentally friendly and socially conscious goods is norm in this level. Partnerships with first tier and second tier suppliers, codes of conducts, and efforts to help suppliers 'green' is necessary. Any needed product with lower environmental standards is carefully weighted, and alternatives are continuously sought after. Products manufactured or derived in relation with poor social standards are not purchased.

H3. Pharmaceuticals

Prescriptions are based on environmental aspects without compromising the quality of therapy. Patients would be given information of the environmental aspects of their medication and how to dispose of it properly. A means of minimizing excess prescriptions of antibiotics is implemented as well as other necessary medications that pose environmental and human health risks. Research and development of more environmentally friendly medications is supported directly or indirectly.

I3. Environmental Responsible Healthcare

Community

Social responsibility is a key aspect of a healthcare center's functions in Level 3. Any opportunity to participate in actively creating an environmentally and socially healthier community is taken. Community teams are vital to aid the healthcare center make decisions representative of the community while transparency and information flow are imbedded in operations and management. Partnerships that influence development, efficiency, transport, nutrition and overall health are key characteristics; the healthcare organization is no longer residing in a community, it is a fluid and active community member.

Patients

Environmental responsibility in regards to patient care is of the highest quality in this level, meaning the healthcare facility will take all means necessary to provide the best healing and healthy environment. Patients are included in environmental efforts, and therefore given the same opportunities as staff and community to make a difference through choices. It is important that the healthcare center represents 'model behavior' and promotes and

encourages environmental stewardship through its own actions, which means communication and transparency on behalf of the healthcare organization.

Employees

A high level of staff engagement means that environmental efforts are founded on staff participation. Freedom, creativity, engagement, transparency, communication and stewardship all describe the relationship between management and staff in regards to environment aspects. A healthy and comfortable workplace environment is as important as patient satisfaction, therefore a non-toxic, healthy, safe and comfortable workplace is necessary, with a means of measuring and continually improving employee environment is a characteristic of Level 3.

Supply Chain

Following the GRI standards, ISO 260000, codes of conduct, and moving beyond guidelines to improve suppliers' environmental and social aspects are all measures taken in Level 3 to protect local and global communities.

Stewardship

In Level 3, healthcare centers are a 'model' example for the community and competitors. Research, development, partnership, promotion and engagement are aspects of their quality of stewardship.

Ethics

Healthcare organizations in Level 3 conduct business with only those companies that adhere to strict social and environmental ethical standards.

Environmental Aspects

Environmental aspects are continually monitored to maintain high quality standards of operation and management, while research and development would aid in the healthcare organization in moving beyond current methods of management, as knowledge about certain aspects increases.

J3. Economic Responsible Healthcare

Community

In every opportunity possible, the healthcare organization would purchase from local vendors and hire employees from the local community. Partnership with local businesses and groups in solving issues and contributing to innovation and development is norm, while supporting the economy by improving and protecting the environment for economic development and human health. These actions have characteristics of genuine and continuous engagement and concern.

Patients

Healthcare centers would be actively involved with patient associations to improve the quality of work and service.

Employees

Locals should be given precedent over others for employment, and include benefits of incentives for employees to contribute to improving the environment and their own health.

Supply Chain

When possible, materials and goods shall be sourced from local areas when the environmental and social impacts are less or equal to sourcing elsewhere.

Partnership

The focus would be on gaining as many partnerships as possible, with locals and elsewhere, to contribute in a positive way to society, the environment, and thus the economy.

K3. Social

Community

The community is a vital component of providing 'wholeness' to the healthcare organization; its participation, opinions and actions are integrated into the system, and therefore transparency and communication are inherent.

Patients

Healthcare centers shall focus on preventative health, by promoting use of information hubs to aid in maintaining health, online communication with doctors and nurses, increased prescription of preventative care and healthy lifestyle. Patient feedback is vital to the process and includes efforts for continuous improvement, with benchmarking and record keeping of successes and failures.

Employees

Like patients, employee health and well-being are equally important, thus communication and feedback help the healthcare center maintain quality relationships with employees. A program for supporting these efforts should be in place to insure voices are heard and information used accordingly, to measure success of implementation and improvement.

Supply Chain

The lifecycle of procured products and goods are examined in efforts to come to a greater understanding of environmental and thus social impacts. Procurement is arranged with purely social responsible companies, and transport of goods and services is also taken into account. Much like partnerships with the community is valued, so are partnerships with business partners to couple the efforts to continue striving for excellence in terms of social

and environmental aspects. Only products that have the least negative environmental and social impacts are purchased.

L3. Communication

Communication is similar to level of compliance for ISO 26000, GRI and Health Promotion. Communication is no longer merely path for spreading internal information, but the venue for education, research and development, partnership, and social activity that is necessary for the quality of involvement and engagement in sustainable healthcare.

6.3.1 Summary of Level 3

Sustainability in Level 3 requires a healthcare center to have environmental and socially responsible behavior engrained into management, operations and thought. The proactive and creative behavior that accompanies this leads to development and innovation in solving difficult environmental and social issues surrounding their operations, within and outside the sphere of influence. Social responsibility is not based on philanthropy, but the active participation in the lives of staff, patients, community and business partners that aid in improving environmental and human health. Before decisions are made, all options are carefully weighted and analyzed to ensure actions taken do not have any negative consequence. Traditionally decisions have been made in terms of monetary cost, yet in Level 3 a sustainable healthcare organization would make decisions based on environmental and social costs with overall goal of quality patient care. A major focus shift in Level 3 is from emphasizing care after illness is acknowledged, to more aggressive preventative care programs and techniques with the objective of improving health before illness or improving overall health and wellbeing. This is exemplified by efforts to improve employee and community health, providing a high quality work environment and preserving ecosystems, which are fundamental to all standards described above.

Level 3 represents supreme excellence in overall effort to improve and maintain quality operations and management. At this level impacts are not so much discussed, because they have mostly been diminished, but conversations continue in regards to seeking further improvement through innovation, creative thinking and partnerships. Additionally, as technology improves, healthcare centers will upgrade technology using health information systems to better contribute to research, patient care and overall efficiency. Correspondingly, as time moves forward these levels will be built upon, expanding outwards, with new levels added as 'sustainability' as we now know it changes with our future circumstance (See Appendix II).

7 Conclusion

Sustainable healthcare is needed due to the weight of the healthcare sector's negative environmental and social impacts. The type of service it provides further strengthens the argument for a healthy environment, as to prevent the ironic disposition of contributing indirectly to the problem that it exists to solve. Healthcare centers are seen by the community as a beacon of health, both respected and seen as a model. It is therefore necessary for healthcare organizations to officially accept this role and the responsibility that accompanies it.

A combination of current guidelines and standards, like ISO 26000, GRI and HPH principles are appropriate methods of achieving sustainable healthcare today (see Figure 7-5) However, employing these standards is not enough; the organization must maintain the highest quality management, implementation, and improvement methods as possible, while preserving excellent stakeholder engagement and service (See Appendix III for simplified summary).

Complimentary and supplementary to these standards are the attitudes, behavior, and level of activity involved in implementation. Education and capacity building clearly emerges as a fundamental aspect that is needed in order to reach the highest level of sustainability in healthcare. Transparency coexists with education, and transparency with genuine implementation of the guidelines and activity described in Level 3. Thus education should be seen as one of the more important activities healthcare centers can take on; it supports CSR, GRI and many ISO 26000 aspects, while displaying and clarifying the inherent importance of social and environmental issues in healthcare and subsequent actions for solutions.

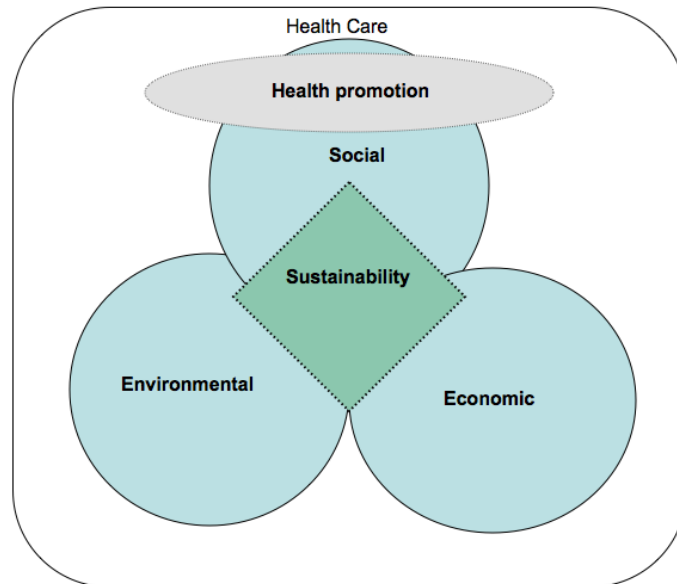


Figure 7-1 'The composition of healthcare sustainability'

Source: (Pelikan & Schmied, n.d.)

The levels described previously lay out the appropriate available guidelines, management characteristics, stakeholder engagement, social and environmental responsibility needed to

reach a 'sustainable' level. They aid in clearing up confusion in what in fact is 'sustainable' and identifying the level a healthcare center is in order to have a clearer view of potential subsequent actions. Healthcare centers should try to use the word 'sustainable' prudently and consider their level of 'sustainability' as described in this thesis. If healthcare centers are able to reach accord on sustainability practice and the levels and quality of actions and improvements, the opportunity for benchmarking and collaboration will clarify the process and make it less difficult. The levels are meant to provide some form of consensus based on logic, well-regarded guidelines and methods and professional opinions, which have been integrated with current 'sustainable' practices to find a 'norm' and develop a framework displaying steps to reaching sustainability in healthcare. This framework outlines differing levels of performance that will aid healthcare organizations in realizing their own sustainability potential.

Based on literature reviews and overview of the concluding framework, 'sustainable healthcare' is a system balanced on sound environmental, social, and economic approaches that eliminate negative social, environmental, and economic impacts while providing a service that prevents or ends environmental and human illness; continually working to maintain human and environmental health, while empowering, promoting, and preserving environmental and social quality for the sake of Earth, and present and future generations.

7.1 Concluding remarks

'Sustainability' is an anthropogenic concept, the laws of thermodynamics prevents 'zero-impact' as chemical reactions are occurring all around us, without human intervention. The world itself is a dynamic, morphing system running on the laws of physics and that of which is unbeknownst to us. The idea of 'conservation' is a relatively new concept, leaving us without a wholly true idea of what level we should be conserving to. Yet, the concept of sustainability addresses these issues by examining human activity, presenting us the ability to retrace our steps and the potential to return full cycle to what was marginally before. If we understand the lifecycle of our operations we have the opportunity to undo or minimize our negative impacts on humanity and the environment. Humans will not disappear from Earth anytime soon; sustainability is not about removing human activity, it is about quieting our existence and allowing other life on Earth to flourish with us.

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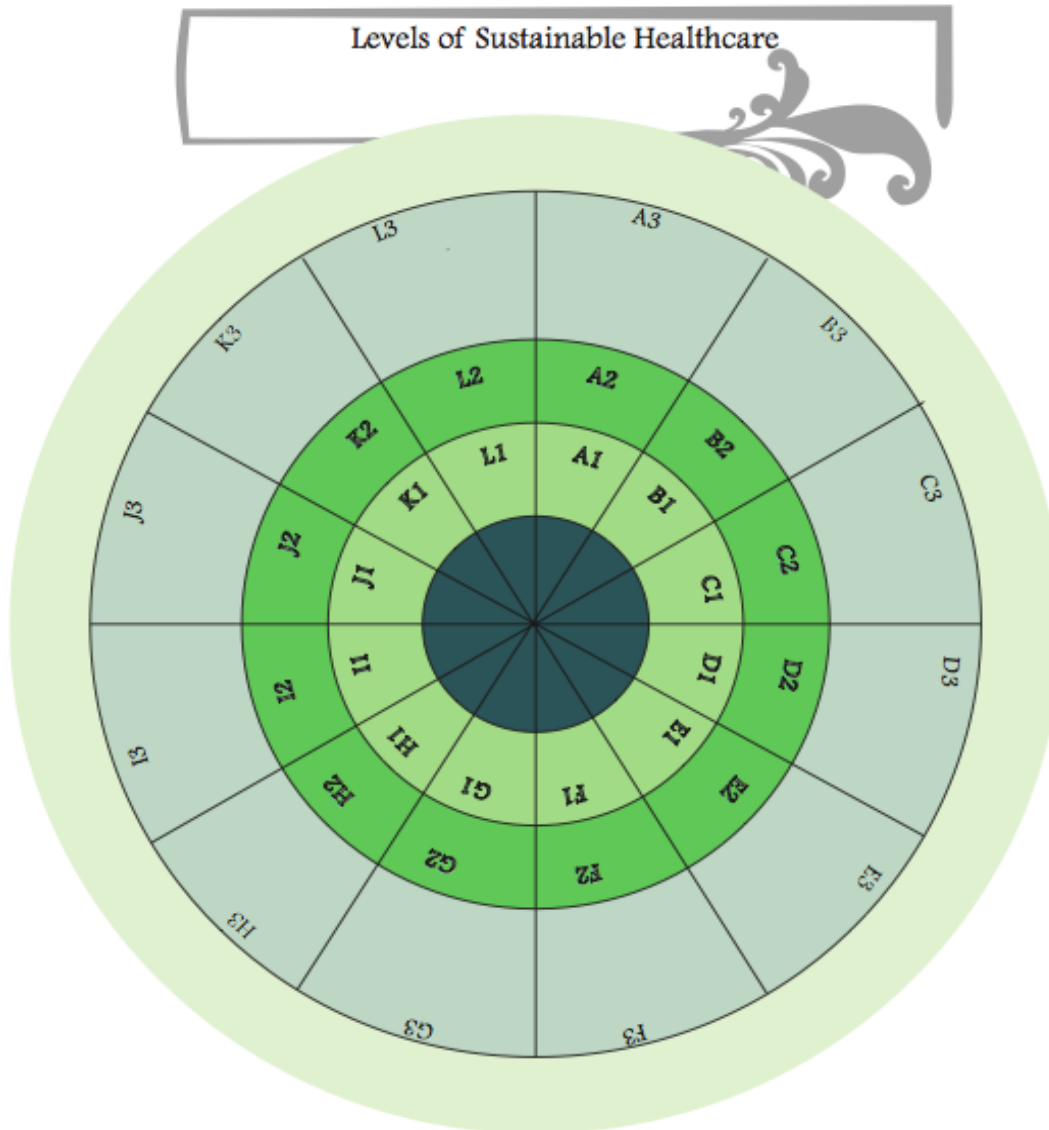
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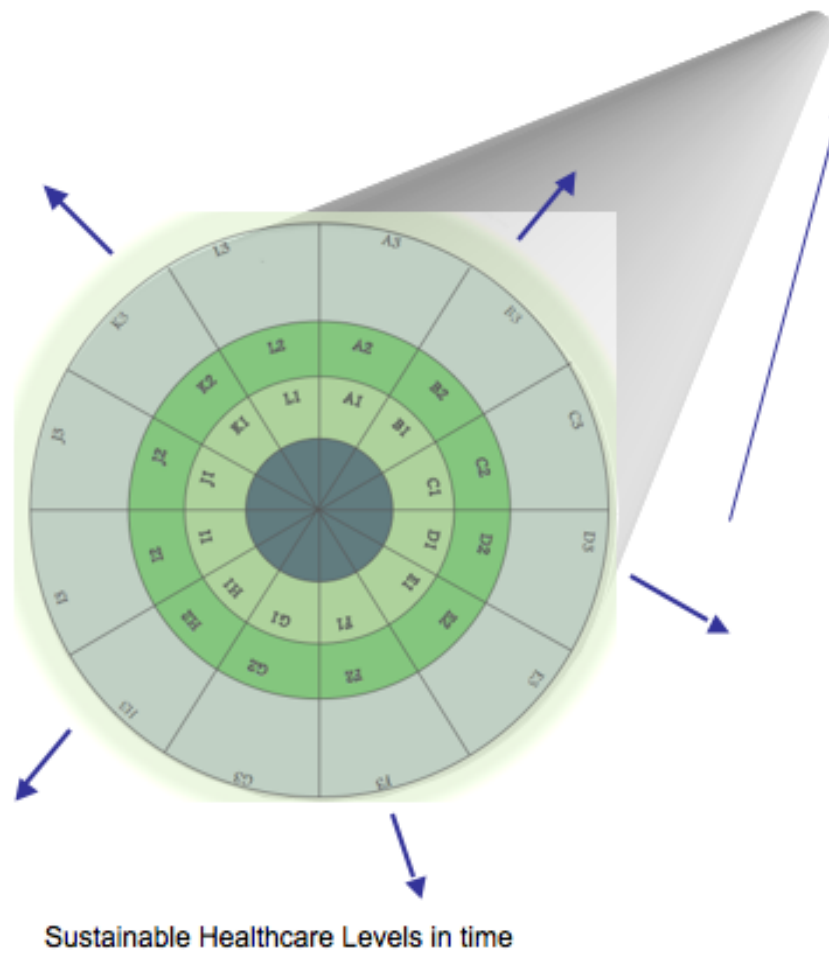
Appendix I



Appendix I: 'Levels of sustainable healthcare' corresponding with descriptions in Chapter 6. Level 1 begins in the center, following Level 2 and then Level 3 in the outermost circle. Beyond the Level 3 sustainability as we know it is able to reach new levels and gain increasingly holistic characteristics as technology and research contributes new criteria.

Source: (Mary Ellen F. Smith, 2012)

Appendix II



Appendix II: 'Sustainable healthcare levels in time' (As time moves forward, and as technology, research and development improve, new levels shall be added and the concept of sustainability will expand into new and unexplored areas.)

Source: (Mary Ellen F. Smith, 2012)

Appendix III

Sustainable Healthcare Levels	Performance Measurement	Auditing Techniques	Sustainability level description
Level 1	<ul style="list-style-type: none"> •Code of conduct •TQM •EMS •IEMS •ISO19001 	<ul style="list-style-type: none"> •Compliance Auditing •Systems Auditing 	<ul style="list-style-type: none"> •Basic or traditional forms of management and operations.
Level 2	<ul style="list-style-type: none"> •Sustainability Reporting •TBL •CSR •ISO 14001 	<ul style="list-style-type: none"> •Environmental Auditing •Ecological Auditing 	<ul style="list-style-type: none"> •Considered the 'norm' level with more environmentally geared management and operations. •Some CSR aspects included.
Level 3	<ul style="list-style-type: none"> •GRI •ISO26000 •HPH 	<ul style="list-style-type: none"> •Auditing for Sustainability 	<ul style="list-style-type: none"> •Highest level achievable under current existing standards •High quality management systems with strongly integrated environmental and social aspects.

Appendix III 'Summary of healthcare levels descriptions with corresponding performance measurement techniques, auditing techniques'

Source:: Information from (Welford, 1995) (Friedman, 2006); Compliation and figure by (Mary Ellen F. Smith, 2012)

Appendix IV

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