

## Chapter 16

# Model for Assessment of Environmental Responsibility in Health Care Organizations

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### ABSTRACT

*Sustainability is considered a paradigm for businesses in the 21st century. Despite this, the existing tools for helping to introduce strategies and manage activities to promote sustainable business are few. These deficiencies become more important in healthcare organizations owing to their particular conditions of resource consumption and waste production. It is, therefore, essential to have objective tools to assist in monitoring environmental sustainability in this type of organization. This chapter therefore sets out a multicriteria assessment system constructed by extension to a fuzzy environment of the technique for order preference by similarity to ideal situation (TOPSIS) to assess the environmental responsibility of a healthcare organization. This model allows joint evaluation of a significant number of decision criteria. The aim is to provide a hospital with a model that is easy to apply, with criteria specific to healthcare, and that allows its responsibility with regard to the environment to be monitored over time. The model has been used in a public hospital.*

### INTRODUCTION

Sustainability is considered a paradigm for businesses in the 21st Century (Garcia et al., 2016). Despite this, the existing tools for helping to introduce strategies and manage activities to promote sustainable business are few (Garcia et al., 2016). These deficiencies become more important in Health Care Organizations owing to its particular conditions of resource consumption and waste production. Health Care Organizations are the only type of company which can generate all the classes of waste, from waste without risk to waste that is potentially infectious, carcinogenic, mutagenic, teratogenic or radioactive. The risk to people and to the environment from this waste is much greater if it is not correctly segregated. It is also vital to carry out action to reduce the consumption of limited natural resources such as water

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and energy, while increasing the protection and conservation of the environment, including reducing the emission of pollutant gases, protecting biodiversity or considering the role of suppliers in action to prevent or reduce waste.

It is, therefore, essential to have objective tools to assist in monitoring environmental sustainability in this type of organization, taking into account a number of factors. That is, by assessing how improvement actions, within a process of continuous improvement, are contributing to improvements in sustainability. However, it is clear that there is little linkage between sustainability reporting and management control systems (Cintra & Carter, 2012).

Nonetheless, despite its importance, the literature on the development of systems for environmental assessment in Health Care Organizations is very limited.

This Chapter therefore sets out a multicriteria assessment system constructed by extension to a fuzzy environment of the Technique for Order Preference by Similarity to Ideal Situation (TOPSIS), to assess the environmental responsibility of a Health Care Organization. This model allows joint evaluation of a significant number of decision criteria, which include any event that may cause adverse effects on water, ground, seas and rivers, wild species or their habitats; it also considers the existence of possible measures to be carried out in Health Care Organizations to minimize the probability of an event, or to eliminate all risk. However, it should be noted that this model is not intended to perform an environmental audit in the field of health care, as it would need to include economic, technical, legal and other criteria, or a system of environmental impact that would require the assessment of a variety of risks and consequences. The aim is to provide a hospital with a model which is easy to apply, with criteria specific to health care, and which allows its responsibility with regard to the environment to be monitored over time. Following the methodology laid down in Carnero (2015), criteria were used that were assessed depending on the number of admissions or annual services provided, making it possible to compare results over time for a single organization, or between organizations. The model has been used in a Public Hospital.

## **BACKGROUND**

The literature includes a large number of contributions on environmental questions (Aragones-Beltran et al., 2009; Higgs et al., 2008; Hsu & Hu, 2008; Kang et al., 2007; Lamelas et al., 2008; Liang et al. 2006; Madu, Kuei & Madu, 2002; Pilavachi, Chatzipanagi, & Spyropoulou, 2009; Tzeng & Lin, 2005; Tseng, Lin, & Chiu, 2009; Van Calker et al., 2006). However, these are invariably related to manufacturing, transport or energy companies. In the case of service companies and, in particular, in Health Care Organizations, the contributions are practically non-existent (Carnero, 2015).

Health Care Organizations, places dedicated to the improvement and development of preventive measures in health care, with respect to their users, those who live in the area and their workers, should be involved in minimizing their own environmental impact, as there is a strong correlation between the two (Comunidad de Madrid, 2005). In order to improve environmental sustainability of a Health Care Organization, however, it is vital to monitor sustainability over time for decision making and management of activities that constitute an organization's system processes (Salvado et al., 2015).

A system of environmental assessment should combine many factors, which may be technical, social, political, economic and environmental, which often conflict with one another (Lahdelma et al., 2000); it may also be necessary to include a number of individuals or decision groups, with different perspectives or responsibilities within the Health Care Organization; as well as the need to incorporate a great

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