SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To assess which form of healthcare waste treatment technology is the most optimal, using a National Health Service organization in England as the setting for a case study.

DESIGN IMPLICATIONS

Depending on economic and environmental feasibility, healthcare institutions could consider a mixed-methods approach to waste storage and treatment. Designers could work with relevant stakeholders to help minimize costs for waste management.

Considerations for choosing appropriate healthcare waste management treatment technologies: A case study from an East Midlands NHS Trust, in England

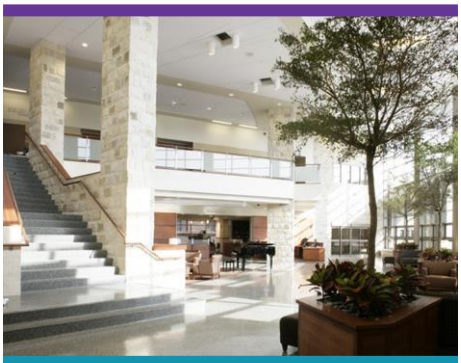
Lee, S., Vaccari, M., & Tudor, T. 2016 | *Journal of Cleaner Production* Volume 135, Pages 139-147

Key Concepts/Context

Hospitals have the potential to significantly improve their socioeconomic and environmental conditions through the implementation of sound policies that are backed by solid research. Developing a strong evidence base for such policy decisions is therefore imperative. The National Health Service (NHS) is among the largest organizations in the United Kingdom, and is also very energy intensive and a prolific producer of waste. A number of financial and legislative drivers already have been put in place to help the organization become more environmentally sustainable; however, the authors hope that this study will be able to inform the NHS of which specific waste treatment technologies are the most effective.

Methods

A form of Multiple Criteria Decision Analysis (MCDA) known as AHP was used to analyze deep landfill, incineration, and autoclaving technologies in this study. AHP focuses on group decision making and seeks to identify the "optimal" outcome based on data availability and inputs where criteria are independent from each other and distinct in nature. Under this framework, the authors assessed each waste disposal method for benefits and drawbacks. A decision scenario was visualized as a hierarchy, and a "pairwise comparison" was performed in order to determine the priority of different variables in this hierarchy. Tables were then constructed to compare alternatives (for example: deep landfill vs. incineration, deep landfill vs. autoclaving, etc.) A score was generated from these comparisons and was used to assess the criteria itself against each variable. The amount of weight produced by each method of waste disposal was calculated and used to determine costs.



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Findings

After all calculations were completed, deep landfill had the highest priority, followed by autoclaving and then incineration. This was despite the fact that deep landfill was by far the most significant producer of carbon dioxide, and that although it is economically feasible, it has a negative reputation in multiple different sectors. The authors claim that this suggests that the best approach to disposal technology is a mix of several methods rather than one single method, because once all factors are considered (environmental impact, cost) there is no truly "optimum" single method.

Limitations

The authors noted several limitations. When using AHP for analysis, "carbon" should have had its own criteria in order to gain a more accurate assessment. A limited number of criteria were included—the study could have benefitted from criteria such as "transport" as well. All conclusions from this study were drawn from complex calculations rather than field research, and data sources were not clearly described. This, along with the fact that this paper concerns a U.K. organization specifically, may make the generalization of these findings difficult.

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ASHE American Society for Healthcare Engineering, A personal membership group of the American Hospital Association

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