



## KEY POINT SUMMARY

### OBJECTIVES

To provide a holistic examination of efficient waste and wastewater management strategies within a healthcare setting.

### DESIGN IMPLICATIONS

Designers can work with waste management teams to understand equipment usage patterns and water consumption rates in order to help generate water-saving opportunities. Flow restrictors and dual flushing are examples of helpful technologies, especially within bathrooms and areas where food is prepared. Designs that help improve behavioral changes, such as signs, can also help improve waste management processes and water consumption rates.

## Environmental audits and process flow mapping to assess management of solid waste and wastewater from a healthcare facility: an Italian case study

Vaccari, M., Montasser, W., Tudor, T., & Leone, L. 2017 | *Environmental monitoring and assessment*. Volume 189, Issue 5, Pages 239

### Key Concepts/Context

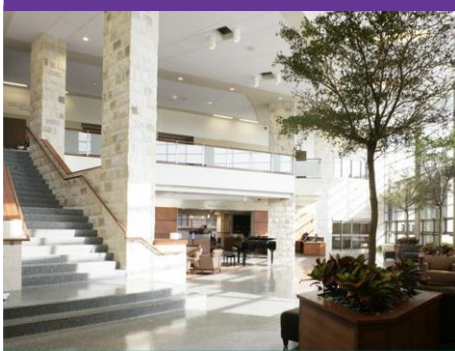
Despite the growing number of policies and legislative drivers aiming for more sustainable resource management approaches and general environmental improvements, there is still a need for more research focusing on the improvement of waste and wastewater management. The authors propose that there are two types of sustainability in the healthcare sector: operational sustainability, which encompasses facility designs that help consume the fewest services and resources, and environmental sustainability, which attempts to reduce the amount of discarded materials such as solid and liquid waste. Although there are many previous studies that analyze waste generation rates, there is a lack of literature that examines liquid waste as well.

### Methods

This study involved a single Italian healthcare facility. Data were gathered from January 2014 to May 2014 and consisted of two phases: 1) the efficiency of the wastewater treatment plant and water consumption, and 2) solid waste generation rates from specific departments. Data were collected and analyzed for 12 different pieces of equipment within the healthcare environment, and the data were analyzed for specific water use, use rate, total consumption for each type of device, annual consumption, and total daily consumption. Data pertaining to solid waste discharge dealt with unsorted and organic waste, along with paper, cardboard, plastic, wood, glass, potentially infectious materials, and tin.

### Findings

Waste and wastewater disposal operations within the analyzed healthcare facility were found to be in line with international standards created by the World Health



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Organization. Most water (85%) was consumed through non-domestic uses such as autoclaves, bedpan washing, and food preparation, as opposed to domestic issues (15%) such as showering and sink use. Overall, data revealed that water consumption in the hospital decreased over the period of 2011-2013. The authors suggest that this was possible in part due to improved technological practices (fixed leaks, installed flow restrictors, recycled water) and behavioral practices. The authors suggest that conservation efforts should be directed toward rooms with high rates of consumption (often wards and canteens) during the first few months of the calendar year.

### Limitations

This study involved the retrospective analysis of data from a single healthcare institution. No field observations were made of waste management practices. The findings and practices discussed in this study may not be applicable to certain healthcare environments.

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