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A COMPREHENSIVE WASTE MANAGEMENT SIMULATION MODEL FOR THE ASSESSMENT OF WASTE SEGREGATION IN THE HEALTH SECTOR

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Abstract

It has been determined that a high percentage of medical waste could be classed as domestic waste due to the lack of segregation at hospitals. Better segregation could thus substantially decrease the amount of medical waste that is required to be treated as hazardous waste. This study aims to assess different segregation levels of domestic waste mixed with medical waste. To do so, the Stella and Vensim simulation packages were used to evaluate medical waste flows in the Thrace Region of Turkey. The most important advantage of the simulation modeling used in this study is the flexibility for adjusting parameters based on circumstances, e.g. in the case of an unforeseen event (such as the COVID-19 pandemic), the system parameters can be modified according to the situation. In this study, it is anticipated for the medical waste generation to increase from almost 2000 tons/year to 3000 tons/year in 2045 in the region, which is more than the capacity of current medical waste treatment plants. Projected waste generation flows show that it is possible to avoid 300 tons of medical waste annually by reducing the domestic content of medical waste to 50%. Precisely, for the current regional treatment capacity to be sufficient up to 2045, it will be crucial to reduce the domestic content in medical waste to 10% in the chronic care departments at regional hospitals. The importance of this further arises, as lack of meeting this need will result in an urgent requirement for installation of new units for the treatment of all the medical waste generated in the region.

Key words: domestic waste, hazardous waste, medical waste flows, simulation modeling, system parameters

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