

# **MEDICAL AND AUTOMOTIVE WASTE GENERATION AND ITS STATISTICAL DEPENDABILITY ON CERTAIN SOCIO- ECONOMIC INDICATORS ANALYSIS: CASE OF LITHUANIA**

*Aistė Karpušenkaitė<sup>1</sup>*

*Tomas Ruzgas<sup>2</sup>*

*Gintaras Denafas<sup>1</sup>*

*<sup>1)</sup> Department of Environmental Technology, Kaunas University of Technology,  
Radvilėnų al. 19, C -505 , LT-50254 Kaunas, Lithuania.*

*<sup>2)</sup> The Faculty of Mathematics and Natural Science, Kaunas University of  
Technology, Kaunas, Lithuania.*

## **Abstract**

While exploring possibilities to efficiently forecast medical and automotive waste generation on national (Lithuania's) level, series of tests and calculations were made to analyze mentioned types of waste generation itself. In this attempt it was decided to separate medical and automotive waste each in two flows – total and hazardous waste. These waste flows composition and its changes over the period of 2004-2015 were analyzed to learn more about possible reasons for waste data fluctuations and dependability to predetermined socio-economic indicators. Annual total medical waste growth rate during 2004-2015 was 13,6%, hazardous medical waste – 19,19%. Total automotive waste generation experienced 9,41% annual growth and hazardous automotive waste – 23,33%. Spearman's rho test, scatterplots and PLS or MLR regression methods were used to determine waste generation data sensitivity and compare how sensitivity shifted when comparing observed and forecasted data to determined socio-economic indicators. Most of independent variables used for certain waste data set were highly collinear when counting monotonic correlation. Changes between independent and dependant variables sensitivity were noticed as developed statistical modelling methods that demonstrated highest efficiency strengthened variables sensitivity to develop better and more efficient structure for accurate forecasting.

**Keywords:** medical waste, automotive waste, waste generation, dependability, data sensitivity, statistics.