Stat 301

Waste Management Analysis

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introduction

Waste management has changed drastically since the 90’s, taxes have been levied and bills passed to emphasize the importance of categorizing waste to recycling reusable materials. Within this analysis, we will focus on a few variables we thought may have an impact on lowering landfill waste. In 1997, a tax was levied on trash hauling of 17% commercial and 9.75% residential. The intention of this tax was to reduce the amount of trash in landfills. This tax begs the question, was average landfill tonnage greater in 1991-1997 than 1998-2017, specifically in the Metropolitan Area. To dive a bit deeper into this question, was the largest county in Minnesota (Hennepin County’s) post-tax landfill mean waste percentage less than the population (MN Metro area )post-tax mean landfill waste Percentage? Lastly, due to the Waste management tax we wanted to analyze the onsite waste tonnage before and after the tax to see if the amount of onsite waste (non-hauled waste burned on location) increased to avoid additional taxes. We will be working with “Wastedata2” using the variables Year, County, WTE and landfill. Additionally, created some variables based off the raw data to understand the difference between pre-tax and post-tax waste distribution. One variable will be labeled (Tax\_Group) as a “factor” to separate the groups of years. We also created variables for the percentage of Landfill and Onsite waste, respectively named (WTE\_Landfill\_Percentage) and (Onsite\_Percentage) type “dbl.” “WTE” data is included in the total landfill waste percentage since this material would contribute to the landfill if it wasn’t burned for energy.

methods

Given this information, can we identify a correlation between the 1997 Waste Management tax and the reduction in total percentage of landfill waste? The Null hypothesis will assume that the 1997 tax has no effect on the total landfill percentage in the Metropolitan Area. Alternatively, the 1997 tax significantly decreased total landfill percentage in the Metropolitan Area. To Analyze the pre-tax and post-tax year groups by “WTE\_Landfill\_percentage” we used an Independent T-test. We also ran this test with “Onsite\_percentage” data to identify opposing changes. To further analyze Hennepin county’s post-tax mean landfill percentage against the population’s mean (MN Metro counties) we ran a Welch Two Sample t-test. In addition, we wanted to see if there were patterns between counties by their tendency to generate onsite waste vs landfill waste. We used a hierarchical cluster analysis to classify these tendencies.

Conclusion

Sources cited

<https://www.revisor.mn.gov/statutes/cite/16A.531>