UNISA university of south africa

Research Report

STA1507 Project B

Assignment 5

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1. RESEARCH QUESTION

Are households in the three types of settlements (urban formal, traditional, and farms) different regarding having a problem with air pollution?

2. METHODOLOGY

Variables:

Settlement Type

Problem with Air Pollution

Description of the variables:

Settlement type - This variable is independent and describes the type or nature of human settlement in each area, such as urban formal, traditional, and farms. Its nominal (categorical) measurement scale, with coding values 1. Urban formal, 2. Traditional, 3. Farms.

Problem with Air Pollution - This variable is dependent, and it measures the extent to which air pollution is perceived to be a problem. It compares the perceived problem with air pollution between the three different types of settlements. Its measurement scale is ordinal, with coding values of 1. Yes, 2. No.

Data analysis methods:

Descriptive statistics and data visualization techniques will be employed to analyze the data collected. The following data analysis methods will be used:

Cross-tabulation Analysis - I will create a table that combines settlement type and air pollution problem, showing the count and percentages of each combination

Frequency Analysis - To determine the distribution of settlement types and the % prevalence of air pollution problems.

Stacked Bar/Column Charts - To display the percentage of households in each settlement type that have a problem with air pollution.

- For the **Settlement type:**

I will create stacked bar/column graphs that will compare the distribution of settlement types and help identify the specific settlement type/s that are most at risk of air pollution problems, frequency tables showing the count and percentage of each type of settlement, using the pivot table to show raw data and converting the raw data to percentages using MS Excels “PivotTable Analyze” then choosing the “Field List” pane, then click summation then count of

Problem with Air Pollution, then go to value field settings, then select “show value as” % of column total.

- For **Problems with Air Pollution:**

I will create stacked bar/column graphs to help visualize the prevalence of air pollution problems across different types of settlements. They will help in showing the proportion of households in different settlement types (urban formal, traditional, farms) that report having a problem with air pollution. This is going to help in seeing which settlement type/s are most affected by air pollution problems. For numerical measure, a Chi-Square Test which is a statistical test, will be used to determine whether there is a statistically significant difference between the three settlement types in terms of having a problem with air pollution. The chi-square test is calculated as follows using MS Excel: =CHISQ.TEST(observed; expected) “enter”.

3. RESULTS

Count of Problem with air pollution	Settlement type			
Problem with air pollution	Urban Formal	Traditional	farms	Grand Total
No	518	244	31	793
Yes	149	50	8	207
Grand Total	667	294	39	1000

Figure 3.1 (Contingency table showing raw data for research question)

Settlement Type	Problem with Air Pollution	Yes	No	Grand Total
Urban Formal		14,90%	51,80%	**66,70%**
Traditional		5,00%	24,40%	**29,40%**
Farms		0,80%	3,10%	**3,90%**

Figure 3.2 (Contingency table showing data in percentages)

Settlement Type	Yes	No	Total	% Yes	% No
Urban Formal	149	518	667	22,30%	77,70%
Traditional	50	244	294	17,00%	83,00%
Farms	8	31	39	20,50%	79,50%
Total	**207**	**793**	**1000**	**20,70%**	**79,30%**

Figure 3.3 (Frequency distribution of air pollution problems in households by settlement type)

Count of Problem with air pollution Problem with air pollution	Settlement type Urban Formal	Traditional	Farms	Grand Total
NO	528,931	233,142	30,927	793
YES	138,069	60,858	8,073	207
Grand Total	**667**	**294**	**39**	**1000**

Chi Square Test	**0,170753743**

Figure 3.4 (Chi-Square Test)

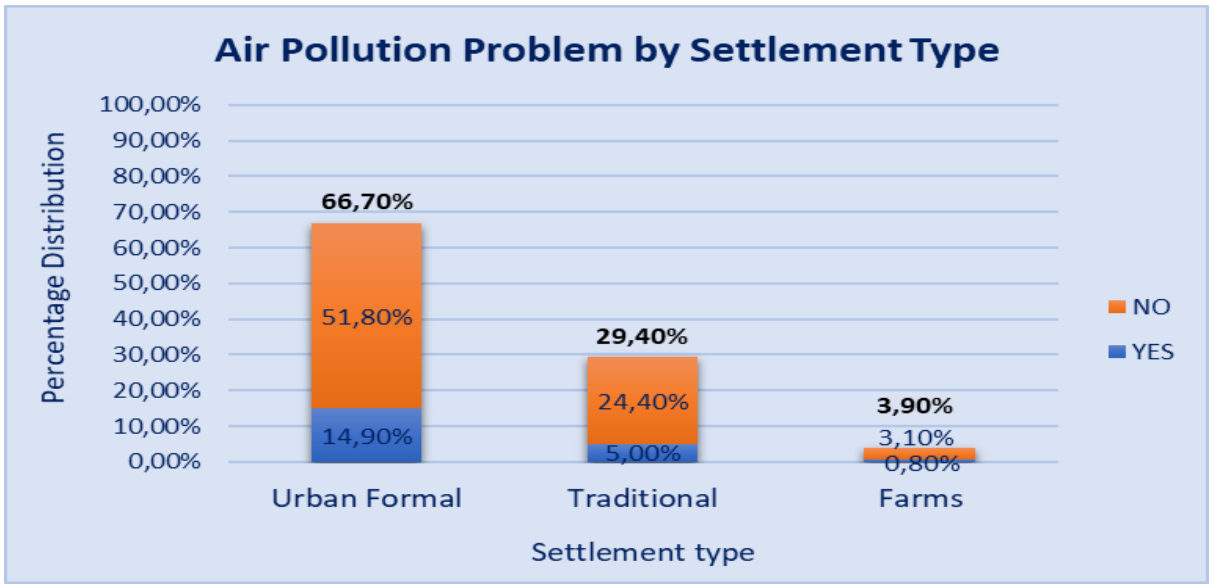

Figure 3.5 (Stacked Bar Chart)

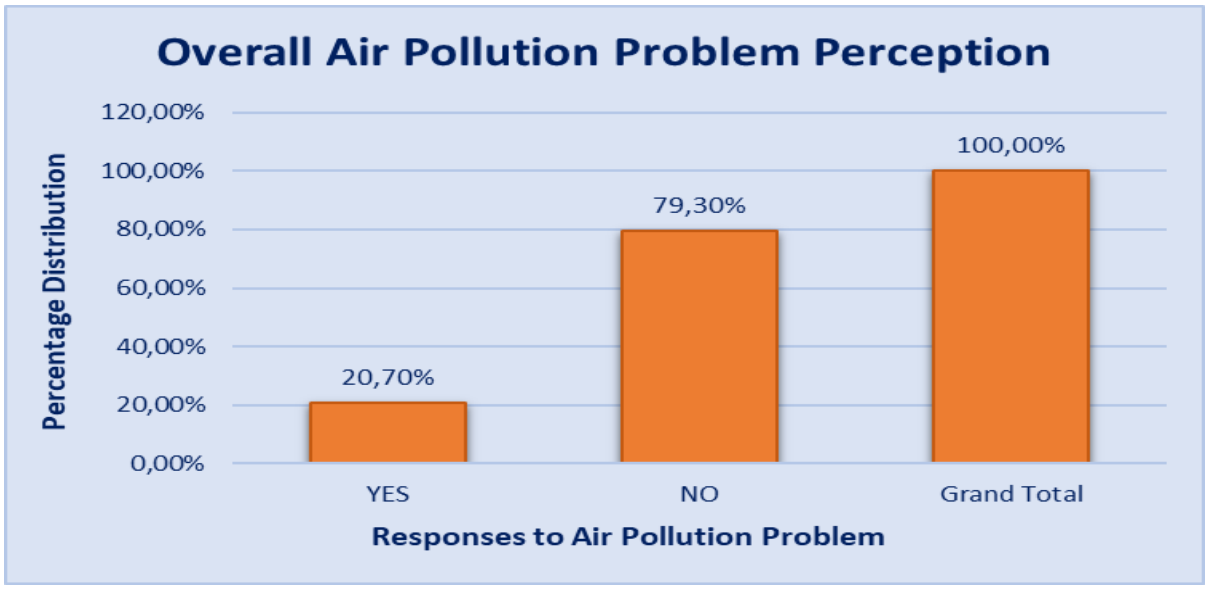

Figure 3.6 (Clustered Column Chart)

4. DISCUSSION

Figure 3.1 (Contingency Table) Shows the raw data for the research question, the table shows that 149 households in urban formal settlements reported having a problem with air pollution, 50 households in traditional settlements, and 8 households in farm settlements. The total for yeses is 207, and the total for no's is 793. The general overview of the data shows that most households reporting a problem with air pollution are in urban formal settlements, and most households perceive no problem with air pollution.

Figure *3.2* (Contingency Table) Shows the data in percentages, it shows that the prevalence of the air pollution problem is highest in urban formal settlements (14,9%), followed by traditional settlements (5%), and then farms (0,8%).

Figure 3.3 The frequency table shows that the overall percentage of households with air pollution is 20,7%. However, there is a significant difference in the percentage of households with air pollution problems between the different settlement types. Urban formal being the highest, followed by traditional, then lastly farms.

Figure 3.4 The Chi-Square Test shows that there is a statistically significant difference between the three settlement types in terms of having a problem with air pollution, value = 0,170753743

Figure 3.5 Is a stacked bar chart of air pollution perception by settlement type, it shows that the proportion of households reporting a problem with air pollution is highest in urban formal settlements, followed by traditional settlements, and then farm settlements.

Figure 3.6 Is a column bar chart with an overall percentage of perception of the air pollution problem. 20,70% (Yeses) of households in all settlement types reported having a problem with air pollution. This means that about one-fifth of all households are affected by air pollution. 79,30% (Nos) of households in all settlement types reported not having a problem with air pollution. This means that about four-fifths of all households are not affected by air pollution.

In conclusion, the data suggests that a huge portion of respondents from Urban Formal and Traditional Settlements report problems with air pollution, while Farms have a lower percentage of such issues. However, most respondents, overall, do not perceive a problem with air pollution.