



Association of environmental pollutants and the prevalence of intellectual disability in Caribbean countries from 2006 to 2016.



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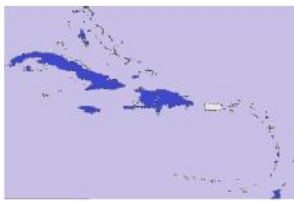
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Introduction

Environmental pollutants are considered risk factors for the development of intellectual disability when exposure occurs during pregnancy and the first years of life. This has been poorly studied in Caribbean countries, our main objective is to investigate this association.

Methodology

A descriptive-exploratory study based on data obtained from the "Our World in data" platform (<https://ourworldindata.org/>) in Microsoft Excel format that included the desired variables. Only the countries that reported all the variables of interest were included. Multivariable regression analyses and linear regression analyses were performed with the SPSS version 20 programs and the Microsoft Excel spreadsheet.



Results and Discussion

Multivariable regression analysis including all the variables demonstrated a significant correlation ($r = 0.99$, $p = 0.049$) between the incidence of intellectual disability and the environmental pollutants measured. After performing a linear regression with each variable, household air pollution ($r = 0.95$, $p < 0.001$) and the prevalence of anemia among pregnant women ($r = 0.94$, $p < 0.001$) demonstrated a strong correlation with the prevalence of intellectual disability. Outdoor air pollutants ($r = 0.71$, $p < 0.001$) and Annual CO₂ emissions ($r = 0.53$, $p < 0.001$), demonstrated a weaker but still statistically significant correlation.

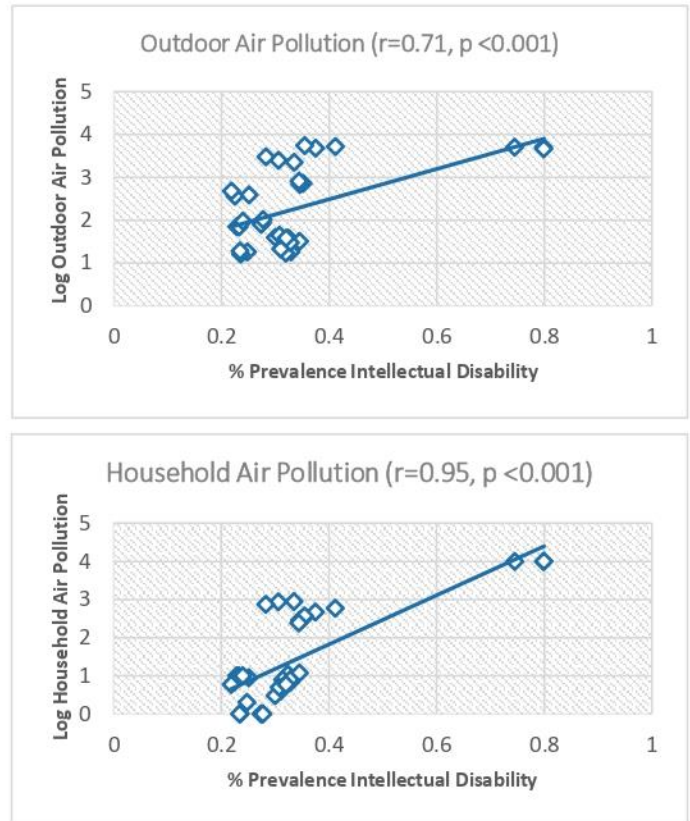
Table 1. Regression analysis.

Data analysis Output	Pearson's Correlation coefficient (r)	P-value
Multivariate regression (All variables included)	0.9876295	0.049983*
Household air pollution	0.9533765	<0.001*
Outdoor air pollution	0.7057074	<0.001*
Prevalence of anemia among pregnant women	0.9433959	<0.001*
Total including LUCF (CH ₄ emissions, CAIT)	0.2779996	0.10
Total including LUCF (N ₂ O emissions, CAIT)	0.325656	0.052
Annual CO ₂ emissions	0.534743	0.00078*

*Statistically significant.

The results found in the analysis for this study suggest that our hypothesis for the association of environmental pollutants and the incidence of intellectual disability is likely. This can be supported by the results found in Emerson et al., where children with intellectual disabilities were more likely to live close to areas with high exposure to outdoor air pollution in comparison with children without intellectual disabilities (1).

Figure 1. Correlation Scatter Plots of statistically significant variables.



During our analysis, there was a strong correlation between anemia in pregnancy and the presence of intellectual disability. A previous study by Wiegiersma et al. found that ASD and Intellectual disability prevalence was higher in children of mothers with anemia during pregnancy (2). While we found a strong correlation between household air pollution and intellectual disability, we could not find studies that supported these results.

Conclusions

We demonstrated that environmental pollutants are strongly associated with the incidence of intellectual disabilities in Caribbean countries. These results coincide with previous studies that have identified the presence of environmental pollutants as risk factors for the development of intellectual disabilities. Other factors not included in our study, including the socioeconomic level, could also influence the different variables and the presence of intellectual disability.

References

1. Emerson et al. 2019, Journal of intellectual disability research. DOI: 10.1111/jir.12561
2. Wiegiersma et al, 2019, JAMA psychiatry, DOI: 10.1001/jamapsychiatry.2019.2309