

Impact of Air Pollutants on Lung Cancer Incidence in the State of Mexico: A Correlation Study

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INTRODUCTION

Air pollution is a well-known risk factor for lung cancer (LC), which remains one of the leading causes of cancer-related deaths worldwide. In the State of Mexico (SM), the diverse levels of industrialization and urban growth offer a unique landscape to examine these effects. This study aims to explore how specific air pollutants are linked to lung cancer rates across localities, providing valuable insights that can shape public health strategies

METHODS

Our goal is to understand the relationship between air pollutants PM10, PM2.5, sulfur dioxide (SO₂), carbon monoxide (CO) and nitrogen oxides (NO) and the incidence of LC in different areas of SM. We want to identify which pollutants have the strongest association and cancer risk. We conducted a retrospective study involving 50 localities. We gathered LC incidence from regional registries and pollutant levels from monitoring stations. We calculated basic statistics for each pollutant and used Pearson correlation coefficients to see how these pollutant levels relate to cancer rates. We also examined geographic patterns, accounting for factors such as population density and socioeconomic conditions.

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- PM2.5 is the strongest correlate of lung cancer incidence in the State of Mexico ($r = 0.68$, $p < 0.01$).
- SO₂ ($r = 0.55$) and NO ($r = 0.47$) also associate; PM10 and CO do not reach significance.

Future Direction for Research

- The advance is practical. We name the pollutants that track lung cancer (PM2.5 > SO₂ > NO) and the municipalities that carry the load. Care teams know where to look.

REFERENCES & ACKNOWLEDGEMENTS

List the most critical references and recognize any support or contributions from others.

- Use QR code to save space and to link to more extensive lists or related works.



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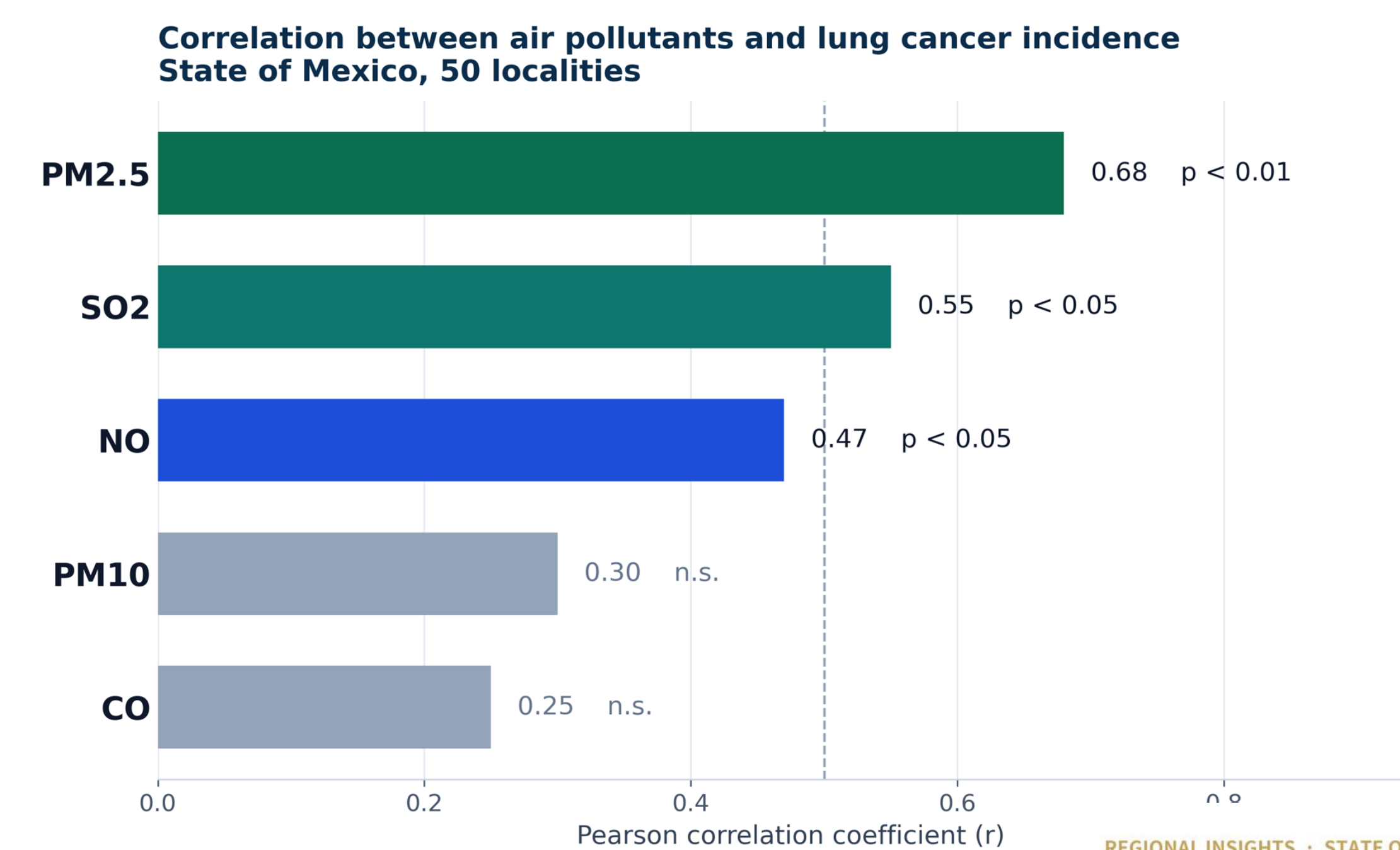
RESULTS

PM2.5 levels showed a strong positive correlation with lung cancer incidence ($r = 0.68$, $p < 0.01$), making it a major risk factor. Sulfur Dioxide (SO₂) also had a significant correlation with cancer rates ($r = 0.55$, $p < 0.05$), highlighting the impact of industrial emissions.

Nitrogen Oxides (NO) were moderately correlated with lung cancer ($r = 0.47$, $p < 0.05$), suggesting an additional risk. PM10 and Carbon Monoxide (CO) had weaker correlations ($r = 0.30$ and $r = 0.25$, respectively), but they still point to a possible link.

Regional Insights: Areas like Ecatepec de Morelos and Tlalnepantla de Baz, with higher levels of PM2.5 and SO₂, also showed higher lung cancer rates.

Regions with heavy industrial activity and high traffic had higher pollutant levels and cancer rates, emphasizing the role of environmental pollution.



REGIONAL INSIGHTS · STATE OF MEXICO

Industrial corridors concentrate PM2.5, SO₂ and lung cancer incidence

Municipalities with heavy industry and high traffic showed higher pollutant levels and higher lung cancer rates.

