

Maternal-infant Child Health and Environment Research Symposium:
“How Local Research can Influence Policy and Practice”

Thursday, February 26th, 2009, 08:00-17:00 hrs
Maple Leaf Room, Lister Conference Centre, University of Alberta

Poster Presentation: **Piotr Klakowicz, Alvaro Osornio-Vargas, Irena Buka**

Mapping the Distribution of Children’s Cancer and Pollution in Alberta: A potential tool to explore correlations and disseminate standardized information

INTRODUCTION

Our Pediatric Environmental Health research addresses questions of spatial distribution and correlation of children’s cancer cases and air-borne carcinogens in Alberta, Canada. Each year approximately 120 new cases of childhood cancer are diagnosed in Alberta. Currently we are linking data from three databases: the Alberta Cancer Registry, Statistics Canada Census, and the National Pollutant Release Inventory (NPRI). The NPRI requires specified industries to report annual releases of more than 300 substances including carcinogens from over 8,000 facilities across Canada.

METHODS

We traced reported air releases of carcinogens by individual facilities in Alberta by year, location, and quantity from 1994 to 2005. In addition to quantity of releases we assessed toxicity levels using a system of Toxic Equivalency Potentials (TEPs), which incorporates both the carcinogen’s toxicity and potential for human exposure through air. TEPs enable for comparisons of amounts of a particular carcinogen to the equivalent amount of a well-known reference carcinogen, benzene.

We found over 900 cases during the period of 1994 to 2005 in which the annual release of a particular carcinogen by an individual facility was at least one tonne of benzene-equivalents. The emissions were ranked and the pertinent carcinogens were found to be arsenic, cadmium, chromium, and benzene. The individual facilities accountable for highest levels, emitting at least 500 tonnes of benzene-equivalents into the air in a single year, were located in or near urban centers.

RESULTS

Working with NPRI data can reveal time, place, quantity, and toxicity of pollution releases into the environment. Although releases do not directly correlate to exposures and are therefore not equivalent to actual levels of risk, toxicity analysis in terms of TEPs may be useful for screening the potential health impacts of such releases.

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CONCLUSION

The linking of environment and health data clearly has inherent limitations, however, it can be furthered by integrating spatial-temporal analysis of pollutants and disease cases. The next step in our project will be to investigate spatial relations between sources of carcinogenic air releases in relation to childhood population density and with children's cancer cases in Alberta.

IMPLICATIONS

Visualizing potentially heavily polluted areas with carcinogens, childhood population density and occurrence of children's cancer, is a way of designing surveillance tools to identify areas where emission control could be pertinent and at the same time, allows for designing exposure prevention actions. Furthermore this tool could be adapted to visualize other pollutant emissions and potentially related diseases and therefore allow for planning of health, education and other pertinent services in local communities.