

DSICCR Tuesday Seminar Series

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Spatial Analysis of Industrial Benzene Emissions and Cancer Incidence Rates in Texas

Dejian Lai, Ph.D.

Professor of Biostatistics
School of Public Health

The University of Texas Health Science Center at Houston

This talk presents a spatial analysis of the association between industrial benzene emissions and the 10-year incidence rates of cancers likely to be associated with benzene exposure (Lymphohematopoietic, lung and lip cancers) at the county level in Texas. The spatial distribution of incident cases of the above cancers between 2004 and 2013 was assessed at the county level and found to have positive spatial auto-correlation. Subsequently, point pattern analysis was performed on industrial emissions of benzene reported to the Toxic Release Inventory (TRI), revealing a non-random spatial pattern. Universal kriging was performed using the industrial emissions data to derive estimates of ambient benzene levels at the county level. An ordinary linear regression model was fitted using the incidence rates as the outcome and the estimated benzene level along with chosen covariates and the residuals were assessed for lingering spatial auto-correlation. As the residuals showed that spatial auto-correlation persists, a spatial conditional auto-regression (CAR) model was fitted instead. In the spatial CAR linear regression model, estimated levels of ambient benzene were not found to be significantly associated with the 10-year incidence rates of lymphohematopoietic, lung and lip cancers at the county level.

Tuesday, April 19th, 2022. 12p – 1p. [Webcast](#)

Contact: Xiaohong.Bi@uth.tmc.edu

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