

# Infant Mortality and Proximity to Industrial Facilities Modification Effect by Neighborhood Socioeconomic Characteristics

Deguen, Séverine<sup>1,2</sup>; Padilla, Cindy<sup>1,2</sup>; Lucas, Emminarie<sup>1,2</sup>; Rey, Grégoire<sup>3</sup>;  
Zmirou-Navier, Denis\*†§¶

<sup>1</sup>EHESP-School of Public Health, Rennes, France; <sup>2</sup>IRSET—Institute for Research in Environmental and Occupational Health, Rennes, France; <sup>3</sup>INSERM-CépiDc, Paris, France; <sup>4</sup>INSERM U954, Vandoeuvre-les-Nancy, France; and <sup>5</sup>Nancy University Medical School, Vandoeuvre-les-Nancy, France.

**Background/Aims:** Evidence of social health inequalities is well established; socioeconomically disadvantaged populations are more strongly affected by health problems. In spite of numerous risk factors already identified, a part of these inequalities remain unexplained. Environmental nuisances are suspected to play a role in this disparity.

**Objective:** To investigate association between infant mortality and presence of polluting industries and to assess whether the strength of the association is modified by socioeconomic characteristics.

**Methods:** An ecological study was conducted in Lille (226,000 inhabitants) located in North France. Information on industries' location was drawn from the French database of the European-Pollutants-Emission-Register. We used census data to characterize neighborhood socioeconomic status. Mortality information was obtained at a municipality level. We investigated by logistic regression the association between infant mortality and the presence of polluting industries in the town of residence of the mother, stratified by socioeconomic characteristics.

**Results:** There were 705 infant mortality cases in Lille between 2000 and 2009 (death rates of 4.2 per 1000 live births). A greater death risk was found in municipalities hosting 1 or more polluting industries (OR = 3.1;  $P = 0.043$ ). The strength of the association was modified by socioeconomic neighborhood characteristics. While there was no association in the subgroup of municipalities with low unemployment or proportion of single-parent families, the risk was increased among municipalities with high unemployment or proportion of single-parent families (OR = 6.6;  $P = 0.07$ –OR = 8.4;  $P = 0.06$ ).

**Conclusion:** This observation may result from a greater exposure to industrial pollution due to a greater number of emitting plants in deprived municipalities. It could also stem from a vulnerability phenomenon whereby residents might be more sensitive to the exposure effect because of a poorer health status and lower access to appropriate care. More refined analyses are underway to identify the most plausible explanations and to communicate a public health message to local authorities.