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

Deguen, Séverine¹,²; Padilla, Cindy¹,²; Lucas, Emminarie¹,²; Rey, Grégoire³; Zmirou-Navier, Denis*†§¶¹

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