

EXPOSURE ASSESSMENT OF A RETROSPECTIVE COHORT OF RESIDENTS NEAR INCINERATORS IN ITALY: A GEOGRAPHICAL APPROACH

Andrea Ranzi, *Environmental Health Reference Centre, Regional Agency for Environmental Prevention of Emilia-Romagna, Modena, Italy*

Michele Cordioli, *Environmental Health Reference Centre, Regional Agency for Environmental Prevention of Emilia-Romagna, Modena, Italy*

Anna Freni Sterrantino, *Environmental Health Reference Centre, Regional Agency for Environmental Prevention of Emilia-Romagna, Modena, Italy*

Paolo Marzaioli, *Epidemiology Unit, Local Health Authority of Reggio Emilia, Italy*

Laura Bonvicini, *Epidemiology Unit, Local Health Authority of Reggio Emilia, Italy*

Carla Ancona, *Department of Epidemiology, Regional Health Service, Lazio, Italy*

Paola Angelini, *Regional Health Authority, Emilia-Romagna, Italy*

Silvia Candela, *Epidemiology Unit, Local Health Authority of Reggio Emilia, Italy*

Paolo Lauriola, *Environmental Health Reference Centre, Regional Agency for Environmental Prevention of Emilia-Romagna, Modena, Italy*

Francesco Forastiere, *Department of Epidemiology, Regional Health Service, Lazio, Italy*

Background and Aims: Health effects of exposure to incinerators are controversial. In Emilia-Romagna region (northern Italy), a multisite project (MONITER project) is focusing on the environmental and health impact of eight municipal solid waste plants (MSW). Effects of past exposures on mortality and cancer incidence are under study. In the first stage a large retrospective cohort of residents has been set up and characterized.

Methods: Study areas were defined as the 4 km zones around the six MSW incinerators, that were already active before 1995. Follow-up period ranged from 1995 (first availability of health data) to 2006. Exposure assessment to incinerators was performed by means of pollution map of particulate, provided by ADMS dispersion model outputs. Collection of past emission data were used as inputs for models. Different models were constructed for each plant, according to renewals during study period. Exposure levels at enrolment (1995) were used, since cumulative exposure could not be estimated as complete residential history since start of the plants were not available. Simulations of pollutants dispersion were also performed for all other sources in the areas (traffic, heating, industries, agriculture). Deprivation index was calculated at census tract level. Exposure estimates at home location were calculated using G.I.S.

Results: A total of 219,615 residents were involved (2,157,390 person/years). During the study period 27,573 deaths for natural causes (mortality rate: 1278x100.000pys), and 14,287 cases of cancer occurred (incidence rate: 758x100.000pys). Mean exposure to particulates from incinerators at enrolment was 6.24 nanograms/m³ [s.d. 14.29]. Mean exposure to NO₂ from all other sources was 56.63 micrograms/m³ [s.d. 32.09]. No relation between deprivation index and exposure to incinerators was observed.

Conclusions: We constructed a large retrospective cohort of residents near incinerators with a geographical approach for exposure assessment. Possible misclassification due to assignment to exposure at a specific time (enrolment) is under study.