### Introduction

**Asian context**

Mesothelioma risk increases in a general population exposed to asbestos from an industrial source.

**Critical appraisal**

The study examined the spatial variation of mesothelioma risk in an area with high levels of asbestos pollution from an industrial plant in Italy, adjusting for occupational and domestic exposures and found a rapidly decreasingly risk with increasing distance from the factory.

**Unique keywords**

Environmental asbestos exposure, mesothelioma

## Abstract

Background: Environmental asbestos pollution can cause malignant mesothelioma, but few studies have involved dose-response analyses with detailed information on occupational, domestic, and environmental exposures.

Objectives: In the present study, we examined the spatial variation of mesothelioma risk in an area with high levels of asbestos pollution from an industrial plant, adjusting for occupational and domestic exposures.

Methods: This population-based case-control study included 103 incident cases of mesothelioma and 272 controls in 1987-1993 in the area around Casale Monferrato, Italy, where an important asbestos cement plant had been active for decades. Information collected included lifelong occupational and residential histories. Mesothelioma risk was estimated through logistic regression and a mixed additive-multiplicative model in which an additive scale was assumed for the risk associated with both residential distance from the plant and occupational exposures. The adjusted excess risk gradient by residential distance was modeled as an exponential decay with a threshold.

Results: Residents at the location of the asbestos cement factory had a relative risk for mesothelioma of 10.5 [95% confidence interval (CI), 3.8-50.1], adjusted for occupational and domestic exposures. Risk decreased rapidly with increasing distance from the factory, but at 10-km the risk was still 60% of its value at the source. The relative risk for occupational exposure was 6.0 (95% CI, 2.9-13.0), but this increased to 27.5 (95% CI, 7.8-153.4) when adjusted for residential distance.

Conclusions: This study provides strong evidence that asbestos pollution from an industrial source greatly increases mesothelioma risk. Furthermore, relative risks from occupational exposure were underestimated and were markedly increased when adjusted for residential distance.
### Factsheet on Asbestos and Asbestos-Related Diseases

#### Annotation

| Fact 1 | In an Italian case-control study to determine spatial variation modeling of mesothelioma risk in surrounding area of an asbestos cement plant, the risks of pleural mesothelioma in relation to occupations were 7.1 (3.5-14.3) for asbestos cement workers, 1.7 (1.1-2.7) for domestic exposure to asbestos and 3.4 (1.8-6.5) for relatives’ asbestos cement workers. |
| Fact 2 | Risk of pleural mesothelioma decreased with increasing distance from the asbestos cement plant, with strong evidence of a spatial trend (p<0.0001). The band at 3-5 km from the asbestos cement plant included a remarkably high concentration of cases (OR 14.3; 4.7-43.6). |
| Fact 3 | Relative risks (RR) of pleural mesothelioma in relation to occupations after adjustment for the residential distance from the asbestos cement plant are 27.5 (7.8-153.4) for asbestos cement workers, 1.3 (0.8-2.3) for domestic exposure to asbestos and 1.4 (0.7-2.9) for relatives’ asbestos cement occupation. |
| Fact 4 | At 10 km from the asbestos cement plant, the relative risk of pleural mesothelioma was estimated to have decreased by about 60%, from 10.5 to 4.2 (still remarkably high). |
| Fact 5 | Residential distance exposure to asbestos was a very strong confounder of occupational exposure. |

#### References