

## Scientific Letter

### Mesothelioma: An Ongoing Problem



To the Director,

Pleural mesothelioma is a cancer uniquely associated in our setting with the inhalation of asbestos fibers, although asbestos exposure can also cause other diseases, including pleural plaques, pulmonary asbestosis, pleural effusions, and other cancers. Given its poor therapeutic response, mesothelioma still has a grim prognosis. It is characterized by 2 specific features: no minimum carcinogenic dose-response level for safety, and a very long latency period, which can reach an average of 40–50 years.

There are 3 well-established sources of asbestos exposure: occupational exposure; cohabitation with an exposed worker; and environmental exposure as a result of living or working in the vicinity of a source of emission.

Some prediction studies foresee the stabilization of pleural mesothelioma incidence in Europe, although most only take into consideration male subjects and occupational exposure. Prediction curves show a sustained increase in cases peaking around 2020, followed by a plateau or stabilization phase, and a subsequent decline.<sup>1–3</sup>

We conducted a retrospective study in the region of Vallès Occidental Est in the province of Barcelona (Catalonia, Spain), a region that comprises 11 municipalities, 442,914 inhabitants, and one reference hospital, the Hospital Universitari Parc Taulí, in Sabadell.<sup>4</sup> The first and largest fiber cement factory in Spain, which was active for 90 years from 1907 to 1997, operated on a site located between 2 of these municipalities (Cerdanyola del Vallès and Ripollit).

We searched the e-cap (the Catalan Institute of Health patient registry and follow-up database) for patients with a histologically confirmed diagnoses of pleural mesothelioma between 1975 and 2020.

In all cases, the patient or a close relative was subsequently interviewed to complete the information about the source of exposure.

As different sources of exposure often overlap, the main source was designated according to the established criterion of highest to lowest intensity of exposure, i.e., occupational, cohabitation, or environmental.<sup>5</sup>

From 1975 to 2020, 274 cases of pleural mesothelioma were diagnosed, 143 due to occupational exposure, 86 to environmental exposure, and 45 to cohabitation with an exposed worker. The percentage of the different exposures varies according to the 5-year diagnostic period, reflecting the predominant type of exposure in the years prior to diagnosis. The overall trend showed a clear increase in the number of new cases during the study period. The

Number of cases of mesothelioma pleural, by 5-yearly diagnostic period and main exposure type

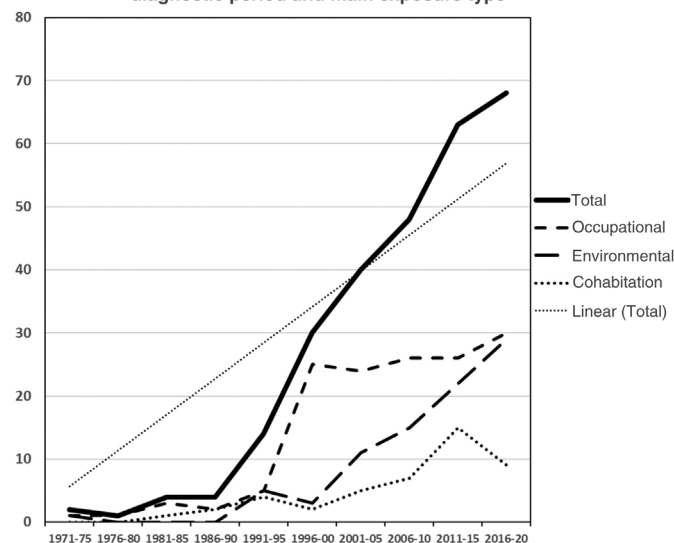


Fig. 1. Number of new cases of pleural mesothelioma in the region of Vallès Occidental Est, by 5-yearly diagnostic periods, total and main exposure to asbestos.

cumulative incidence for the years 1996–2020 in our area was 2.21 cases/100,000 inhabitants.

In Fig. 1, the 274 new cases of pleural mesothelioma diagnosed in the study area are shown as the total number of cases, the number of cases by main source of exposure, and the overall trendline for the period. New cases are grouped by 5-year periods (Fig. 1).

Since their inception in 1975, the 5-yearly case number records have shown an increase in the total number of pleural mesotheliomas, with an upward trend in the epidemiological curve that shows no signs of stabilization in the total number.

If we study the figures according to the main sources of exposure, we see that:

- The number of cases of occupational exposure has plateaued since 1996, although a wider range of occupations has been appearing in recent years. This may be due to longer latency periods associated with less intense exposures or increased awareness of occupational risk by physicians and/or affected workers.
- The number of cases of exposure due to cohabitation has fallen since 2011, 40 years after the 1977 ban on bringing work clothes home to wash. Workers' clothes used to be laundered by a member of the family (usually the wife).

This finding suggests a slow decline in cases resulting from measures to prevent exposure due to the long latency period between exposure and disease. Therefore, the prevention measures we adopt today will have their greatest effect some years down the line, with new cases falling after the end of the latency period since last exposure.

- The number of cases of environmental exposure has increased since 1996, and overall case numbers have continued to increase between then and 2020. This is due to environmental exposure to asbestos in poor condition, as a result of either proximity to former contaminated industrial sites or inhalation of fibers from asbestos-containing materials in old buildings, demolition sites and landfills that contain remains of degraded asbestos.

The number of pleural mesothelioma diagnoses continues to grow in Vallès Occidental Est. Our data show that in recent years mesothelioma and, therefore, all asbestos-related disease, is still largely due to occupational exposure. However, newly diagnosed cases are increasingly due to environmental pollution by asbestos, and this is a serious public health problem.

The current problem of exposure to asbestos is therefore no longer a uniquely occupational issue limited to certain businesses or professional activities, as was the case until the 1990s, when patients were mainly people who worked in Spanish towns with significant levels of pollution from fiber cement factories, shipyards, etc. A similar pattern of occupational exposure was detected in the province of Barcelona during this period.<sup>5</sup> More recent studies in our area have already detected the increasing importance of environmental exposure as a cause of pleural mesotheliomas.<sup>6,7</sup> This type of exposure is remarkable for higher rates of new cases among women, as reported in descriptive studies conducted in other countries.<sup>8</sup>

Environmental exposure is now the main cause of the sustained increase in the number of new cases of pleural mesothelioma in our area and in others where exposure to materials containing degraded asbestos persists.<sup>9,10</sup>

Despite the 2002 ban on importing, using, and installing asbestos-containing materials, the cumulative incidence of pleural mesothelioma continues to rise.

Our data suggest that the presence of deteriorated asbestos-containing materials (in homes, schools, workshops, old factories, other types of buildings, trains, ships, old vehicles, landfill sites, etc.) is a threat to public health and its removal should be a health policy priority for the general population.

### Data sharing

Data will be provided on reasonable request to the corresponding author. The most relevant study data are included in the article.

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This study has not received any public or private grants or funding.

### Conflict of interest

No commercial or financial relationships that could generate any conflict of interest were involved in the preparation of this article.

### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.arbres.2023.03.025](https://doi.org/10.1016/j.arbres.2023.03.025).

### References

- Peto J, Decarli A, La Vecchia C, Levi F, Negri E. The European mesothelioma epidemic. *Br J Cancer*. 1999;79:666–72. <https://www.nature.com/articles/6690105> [consulted 26.1.23].
- Hodgson JT, McElvenny DM, Darnton AJ, Price MJ, Peto J. The expected burden of mesothelioma mortality in Great Britain from 2002 to 2050. *Br J Cancer*. 2005;92:587–93. <http://dx.doi.org/10.1038/sj.bjc.6602307> [consulted 26.1.23].
- López-Abente G, García-Gómez M, Menéndez-Navarro A, Fernández-Navarro P, Ramis R, García-Pérez J, et al. Pleural cancer mortality in Spain: time-trends and updating of predictions up to 2020. *BMC Cancer*. 2013;13:528. <https://bmccancer.biomedcentral.com/articles/10.1186/1471-2407-13-528> [consulted 26.1.23].
- Tarrés J, Abós-Herrándiz R, Albertí C, et al. Enfermedad por amianto en una población próxima a una fábrica de fibrocemento. *Arch Bronconeumol*. 2009;45:429–34. <https://www.archbronconeumol.org/es-enfermedad-por-amianto-una-poblacion-articulo-S0300289609002233> [consulted 26.1.23].
- Grupo de Estudio del Mesotelioma en Barcelona (GEMEB). Mortalidad por mesotelioma pleural en la provincia de Barcelona. *Med Clin (Barc)*, 101 (1993), pp. 565–9. <https://www.tdx.cat/bitstream/handle/10803/4597/aat6de6.pdf;jsessionid=4937C95B54CD6C019672BC55-DAE169CF?sequence=6> [consulted 26.1.23].
- Tarrés J, Albertí C, Martínez-Artés X, et al. Pleural mesothelioma in relation to meteorological conditions and residential distance from an industrial source of asbestos. *Occup Environ Med*. 2013;70:588–90. <https://oem.bmj.com/content/70/8/588.long> [consulted 26.1.23].
- Orriols R, Tarrés J, Albertí-Casas C, Rosell-Murphy M, Canela-Soler J, Abós-Herrándiz R, Orriols R. Malignant asbestos-related disease in a population exposed to asbestos. *Am J Ind Med*. 2020;63:796–802. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/ajim.23141> [consulted 26.1.23].
- Marinaccio A, Corfiati M, Binazzi A, et al. *Occup Environ Med*. 2018;75:254–62. <https://oem.bmj.com/content/oemed/75/4/254.full.pdf> [consulted 26.1.23].
- Ferrante D, Mirabelli D, Tunesi S, et al. Pleural mesothelioma and occupational and non-occupational asbestos exposure: a case-control study with quantitative risk assessment. *Occup Environ Med*. 2016;73:147–53. <https://oem.bmj.com/content/73/3/147.long> [consulted 26.1.23].
- Xu R, Barg FK, Emmett EA, et al. Association between mesothelioma and non-occupational asbestos exposure: systematic review and meta-analysis. *Environ Health*. 2018;17:90. <http://dx.doi.org/10.1186/s12940-018-0431-9> [consulted 26.1.23].

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