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Data linkage to national Australian health insurance data to investigate exposure to environmental hazards: the example of residential asbestos

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Introduction

The enrolment data for Medicare, the Australian universal health insurance provider, covers almost the entire population. Medicare data are commonly used for data linkage, usually to access national medical and pharmaceutical data. However, the enrolment data also enable the identification of geographical cohorts for studies analysing exposure to environmental hazards.

Objectives and Approach

One example of this was the ACT Asbestos Health Study examining the health risks associated with living in houses insulated with loose-fill asbestos in the Australian Capital Territory. The Medicare Enrolment File contains the personal details and addresses of all people enrolled since 1984, including all updates to these details. We linked these data to a register of 1100 affected properties, with subsequent linkage to the national death index and the Australian Cancer Database. We estimated Standardized Incidence Ratios (SIR) for selected cancers in people living in these houses to obtain a measure of exposure to environmental risk within the population.

Results

After intensive cleaning and standardisation, nearly all (99.8%) of the affected addresses were linked. There were over one million people who had at least one ACT address between 1983 and 2013, and 2% of these had lived at an affected address and classified as exposed. The adjusted incidence of mesothelioma in exposed males was 2.5 times that of unexposed males (SIR 2.54, 95% CI 1.02–5.24), and there were some statistically significant results. The study population, number of deaths and cancers of interest were validated against the ACT census and registry figures. There were some limitations in coverage due to the period of available data, the frequency of address

updates, and records with postal rather than residential addresses, but these were tested by sensitivity analyses.

Conclusion/Implications

The study demonstrates the power of data linkage to (a) obtain a measure of exposure to an environmental risk within a population, and (b) obtain outcomes for the resulting case and control cohorts. This method could be applied in other risk studies where exposure is based on geography.