

PARTICULATE AIR POLLUTION IN ARMIDALE

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Declaration

I certify that the substance of this dissertation has not already been submitted for any other degree and is not being currently submitted for any other degrees.

I also certify that to the best of my knowledge any help received in preparing this dissertation, and all sources used, have been duly acknowledged.



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Abstract

Epidemiological studies have consistently shown associations between particulate air pollution, especially with fine particles, and mortality and morbidity. This study has assessed the effects of particulate air pollution in terms of health status and economic cost and reviewed policy options to reduce the air pollution problem in Armidale.

The first stage of the study involved a theoretical assessment of the health effects and economic costs of the current level of air pollution. The calculation of health effect used dose-response relationships from relevant epidemiological literature. Recognised monetary values were attached to estimated health effects. A conservative estimate of the annual economic cost of mortality effects and restricted activity days due to particulate air pollution in Armidale ranged between A\$6.5 million and A\$25.7 million.

Using Analysis of Proportions and Poisson regression, the second stage of the study empirically established a relationship between respiratory morbidity and particulate air pollution, based on respiratory visits to local General Practitioners' (GP) clinics. The relationship showed that, at average values of minimum temperature and air pollution during winter, 14.8 percent of all patients or 7.45 persons per day had respiratory illness associated with particulate air pollution. The average daily cost of GP visits alone for pollution induced respiratory illness was calculated to be A\$1,125.

The third stage of the study investigated the behaviour and perception of the population and their attitudes towards wood heaters and air pollution in Armidale. The household survey used a contingent valuation method to assess the willingness to pay for clean air.

The study also examined strategies for wood smoke control used in Australia and overseas and explored possible policy options to reduce particulate air pollution in Armidale. Besides various incentives and voluntary options, the analysis reinforced the need for mandatory regulations for an effective air pollution control strategy.

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