PARTICULATE AIR POLLUTION IN ARMIDALE

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Thesis Submitted in fulfilment of the requirements for the Degree of Doctor of Philosophy

The University of New England
Armidale, Australia

September 2002

Acknowledgments

I wish to express my most sincere gratitude to Professor Kevin Parton, my supervisor, for his guidance over these years. I am grateful for his confidence in me, as well as for his devoted effort, time and inspiration. I must thank Bev Parton who together with Kevin gave me the shelter when I needed it most.

I would also like to thank my research supervisors for their support. Associate Professor Howard Doran helped me immensely with my econometric analysis and displayed infinite patience while dealing with my occasional ignorance. Howard and Heather Doran were always there with encouragement and advice. Dr. Jeanne Madison offered many insightful comments on my work. I am grateful to them all.

I would like to thank Dr. S. Hossain for responding to my panic calls, reassuring me that the data were all right, Dr. David Plummer for extending all his support and advice and Dr. Chris Donavon for his help with data collection. I am grateful to Ms. D. Robinson, Dr. G Baker and Dr. Zafar for their comments and feedback. I must thank Ms. Thea Harris for her timely advice and support in administrative matters and Dr. M. Jones for his superb editing work.

I wish to express my gratitude to all the participating GPs in Armidale for their time and input. Without their cooperation, this study would have not been possible. I also wish to acknowledge the support extended by the Armidale Dumaresq Council with air pollution data, the New England Division of General Practices and the School of Health, University of New England.

I must thank my family and loved ones for their patience and encouragement while I was in the doctoral program, especially, my son Sadi, for his understanding.

I dedicate this thesis to my sister, Poly, for all her sacrifices to make me feel comfortable and at peace.

Above all, I am grateful to God.

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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