

LUNG FUNCTION AND AIR POLLUTION IN AUSTRALIAN SCHOOL-CHILDREN

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Background and Aims: Motivated by the review of Australian air quality standards, we aimed to quantify the effect of air pollution on lung function in a national sample of Australian school-children.

Methods: Nationally monitored data was assembled for a recent five-year period, and 30 sites chosen to maximise variation in exposure to 'criteria' pollutants. Two schools were chosen from each site, within 2.5 km of monitoring site. We recruited 50-60 children per school and obtained a sample of 3,200 children. Children had to live and go to school within a 2.5 km radius of the air monitoring stations. GEE models were used to examine associations after adjustment for design factors and covariates. Multi-pollutant models were examined.

Results: Lung function was significantly adversely affected by NO₂ with declines in pre-bronchodilator FEV₁, post-bronchodilator FEV₁, and FVC of 26.2 ml/s (95% CI 10.1-42.2), 25.9 ml/s (10.4, 41.4) and 25.3ml (10.0-40.6), respectively, per IQR of mean NO₂ over the last 12 months. Results were similar for mean lifetime exposure, and when other pollutants were adjusted for. SO₂ showed adverse effects in atopic children and in males. Mean lifetime NO₂ levels were 9.3 ppb (range 2.8 – 18.3 ppb).

(Need to add something re particle results – weak associations for limited outcomes as this something that they will be interested in).

Conclusion: Long-term exposure to NO₂ reduces lung function in Australian school-children at levels below current air quality standards.