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.