

## Asthma in exercising children exposed to ozone: a cohort study

*Rob McConnell, Kiros Berhane, Frank Gilliland, Stephanie J London, Talat Islam, W James Gauderman, Edward Avol, Helene G Margolis, John M Peters*

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**Department of Preventive Medicine, University of Southern California School of Medicine, Los Angeles, CA, USA** (R McConnell MD, K Berhane PhD, F Gilliland MD, T Islam MS, W J Gauderman PhD, E Avol MS, Prof J M Peters MD); **National Institute of Environmental Health Sciences, Research Triangle Park, NC, USA** (S J London MD); **and California Air Resources Board, Sacramento, CA, USA** (H G Margolis MS)

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**Correspondence to:** Dr Rob McConnell, Department of Preventive Medicine, University of Southern California School of Medicine, 1540 Alcazar Street, CHP 236, Los Angeles, CA 90089-9011, USA (e-mail: [rmcconne@hsc.usc.edu](mailto:rmcconne@hsc.usc.edu))

### Summary

**Background** Little is known about the effect of exposure to air pollution during exercise or time spent outdoors on the development of asthma. We investigated the relation between newly-diagnosed asthma and team sports in a cohort of children exposed to different concentrations and mixtures of air pollutants.

**Methods** 3535 children with no history of asthma were recruited from schools in 12 communities in southern California and were followed up for up to 5 years. 265 children reported a new diagnosis of asthma during follow-up. We assessed risk of asthma in children playing team sports at study entry in six communities with high daytime ozone concentrations, six with lower concentrations, and in communities with high or low concentrations of nitrogen dioxide, particulate matter, and inorganic-acid vapour.

**Findings** In communities with high ozone concentrations, the relative risk of developing asthma in children playing three or more sports was 3.3 (95% CI 1.9-5.8), compared with children playing no sports. Sports had no effect in areas of low ozone concentration (0.8, 0.4-1.6). Time spent outside was associated with a higher incidence of asthma in areas of high ozone (1.4, 1.0-2.1), but not in areas of low ozone. Exposure to pollutants other than ozone did not alter the effect of team sports.

**Interpretation** Incidence of new diagnoses of asthma is associated with heavy exercise in communities with high concentrations of ozone, thus, air pollution and outdoor exercise could contribute to the development of asthma in children.