

COMMITTEE ON THE MEDICAL EFFECTS OF AIR POLLUTANTS**OZONE – EFFECTS ON RESPIRATORY SYMPTOMS IN PANEL STUDIES
–KEY PAPERS**

Selected papers from the reference list to the paper on ozone and respiratory symptoms are attached. Reasons for the selection are given below.

UK studies

Higgins, B.G., Francis, H.C., Yates, C.J., Warburton, C.J., Fletcher, A.M., Reid, J.A., Pickering, C.A.C. and Woodcock, A.A. (1995) Effects of air pollution on symptoms and peak expiratory flow measurements in subjects with obstructive airways disease. *Thorax* **50**, 149-155.

Associations in asthmatics at low concentrations

Taggart SC, Custovic A, Francis HC, Faragher EB, Yates CJ, Higgins BG et al. (1996) Asthmatic bronchial hyperresponsiveness varies with ambient levels of summertime air pollution. *European Respiratory Journal*; **9**(6):1146-1154.

NB Unusual measurement method in above two studies

Ward, D.J., Roberts, K.T., Jones, N., Harrison R.M., Ayres, J.G., Hussain, S. et al. (2002). Effects of daily variation in outdoor particulates and ambient acid species in normal and asthmatic children. *Thorax* **57**, 489-502.

European studies – significant associations at lowest concentrations

Brunekreef, B., Hoek, G., Breugelmans, O. and Leentvaar, M. (1994) Respiratory effects of low-level photochemical air pollution in amateur cyclists. *Am.J.Respir.Crit.Care Med.* **150**, 962-966.

Associations in non-asthmatics at low concentrations but with vigorous exercise

Desqueyroux, H., Pujet, J.-C., Prosper, M., Squinazi, F. and Momas, I. (2002). Short-term effects of low-level air pollution on respiratory health of adults suffering from moderate to severe asthma. *Environ Health* **89**, 29-37.

In addition to Higgins et al above, association robust in multi-pollutant model in asthmatics at low concentration. City centre monitor underestimating ozone concentrations?

Studies showing concentration-response functions (Fig 1-4 in main paper)

Ostro, B.D., Lipsett, M.J., Mann, J.K., Krupnick, A. and Harrington W. (1993). Air pollution and respiratory morbidity among adults in Southern California. *Am. J. Epidemiol.* **137**, 691-700.

Schwartz, J., Dockery, D.W., Neas, L.M., Wypij, D., Ware, J.H., Spengler, J.D., Koutrakis, P., Speizer, F.E. and Ferris, B.C. (1994). Acute effects of summer air pollution on respiratory symptom reporting in children. *Am. J. Respir. Crit. Care Med.* **150**, 1234-1242.

Note discussion of multi-pollutant model and reduction in sample size.

Thurston, G.D., Lippmann, M., Scott, M.B. and Fine, J.M. (1997) Summertime haze air pollution and children with asthma. *Am J Respir Crit Care Med* **155**, 654-60.

Studies showing sensitive groups

Delfino, R.J. (1998). Symptoms in pediatric asthmatics and air pollution: differences in effects by symptom severity, anti-inflammatory medication use and particulate averaging time. *Environ. Health Perspect.* **106**, 715-761.

Note higher odds-ratios in small sub-groups (although not all chosen a priori)

Personal exposure

Delfino, R.J., Coate, B.D., Zieger, R.S., Seltzer, J.M., Street, D.H., Koutrakis, P. (1996). Daily asthma severity in relation to personal ozone exposure and outdoor fungal spores. *Am. J. Respir. Crit. Care Med.* **154**, 633-641.

Delfino RJ, Zeiger RS, Seltzer JM, Street DH, Matteucci RM, Anderson PR et al. (1997) The effect of outdoor fungal spore concentrations on daily asthma severity. *Environmental Health Perspectives*; **105**(6):622-635.

Note change in limit of detection between studies.