

Impact of air pollution on respiratory disease

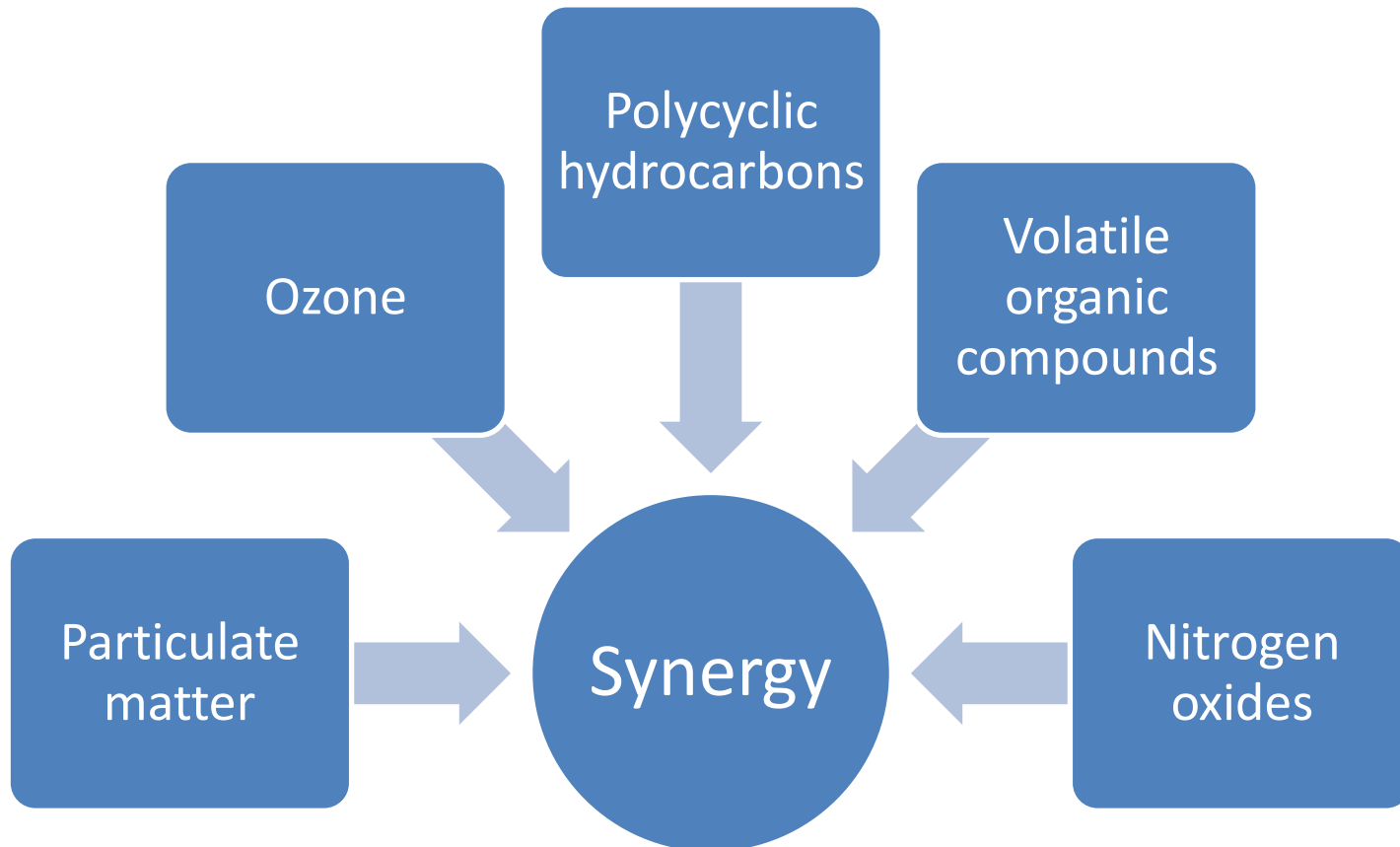
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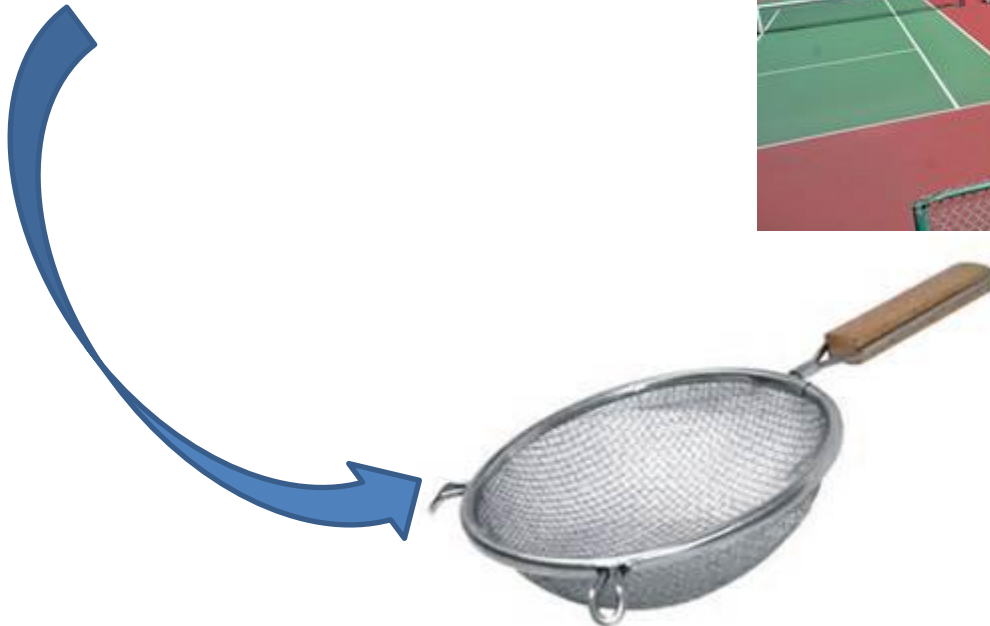


Which pollutants?

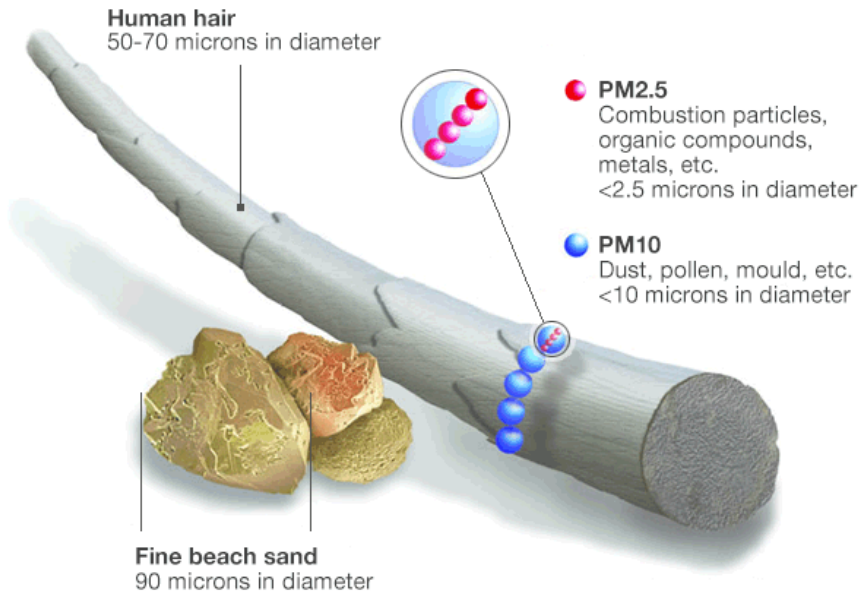


10,000
litres of
air/day

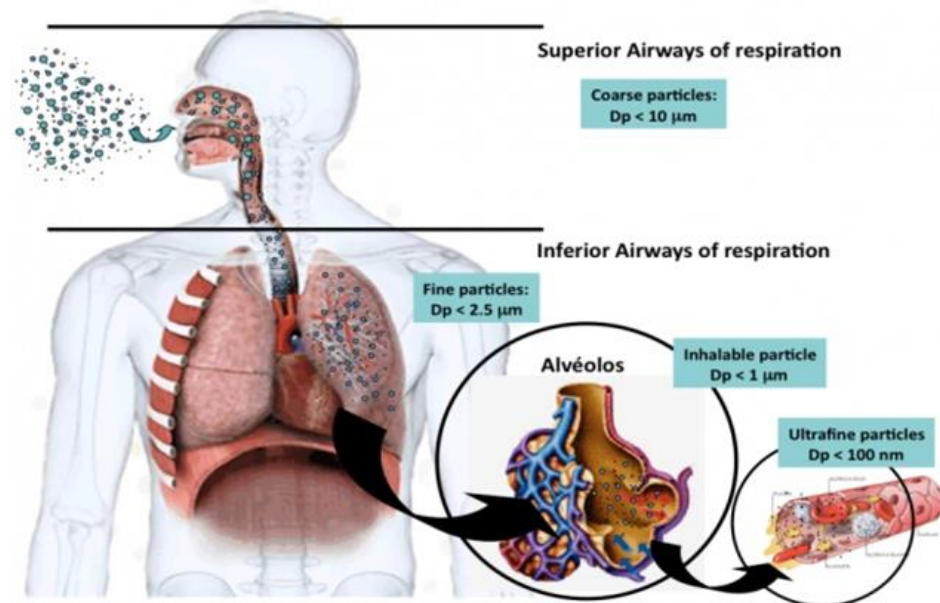
The lung as a sieve



Particulate matter



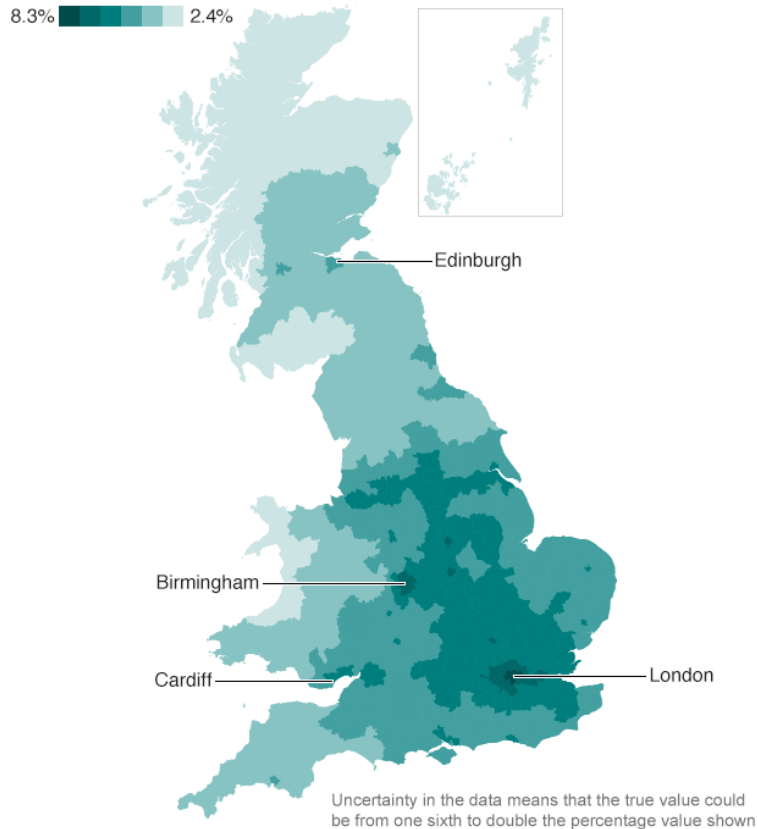
Source: US EPA



Major cause of mortality

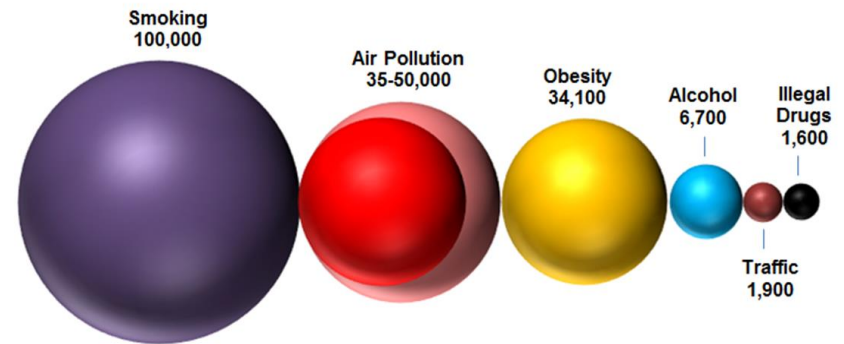
Air pollution deaths

Estimated percentage of adult deaths attributable to PM 2.5 particulate air pollution
Map data does not include other types of air pollution, eg nitrogen dioxide



Source: Public Health England

BBC



Susceptible groups

- Children
 - Increased respiratory volume per weight
 - More sensitive to airways irritation and higher risk of developing infections
- Elderly
 - Poorer immune systems and less reserve
- Pre-existing conditions
 - Asthma / COPD
- Pregnancy
 - Reduced birth weight and increased maternal complications

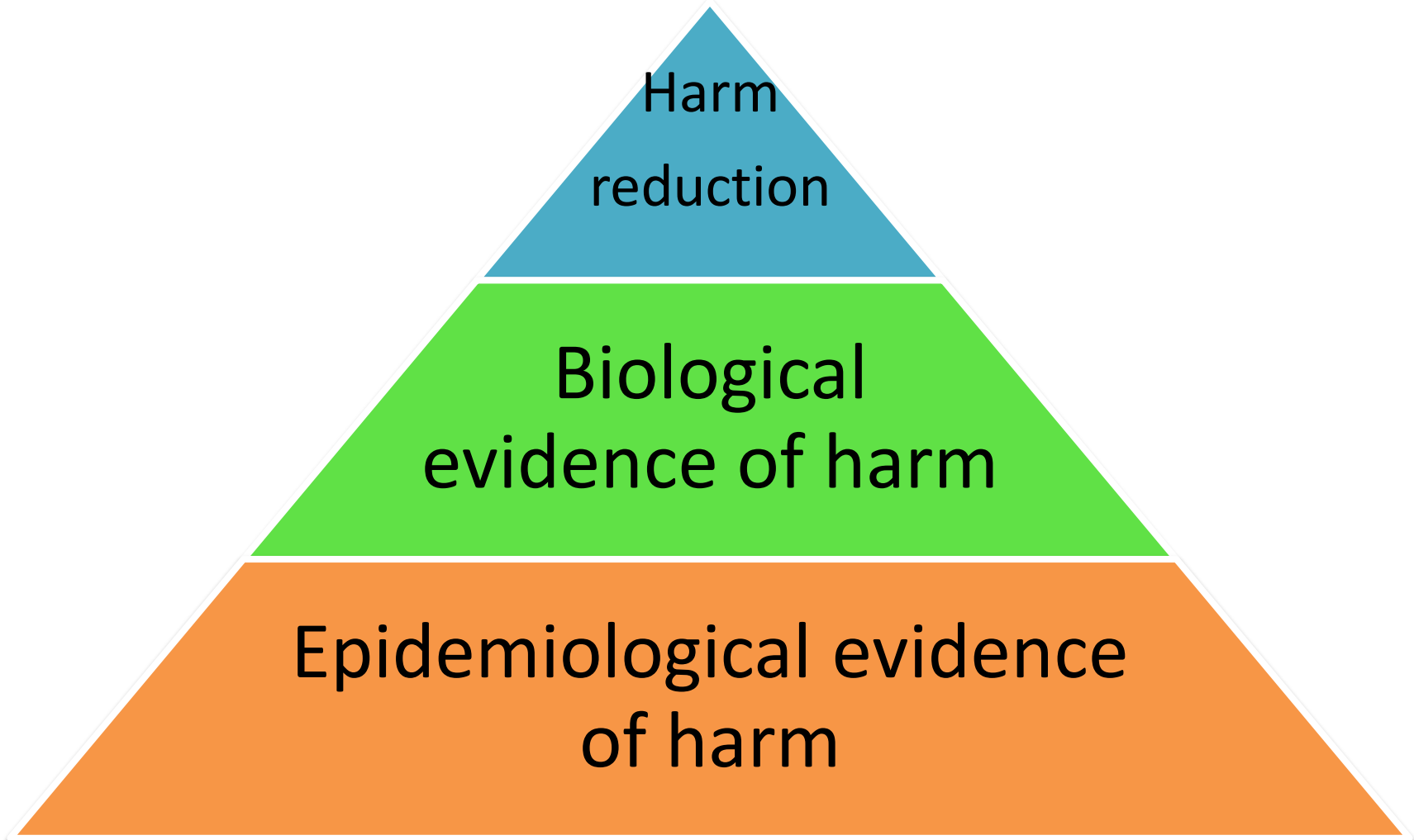


Respiratory symptoms and medication usage

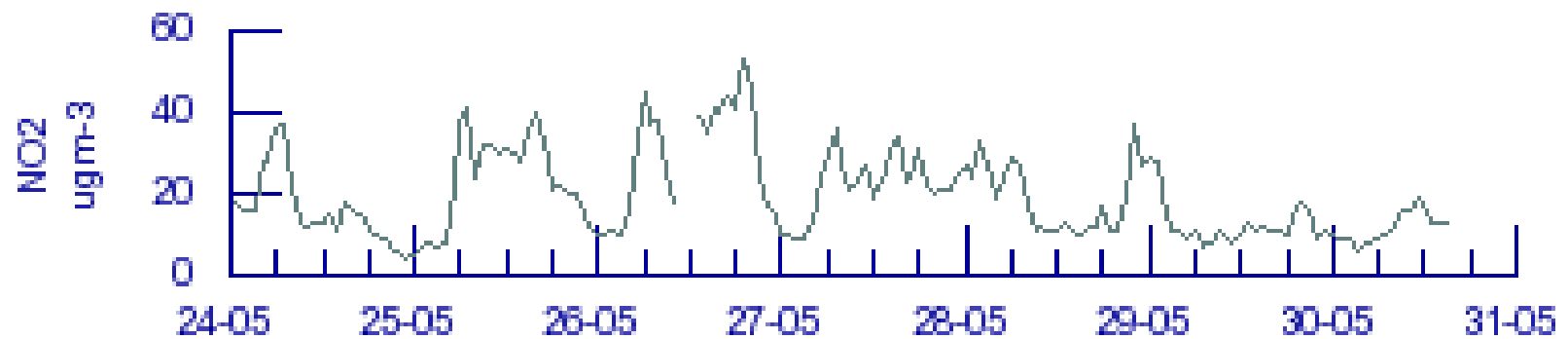
- Increases in particulate matter associated with
 - Severe asthma symptoms
 - Missed school days
 - Increase in adult asthma exacerbations
 - Increased medication usage
- Increases in particulate matter associated with
 - Hospitalisation with bronchiolitis in infants
 - Children attending ED with asthma
 - Adult hospitalisation due to respiratory symptoms



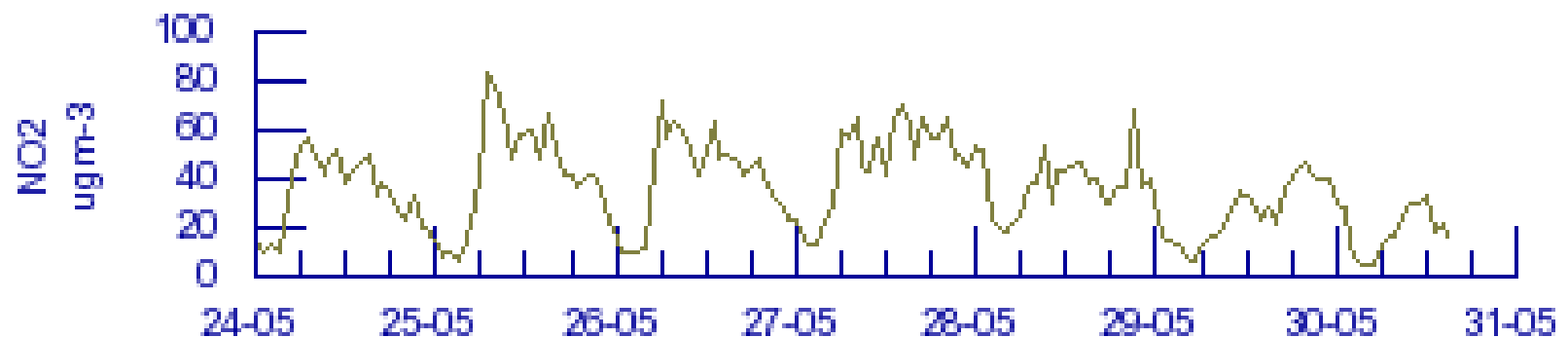
Does intervention work?



Leeds Centre



Leeds Headingley Kerbside

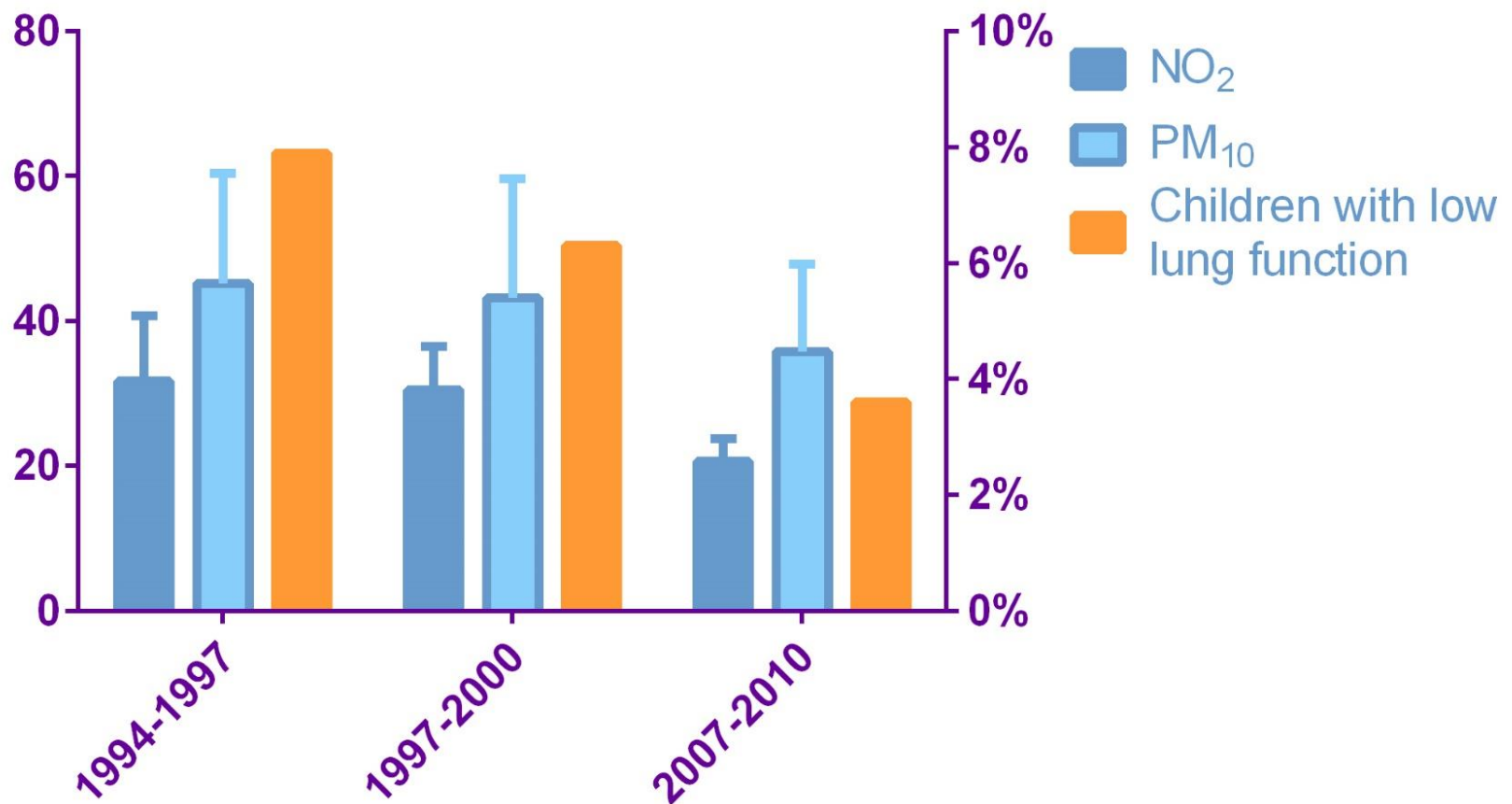


Southern California experience

- Historically plagued by high pollution levels
- Number of interventions to reduce air pollution
- Air pollution trending downwards



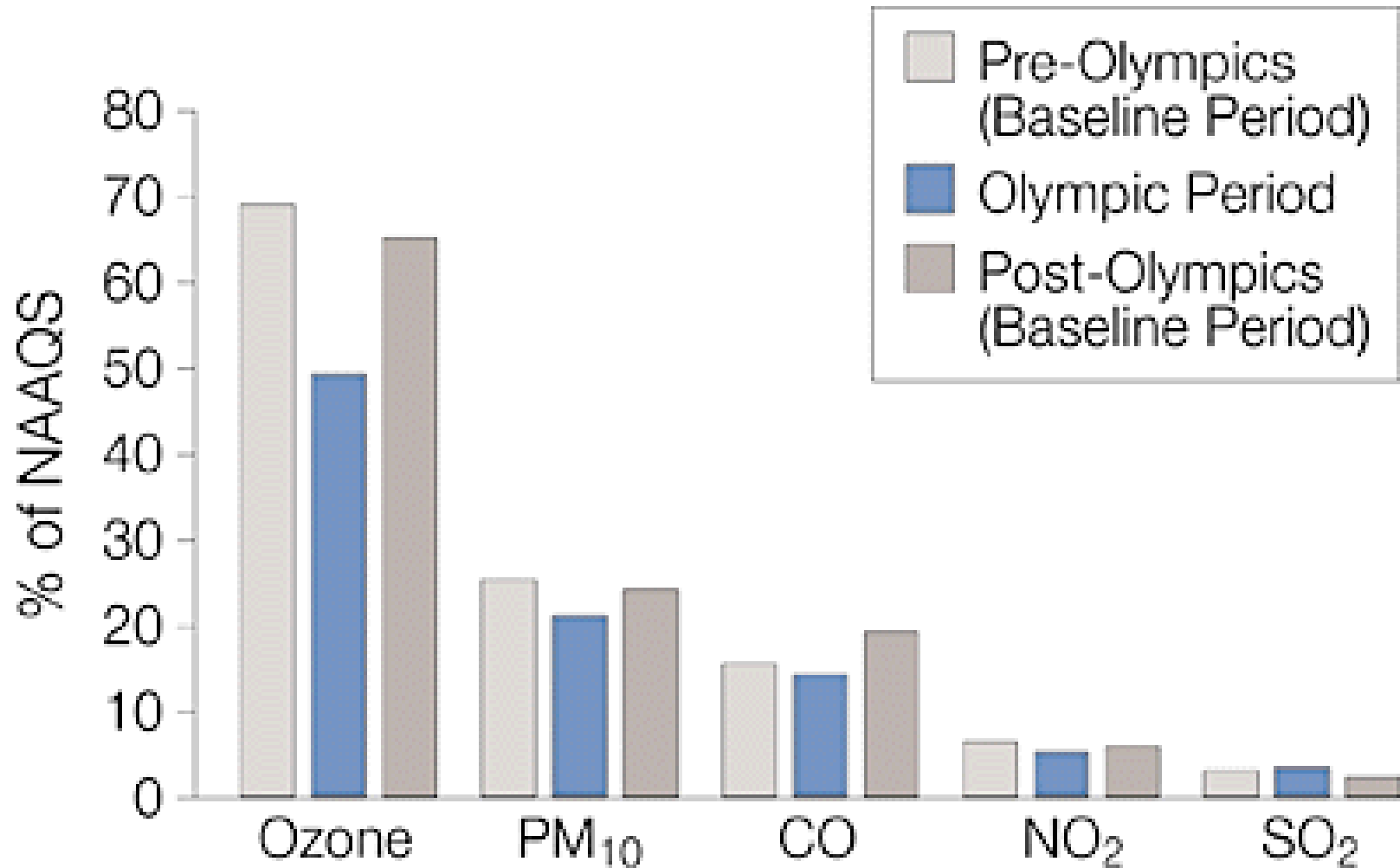
Improvements in pollution and lung function



Can traffic congestion measures help?

- At Atlanta Olympics strategies introduced to minimise increase in traffic congestion
 - Integrated public transport
 - Park and ride schemes
 - Alternate working hours
 - Teleworking
 - Closure of downtown to private cars
 - Altered delivery schedules

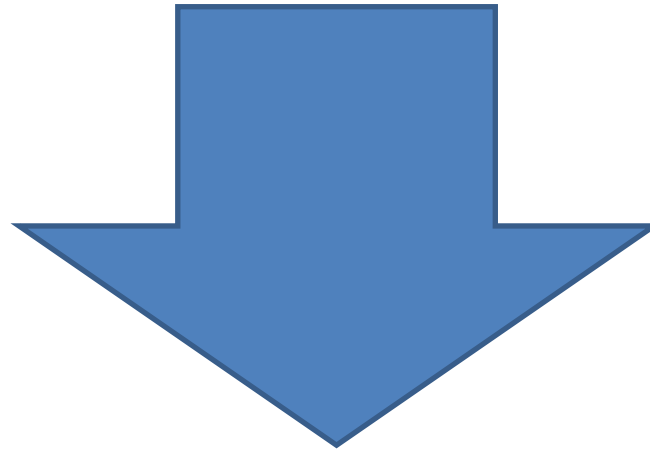




JAMA. 2001;285(7):897-905

Effect on asthma admissions

- 40% decrease in asthma admissions during 17 days of Olympic compared to 4 weeks pre- and post- event





Impact of smoking ban

- Reduced respiratory symptoms in bar-workers
- Reduction in second-hand smoke exposure
- Reduction in heart attacks

Source:

Ayers et al. Occ environmental med; 66: 339-346 Haw. BMJ; 2007; 335 Goodman et al. Int J Pub Health 2009; 54: 367-378





Harm from asbestos exposure first recognised during early 20th Century
Asbestos producers well aware of dangers in the 1930s

Asbestos use restrictions only really in place at the end of 20th Century despite strong evidence of harm!

