

# The predicted number of air pollution related deaths in the UK during the August 2003 Heatwave

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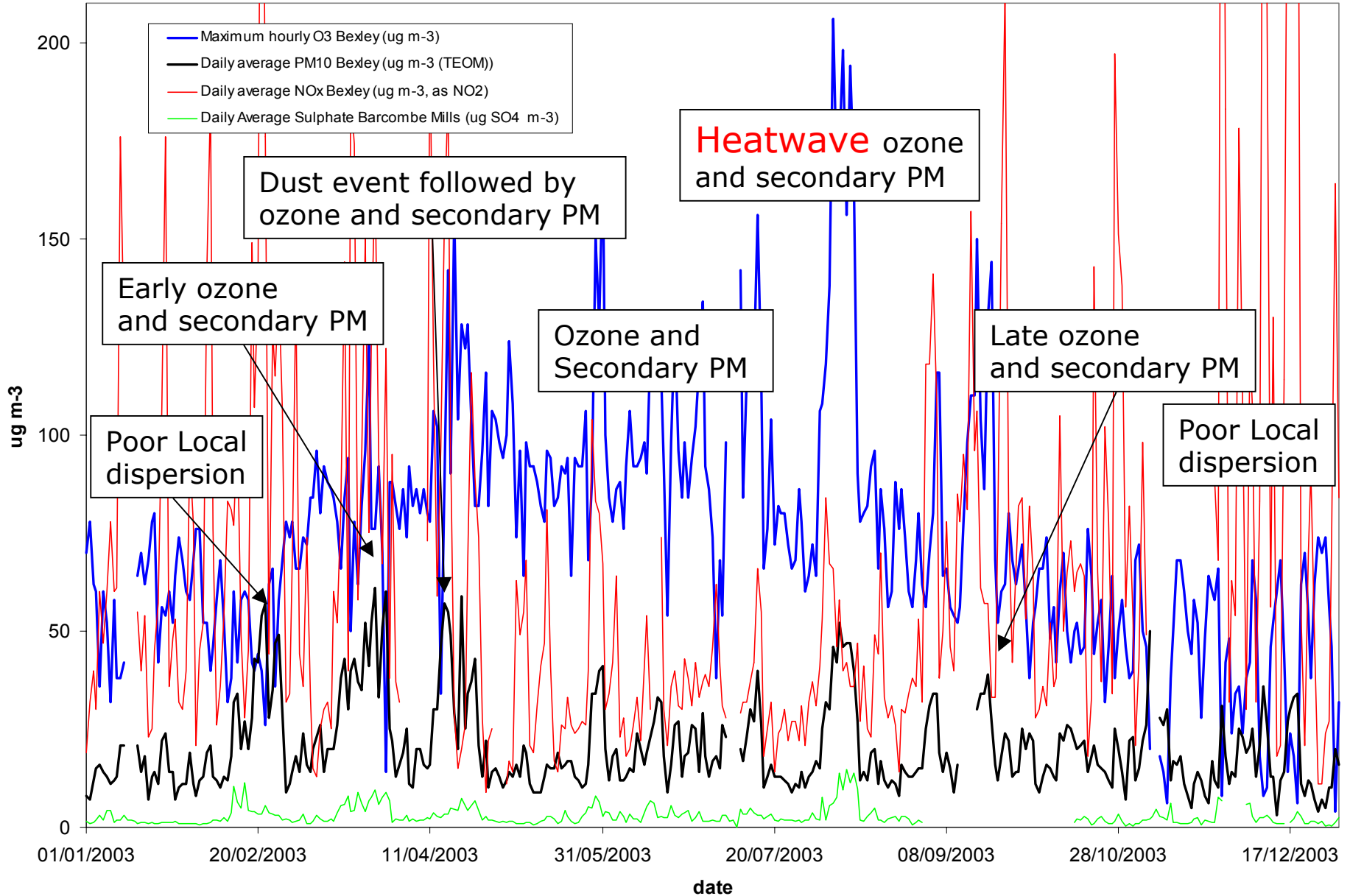
06/05/2004

# Outline

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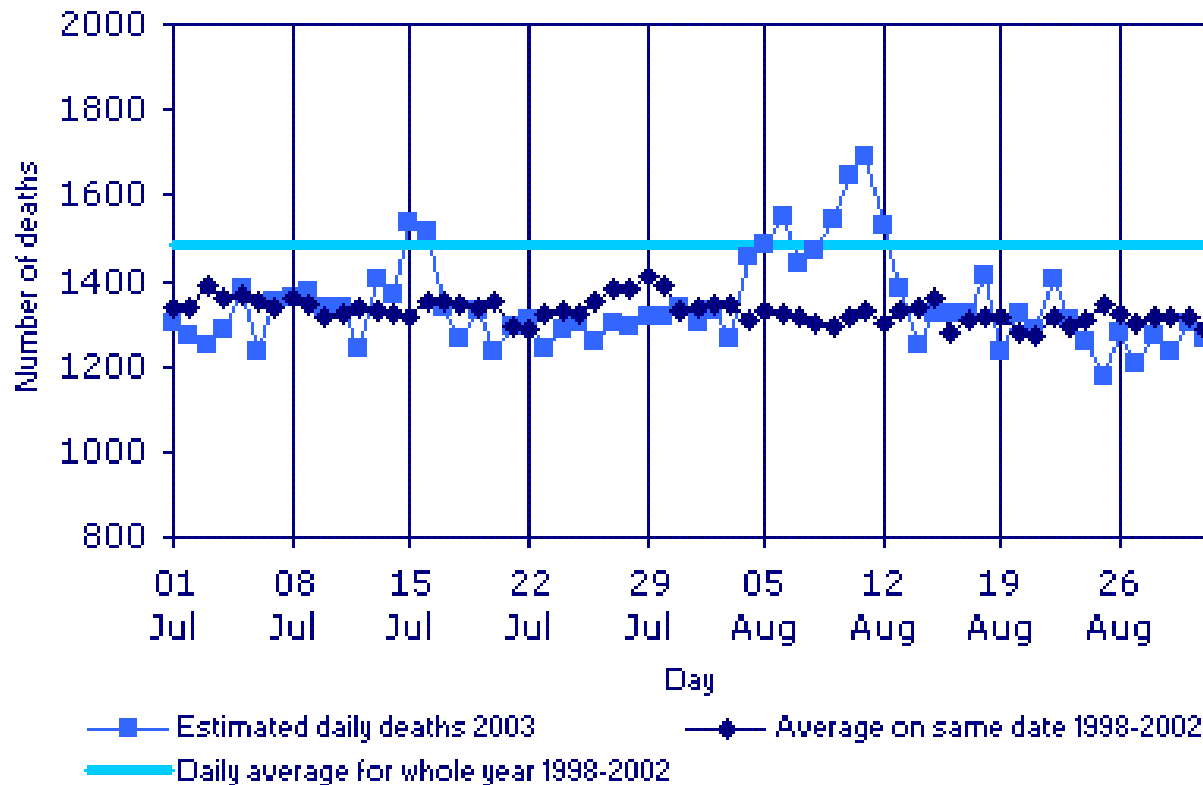
- Ozone and PM<sub>10</sub> concentration in the UK during 2003
- August 2003 Heatwave
- Air Quality monitoring and other input data
- Results

# Ozone and PM<sub>10</sub> during 2003



# National Statistics

- ONS estimate of 2045 excess deaths between 4-13 August compared with 1998-2002 average



# August 2003 heatwave

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- Previous studies have suggested that a significant proportion of additional deaths could be due to air pollution
  - Compared ozone and PM<sub>10</sub> concentrations during the heatwave with the same period in 2002
  - Quantify health effects using published dose-response functions

# Air Quality Monitoring data

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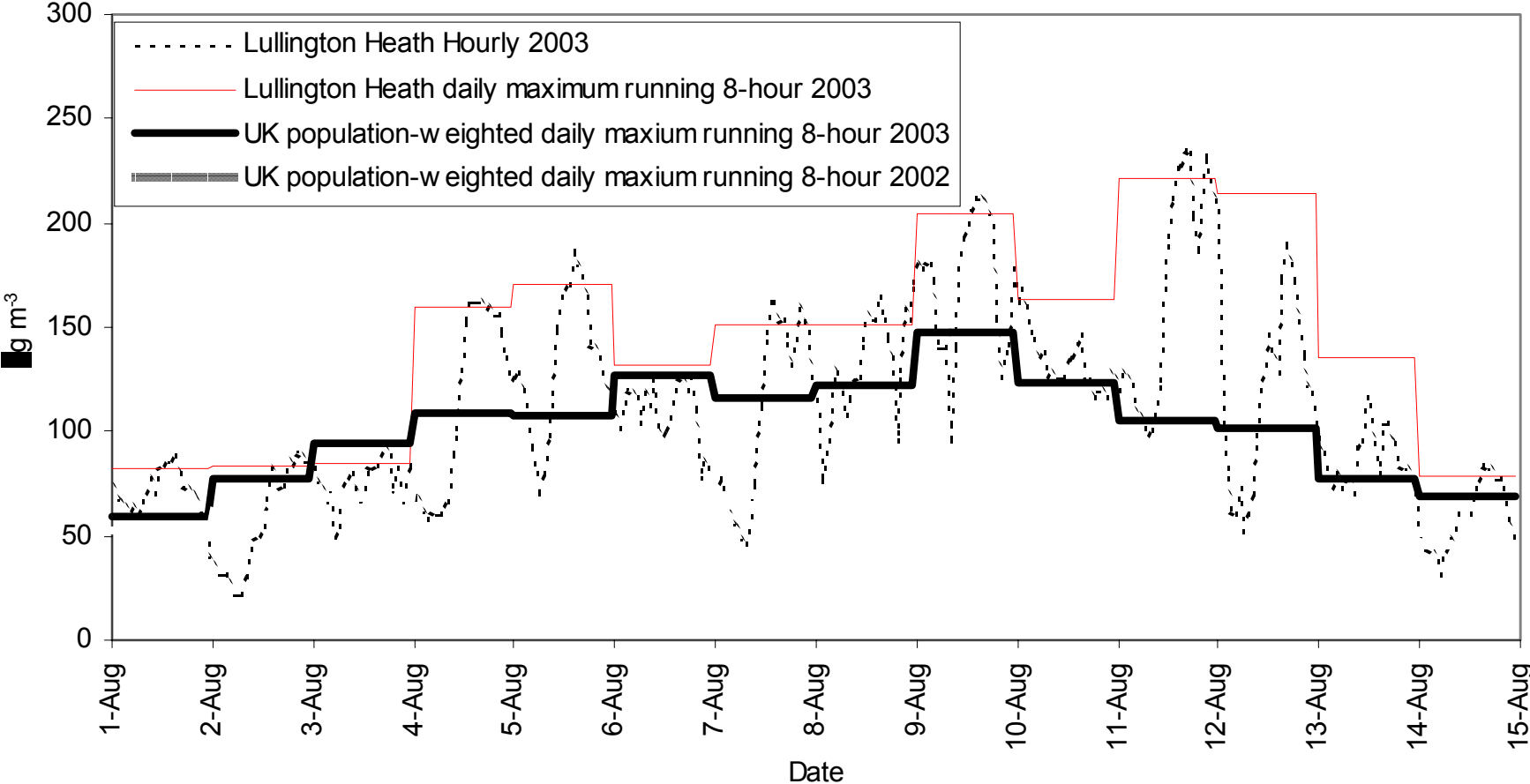
- Ozone at 78 sites
- PM<sub>10</sub> at 53 sites
- Summarised by calculating the average concentration on each day in each of 43 zones

## Other data

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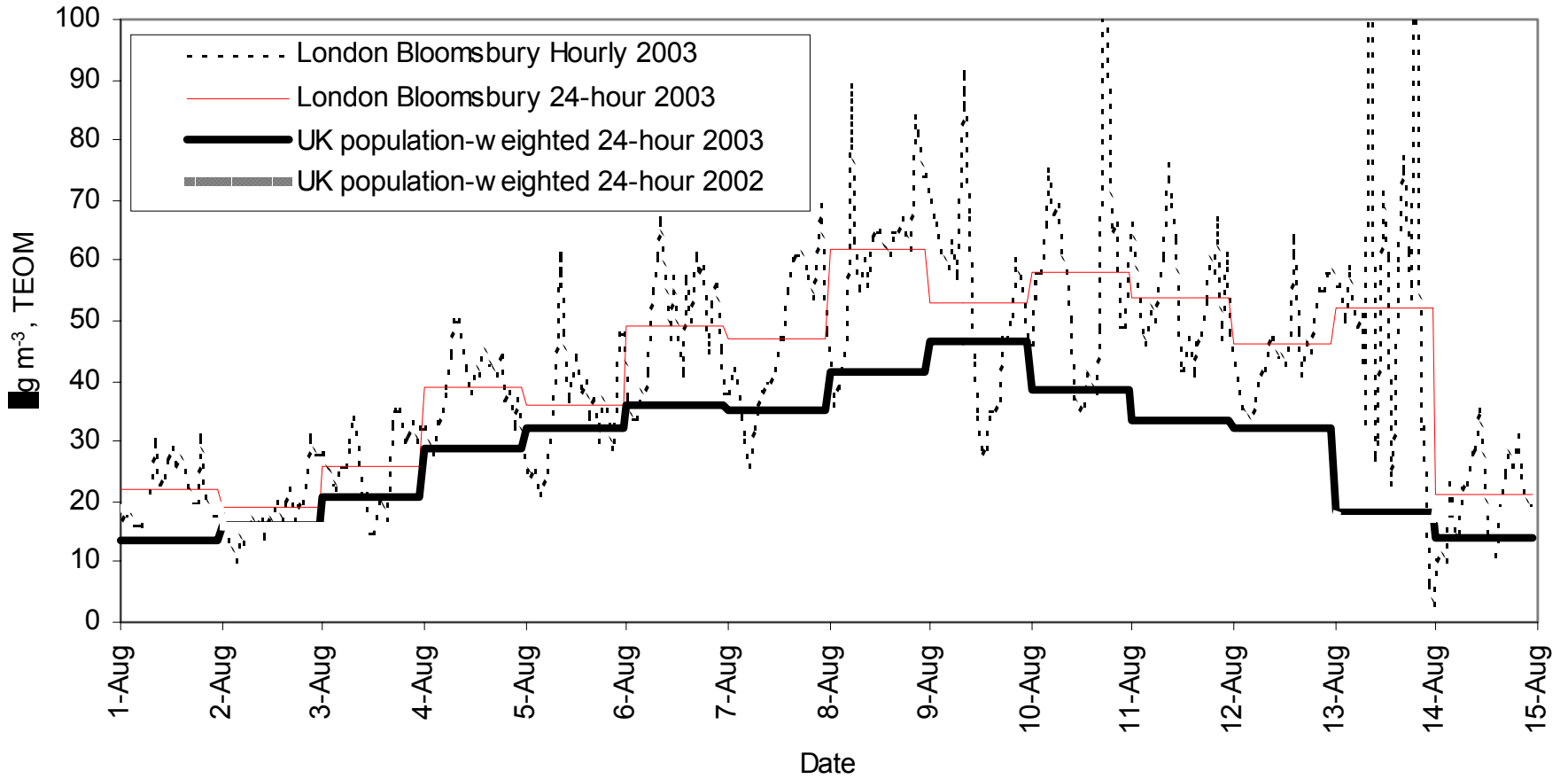
- UK baseline death rate 1024 deaths per 100,000
- Dose response coefficients from time series epi studies (summarised by COMEAP, 1998):
  - Ozone 0.6% increase per  $10 \mu\text{g m}^{-3}$  daily max running 8-hour mean
  - $\text{PM}_{10}$  0.75% increase per  $10 \mu\text{g m}^{-3}$  24-hour mean
- UK population distribution from Census

# Ozone





# PM<sub>10</sub>



# Results for the UK

- 225 – 593 additional deaths brought forward due to ozone
  - Range represents 100  $\mu\text{g m}^{-3}$  and 0  $\mu\text{g m}^{-3}$  thresholds for effect
- 207 additional deaths brought forward due to  $\text{PM}_{10}$ 
  - Assumed that the effects are independent
  - Could be confirmed by epi study of the heatwave
- Represents 21 – 38% of ONS reported excess deaths in England and Wales

# Publications

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- Stedman, J R (2004) The predicted number of air pollution related deaths in the UK during the August 2003 heatwave. *Atmospheric Environment*, **38**, 1087-1090
- Fischer, PH, Brunekreef, B and Lebret, E (2004) Air Pollution related deaths during the 2003 heat wave in the Netherlands. *Atmospheric Environment*, **38**, 1083-1085
  - 400–600 additional deaths during the summer of 2003