

# STATISTICS SEMINAR

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Thursday, March 31, 2016  
Dickens Hall, Room 207, 4:00-5:00 pm  
Refreshments: Dickens 108, 3:30-4:00 pm



## **Preferential Selection of Environmental Monitoring Sites: Origins, Impacts and Mitigation**

In the 1960s, over 2000 sites in the UK monitored black smoke (BS) air pollution due to concerns about its effect on public health that were clearly demonstrated by the famous London fog of 1952. Abatement measures led to a decline in the levels of BS and hence a reduction in the number of monitoring sites to less than 200 by 1996. Treating the BS example as a case study, the speaker will argue that the sites to be removed were preferentially selected, causing estimates of metrics used by regulatory agencies to be too high. He will describe an approach to mitigating the effects of preferential sampling in calculated aggregate estimates of the BS concentration levels. And finally he will describe what happens when environmental epidemiologists calculate health risks using the BS data. The large number of monitoring sites and their associated high dimensional data vectors rules out naïve use of classical geostatistical methods in this work and novel approaches for handling such data will be described. The work has important general implications for the setting of regulatory standards and the design of monitoring networks. Most importantly it points anew to the importance of good design in statistical measurement and testing.