

概 要：

Air pollution and Covid-19 offer two recent public health issues with significant worldwide impact. Statistical regression models constructed in terms of smooth functions of predictor variables - generalized additive models - can be very helpful in analyzing data arising in relation to both. This talk illustrates this with two case studies. The first is the modelling of 40 years worth of spatially referenced daily particulate air pollution data over the UK, with the aim of producing epidemiologically useful pollution burden estimates at different locations and times: the data contain some 10 million observations, and novel methods were required to deal with this data volume. The second case study concerns inference of the daily number of new Covid-19 infections from the clinical data available. GAM like models are useful, but some method extensions are needed to obtain the best possible reconstructions. Interestingly, in the UK context infections appear to have been in decline some time before each of the full stay-at-home lockdowns, with the timing of lockdown coinciding rather with an immediate rapid increase in deaths, which lag infections by several weeks.