A multi-dimensional environment-health risk analysis system for the English regions

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There is an overwhelming body of evidence that environmental pollution, and air pollution in particular, is a significant threat to health worldwide. While in developed countries the introduction of environmental legislation and sustainable technologies aims to mitigate adverse effects, developing countries are at higher risk. Within the scope of the British Council funded KEHRA project, work is on-going to develop a reproducible and reliable system to assess health risks due to exposure to pollution under climate change and across countries.

Our approach is based on the use of Bayesian Networks. We used these graphical models to explore and model the statistical dependence structure of the intricate environment-health nexus. We developed a robust modelling workflow in the R programming language to facilitate reproducibility and tested it on the English regions in the United Kingdom. Preliminary results are encouraging, showing that the model tests generally well in sample (training data spans the period 1981-2005) and has good predictive power when tested out of sample (testing data spans the period 2006-2014). We plan to show the results of this preliminary analysis as well as test the model under future climate change scenarios. Future work will also investigate the transferability of the model from a data-rich (England) to a data-poor environment (Kazakhstan).