**NIAM activity on PM2.5**

As one of our first activities in NIAM we would like to look at how countries are addressing PM2.5 pollution, including how they model it, how they assess the health impacts, and how this feeds into policy. As a first step we are gathering information on current work in this area towards organisation of a virtual meeting in November.

If you are interested in participating please register your interest with an e.mail to [h.apsimon@imperial.ac.uk](mailto:h.apsimon@imperial.ac.uk). And if you are already working in this area we shall be grateful if you can also send a response to the questions below which will help us in planning a focus on this topic.

1. **Modelling PM2.5**

If you model PM2.5 concentrations in your country:-

1. Do you use GAINS, or independent modelling- in which case please give brief details.

*We try to use CMAQ for regional modelling and CALPUFF for local/city levels.*

1. What distance scales do you cover- e.g. European, national, city: and with what spatial and temporal resolution?

*We cover some specific regions/cities in Slovakia by local model, and middle of Europe by regional model. The spatial resolutions for regional model is approx. 4.5 km, bat we also did simulation with 1.5 km. In next year’s we want to make regional simulation by 1 or 2 km grid resolution depending on the available computer power in institute. We computed concentrations with hourly time resolution.*

1. What components of PM2.5 do you include- e.g. primary PM2.5, secondary inorganic aerosol, secondary organic aerosol, natural dust etc?

*We include primary PM2.5 to model input, secondary are calculated by CTM model. We do not include natural dust, like see-salt or dust from fields to our calculations yet, but we want to include them.*

1. What emissions data do you use e.g. a national inventory. Are there particular sources you think are uncertain, missing, or would like to discuss?

*For large domain we use TNO MAC III 2015 emission data, and we replace them in the Slovakia region by national inventory.*

1. Have you undertaken validation of your model against measurements, and if so what measurements do you have available to use.

*We have national monitoring network of stations – 38 stations* *providing us the hourly measurements of PM2.5 concentrations. We validated the model with the measurements according the FAIRMODE DELTA-TOOL and also we perform basic statistic like computation of r, BIAS, RMSE*.

1. What do you think are the most important uncertainties or aspects of PM2.5 modelling that you would like to discuss.

*There is a large uncertainty of PM2.5 emissions especially concerning local heating, waste combustion. Also time-profiles and speciation of the emissions are very uncertain.*

1. **Assessing health impacts**

The health impacts of PM2.5 are a major driver to reduce air pollution.

1. We are interested in how you use data on concentrations of PM2.5, either modelled or measured or both, to assess human exposure and health impacts? *We recalculated number of premature deaths caused by PM2.5 exposure according the WHO guidance, but we also evaluated this number with uncertainties. We include both, model and measurements. Results are available at* Meteorological Journal VOL 23, year 2020/1, p33. <http://www.shmu.sk/en/?page=31>
2. If you undertake such assessments of health impacts of PM2.5, do you follow WHO guidance and base this on total mass of PM2.5, or do you focus on particular components and/or differentiate relative toxicity?

*We just deal with total mass of PM2.5, since we do not have enough measurements of PM2.5 components, and also modelled data are too uncertain for this purpose.*

1. What health impacts do you consider e.g. mortality, asthma etc; and what risk coefficients do you use? Premature deadths, metrics from *WHO, 2013, Health risks of air pollution in Europe – HRAPIE project*
2. Do you assess the economic costs of health impacts, and if so what do you include e.g. life years lost, hospital/medical costs, loss in productivity/working days lost etc.?

*The other instate assessed this (Ministry of environment).*

1. **Policy applications**

We are also interested in the application of your work, particularly as input to development of policy.

1. How do you relate your work to environmental goals e.g. compliance with regulations, or comparison with WHO guidelines?

Our institute just inform the Ministry of environment and they decide

1. **Publications**

Have you published your work, in which case please give references is available?

*We tried to estimate real transboundary pollution for pollutants PM10, PM2.5 and NO2 in Slovakia. For PM10 and NO2 there is English paper https://www.sciencedirect.com/science/article/pii/S1309104220300453 . Results for PM2.5 are published one in Slovak Meteorological journal, but there are qualitatively similar as PM10 results.*

1. **Questions**

Are there particular aspects of questions that you would like NIAM to address on PM2.5, including at the virtual meetings proposed for November.

Please e.mail your response to Helen ApSimon: h.apsimon@imperial.ac.uk