**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.

Independent modelling. Model chain: RIO-IFDM-OSPM => Atmostreet

<https://www.irceline.be/en/documentation/models>

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

National, regional + city (street level)

10x10 m

hourly

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

Our assessment model is not a deterministic model but is based on an intelligent interpolation technic (RIO). In our assessment model the different components of PM2.5 are supposed to be included in the RIO-model (measurements).

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?

2 models of our model chain use specific emissions: transport, shipping and industrial emissions. There are some issues concerning uncertainties of the shipping emissions and the local transport emissions.

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

Yes. We validate our model on a regular basis and we validate with independent measurements stations using the European model quality objectives. These model quality objectives are designed taken into account measurements uncertainty.

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

For the assessments modelling: /

For the planning modelling: agricultural emissions

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 use modelled data (RIO, resolution 4kmx4km) to assess health impacts. As a consequence we have health impact output (mortality) on the same resolution.

1. 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 focus always on PM2.5 total mass. <https://www.ircel.be/nl/documentatie/publicaties/wetenschappelijke-rapporten/gezondheidsimpact-luchtkwaliteit-belgie-2018/view> (in dutch)

Comparison is always made with the WHO values and we also use the recommended dose-respons relations.

1. What health impacts do you consider e.g. mortality, asthma etc; and what risk coefficients do you use?

Mortality. Risk coefficients from HRAPIE and COMEAP

Morbidity: a large scale of different health endpoints. Risk coefficients from different studies.

1. 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.?

Yes, in studies. There is also a tool in development to calculate economical cost (up until the neighbourhood level) for several morbidity health endpoints.

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?

We have an Air Quality Plan that contains the ambition to reduce the health impact of air pollution.

In the long term (2050) it is our ambition that the air quality in Flanders no longer has significant negative health effects on its residents. Therefore, the concentrations of polluting pollutants must fall below the WHO recommended values.

In the midterm (2030) we want to reduce the health impact of air pollution by 50% compared to 2005. As an indicator we use the number of premature deaths from long-term exposure to PM2.5, which we calculate by using the dose-response relationships from HRAPIE.

1. **Publications**

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

<https://www.ircel.be/nl/documentatie/publicaties/wetenschappelijke-rapporten/gezondheidsimpact-luchtkwaliteit-belgie-2018/view> (in dutch)

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.

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