Impact assessment and health - lessons from the Covid-19 pandemic

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Background

What the Covid-19 Pandemic showed us again very prominently is the relevance of environmental quality and healthy environmental conditions. Already with the first major outbreaks of the Covid-19 Pandemic in Wuhan, China and Lombardy, Italy, discussions emerged over the role of environmental quality and in particular air quality as an influencing factor for Covid-19 spread and mortality (e.g. Gerretsen 2020; Fischer 2020). With both regions being known for their high levels of air pollution and industrial production, researchers quickly turned to evaluating the influence of environmental quality aspects for Covid-19 mortality (e.g. Ogen 2020; Contini & Costabile 2020; Conticini et al. 2020; Wu et al. 2020).

While impact assessments cannot influence the spread of Pandemics such as Covid-19 directly, they are designed to influence how environmental and human health impacts are considered in decision-making. With both the European EIA and SEA Directives including health and population as topics for impact assessments, practice should be considering effects from proposed projects, plans and programs on human health and populations. In addition, NEPA regulations explicitly include the call for human health impacts in NEPA reviews and multilateral development banks require the consideration of health in their IA standards (Fischer & Cave 2018). The focus of IA is thus not limited to purely eco-centered aspects, but also includes impacts on population, human health, well-being and cultural values (cf. the comments in Iglesias-Merchan & Domínguez-Ares 2020).

Our topic and goal

In this student project, we want to first investigate in an exploratory manner the links of environmental quality and Covid-19 cases and mortality in different regions of the world. Based on a review of the state of research on Covid-19 and environmental factors we will next assess the linkages for cities and regions in for example Europe, North and South America (depending on access to data). Linked to an ongoing cooperation with the Charité, we will correlate ambient air quality data with Covid-19 incidence. In a final step, we will discuss how the link of environmental quality factors and health impact might be better considered in IAs. Therefore, we will evaluate different approaches and tools, which can be used to predict air quality changes and how these can be linked to predicting health effects.

Milestone 1: Background & literature review

We will first review the state of research on linking Covid-19 with environmental quality factors such as particulate matter (PM2.5, PM10), NO2, O3 etc. As understanding of Covid-19 increases so does the knowledge on risk factors for severe illness and mortality. We will assess which health conditions affecting Covid-19 might be related to environmental quality factors. E.g. poor air quality is known to increase the likelihood of developing asthma, COPD and cardiovascular diseases, which all are
regarded as risk factors for severe course of Covid-19 and increased mortality (e.g. Zhou et al. 2020; Li et al. 2020).

This step will involve initial individual tasks by the participants in building a first knowledge base on health, environmental quality factors and Covid-19. Guiding questions will be for example:

- Which diseases and health conditions are risk factors in Covid-19 infections?
- How is environmental quality influencing human health?
- Which environmental factors are most relevant in explaining human health problems?
- How is human health defined in different contexts?
- What is the international regulatory context of public health in IAs?
- Where are thresholds & limit values available for health related environmental factors?
- What health data/information related to environmental quality is available?

**Milestone 2: Evaluating environmental quality and Covid-19**

We will decide on cities and regions for a detailed analysis of environmental quality and Covid-19 cases and mortality. For these regions, we will collect data on Covid-19 and environmental quality factors as well as possibly relevant confounders (e.g. social status, population density etc.). Data might come for example from the John Hopkins University (https://coronavirus.jhu.edu/map.html), the European Environment Agency (https://www.eea.europa.eu/themes/air), national data hubs etc.

We will analyses the data using easy statistical means and will determine the correlation of environmental quality and Covid-19. Students will likely be working in subgroups on different regions (e.g. Europe, North America, and South America).

**Milestone 3: Linking to Impact Assessments**

We will reflect relevance of and difficulties in integrating health considerations in impact assessment and discuss these. How can environmental quality related health issues be integrated in IAs? Which models and tools are available, e.g. for modelling and predicting air quality effects?

As far as beneficial public health implications are concerned, there seems to be a profound pair of tools of the U.S. Environmental Protection Agency available, which promise value to be considered in terms of their applicability: AVERT® and COBRA®. Hayes and Kubes®, for example, analyzed for the American Council for an Energy-Efficient Economy the health impacts of a 15% reduction in electricity consumption nationwide. They used U.S. EPA’s tool ‘AVERT’, “finding annual emission reductions of 11% for PM2.5, 18% for NOx, 23% for SO2, and 14% for CO2”. Furthermore, they used U.S. EPA’s COBRA tool to rank U.S. states and cities where the largest positive impact on public health was to be expected (coal state West-Virginia per capita, for example). Moreover, the ‘Chesapeake Climate Action Network” used AVERT and COBRA to discuss the benefits of increasing renewable energy usage in Maryland, concluding that a reduction of 8.1 million tons of CO2 would prevent 290 premature deaths and over 3,000 asthma attacks annually.

We will discuss how such tools and approaches might be applicable in IAs and help strengthening the consideration of human health as a topic in IA.

**Organization**
The work will be structured and presented in plenary sessions and conducted in student sub-clusters. The results of our analysis will be compiled into a report (presumably a Wiki). We will have our virtual plenary meetings presumably on Friday mornings (to be finally determined in October) and will decide together, depending on then regulations, how we wish to use the excursion week in November (23.–27.11.2020). Date and details of our first plenary meeting will be shared with the participating students in October.

The project will be carried out as an online course again using mainly ISIS and Zoom with additional tools possibly to be added where and when needed.

Students choosing the project will have the option to participate in the virtual conference session “Health is disruptive – Will it be better integrated with SEA in a (post) COVID-19 world?” on September 9th, 2020. This will allow for an introduction to the topic of health in IA and possible networking with international IA practitioners and researchers. Contacts to be used during the project later on, e.g. for targeted expert interviews might be established.

Contact

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References


2 https://www.epa.gov/stateandlocalenergy/avoided-emissions-and-generation-tool-avert#when
5 https://chesapeakeclimate.org/clean-energy-and-the-majority-leader/