

# Air pollution, health risks and coping strategies in China

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# VALORISATION

## **Valorisation**

Valorisation is defined as “the process by which knowledge created by research is made available to society and by which it is transformed into economic and social impact” (National Valorisation Committee, 2011). This impact can be in all kinds of forms depending on the nature of the research, with a broad distinction made between fundamental and applied research. Based on the understanding of this thesis, which has strong relevance to the social, environment and health development, we can say that the experience and scientific impact yield from this thesis and beyond, in terms of scientific publications, can serve as a basis for further research, a tool for interdisciplinary education, and a reference for decision-making.

## **General innovations**

The more experiences we draw from other samples, the less fragile when facing the similar problems and the better we prepare. By collectively using data, research results, systematic review, it is possible to triangulate on what and how the health changed under the background of urbanization and environmental change, and more specifically how the health is affected under the various policies coped with the negative effect of urbanization. On these grounds, this research has great value for trying to bridging the gap between health related studies and decision-making, particularly in China. Firstly, we use geographical regression and time series study to identify the characteristics of health risks caused by air pollution. An additional explore is made to evaluate the progress and the challenges for the sustainability of the air pollution control strategies in China. While for the EU, although air pollution is still risking the public health, numerals of effective air pollution control strategies are already in place. Using systematic review, we comprehensively analyse the recent air control strategies in the EU and the health and health equity benefit, which in one way, give a general summary of the effectiveness of the strategies, and in another way, shed a light on how to embed health studies into policies and vice versa, how to maximum the health benefit from air pollution control strategies.

### **Approach for valorisation from this thesis**

Three general implications of this study can be summarized; 1) the population's vulnerabilities to air pollution varies geographically and varies among the individuals; 2) there are challenges for the fully enforcement and the sustainability of the ongoing air pollution control strategies; 3) and it is necessary to embed the health related research to decision making, and vice versa, to transfer the policies into health benefit. The valorisation thus can be achieved through the following perspectives.

In an academic setting, awareness has been and still can be developed by publishing the study results in national and international journals and presenting the results at national and international conferences. The relationship between air pollution to health is a complicated issue because of the confounders both internally and externally. Three chapters from this dissertation have been reported in international conferences and inspired a debate on the association between air pollution and public health, in terms of how to improve the methodology and how to combine confounders in health related studies to make the health risk-estimate more accurate. Still, more has to be done. A comprehensive and systematic explore on the progress of air pollution control strategies, particularly for the strategies targeting the most vulnerable groups, and their health impact still require further studying. A broad range of academic debate will be aroused as the result of this thesis will go back to the key stakeholders, including the government officials and researchers participated the interviews and beyond.

For education, although environmental health has been an old topic for decades, which in most of the cases is embedded in either global health or environment sciences, an enhanced understanding for students on how the environment, more specifically deteriorated environment, is influencing the health and the interactions between human development and environment protection is largely needed, particularly under the rapid urbanization setting like China, India but also including those developed countries who are facing with same issues. In addition, this enhancement should not be limited to the groups who are studying environmental health, but also to the related disciplines, including health care, medicine, policy, management, business, etc. This would link to the further

knowledge dissemination to the public, which will be achieved through the third party like FORHEAD in terms of report and public propaganda.

In terms of decision-making, the recent (2017) China's National People's Congress committed to a "faster progress" on air pollution control in China. Although plenty of studies have been done including source apportionment and health impact assessment, transferring these knowledges into policy is still largely missing during the decision-making according to our investigation in China. Challenges that are hindering the sustainability of the air pollution control strategies do not only include the gap between research and decision-making, but also a lack of participatory, an unbalanced interests among the stakeholders, emphasizing less on the environmental protection, etc. Bringing those issues to the table with relevant suggestions can provide a clear picture on what has to be done during the decision-making and implementation. This does not just target to the government, who is the decision maker, but also to the researchers, the industries, the publics, and any others who are and should be involved in the decision-making, implementation, and supervision. This thesis will provide a bridge connecting policy makers and main stakeholders. Debate on the issues that is facing in terms of air pollution control and what can be expected from the government will be aroused.