Air pollution generated by freight transport vehicles in Brussels: a dynamic approach to measure the real impact
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Publication date:
2019

Document Version:
Final published version

Citation for published version (APA):

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Etats Generaux de l’Air de Bruxelles

Resistance is in the Air:
Citizens, science and air pollution

International interdisciplinary symposium
Brussels, 25-26 April 2019
www.brusselsair.org

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2. Context: Les États Généraux de l’Air
3. Programme
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1 Theme of the symposium

Resistance is in the air. All over the world, awareness of air pollution as a serious matter of concern is growing. This is prominent in the rise of citizen groups claiming their right to clean air, the increasing number of newspaper articles on the subject, and the growing mobilisation across broad ranges of society. At the same time, air pollution is also academically taken up more widely and consistently: an increasing amount of scholarship is looking into the issue from a wide variety of disciplines. Air quality policies are also at a turning point. The growing number of citizen science projects, living labs, crowd-sensing and other similar initiatives contributes to blurring the boundaries between “citizens” and “experts”. This shows the potential of dialogue and collaboration among different actors, but also represents a step towards transcending these categories and making place for promising new ways of thinking about research, action and citizenship. Overall, there is a sense of urgency, rooted in state-of-the-art knowledge about the risks of exposure, the apparent inadequacy of the current legal framework, policy and infrastructural solutions, and the -sometimes distorted- way information on air pollution is collected and disseminated.

It is in this context, this international interdisciplinary symposium will focus on the theme of ‘resistance’, in its diverse possible meanings. The socio-demographic characteristics of people can make them more or less resistant to the impacts of air pollution on their health and wellbeing, while their economic situation is likely to exacerbate or help addressing their vulnerability. Historical path dependencies in the urban form and infrastructure, as well as established power relations among groups and stakeholders can make socio-technical systems resist change and innovation. Citizens concerned with the health and environmental threats of air pollution may engage in active resistance against actual status quo by physically changing their living environment, by exerting political pressure in the streets and in courts, or by taking steps towards alternative metabolisms of air and its pollution. In doing this, they may take resource to existing atmospheric science or contest the state of the art and engage in the co-production of alternative forms of knowledge. However, citizens do not only resist air pollution. Citizens also happen to resist against prioritising air pollution as a matter of concern and protest against measures to tackle it: referring to social justice, individual freedom or discourses about economic viability and growth, significant groups of citizens claim the ‘need’ or ‘right’ to drive the car or to engage in other polluting practices. Not seldom, it comes to a conflict between citizen groups and other actors with different interests in the air.

2 Context: Les États Généraux de l’Air

The objective of the symposium is to provide a platform for scholarly dialogue and interdisciplinary exchange, among scholars but also with citizens and activists. Bridging the disciplinary gaps, as well as engaging with the larger societal debate, this symposium has the ambition to urge political agenda-setting by pushing reflection on strategies and pathways to more ambitious and broadly supported air quality regulations.

In this regard, the symposium is part of a larger event, which includes a citizen’s day as a forum for societal dialogue and a hackathon for cleaner air through open data mining and manipulation. Scholars who participate in the academic conference are most welcome to also participate in the other activities of the event. Similarly, we will invite the broader public to participate in selected sessions during the academic conference. The event as a whole will provide a forum for critical debate across a range of perspectives on air pollution, will raise awareness about its impact on health and on the environment, learn and exchange about socio-ecological future alternatives and strategies towards change, and will help bridging the gap between science, lived experience, policy and practice.
3 Programme

Day #1 - Thursday April 25th

08:30 – 09:30  Open doors & coffee

09:30 – 10:30  Plenary session
   o Welcome and introduction (N. da Schio)
   o #BXLdemandscleanair (Bruxselair)
   o Multiple environmental exposures in cities and what actions to take to reduce them (M. Nieuwenhuijsen)

10:30 – 12:30  Parallel sessions
   1.1 Citizen science: experience from the field (i) (chair: M. Loopmans)
   1.2 Exposure on the move (chair: B. de Geus)
   1.3 On the governance of air pollution (chair: R. Weikmans)

12:30 - 14:00  Standing Lunch & Poster presentations (chair K. Fransen & B de Geus)

14:00 – 15:30  Parallel sessions
   2.1 Citizen science: between innovation and resistance (chair: K. Boussauw)
   2.2 Air pollution beyond science: making visible the invisible (chair: T. Bauler)
   2.3 Strategic coalitions for cleaner air (chair: C. Bouland)

15:30- 16:00  Coffee & tea

16:00 – 18:00  Thematic & mobile workshops
   (registration requested www.brusselsair.org/workshops/)
   o Health professionals against pollution
   o From a mobility project to a city project
   o Health and environmental justice in Molenbeek
Day #2 - Friday April 26th

08:00 – 09:00  #Filtercafefiltre: citizens action at ‘Parvis de Saint Gilles’ (3 min. walk from venue)

09:30 – 10:30 Plenary session
  o  New challenges to Air Governance: testing the limits of current frameworks
    (D. Misonne, U. Taddei, E. Scotford)

10:30 – 11:00  Coffee & tea

11:00 – 12:30 Parallel sessions
  3.1 Citizen science: experience from the field II (chair: B van Heur)
  3.2 From data to knowledge (chair: E. Dons)
  3.3 Policies and plans for cleaner air (chair: M. Hubert)

12:30 – 13:30 Lunch

Practitioners meet Scientists

13:30 – 15:00  Public lecture
  o  Air, Citizens & Science
    (A. Kenis, G. Walker, G. Fuller)

15:00 – 17:00  Round table discussions / world café
  o  Pollution sources
  o  Impacts on health
  o  Urban planning
  o  Knowledge & data

17:00 – 20:00 Drinks & goodbye
18:00 – 20:00 Kiddical Mass Brussels (starts 18h Porte de Namour – Arrives 19h Pianofabriek)
4 Scientific supervision & organisation
   o Coordinator: Nicola da Schio (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)

   o Tom Bauler (Université Libre de Bruxelles, IGEAT)
   o Catherine Bouland (Université Libre de Bruxelles, CRSET)
   o Kobe Boussauw (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)
   o Nicola da Schio (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)
   o Bas de Geus (Vrije Universiteit Brussel, MFYS & MOBI)
   o Evi Dons (Hasselt University, Centre for Environmental Sciences)
   o Koos Fransen (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)
   o Michel Hubert (Université Saint-Louis – Bruxelles, IRIB)
   o Anneleen Kenis (FWO, King’s College London)
   o Maarten Loopmans (KU Leuven)
   o Delphine Misonne (FNRS, Université Saint-Louis – Bruxelles, CEDRE)
   o Joren Sansen (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)
   o Bas van Heur (Vrije Universiteit Brussel, Cosmopolis Centre for Urban Research)
   o Romain Weikmans (FNRS Université Libre de Bruxelles, IGEAT)

5 Practicalities
The symposium is hosted at PianoFabriek, Rue du Fort Straat 35, Saint Gilles, Brussels

Registration requested: https://www.brusselsair.org/resistance-in-the-air/registration/

Fee 120 euro for 2 days (reduction for civil society, master’s & bachelor’s students, 15 euros per day)
The fee covers the venue, lunches and refreshments on both days. Travel costs and accommodation in Brussels are not included.

For more information, contact: Nicola da Schio (ndaschio@vub.be)
Parallel sessions

1 Day #1 morning - 10:30 to 12:30

1.1 Citizen science: experience from the field I
Chair: Maarten Loopmans
maarten.loopmans@kuleuven.be

The BREATHE project: a citizen magnetic-bio-monitoring technique to analyse concentration and origin of air pollutants up to decision making
Davia Dosias-Perla, Lionel Scotto d’Apollonia, Pierre Camps, Thierry Poidras and Patrick Davia.DOSIAS-PERLA@cnrs.fr
BREATHE project mobilizes an innovative device called Artivistes-atelier (AA) to articulate a Participatory Action Research program on political decision making and Citizen Sciences one on the air quality issues. The chosen common thread is a citizen measurement of the concentration of air pollutants deposits in urban and peri-urban areas. The European community takes France and five other members states to EU Court of Justice for failure in their air quality policies so with BREATHE we will co-produce high-resolution maps of the deposits of anthropogenic toxic metals on plant leaves.

(How) Can Citizen Science be Good Science?
Evelyne Elst, Celine Van Gorp, Christophe Stroobants, LIFE VAQUUMS-project team, Interreg Project Zuivere Lucht-team e.elst@vmm.be
Over the past decade the awareness of the link between air quality and health issues increased. Resulting in an increased interest among citizens and local authorities in street level, real time information on air quality. Though dense networks of local data can be valuable additions to the reference measurements, there are some pitfalls. In Flanders we avoid these and face the problems head-on through tools under development in our international projects INTERREG ‘Zuivere Lucht’ and LIFE VAQUUMS. Both projects engage directly with the citizen scientists, local authorities and domain experts.

Citizen science between the government, media and civil society: Experiences from deploying India’s largest network of scientifically validated real-time PM2.5 monitors
Ronak Sutaria, Patrik Oskarsson (@poskar) patrik.oskarsson@slu.se
‘Participatory environmentalism: Mobilising citizens for air pollution mitigation and improved environmental health in India’ - This project examines the conditions which enable citizens to become actively engaged in pollution control for improved environmental health. Low cost pollution monitors may allow people to link personal health effects directly to pollution thereby enabling a better understanding of pollution and personal exposure. The resulting improved knowledge of what pollution is and where it comes from is expected to support community mobilisation to mitigate pollution.

Measuring air quality in a rural community and mapping out routes that turn measurements into mechanisms for decision making and actions"
Adrián Álvarez González ad.alvarez@udd.cl
An ethnographic and participative approach explores the way in which the data collected by a low-cost sensor network can become useful and actionable information for the potters of the Pomaire, a central and rural community in Chile, who due to their pottery activity are the main emitters of PM as well as the main economic and identity source in the village.

Use of low-cost sensors for the measurement of Atmospheric Particulate Matter from various sources: A school experience in the Atacama Desert
Nicolas Zanetta nicolaszanetta@gmail.com
1.2 Exposure on the move
Chair: Bas de Geus (@Bas_de_Geus)
bas.de.geus@vub.be

Peak exposure to black carbon in everyday life
Evi Dons, Michelle Laeremans, Juan Pablo Orjuela, Ione Avila-Palencia, Audrey de Nazelle, Mark Nieuwenhuijsen, Joren Buekers, Martine Van Poppel, Patrick De Boever, Tim Nawrot, Luc Int Panis (@LucIntPanis)
evii.dons@uhasselt.be

Air pollution peak exposures are omnipresent in our lives. Especially when moving around in a city, there is a high chance for being exposed to peak exposures. Peak exposures may contribute disproportionately to longer term health outcomes, or they may trigger a next stage in the development of a disease. Until now the independent impact of repeated peak exposures was not studied, with the main motivation being that the number of peaks and longer-term average exposure are highly correlated. In our research we found that this is not always true.

L’air d’un Bruxellois: self-portraits of personal exposure to air pollution
Nicola da Schio (@nicdas13), with Arnaud Dubois, Cécile Herr, Katia Xenophontos (@Lanomadesed), Lorenzo Glorie, Matthieu Coulonval
ndaschio@vub.be

We analyse exposure to air pollution by drawing seven portraits of Brussels residents, combining an account of their spatio-temporal trajectories with average levels of exposure. Inter alia, these portraits help revealing the variation between people and between activities and the influence of contextual factors. By showing the little possibilities to reduce individual exposure by changing a person’s routine, also, we emphasise the limits of tackling exposure through strategies focused on individual behavioural change and make the case for collective solutions to reduce people vulnerability.

Air pollution generated by freight transport vehicles in Brussels Metropolitan Region: a dynamic approach to measure the real impact
Koen Mommens, Nicolas Brusselaers, Tom van Lier and Cathy Macharis (Koen.Mommens@vub.be)

Air pollution is considered the largest threat to human health, a large share of these transport-related emissions being attributable to freight transport. The associated external costs of air pollution are directly linked to the number of vicinal receptors. Studies so far have only considered the static link between the presence of the emission source and the number of its vicinal receptors, often based on the home location, as such making abstraction of individual travel patterns. This research combines both dynamic receptor densities and freight transport emission sources.

Breathing resistance – is ‘effective’ respiratory protection really effective in a community setting?
Claire Judith Horwell (@claire_horwell)
Claire.horwell@durham.ac.uk

This talk will discuss how respiratory protection is being worn, by the public, to reduce exposure to air pollution. Yet, is industry-certified protection suitable for public use without training in fit? And are cheap masks worse than wearing no mask at all? Do they provide a false sense of security? What responsibilities do governments have to inform the public about the likely effectiveness of personal exposure reduction measures?

Making invisible air pollution visible: A scientifically sound methodology to include air pollution (model) data in routing applications
Bram Vandeninden (@bramv093)
vandeninden@irceline.be

Cyclists and pedestrians often commute in polluted air without being aware of it. We conducted comprehensive research to detect the spatial and temporal patterns of air pollution for cyclists and pedestrians during travel. Further, We will provide an API that can be used to incorporate air quality in routing applications (or in recreational apps) with the best available air pollution model data, enabling the possibility to explore the difference in air quality for a number of similar route alternatives in their daily commuting and/or recreation.
1.3 On the governance of air pollution

Chair: Romain Weikmans (@RomainWeikmans)
rweikman@ulb.ac.be

Air pollution and social justice perspectives in socio-ecological systems

Gabriel Marques Mostaço, Clarissa Ferreira Macedo D’Isep, Jorge Alberto Mamede Masseran
clarissa.disep@gmail.com

There is a profound interaction between air pollution and social justice. Recently, air pollution was defined as the main cause of premature death in the whole world. In this sense, low socio-economic status populations have higher rates of exposure to air pollutants, aspects of concern in social justice. Through a socio-ecological systems perspective, we hypothesize that mechanisms of polycentric governance bring positive interfaces to foster policy formulation against social vulnerability, reducing the distance between decision makers and those who are unfairly affected by State actions.

Sortie du diesel et de l’essence en Région de Bruxelles-Capitale : résultats de la consultation des parties prenantes

Sarah Hollander
shollander@environnement.brussels

The regional Brussels Government decided last year to launch a stakeholder consultation on the target to ban diesel in 2030 and petrol in a next step and to develop the alternative technologies on a short and medium term. This presentation will give an overview of the results of this stakeholder consultation and of the next steps and actions the Brussels Capital Region will take.

Air Pollution in Paris: The Lack of Awareness of the Risks Related to Air Pollution by Public Authorities

Tony Renucci (@TonyRenucci)
Tony.Renucci@eleve.ena.fr

This study is devoted exclusively to outdoor air pollution of PM and NO2 pollutants in the city of Paris. This work is based on an in-depth analysis of parliamentary and institutional reports, scientific studies and specialized press articles. The aim is to explain and illustrate the link between air pollution and health, socio-economic and legal risks, and to identify the public policies put in place to address these risks.

Air Pollution in times of Brexit: Civil Society and the Contested Game of Multilevel Governance

Anneleen Kenis
anneleen.kenis@kcl.ac.uk

Air pollution is figuring high on the public agenda in London (UK). The fight against ‘illegal’ levels of air pollution has gained momentum during the last five years. Interestingly, civil society groups have played a key role in staging the issue, invoking, amongst others, European air quality legislation to support their demands and claims. Thereby they play the game of multilevel governance in their own way: by referring to higher levels of policy-making, they attempt to enhance the legitimacy of their demands towards local or national policy makers. In this process, different civil society actors frame the kind of policies needed to meet the European obligations in diverging ways, thus translating European policies in ways which support their own political claims. While they have been very successful in this so far, Brexit risks to represent a game breaker for this approach. Not coincidently, several actors have advocated against Brexit by bringing air quality legislation into the debate. This paper analyses how civil society actors play the game of multilevel governance in a changing context and how this forces them to rearticulate their strategies, discourses and claims.

On the underestimation of the health effects of exposure to air

Catherine Bouland (@cathbouland1)
catherine.bouland@ulb.ac.be

Air pollution is not a new phenomenon, it is mostly controllable and often avoidable, however it has long been neglected. The effects on health are important, affecting men, women, children, pregnant women, patients and socio-economically disadvantaged people. People often combine several environmental exposures. Deaths, cardiorespiratory diseases and cancers are among the quantified health effects both globally and nationally. The numbers are impressive, they are compared to mortality related to road accidents, or translated into equivalent cigarette smoke. For example, 632 premature deaths were attributed to air quality in the Brussels-Capital Region. A reduction in both local and transported emissions could contribute to a reduction in the number of diseases and prevent premature deaths. However, these figures only reveal the tip of the iceberg,
as they do not include the wide spectrum of health effects such as learning disorders, hyperactivity, mental health and brain development. Health concerns, symptoms and diseases not yet addressed by epidemiologists are getting identified. Lifelong exposure, windows of critical sensitivity, neuro-developmental and brain effects, and the composition of the particle matter we breathe are all elements to be deeper explored. An improved monitoring of both health and environment, an in-depth understanding of the involved physiological mechanisms, the study of mixtures and synergies, support the underestimation of the global impact on human health. A revisited interpretation of the environmental related health impacts could lead to paradigms shifts for action and decision.
Day #1 afternoon - 14:00 to 15:30

2.1 Citizen science: between innovation and resistance

Chair: Kobe Boussauw (@KBoussauw)
Kobe.Boussauw@vub.be

Air quality Citizen Science, between representation, reference and resistance
Anna Berti Suman, Sven Schade (@Abesuman)
A.BertiSuman@uvt.nl

Citizen Science is discussed as a resistance practice as it produces scientific facts “outside the institution of science”, fuelling political struggles (Kullemberg 2015, 68). We will stress that air quality Citizen Science movements challenge the system but staying ‘grounded’ in scientific facts. In addition, we will argue that air quality Citizen Science to realize its full potential needs to gain external recognition. Through the investigation of the policy uptake of Citizen Science, we will demonstrate that Citizen Science can be complementary with public information on air pollution.

Citizen science using airQmap as air quality monitoring tool: a case study in Mechelen
Martine Van Poppel, Jan Peters, Stijn Vranckx (@stijnvranckx), Jo Van Laer
martine.vanpoppel@vito.be

The paper shows the results of a mobile monitoring campaign performed by citizens in Mechelen. The study is part of the local citizen observatory Meet Mee Mechelen, initiated as part of the European H2020 project Ground Truth2.0 and the Flemish project Flamenco. Measurements were carried out using airQmap (www.airqmap.be), a user friendly monitoring tool developed by VITO to map black carbon (BC) at street level. Measurements were performed during morning and evening peak hours and in different seasons. Results show large spatial and temporal variability.

When geography meets citizen science: how data and maps shape the air quality debate
Koos Fransen (@Koos_Fransen), Nicola da Schio (@nicdas13) and Kobe Boussauw (@KBoussauw)
koos.fransen@vub.be

The way in which air pollution data is collected and results are communicated have a strong impact on the meaning of air pollution with respect to living, working and travelling in the city. In the current paper, we critically assess the differences between findings resulting from the official IRCEL methods and those from two citizen science projects (Luftdata and AirCasting). The analysis shows a different distribution of pollution, and, additionally, indicates that citizen science-based measurements are related to socio-economic variations throughout the city not shown in the IRCEL results.

How to deal with resistance in air quality monitoring? A scientist perspective
Sonja Grossberndt, Nina Castell, Philipp Schneider, Alena Bartonova, Hai-Ying Liu
Sonja.Grossberndt@nlu.no
2.2 Air pollution beyond science: making visible the invisible

Chair: Tom Bauler
tbauler@ulb.ac.be

And then it came this number PM 2.5/ aesthetics and politics of the datafication of urban air

Agata Marzecova, Hanna Husberg and Liu Xin
(contact@agatova.sk)

Our paper, produced in collaboration among the environmental scientist, feminist scholar and visual artist, will highlight how new imaginaries of urban air, developed in response to recent practices of technological sensing of particulate pollution, are co-generative of novel modes of governance.

Good Air is (a) Good - Unpacking Artistic Modes of Resistance Against Air Pollution

Alexandra Toland, Friederike Landau (@f_ihigh)
friederike.landau@metropolitanstudies.de

The paper discusses artistic activism within the ‘Anthropocene’, which captures environmental psychological/political implications of human action on the earth’s surface. Within this discourse, urbanization is affected by forms of sensory stress (e.g., visual pollution, consumer-stimulating noises, smells, vehicular emissions). We focus on the a/effects of air pollution in urban ecosystems, presenting empirical results from exploratory field research and introducing conceptual underpinnings of investigating artistic projects dedicated to themes of urban air quality, dust and smog.

Atmospheres without limits

Philippa Barr (@philippabarr_)
philippa.barr@hdr.mq.edu.au

This paper considers how affect forms part of an engagement strategy to compel the regulation of atmospheric pollution. Using a series of case studies from various real or perceived air pollution events, including the London smog, the plague in Sydney and similar episodes in Milan, I argue that the very intangible, uncontrollable and transboundary nature of sensations like odor has in many ways a more profound effect on the public then scientific measurement of poor air quality.

Bxl’air bot: a journalistic point of view about air quality in Brussels

Laurence Dierickx (@ohmyshambles)
Laurence.Dierickx@ulb.ac.be

"Bxl'air bot" is an automated news production project conducted, during one year, within the newsroom of the monthly magazine Alter Echos. The purpose of this online platform was to collect public data disseminated in real-time, to store them into a relational database, and to deliver insights to the audiences as well to the journalists, in order to support them in a wider investigative about air quality.
2.3 Strategic coalitions for cleaner air

Chair: Catherine Bouland (@cathbouland1)
Catherine.bouland@ulb.ac.be

Co-designing air quality interventions for Somers Town, London: Data, politics and possibilities for action
Sarah Bell, Slaney Devlin, Claire Holman, Charlotte Johnson (@charlojohnson)
c.johnson@ucl.ac.uk

Somers Town is a residential neighbourhood in central London with critically high levels of air pollution. In addition, it is a crucible for broader pressures in the UK political economy, such as national transport infrastructure upgrades, housing supply pressures, and urban low carbon transition, all of which directly impact the local environment. This paper discusses a collaboration between the Neighbourhood Forum and UCL’s Engineering Exchange. The paper covers the co-design approach, the outputs and outcomes, & the broader politics of community action on air quality.

The AIR (Air pollution Interdisciplinary Research) Network
Jana Wendler (@janawendler)
jana.wendler@gmail.com

The AIR Network project is an interdisciplinary research partnership of African and European researchers and members of the Mukuru informal settlement in Nairobi, Kenya, working on the issue of air pollution. Using a range of creative methods, from music production to legislative theatre, the network explored innovative, participatory approaches to raising awareness and developing solutions. In this talk, we will share our experience and preliminary outcomes from the project, in particular how creative methods may enable more equitable ways of knowledge production in air pollution research.

Future health professionals interacting with citizens in joint actions on air quality monitoring
Jelena Gajić, Dubravka Dimovski, Boško Vukajlović, Marija Jevtić, Srđan Kukolj, Vlatka Matković Puljić
marija.jevtic@uns.ac.rs

This research is a result of cooperation with the HEAL, and is intended to give Public Health PhD students an overview of possibilities enabled by this type of measurement, and the ways in which they can influence their environment and society, both as citizens and researchers. The goal of this research was to: monitor the air pollution levels in everyday situations and in different locations where actual exposure happens; raise public awareness on air pollution, human exposure and health impacts of it, raise awareness on the harmful personal habits that may contribute to air pollution.

Unmask my City – doctors urging for clean air in our European cities
Vlatka Matkovic Puljic (@VlatkaMatkovic), Marija Jevtic, Srdjan Kukolj, Catherine Bouland (@cathbouland1)
vlatka@env-health.org

Just like the anti-tobacco campaigns of the late 20th century, doctors are sounding alarms about the health risks of poor air quality in our cities. Air pollution is now responsible for over 6.5 million premature deaths per year. Health experts are dedicated to improving the health of patients and communities. Improving air quality and reducing emissions in our cities will save millions of lives and improve health outcomes for billions of people. Unmask My City calls on decision makers to adopt policies and programmes to meet the World Health Organisation’s air quality guidelines.
3  Day #2 morning - 11:00 to 12:30
3.1  Citizen science: experience from the field II

**Chair:** Bas van Heur (@basvanheur)
**Bas.Van.Heur@vub.be**

**Beyond data collection on air quality: forging new relationships via the Meet Mee Mechelen citizen observatory**
Uta When, Stijn Vranckx (@stijnvranchx), Kim Anema, Ellen Pfeiffer, Marten Schoonman
**stijn.vranckx@vito.be**

Researcher - Environmental Modelling (VITO, Belgium). • Regional and local scale air quality modelling; • Computational fluid dynamics (CFD) for atmospheric dispersion & urban microscale modelling; • Development of environmental indicators and monitoring tools ; • Spatially-dynamic land use modelling and optimization; • Citizen science and launching participatory processes for environmental monitoring and decision making; • Broad experience in policy support in environmental topics: air quality, ecosystem services and environmental quality of life

**Citizens’ associations for air quality issues: from resistance to community empowerment in the LOOPER project**
Massimiliano Condotta, Chiara Scanagatta, Imre Keseru, Jesse Pappers (@JessePappers), Cathy Macharis
**jesse.pappers@vub.be**

This presentation focuses on mobility in cities. In the LOOPER project, we research how co-creation processes can be used to solve urban problems such as air pollution and traffic safety.

**Promoting Behaviour Change through the Usage of Low-Cost Air Quality Sensors: An Experimental Study**
Laura Temmerman, Carina Veeckman
**laura.temmerman@vub.ac.be**

In the framework of the European project hackAIR, imec-SMIT-VUB conducted a quasi-experimental design to investigate the impact of owning a low-cost air quality (PM) sensor and having access to local air quality data of Brussels on the belief, knowledge and behaviour of citizens. A positive significant impact was observed on the belief and knowledge of participants, and on soft-mobility behaviours; demonstrating the potential of low-cost sensors for the education and empowerment of citizens. In-depth interviews also highlighted barriers to the practice of air quality friendly behaviours.

**A participatory approach to study Spatial distribution of Black Carbon in an elementary school catchment area with a focus on Morning Rush Hour (MRH)**
Luca Boniardi, Evi Dons, Luc Int Panis, S. Fustinoni
**luca.boniardi@unimi.it**

This contribution is part of the MAPS MI project, “Mapping Air Pollution in a School catchment area of Milan”. The project has the aim of studying with a participatory approach exposure to air pollution of schoolchildren in Milan, using LUR models, air pollutants personal monitoring and biological monitoring techniques.
3.2 From data to knowledge
Chair: Evi Dons
evi.dons@uhasselt.be

Moving from data to knowledge: Harnessing the power of dense networks of environmental monitors to mitigate environmental challenges
Jennifer Salmond, Lena Weissert, David Williams
j.salmond@auckland.ac.nz

We have developed low-cost air quality sensors for deployment in high-density hierarchical networks. These sensors, combined with new data quality control and analysis techniques to manage uncertainty in sensor calibration, have the potential for an explosion in reliable data acquisition. We examine the added value of combining social and environmental data sets using fusion measurement and modelling approaches to provide tools to aid decision making, and connect citizen science to regulatory measurement.

How joint exposure measurements to traffic related noise and air pollution in citizen science campaigns result in multidisciplinary benefits
Luc Dekoninck
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Noise exposure is not only a health impact, it is also a very sensitive and cheap way to measure the amount of traffic and quantify the short-term variability of traffic. The noise measurement adds the most important driving factor to the air pollution data sets: the variation in traffic density and traffic dynamics near the subject. Quantifying the short-term variability of the exposure enables the disentanglement of the influence of the local traffic contribution, the impact of meteorology on the local dispersion and the impact of large-scale changes in background concentrations.

Air quality monitoring and dispersion modeling: emergence of a supra-national priority as simultaneously citizen, scientific and jurisdictional
yassir.damoun@univ-evry.fr

Air pollution, which characterizes urban areas, is of increasing interest to scientists, political actors, civic associations or even international institutions who wish to emerge a global and harmonized approach of this issue. This transversality proves to be unavoidable as the protection of the air requires an interdisciplinary approach that can connect as well as the legal, scientific, numerical, political or social points of view of this problematic. This transversality represents the suitable response to the complexity of the problems related to atmospheric pollution, particularly in terms of its study, its modelling and its protection. For example, the French judge acted as a European judge for more effective protection the right of citizens to have an Air Quality in order to exceed the national conceptual, technical and institutional limitations to reinvigorate citizens’ protection of the air.

The link between air pollution and mortality in Belgium: from a descriptive and analytical point of view.
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The link between air pollution and mortality in Belgium: from a descriptive and analytical point of view.
3.3 Policies and plans for cleaner air

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AirTech’byDesign: Injecting Technology into Urban Design in the battle against Street Canyon Pollution
Dimitri Voordeekers
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Street canyons represent the most problematic arteries of our cities concerning air quality. Both urban design and technological solutions, such as photocatalyst, have proven to be powerful tools for improving the air quality and overall health. Therefore, the Research group for Urban Development, DuEL and BioGEM of the University of Antwerp decided to team up to tackle together this urgent challenge. The doctoral project aims to illustrate the potential effects of a synergetic implementation of urban design and technical solutions to enhance local air quality.

Etats des lieux de la qualité de l’air et évaluation de l’impact de politiques de mobilité sur les émissions et concentrations de polluants atmosphériques en Région de Bruxelles-Capitale
François Goor, Olivier Brasseur et Anne Cheymol
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Air pollution in the Brussels Capital Region has to be improved to protect the citizens health regarding the WMO recommandations and the european limit values. In this talk, the air quality problem in Brussels and the actions implemented to improve air quality will be explained. Their impact (such as LEZ and phasing out of the thermic motors) and the model developped in Brussels Environement to estimate theses impacts will be also presented.

Assessing impacts on mortality and economic benefits of reduction in ambient air pollution in the Brussels Capital Region
Jonathan Andrieux
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This research aims to estimate the impact of reducing air pollution levels on premature death among adults above thirty years of age in the Brussels Capital Region. We used AirQ+ to evaluate the impact of reduced long term exposure to PM2.5, NO2 and Black Carbon. Estimates calculation for all causes and specific mortality included the attributable proportion of cases; number of attributable cases per 100 000 population at risk; proportion of cases in each category of air pollutant concentration; cumulative distribution by air pollutant concentration and Years of Life Lost.

The politics of sustainability experiments; Rise, diffusion and system innovation ‘backlash’ of the 80 km/h sections on Dutch motorways (1999-2017)
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This contribution takes issue with prevailing overoptimistic expectations of deploying sustainability experiments as transition instruments, eliciting the politics involved. The critical case involves the evolution (1999-2017) of the 80 km/h sections on Dutch motorways, where the speed limit was lowered in order to alleviate air quality problems in the surrounding residential areas. After initial success of the first experimental section and subsequent scaling-up with four more sections, the recent introduction of 130 km/h sections displays a system innovation ‘backlash’.
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Making invisible air pollution visible: A scientifically sound methodology to include air pollution (model) data in routing applications
Bram Vandeninden b.vandeninden@vmm.be

Cyclists and pedestrians often commute in polluted air without being aware of it. We conducted comprehensive research to detect the spatial and temporal patterns of air pollution for cyclists and pedestrians during travel. Further, We will provide an API that can be used to incorporate air quality in routing applications (or in recreational apps) with the best available air pollution model data, enabling the possibility to explore the difference in air quality for a number of similar route alternatives in their daily commuting and/or recreation.

Impact of the built/non built environment on mental health in Brussels
Ingrid Pelgrims, H Keune, I Thomas, S Trabelsi, H Bastiaens, R Remmen, T Nawrot, E M De Clercq (ingrid.pelgrims@sciensano.be)

This research project (NAMED) intends to investigate the impact of the (non-)built environment on mental health in Brussels. An epidemiological study will be carried out based on the coupling between data from the national health surveys and specific indicators describing each participant’s surroundings in terms of (non-)built environment, quality of air and noise. PM 2.5, BC and NO2 exposure levels will be interpolated for each participants residential address, based on the X,Y coordinates. The environmental perception will also be analyzed including air pollution, bad smell and noise.

Ethical considerations of recommending or distributing facemasks for community protection from ambient air pollution events: an organizational perspective
Fiona McDonald, Claire J. Horwell, Richard Wecker, Lena Dominelli, Miranda Loh, Robie Kamanyire, Ciro Ugarte, Djoni Ferdiwijaya (fiona.mcdonald@qut.edu.au)

Protecting populations from air pollution events is a global health issue. Exposure to some sizes, compositions and concentrations of airborne particulates is harmful, but there is limited evidence of the efficacy of facemask use in community settings during air pollution events. We analyse the ethical implications for public health and emergency management agencies of whether to recommend and/or distribute facemasks during such events. We consider such decisions against ethical principles from public health ethics, such as effectiveness, precaution, autonomy, justice and harm and benefit.

Health, Environment and Susceptible Populations
Claire Demoury, Raf Aerts, Eva M. De Clercq (eva.declercq@sciensano.be)

Research suggest that people respond to environmental stress differently, according to sociodemographic characteristics and preexisting health problems. The aim of the HEASP project is to identify factors that modify the association between mortality and environmental exposures. The associations are assessed for specific medical conditions (diabetes, cardiorespiratory disease, ...). This is done by linking mortality data to data on medication sales and medical interventions, as well as environmental data (such as air pollution). The study population covers urban mortality between 2010 and 2015.
First year of air quality monitoring by the new satellite instrument TROPOMI on board of the COPERNICUS SENTINEL 5P mission
Isabelle De Smedt, Nicolas Theys, Christophe Lerot, Henk Eskes, Pepijn Veefkind, Michel Van Roozendael (isabelle.desmedt@aeronomie.be)

S5P is the first mission of the European Copernicus Programme dedicated to the monitoring of air quality. The satellite instrument TROPOMI aboard S5P represents a breakthrough in air quality from space thanks to an unprecedented spatial resolution. TROPOMI daily global observations are used for improving air quality forecasts as well as for monitoring the concentrations of atmospheric constituents (like NO2, CO, HCHO, SO2, O3, aerosols and clouds) in order to better estimate the emissions in the atmosphere.

The Interreg Central Europe AWAIR project: Environmental integrated, multilevel knowledge and approaches to counteract critical air pollution events, improving vulnerable citizens quality of life in Central Europe Functional Urban Areas
The AWAIR project brings together research Institutions and public administrations from four different countries, boosting cooperation and common policy strategies at national and EU level. Local policy makers will then benefit from the publication of the project results, including guidelines and tools to support them in dealing with issues of air pollution in their own territories. Additionally, functional urban areas involved in AWAIR will participate in many international initiatives and networks dealing with air quality & municipalities management.

L’air d’un Bruxellois: self-portraits of personal exposure to air pollution
Nicola da Schio, with Arnaud Dubois, Cécile Herr, Katia Xenophonotos, Lorenzo Glorie, Matthieu Coulonval (katiaxeno@gmail.com)
We analyse exposure to air pollution by drawing seven portraits of Brussels residents, combining an account of their spatio-temporal trajectories with average levels of exposure. Inter alia, these portraits help revealing the variation between people and between activities and the influence of contextual factors. By showing the little possibilities to reduce individual exposure by changing a person’s routine, also, we emphasise the limits of tackling exposure through strategies focused on individual behavioural change and make the case for collective solutions to reduce people vulnerability.

Measuring air quality in a rural community and mapping out routes that turn measurements into mechanisms for decision making and actions
Adrián Álvarez González ad.alvarez@udd.cl
An ethnographic and participative approach explores the way in which the data collected by a low-cost sensor network can become useful and actionable information for the potters of the Pomaire, a central and rural community in Chile, who due to their pottery activity are the main emitters of PM as well as the main economic and identity source in the village.

The BREATHE project: a citizen magnetic-bio-monitoring technique to analyse concentration and origin of air pollutants up to decision making
Davia Dosias-Perla, Lionel Scotto d’Apollonia, Pierre Camps, Thierry Poidras and Patrick Nicol (davia.dosias-perla@cnrs.fr)
BREATHE project mobilizes an innovative device called Artivistes-atelier (AA) to articulate a Participatory Action Research program on political decision making and Citizen Sciences one on the air quality issues. The chosen common thread is a citizen measurement of the concentration of air pollutants deposits in urban and peri-urban areas. The European community takes France and five other members states to EU Court of Justice for failure in their air quality policies so with BREATHE we will co-produce high-resolution maps of the deposits of anthropogenic toxic metals on plant leaves.
Future health professionals interacting with citizens in joint actions on air quality monitoring
Jelena Gajić, Dubravka Dimovski, Boško Vukajlović, Marija Jevtić, Srđan Kukolj, Vlatka Matković Puljić
marija.jevtic@uns.ac.rs

This paper is a result of cooperation with the HEAL, and is intended to give Public Health PhD stu-dents an overview of possibilities enabled by this type of measurement, and the ways in which they can influence their environment and society, both as citizens and researchers. The goal of this research was to: monitor the air pollution levels in everyday situations and in different locations where actual exposure happens; raise public awareness on air pollution, human exposure and health impacts of it, raise awareness on the harmful personal habits that may contribute to air pollution.

Unmask my City – doctors urging for clean air in our European cities
Vlatka Matkovic Puljic, Marija Jevtic, Srdjan Kukolj, Catherine Bouland
vlatka@env-health.org

Just like the anti-tobacco campaigns of the late 20th century, doctors are sounding alarms about the health risks of poor air quality in our cities. Air pollution is now responsible for over 6.5 million premature deaths per year. Health experts are dedicated to improving the health of patients and communities. Improving air quality and reducing emissions in our cities will save millions of lives and improve health outcomes for billions of people. Unmask My City calls on decision makers to adopt policies and programmes to meet the World Health Organisation’s air quality guidelines.

Benefits of reduced air pollution levels on premature death in the Brussels Capital Region.
Jonathan Andrieux jonathan.andrieux@ulb.ac.be

This research aims to estimate the impact of reducing air pollution levels on premature death among adults above thirty years of age in the Brussels Capital Region. We used AirQ+ to evaluate the impact of reduced long term exposure to PM2.5, NO2 and Black Carbon. Estimates calculation for all causes and specific mortality included the attributable proportion of cases; number of attributable cases per 100 000 population at risk; proportion of cases in each category of air pollutant concentration; cumulative distribution by air pollutant concentration and Years of Life Lost.

Population exposure to black carbon in Brussels-Capital Region: the ExpAIR project
Véronique Schoemann, Thierry de Vos, Olivier Brasseur, François Beaujean, Priscilla Declerck, Billie Heene
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The objectives of the ExpAIR project were: (1) to assess the individual exposure of the population to air pollution in Brussels Capital Region; (2) to inform and increase awareness among the Brussels citizens so that they can reduce their exposure to urban pollution, e.g. by choosing less polluting means of transport. With the help of volunteering citizens, black carbon concentrations were measured indoors and outdoors. Based on these data and modelling, maps of black carbon concentrations in Brussels were produced.

Strategy to Evaluate Health Risks of Short-term Exposure of Air Pollution in Vulnerable Individuals
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The poor air quality including high levels of particulate matter, ozone and nitrogen oxides, represents a major threat to public health and especially for the most vulnerable population like children or elderly. Biomarkers, used as measurable indicators of exposure, effect and susceptibility, may help to monitor children’s health and take decisions to limit the pollutant exposure of the population. This pioneering project aims evaluate the feasibility of collecting and analysing biomarkers in urine and saliva of children in order to develop a non-invasive method to measure the effects of air pollution on their respiratory system. If a successful conclusion is obtained, a larger-scale study might be possible in the future.