

Combining sensor and socio-economic data

Exposition to air pollution

Marie-Pierre de Bellefon - INSEE

ESSNet Big Data - WPL Preparing Smart Statistics
London meeting 3-5 June 2019



- 1 Understanding the context
- 2 Defining a Pilot Project
- 3 Working together

Sommaire

- 1 Understanding the context
- 2 Defining a Pilot Project
- 3 Working together

INSEE : exploring new data sources

- Saturation effect : many territorial issues have been studied with existing sources
- August 2018 : launch of a working group dedicated to new data sources
- October 2018 : first contacts with the Smart City Innovation Center in Nice
- May 2019 : begin of the concrete work with the sensor's data collected by the center

IMREDD : collecting and using city data

About IMREDD

- Mediterranean Institute for Risk, Environment and Sustainable Development
- Co-funded by the University of Nice and the Nice metropolis
- "A new model of cooperation between the academic world, enterprises and the territory"
- The smart city innovation center : a collaborative technology platform

⇒ Contrary to other smart cities, access to raw data, no "black box"

IMREDD : collecting and using city data

Data collected

- Energy consumption, passenger flows, traffic data, water flows, air pollution, noise

Partners

- Institutions, industries, start-ups, academics, associations



IMREDD : collecting and using city data

Developing its activities based on four strategic axes

- Environment
- Risks
- Mobility
- Energy

⇒ Looking for new partnerships to bring something out of its data

⇒ Perfect timing for launching a collaboration with Insee

Sommaire

- 1 Understanding the context
- 2 Defining a Pilot Project**
- 3 Working together

Three key elements of this partnership

- 1 Guide public-decision maker : the studies resulting from this partnership aim at shedding light on territorial issues.
- 2 Standardise data : sensor's data need to be organized before being intersected with other sources.
- 3 Share data : solutions have to be found to intersect data from both partners.

Unequal exposure to air pollution : question

European Environment Agency - *Report 2018*



Unequal exposure to air pollution : question

European Environment Agency - *Report 2018*

- Groups of lower socio economic-status are more vulnerable to air pollution
- They are also more exposed.
- "The social inequalities in the impacts of and exposure to environmental health hazards are likely to continue in the future and thus require increased recognition in policy across governance levels."

⇒ Could we explore this question at a local scale ?

Unequal exposure to air pollution : issue

To which extent are people from lower socio-economic status more exposed to air pollution ?

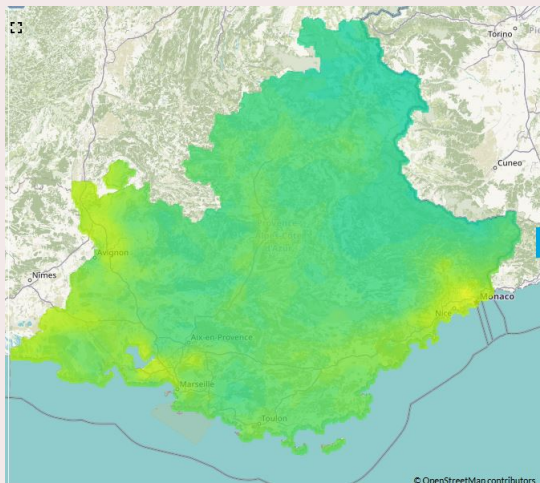
Unequal exposure to air pollution : data

Social deprivation index : INSEE

- Fiscal data : geolocated data with dwelling and household characteristics (including income)
- Composite index : selection of useful categories by an automatic method.
- Confidentiality : using an aggregate index allows to share fiscal data

Unequal exposure to air pollution : data

Air pollution : Imredd and AtmoSUD



Choisir une date

03/06/2019



Choisir une zone géographique

Provence-Alpes-Côte d'Azur



Filtrer par polluant

MULTI-POLLUANT

← PM10

O3

NO2

SO2

Accès direct

- ➊ Risque allergique aux pollens
- ➋ Accéder aux indices nationaux (IQA, Atmo)
- ➌ Accéder aux indices européens

Unequal exposure to air pollution : data

Air pollution : Imredd and AtmoSUD

- Open Data : regional air quality agency (Atmo Sud) provides freely its data : 25 meter grid - 2012-2018 - hourly data
- **Better precision on the Nice city, because of specific sensors financed by the metropolis and collected by Imredd.**
- Methodological discussions about the accuracy of a composite index.

Sommaire

- 1 Understanding the context
- 2 Defining a Pilot Project
- 3 Working together**

Agreement

Master agreement

- Officializing the collaboration between Insee and Imredd
- Defining the public policies concerned by our future studies
- Explaining the characteristics of our respective datasets

Specific agreements

- One per study
- Details about workforce, data and problematics
- ex : which impact had the opening of the tramway line on the mobility of deprived population and their exposure to pollution ?

Workforce

- Imredd : head of innovation and strategic partnerships + three interns to work on the sensors data.
- Insee : head of the territorial analysis unit + one intern to work on the socio-economic data base
- Nice Metropolis : data engineers building a platform to collect sensor data
- Others : expert in air quality measurement, researchers,...

Collaborative platform

- Classical framework for sharing documents and information.
- Not fit for sharing sensitive data
- Ideas : Insee's Secure Data Hub (member of the International Data Access Network)

Timeline

- April 2019 : begin of the internships and the concrete collaboration
- June 2019 : first draft of framework convention
- September 2019 : end of the internship, first concrete elements about the correlation between exposition to pollution and socio-economic vulnerability.
- Autumn 2019 : following of the project with mobility and health data

Thank you for your attention