HEASP – HEALTH, ENVIRONMENT AND SUSCEPTIBLE POPULATIONS

Health Impact Assessment unit

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Data4Research

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World Health Organization (2016): 7 million deaths attributable to the joint effects of household and ambient air pollution in 2012

Air pollution-related mortality: stronger associations have been reported in **diabetic subjects**

Heat-related mortality: stronger associations have been reported in **elderly subjects**

→ Health effects might be exacerbated in **susceptible subgroups** exposed to the same levels of exposure as the whole population

Introduction	Materials & Methods	Discussion

Objective

Study of the individual effect modifiers of the association between environmental exposures and mortality

Association between **exposure to air pollution**, **heat** and **mortality**

- according to **individual characteristics** and **preexisting medical conditions**

- **using national administrative databases**

| **Introduction** | Materials & Methods | Discussion |

Administrative databases

- **National Register, National database for cause of death statistics (Statbel)**
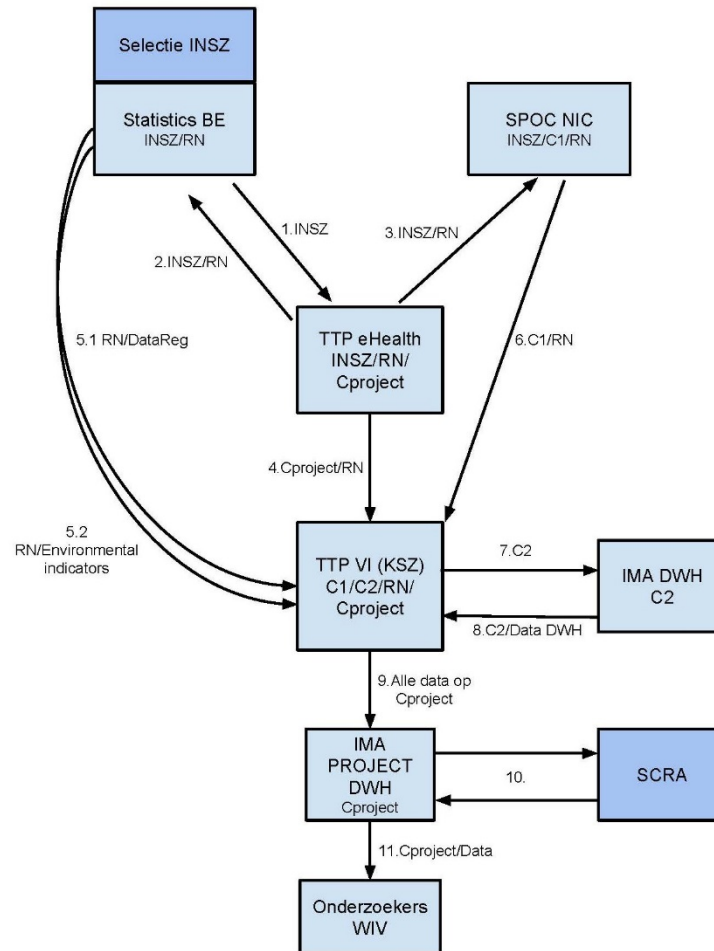
  ↳ Available individual information: date and cause of death, date of birth, gender, municipality and exact address of residence at the time of death, date of moving to the last address, etc…

- **Pharmaceutical, Health care and Population databases (IMA-AIM)**

  ↳ Available individual information: medication prescription, health care use of both ambulatory and hospital care, socioeconomic characteristics, etc…
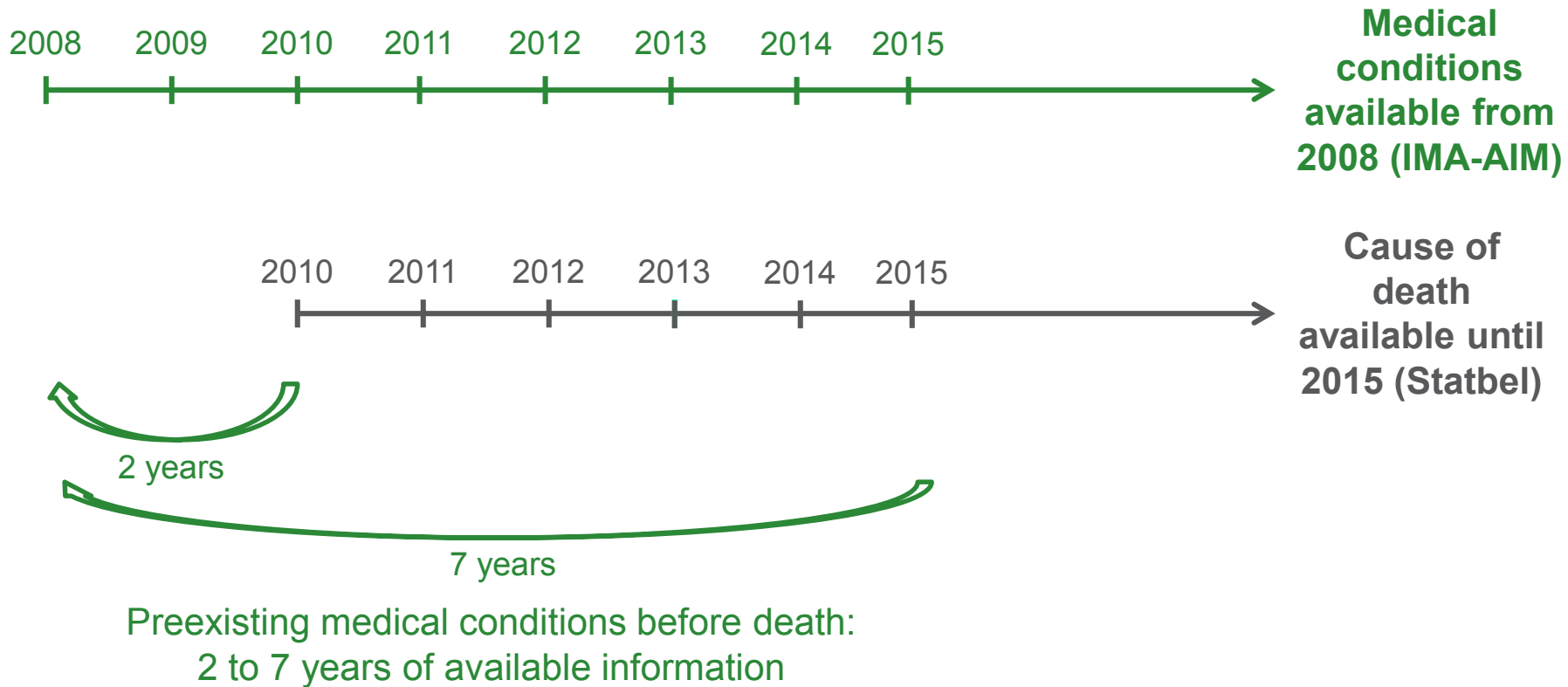
Data traject

2008 2009 2010 2011 2012 2013 2014 2015

Medical conditions available from 2008 (IMA-AIM)

2010 2011 2012 2013 2014 2015

Cause of death available until 2015 (Statbel)

2 years

7 years

Preexisting medical conditions before death:
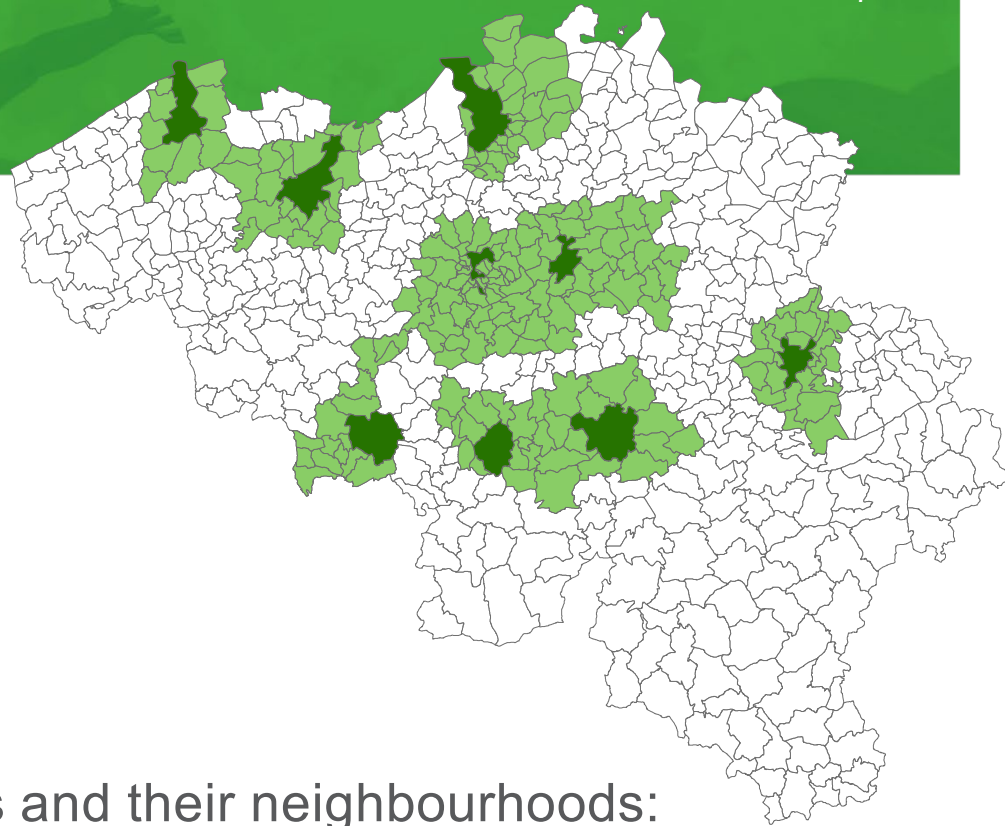2 to 7 years of available information

Study design

Population of interest

- people of all ages

- who died from natural causes
  between 2010 and 2015

- residing in 9 big Belgian cities and their neighbourhoods:
  Brussels, Antwerpen, Gent, Leuven, Brugge,
  Charleroi, Mons, Liège and Namur

Case-crossover design

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Medical conditions

Indicators for individual preexisting medical conditions:

↳ Information for each subject within the 1st, 2nd, … 7th year before death

- **Pharmaceutical database**
  - ATC codes selected to indicate hypertension, COPD, asthma, diabetes, heart diseases, thrombosis, cardiovascular affections etc…
  - Defined Daily Dose per ATC code

- **Health care database**
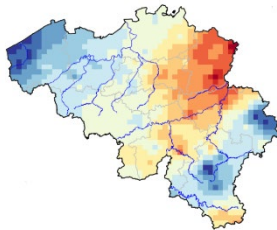 - Interventions for ischemic diseases, diabetes, renal failure

Environmental exposure

- **Daily** exposure based on **spatial interpolation** of available **observations**

  - **Air pollution**
    $PM_{2.5}$, PM_{10}, O_3, NO_2, BC,
    provided by the Belgian Interregional Environment Agency (Irceline)

  - **Meteorological data**
    temperature, precipitations, relative humidity
    provided by the Royal Meteorological Institute of Belgium (RMI)

- Exposure based on the **geographical coordinates** of the residence at the time of death
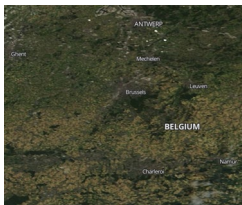
  - **Greenness (% tree cover)** yearly image
    from MODIS VCF

Population selection

Period 2010 – 2015:

N =
642,901

Target municipalities:

N =
337,124

Natural and known cause of death:

N =
307,877

**Population
of interest**

economie
Statistics Belgium

IMA-AIM data coupling, SCRA

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Limitations / Strengths

- **-** Data not design for research

- **-** Individual information rather rudimentary

- **-** Variables used as proxies

- **+** Large population samples, national study

    + possibility of reconstructing each individual's medical history for a period up to 7 years preceding the final outcome

- **+** Cost-efficient

- **+** Standardized data collection

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Conclusion

The use of **national administrative databases** is a cost-efficient method to investigate public health issues

This work will

- allow the identification of specific **susceptible populations** at risk

- help to determine the impact of medical conditions on mortality related to heat and air pollution

- improve understanding health-environment **interactions** related to mortality

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