

# 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

**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**

- **National Register, National database for cause of death statistics (Statbel)**

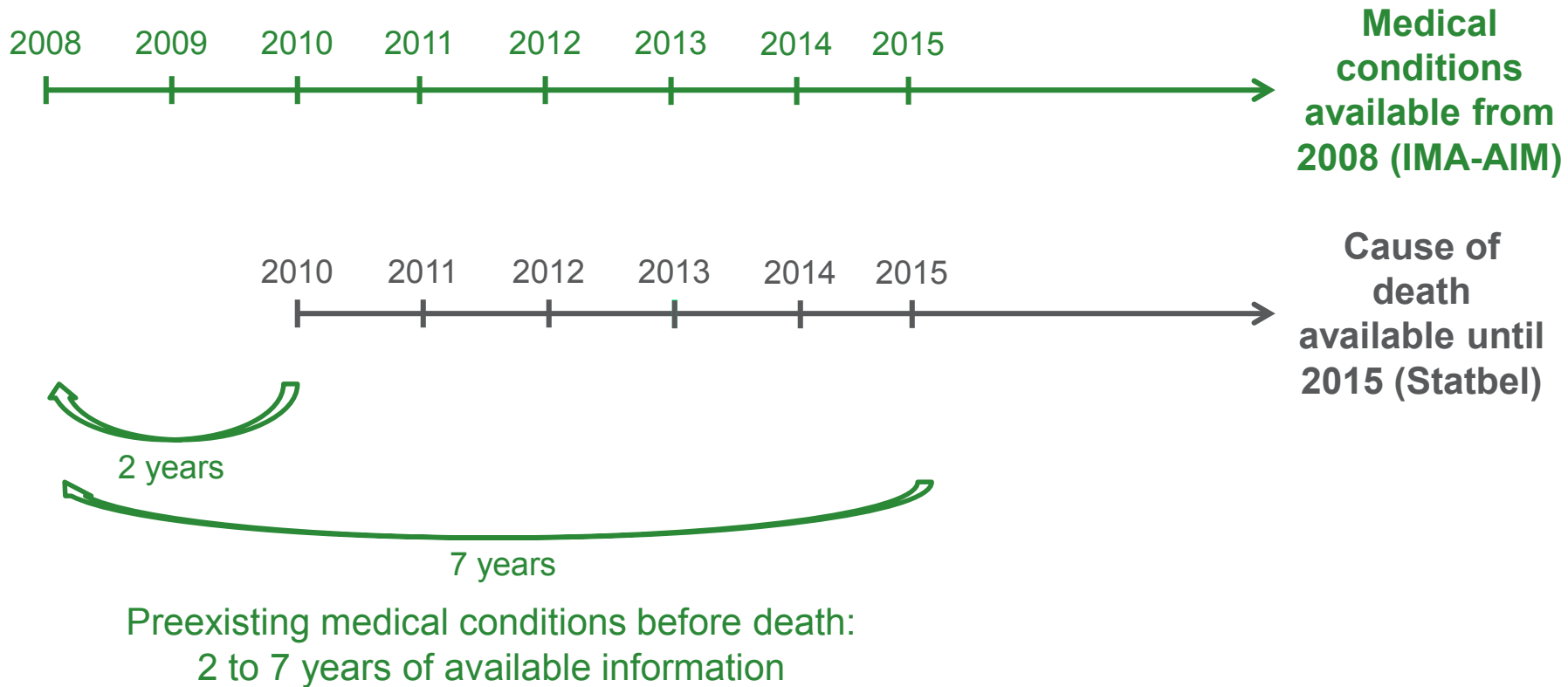
↳ Available individual information: date and cause of death, date of birth, gender, municipality and exact address of residence at the time of death, date of moving to the last address, etc...

- **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 availability - study period

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Introduction

**Materials & Methods**

Discussion

## Population of interest

- people of all ages
- who died from natural causes between 2010 and 2015
- and residing in 9 big Belgian cities: Bruxelles, Anvers, Gand, Louvain, Bruges, Charleroi, Mons, Liège and Namur

## Case-crossover design

# Medical conditions

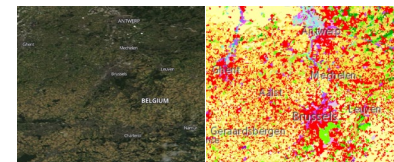


## Indicators for individual preexisting medical conditions:

↳ Information for each subject within the 1<sup>st</sup>, 2<sup>nd</sup>, ... 7<sup>th</sup> 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

- **Daily exposure based on spatial interpolation of available observations**
  - **Air pollution**  
PM<sub>2.5</sub>, PM<sub>10</sub>, O<sub>3</sub>, NO<sub>2</sub>, BC,  
provided by Irceline
  - **Meteorological data**  
temperature, precipitations, relative humidity  
provided by RMI
- **Greenness (% tree cover) yearly image from MODIS VCF,**  
**Land cover from CORINE Land Cover (2012)**
- Exposure based on the **geographical coordinates (X,Y)** of the residence  
at the time of death





# Population selection

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Period 2010 – 2015:

N =  
642,901



Target municipalities:

N =  
337,124



Natural and known cause of death:

N =  
307,877



Available geographical coordinates:

N =  
304,483

Population  
of interest



Statistics Belgium



IMA-AIM data coupling, SCRA

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# Limitations / Strengths

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- 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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Materials & Methods

**Discussion**

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

# Acknowledgements

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