THE BELGIAN NATIONAL BURDEN OF DISEASE STUDY

Establishing disease models for the Belgian national burden of disease study: challenges and perspectives

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Belgian national burden of disease study (BeBOD)

Which diseases are impacting our population the most?

low back pain   *coronary heart disease*   *common cold*

Summary Measures of Population Health

YLD + YLL = DALY

**Severity** of case: duration, reduction quality of life

Severity of death: residual life expectancy

# Belgian national burden of disease study (BeBOD)

Main objectives

- Establish a **coherent framework** for routinely quantifying the burden of disease in Belgium using the DALY metric

- Calculate Belgian DALYs for key diseases and risk factors, allowing **methodological flexibility**

- Interaction with local stakeholders & capacity building

- Valorisation and appraisal of **local data sources**

The calculation of the non-fatal component of the disease burden (YLD) follows a stepwise approach
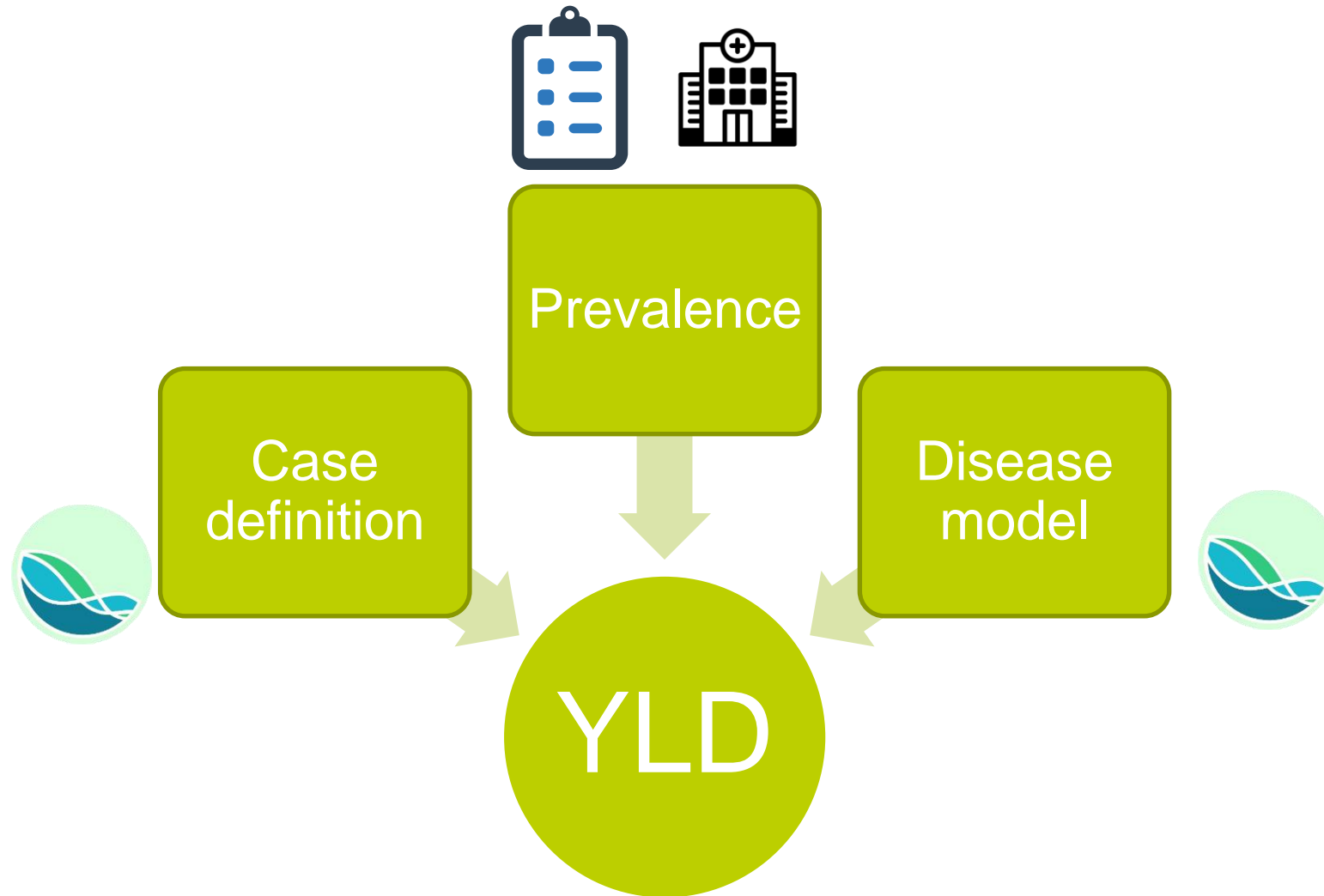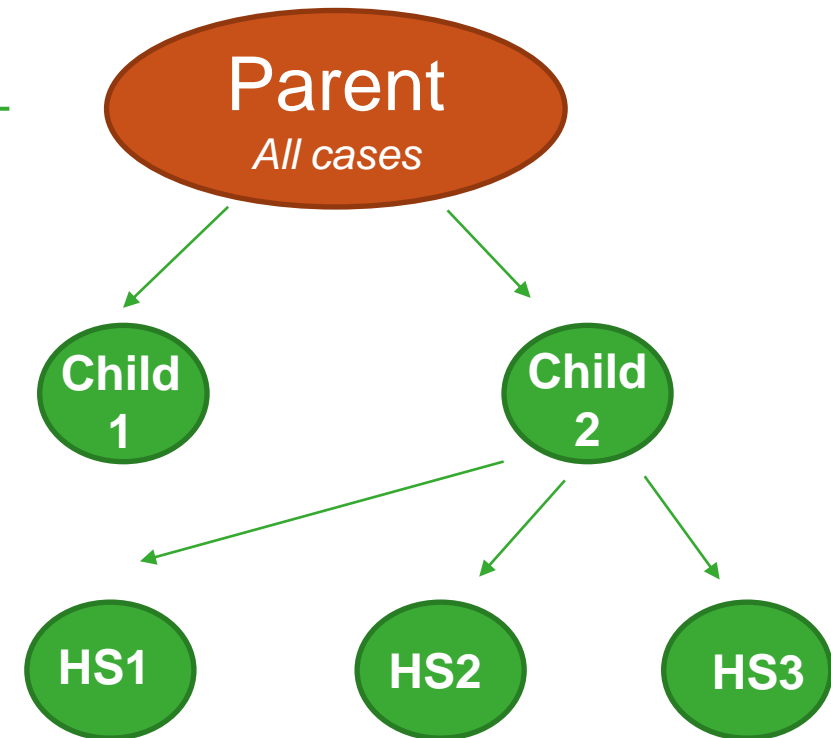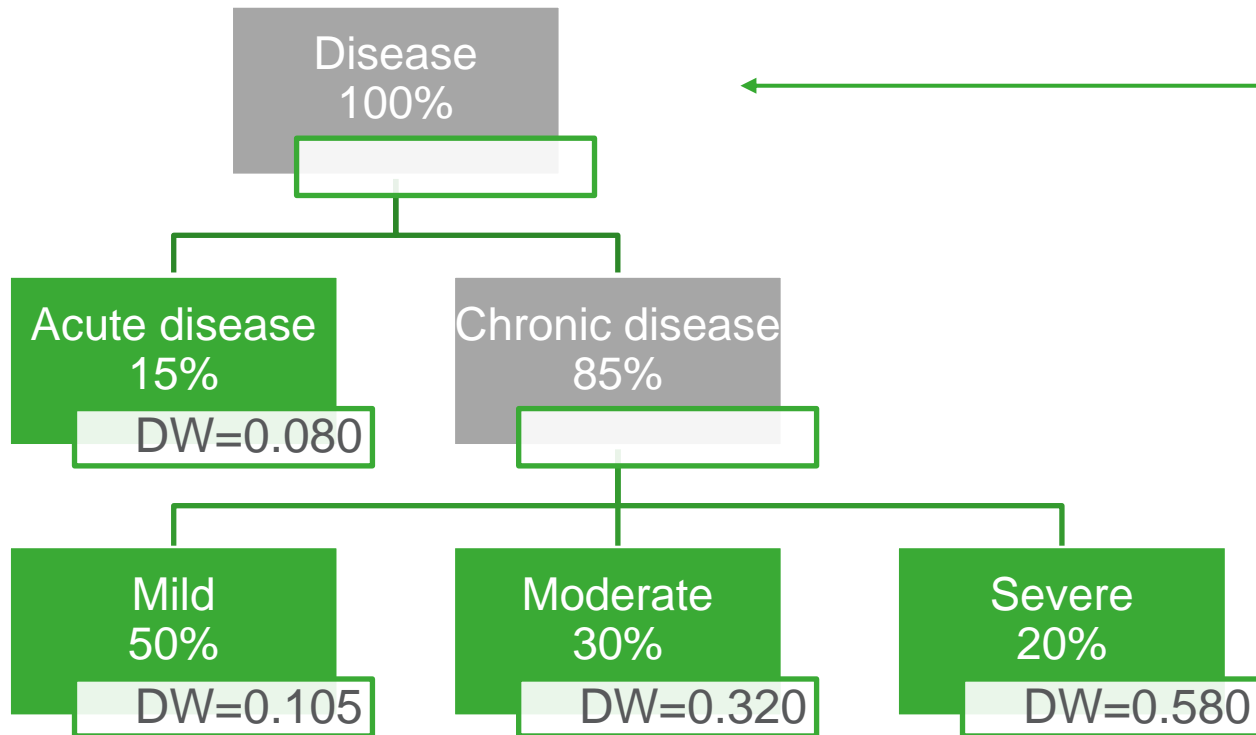
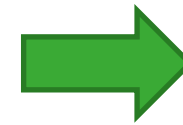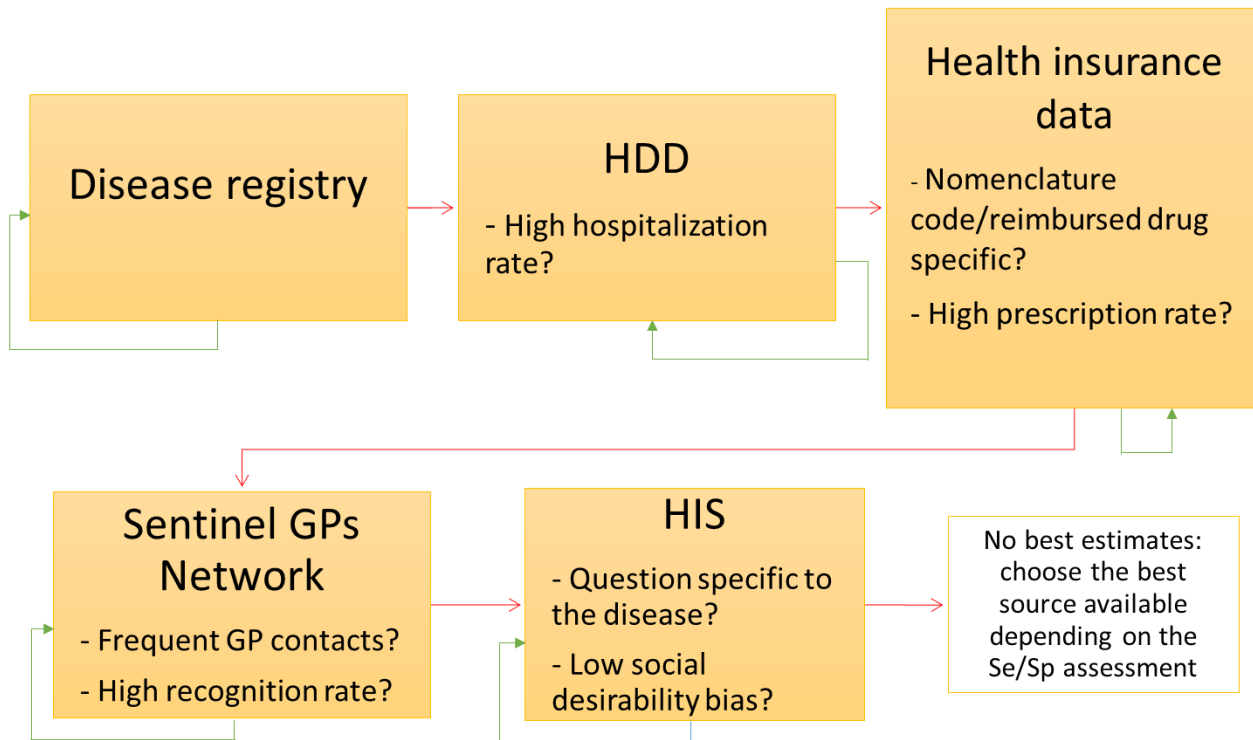# Prioritization of outcome to include in the study
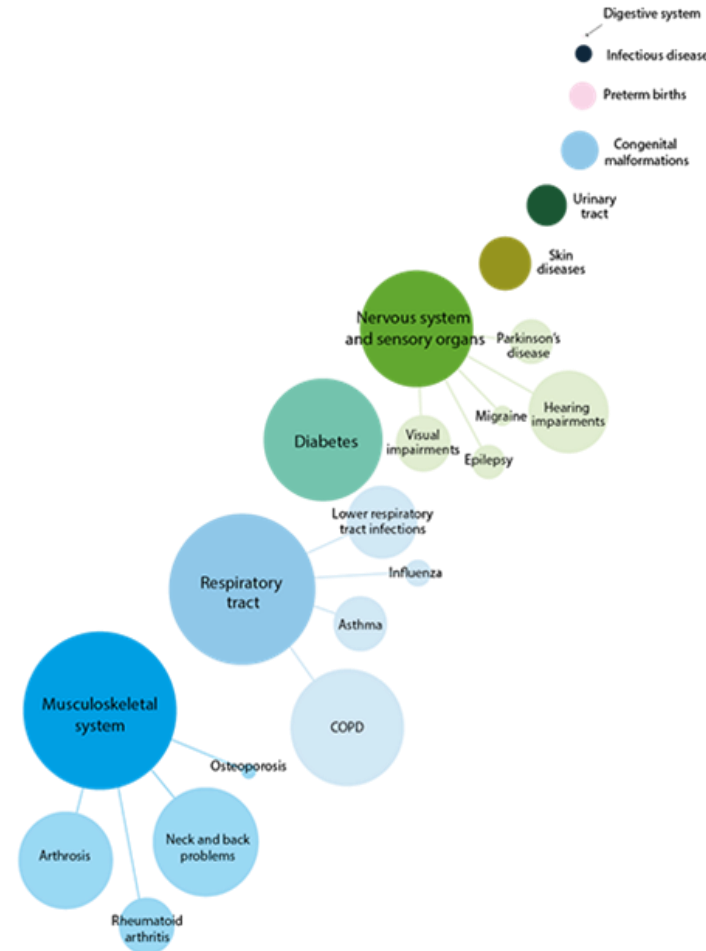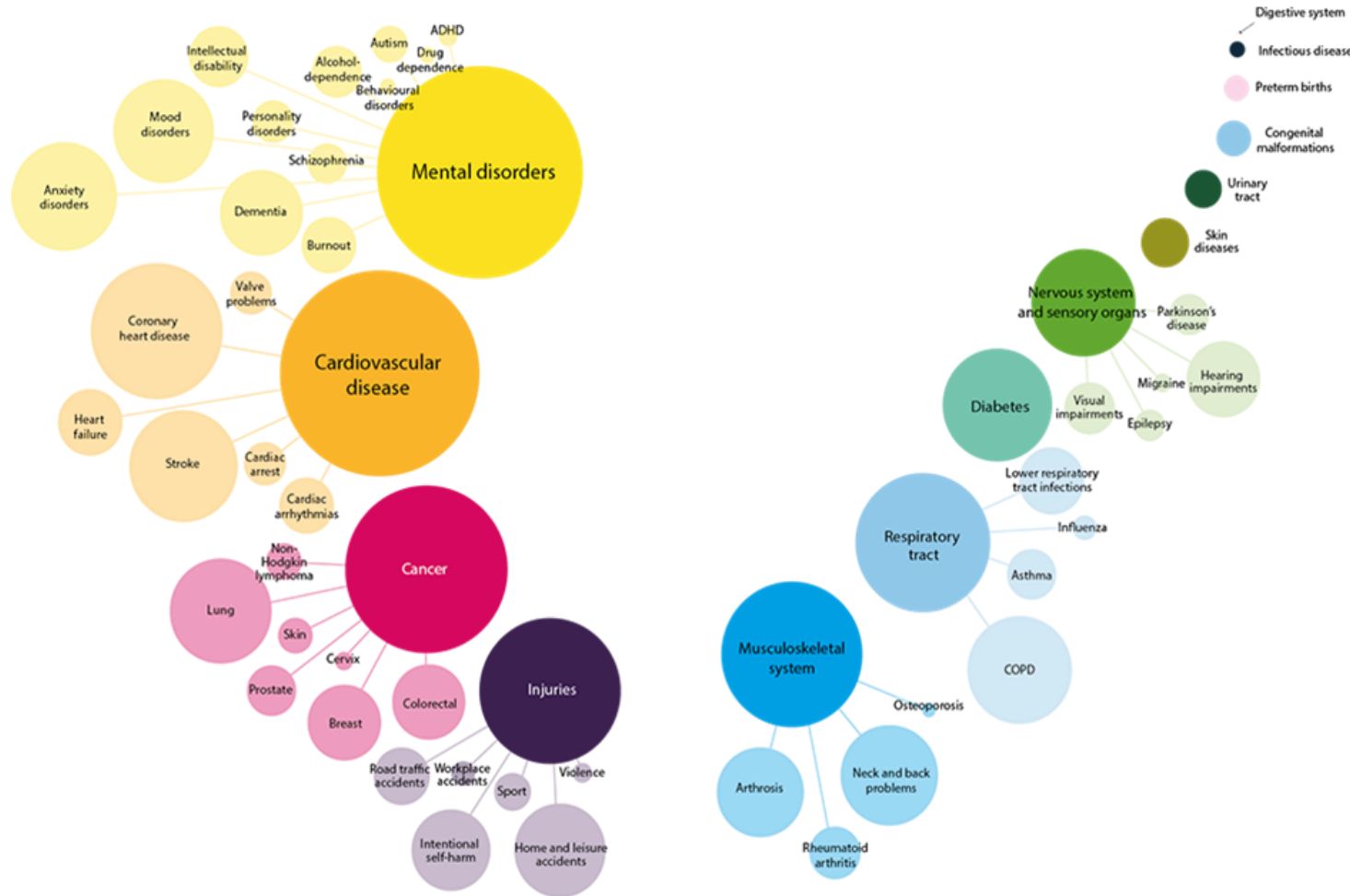
- **Top causes** of disease burden in Belgium based on the WHO **Global Health Estimates**

- Outcomes for which Sciensano has specific **expertise** and **resources**

- Outcomes that are relevant for estimations of the **burden** associated with **risk factors**

Methodology for the establishment of the disease model

- **Disease model**

Identification and evaluation of data sources to select the best available data source

Disease registry

HDD
- High hospitalization rate?

Health insurance data
- Nomenclature code/reimbursed drug specific?
- High prescription rate?

Sentinel GPs Network
- Frequent GP contacts?
- High recognition rate?

HIS
- Question specific to the disease?
- Low social desirability bias?

No best estimates: choose the best source available depending on the Se/Sp assessment

Evaluation of data sources (sensitivity/specificity) based on their ability to **capture symptomatic cases** of a disease
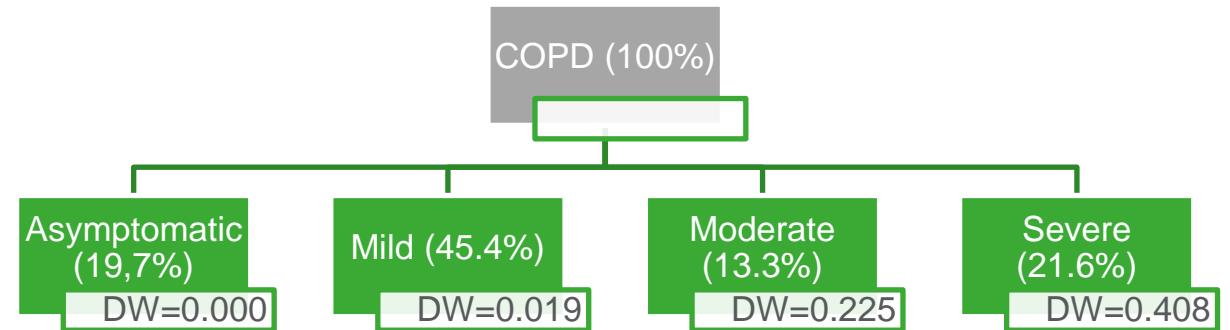
Selection of the «best available» national data

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Chronic obstructive pulmonary disease (COPD)
Disease models

The severity grading of COPD follows the **GOLD** class definition

GOLD CLASS	FEV1 Score
I: Mild	≥ 80% of normal
II: Moderate	50-79% of normal
III & IV: Severe	< 50% of normal

COPD (100%)

Asymptomatic (19,7%) — DW=0.000

Mild (45.4%) — DW=0.019

Moderate (13.3%) — DW=0.225

Severe (21.6%) — DW=0.408

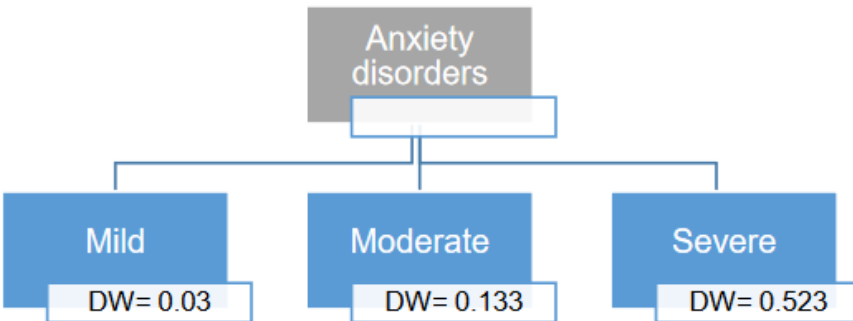| Health state	Lay description	DW
Asymptomatic COPD		0.000
Mild COPD	This person has cough and shortness of breath after heavy physical activity, but is able to walk long distances and climb stairs.	0.019
Moderate COPD	This person has cough, wheezing, and shortness of breath, even after light physical activity. The person feels tired and can walk only short distances or climb only a few stairs.	0.225
Severe COPD	This person has cough, wheezing, and shortness of breath all the time. The person has great difficulty walking even short distances or climbing any stairs, feels tired when at rest, and is anxious.	0.408

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Mental and substance use disorders
Disease models

Health state	Lay description	DW
Anxiety disorder, mild	Feels mildly anxious and worried, which makes it slightly difficult to concentrate, remember things, and sleep. The person tires easily but is able to perform daily activities.	0.030
Anxiety disorder, moderate	Feels anxious and worried, which makes it difficult to concentrate, remember things, and sleep. The person tires easily and finds it difficult to perform daily activities.	0.133
Anxiety disorder, severe	Constantly feels very anxious and worried, which makes it difficult to concentrate, remember things, and sleep. The person has lost pleasure in life and thinks about suicide.	0.523

Anxiety disorders

Mild — DW= 0.03
Moderate — DW= 0.133
Severe — DW= 0.523

Health state	Parent	Proportion	Source
Anxiety disorder	N/A	100%	Per definition
Mild	Anxiety disorder	55%	GBD 2017
Moderate	Anxiety disorder	27%	GBD 2017
Severe	Anxiety disorder	18%	GBD 2017

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Amphetamine dependence
Disease models
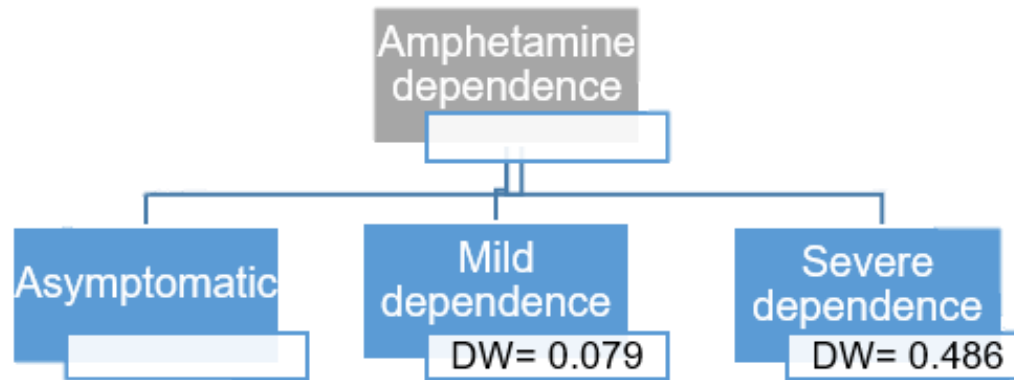
Health state	Lay description	DW
Asymptomatic	Not applicable	Not applicable
Mild dependence	Uses stimulants (drugs) at least once a week and has some difficulty controlling the habit. When not using, the person functions normally.	0.079
Severe dependence	Uses stimulants (drugs) and has difficulty controlling the habit. The person sometimes has depression, hallucinations, and mood swings, and has difficulty in daily activities	0.486

Health state	Parent	Proportion	Source
Amphetamine dependence	N/A	100%	Per definition
Asymptomatic	Amphetamine dependence	65%	European Web Survey on Drugs (Matias et al. 2019)
Mild dependence	Amphetamine dependence	18%	European Web Survey on Drugs (Matias et al. 2019)
Severe dependence	Amphetamine dependence	17%	European Web Survey on Drugs (Matias et al. 2019)

Challenges
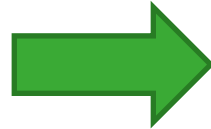
- Survey data limitations Severity and prevalence proportions are based on U.S. data (e.g., MEPS)
- Limited national epidemiological data

- Applicability in the Belgian Context
- Uniform Severity Assumptions

- Lack of Clinical Alignment

Complexity for Clinicians/Experts

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Current status of BeBOD

Total Disease Estimates

38 Diseases: DALY estimates

Cancer Estimates

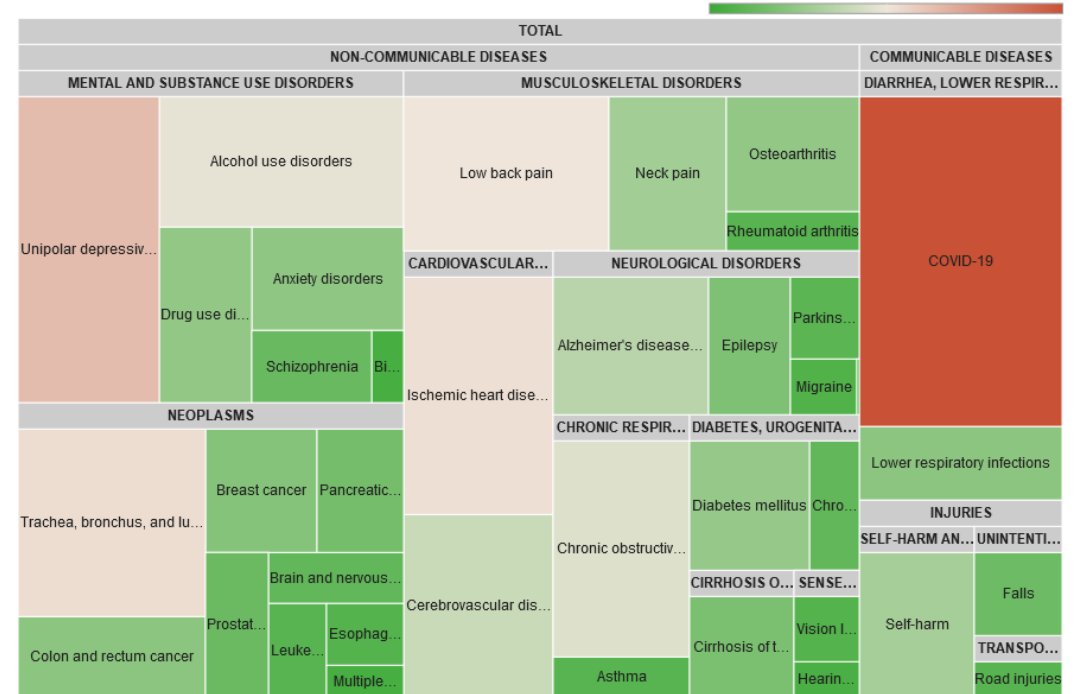57 Types of Cancer: Non-fatal burden

Causes of Death

151 Causes: Mortality estimates

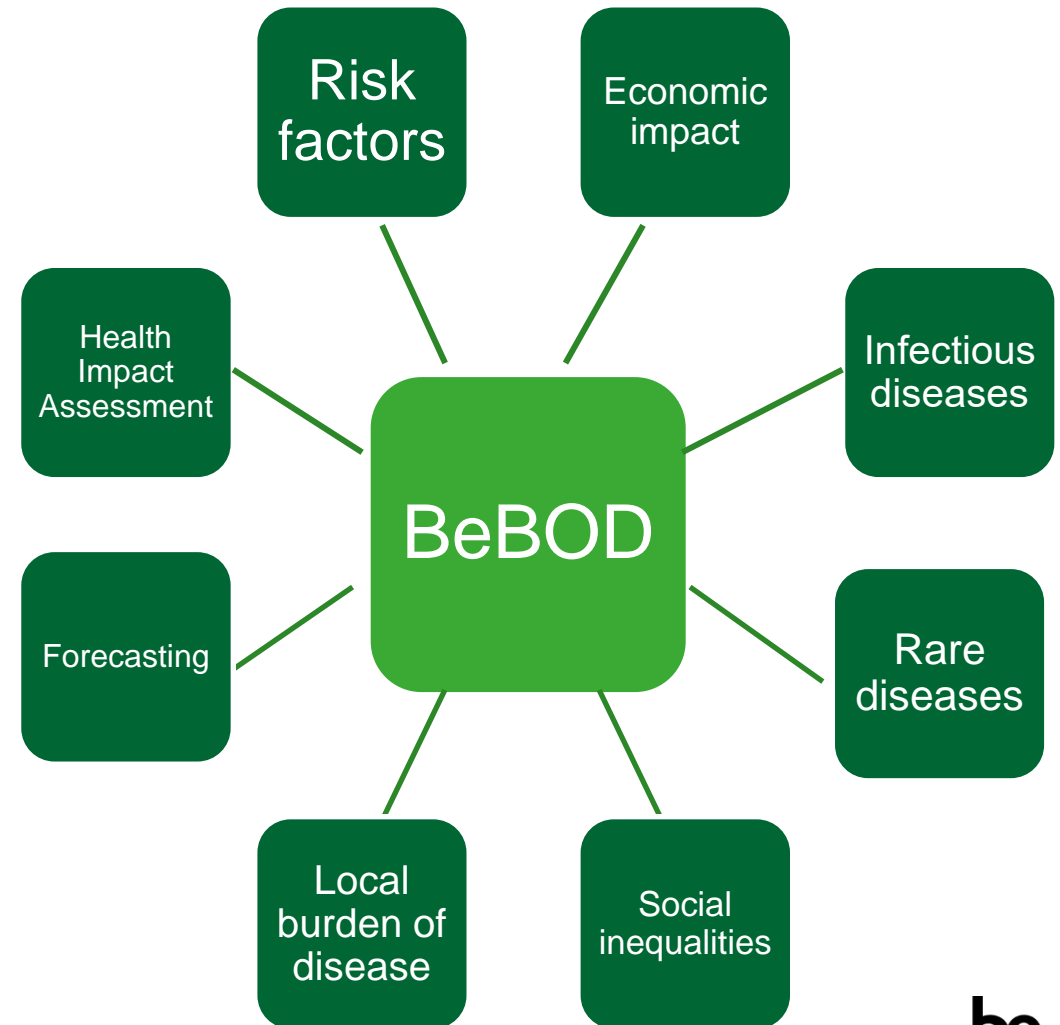**Smoking Impact**

Deaths attributable to cigarette smoking

Read the factsheet at Healthybelgium.be

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Future perspectives for BeBOD

- Incorporate severity distribution in national surveys
  - Collect data on disease severity (mild, moderate, severe) through current surveys

Risk factors

Economic impact

Health Impact Assessment

Infectious diseases

BeBOD

Forecasting

Rare diseases

Local burden of disease

Social inequalities

https://burden.sciensano.be

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Key message

Using adapted Global Burden of Disease (GBD) disease models, BeBOD calculates disease prevalence and severity levels to offer a **consistent** but locally relevant picture of health impacts. While GBD models offer a **valuable framework**, applying them in Belgium reveals **challenges**, including **limited local epidemiological data**, non-alignment with clinical grading, and reliance on U.S. survey data. Moving forward, enhancing **local data integration** and refining disease models for **regional specificity** is key for accurate disease burden estimates in Belgium.

Thank you

Contact

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