

# Routine

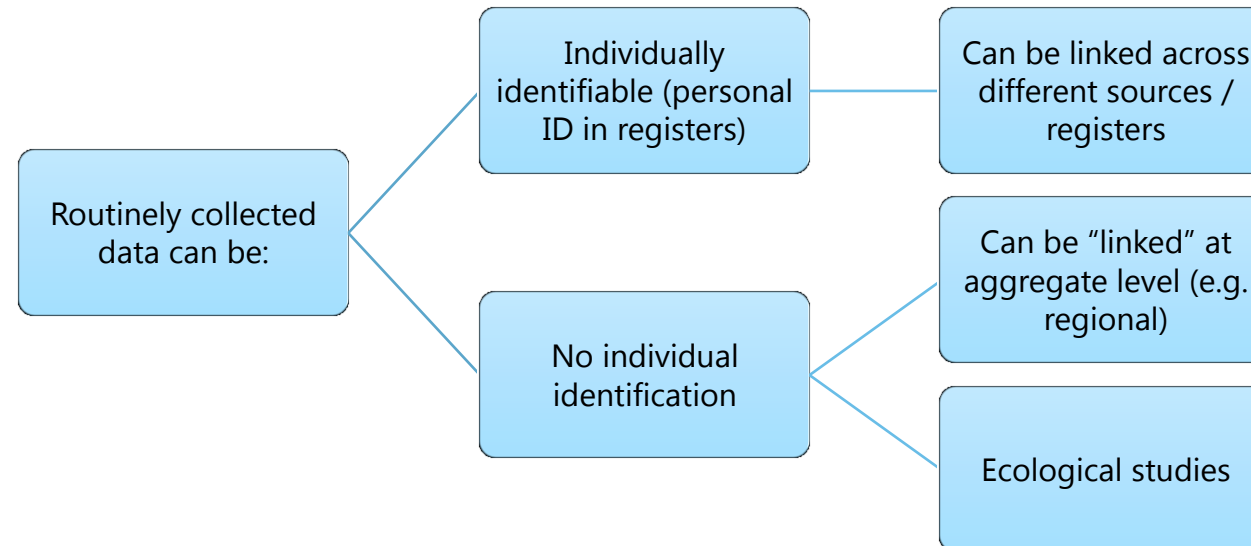
# data

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# Definition

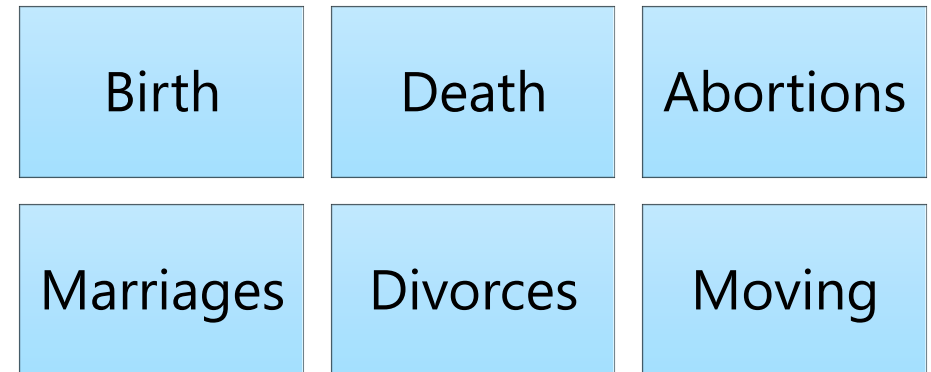
Regularly collected data on health indicators used to track health trends and inform public health interventions.

- Vital statistics
- Administrative data systems
- Compulsory notifiable diseases
- Specific disease registries (population based, or hospital based) e.g. Cancer registration, Congenital malformations
- Continuous or repeated surveys of representative samples of the population



# Data sources – Czech Republic

- Routine statistical data (ČSÚ)
- Administrative data series - census, etc.
- Specific disease registries (ÚZIS) – available in aggregated form
- Repeated population health survey on a representative sample of the population



# National Registry of Newborns

- Device identification
- Newborn registration number
- Birth number of the mother
- Frequency of pregnancy - sequence of pregnancies
- Place of residence – municipality number, ORP, region, district
- Newborn – citizenship
- Mode of delivery
- Fetal position
- Date of birth
- Vitality
- Weight (g)
- Gestational age
- Treatment in the ward - mandatory, if the birth was not at home or outside the ZZ
- Apgar score (optional for birth outside ZZ)
- Treatment at the Department of Selected Diseases and Complications
- Screening performed
- Congenital defect (in a live birth)
- Date and time of termination of ZN
- Reason for termination of ZN incl. IČA during translation
- Death

# Mortality

Certificate of examination of the deceased

- Age
- Gender
- Marital status
- Education
- Citizenship and country of birth
- Place of death (in hospital, at home, etc.)
- The underlying cause of death (WHO defined as (a) the disease or injury that initiated the chain of medical conditions directly leading to death, or (b) the circumstances of the accident or violence which caused the fatal injury).
- Causes of death are coded according to the International Statistical Classification of Diseases and Associated Health Problems (ICD - latest version ICD-11)

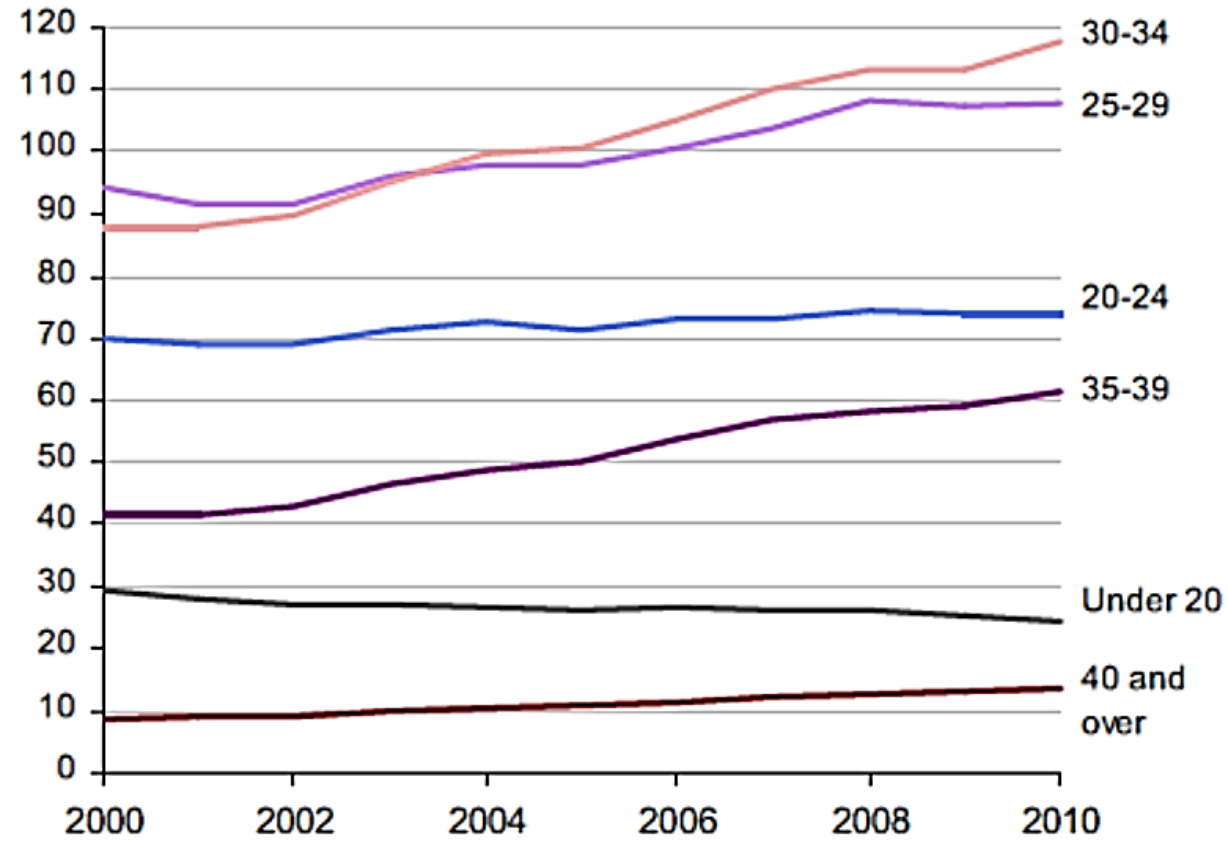
# National health registers in the Czech Republic

- National Cancer Registry
- National register of hospitalized patients
- National Reproductive Health Registry
- National Registry of Cardiovascular Operations and Interventions
- National register of joint replacements
- National register of occupational diseases
- National registry for treatment of drug users
- National register of injuries
- National register of autopsies and toxicological examinations
- National diabetes register
- National register of intensive care

# Why it is important

## Age-specific fertility rates, England and Wales, 2000–2010

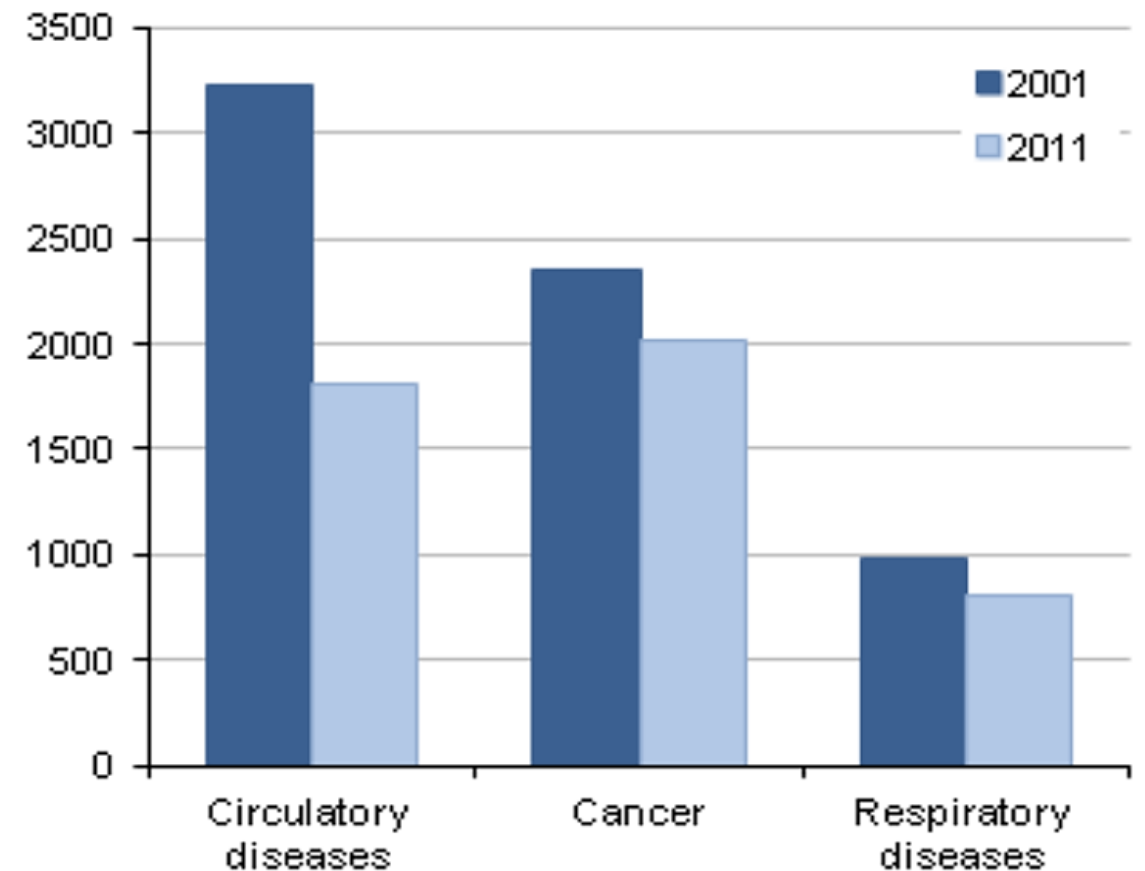
Births per 1,000 women in age-group



Source: Office for National Statistics

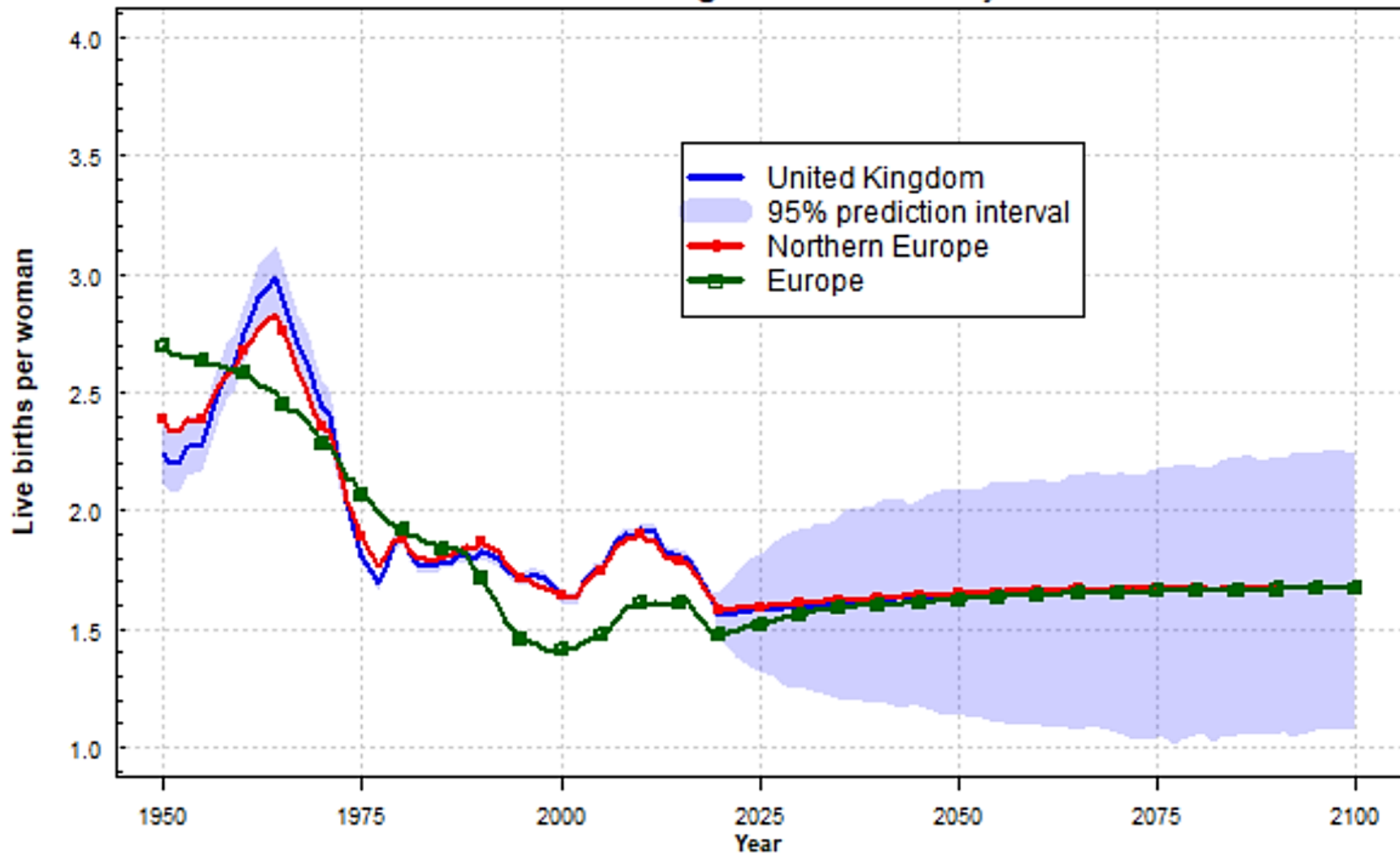
## Male age-standardised mortality rates, for three categories of cause of death, 2001 and 2011

Rate per million population



Source: Office for National Statistics

## United Kingdom: Total fertility



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United Nations, DESA, Population Division. *World Population Prospects 2022*. <http://population.un.org/wpp/>



# Global Burden of Diseases, Injuries, and Risk Factors (GBD)

“global descriptive epidemiology”

<https://www.healthdata.org/research-analysis/gbd>

Systematic, scientific effort to quantify the comparative magnitude of health loss due to diseases, injuries, and risk factors by:

- age
- sex
- geographies
- specific points in time

Compare the effects of different diseases that kill people prematurely and cause ill health and disability

GBD was established by WHO, WB and Harvard in 1996, currently led by the Institute for Health Metrics and Evaluation (IHME), University of Washington

# GBD metrics

## OUTCOMES

- All-cause mortality
- Deaths by cause
- Years of life lost (YLLs)
- Years lived with disability (YLDs)
- Disability adjusted life years (DALYs)

## PREDICTORS

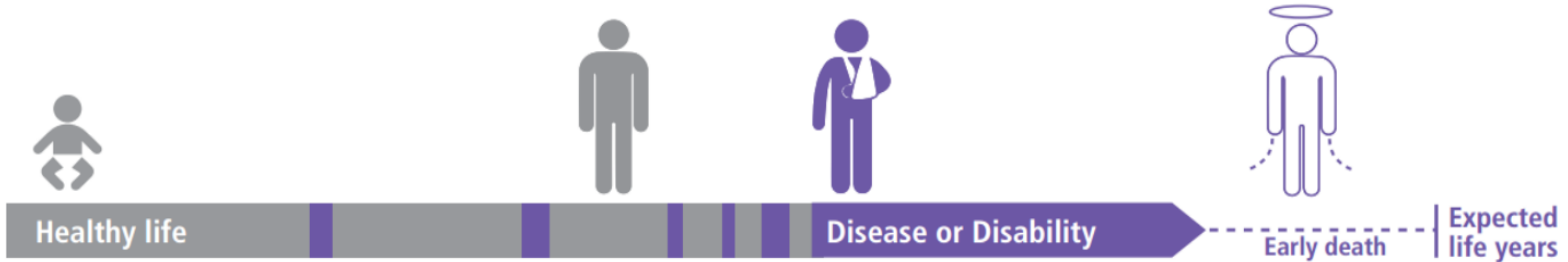
- 291 causes of diseases and injuries
- 67 risk factors

# DALY

Disability Adjusted Life Years measure the overall burden of disease, expressed as the cumulative number of years lost due to ill-health, disability or early death.

$$= \text{YLD} + \text{YLL}$$

Years Lived with Disability + Years Life Lost



Source : Wiki Commons

$$\text{DALYs} = \text{Years of life lost due to premature mortality (YLL)} + \text{Years lived with disability (YLD)}$$

# Practical part 1

Go to:

<https://vizhub.healthdata.org/gbd-compare/>

# Questions and answers

- What causes contribute more to DALYs globally up to 2021: Chronic diseases, infectious and neonatal diseases, or injuries?
- What causes contribute more to YLDs globally up to 2021: Chronic diseases, infectious and neonatal diseases, or injuries?
- In which sex COVID19 caused more deaths?
- What was the main cause of death in Czechia in 2021?
- Compared with high socio-demographic index (SDI) countries, what was the difference in death rate in Czechia in 2021
- What are the categories of risk factors in GBD webpage?
- High systolic blood pressure is a risk factor for multiple diseases. Identify all the diseases that can benefit of blood pressure control and write the respective attributable risk percentage.

Break time

# Advantages and disadvantages of routine data

## Advantages

- Data already collected
- Large number of observations
- Objective observations

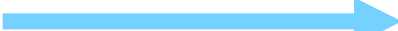
## Disadvantages

- Quality of sources may differ
- Sometimes only aggregated data is available (only suitable for ecological studies)
- Limited information: No information on socioeconomic status or other useful variables

# What to measure

Mortality  Vital statistics registers

Incidence and prevalence  Disease specific register

Others: admission rate,  Healthcare utilization registers  
outpatients visits,  
immunization coverage



# Data quality

Quality: Accuracy, completeness, timeliness

Issues: underreporting, data duplication, incomplete records:

Validation and quality control: cross-referencing sources, regular audits

# Applications

Disease surveillance for outbreaks detection

Health program evaluation

Trends analysis and policy making

# Health surveys

- Often designed to be nationally representative
- Often repeated to allow comparisons over time
- Often open access data
- Much more information than routine data
- Often limited by low response rates (so not strictly nationally representative)

# Health surveys – examples

- The Health Survey for England (HSE)
- Scottish Health Surveys (SHeS)
- European Health Interview Survey (EHIS) - Eurostat
- European Health Examination Survey (EHES) – planned
- US National Health and Nutrition Examination Survey (NHANES)
- Study of Health, Ageing and Retirement in Europe (SHARE)
- English Longitudinal study of Ageing (ELSA)

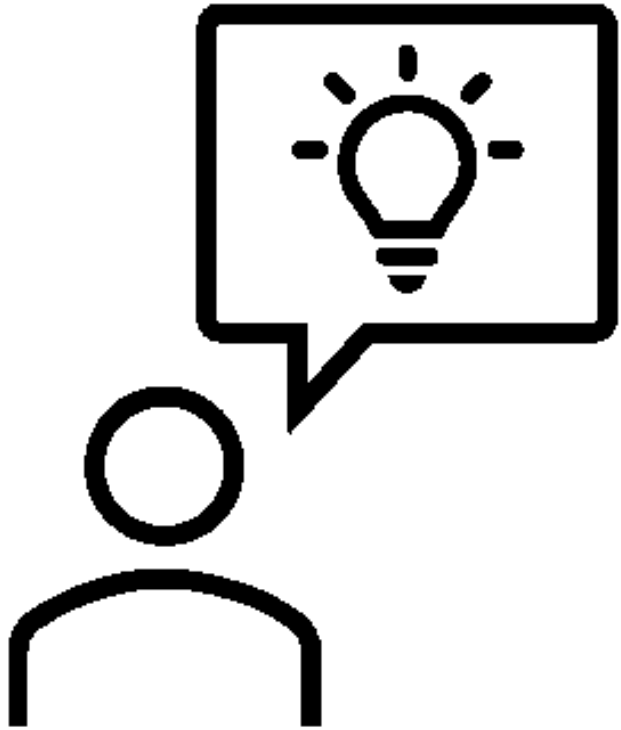
# The Health Survey for England (HSE)

- Provide annual data from nationally representative samples to monitor trends in the nation's health
- Estimate the proportion of people in England who have specified health conditions
- Estimate the prevalence of certain risk factors associated with these conditions
- Examine differences between subgroups of the population (for example by age, sex or income) in their likelihood of having specified conditions or risk factors
- Assess the frequency with which particular combinations of risk factors are found, and in which groups these combinations most commonly occur
- Monitor progress towards selected health targets
- Since 1995: measure the height of children at different ages, replacing the National Study of Health and Growth
- Since 1995: monitor the prevalence of overweight and obesity in children

# Data linkages

- Various types of routine data can be linked
  - Register with register(s)
  - Survey with register(s)
  - Survey with survey(s)
- Only possible if
  - Individuals have personal ID (for individual linkage)
  - Individual have known location (for geographical linkage)
  - Ethical approval is available (may require informed consent)

# Are people diagnosed with mental health disorders at higher risk of mortality in Czechia?

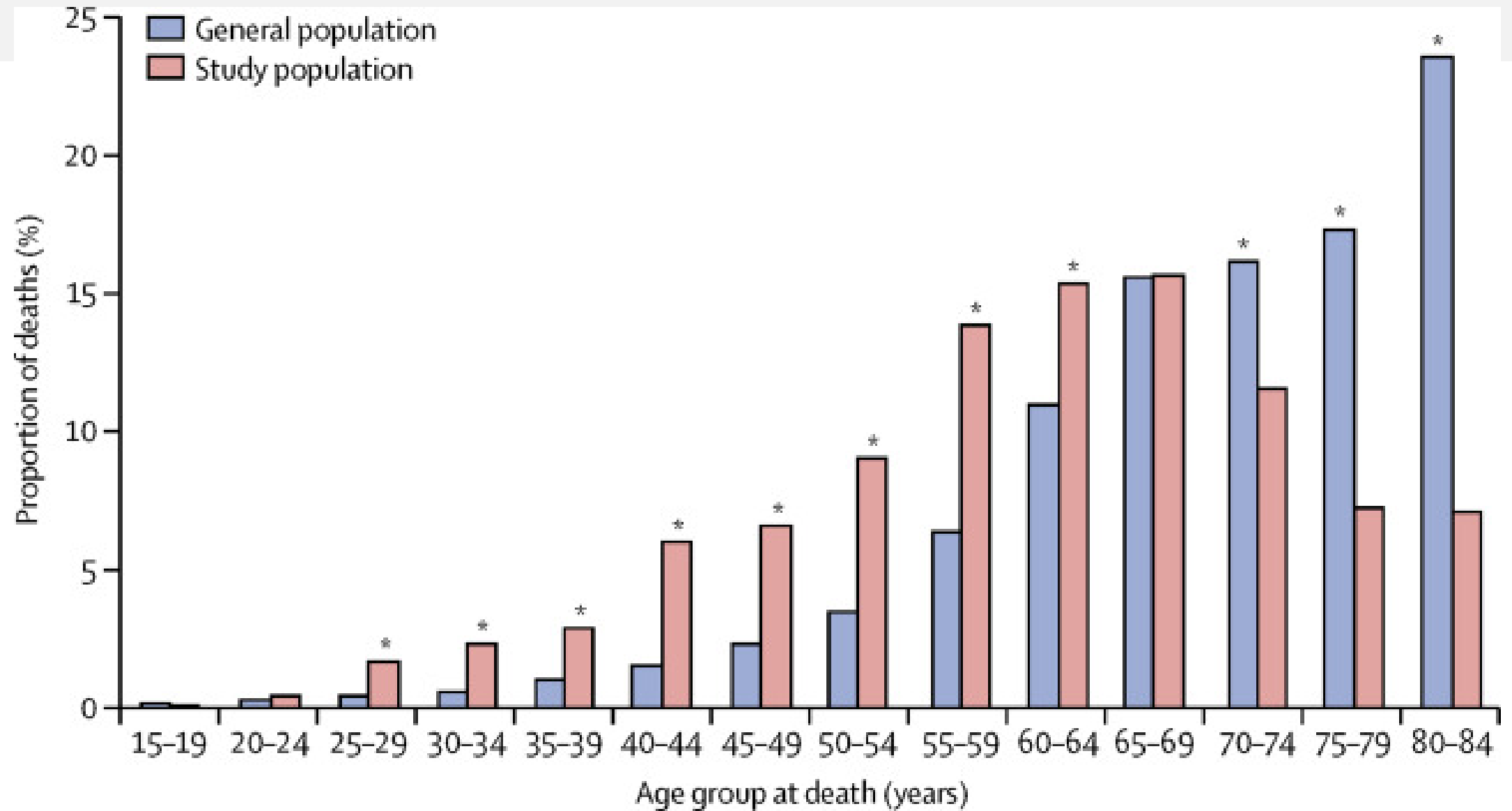


Comparison group

General population – people not hospitalized for mental health disorders

Data sources

Registry of inpatients discharges  
Cause of death registry





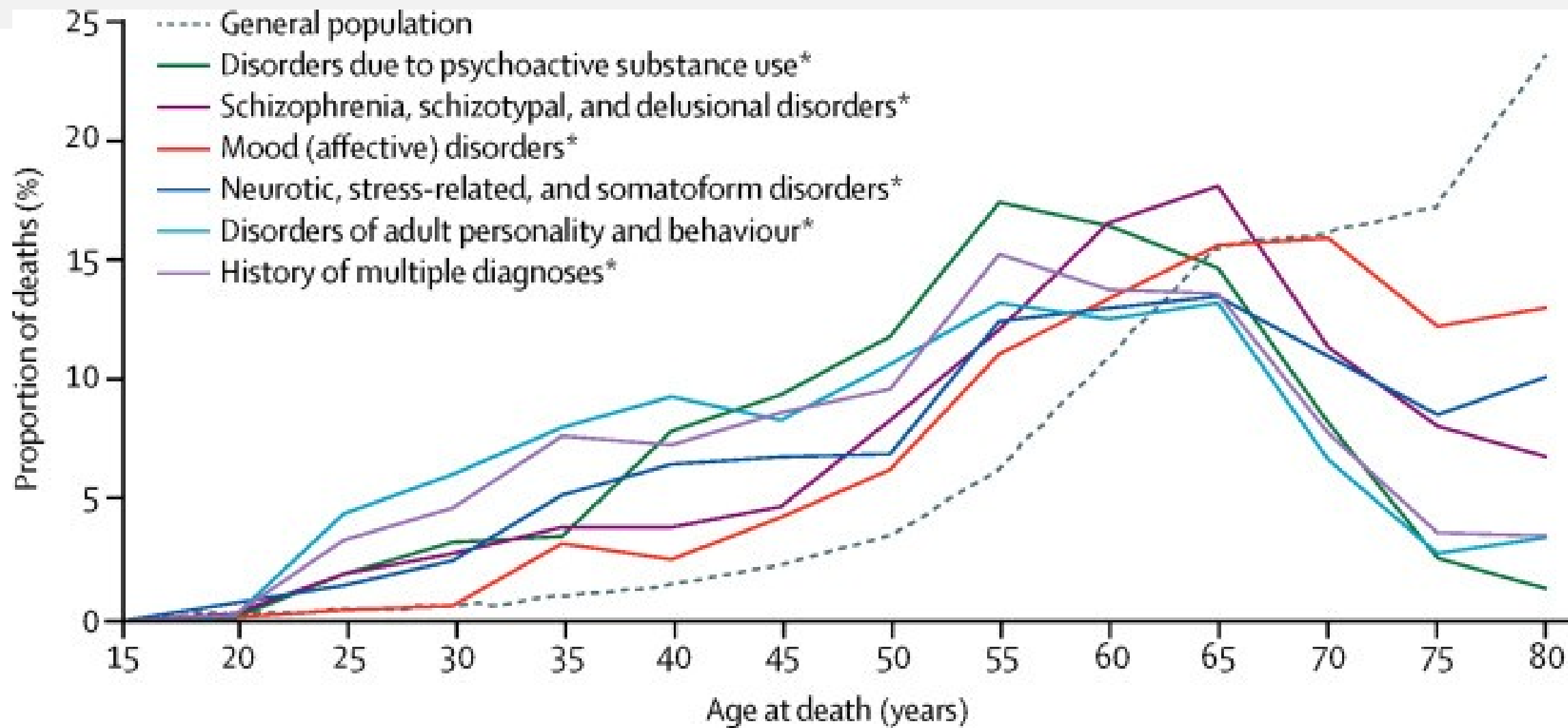
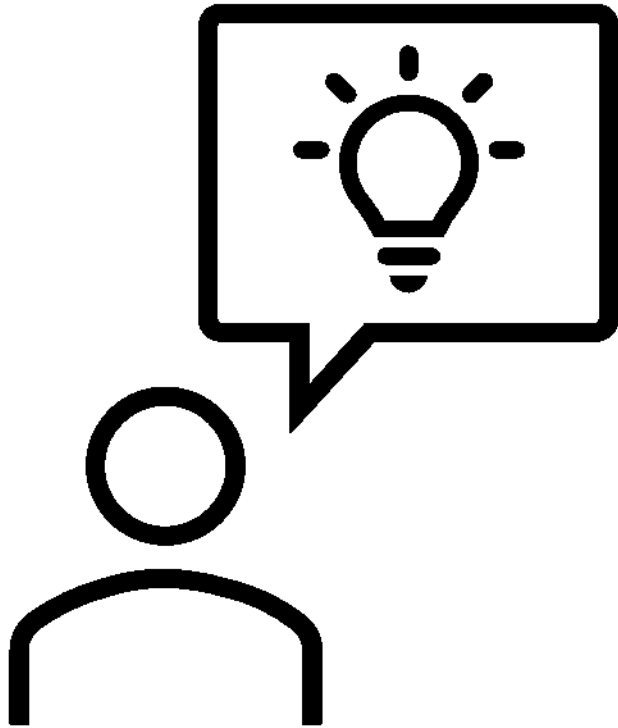


Table 3. Standardised annual mortality ratios of the study population in comparison with the general population in 2014

	SMR	95% CI
General population	1 (ref)	..
Any diagnoses	2.2	2.2–2.3
Disorders due to psychoactive substance use (F10–19)	3.5	3.4–3.7
Schizophrenia, schizotypal, and delusional disorders (F20–29)	2.3	2.1–2.5
Mood (affective) disorders (F30–39)	1.6	1.5–1.7
Neurotic, stress-related and somatoform disorders (F40–48)	1.8	1.6–1.9
Disorders of adult personality and behaviour (F60–69)	2.3	2.0–2.6
Individuals with a history of multiple diagnoses	2.9	2.7–3.2

# Does conditional cash transfers reduce maternal mortality in Brazil?



Outcome

Maternal mortality

Predictors

Duration of CCT (years)

Coverage of CCT (%)

## Data sources

- Mortality Information System for maternal and under-5 deaths, Primary Care Information System for FHP coverage, Live Births Information System and Outpatient Information System for hospital admissions
- The Ministry of Social Development databases were used to calculate BFP coverage
- Brazilian Institute of Geography and Statistics (IBGE) was used for socioeconomic variables. From the 2000 and 2010 IBGE National Censuses (income per person, poverty rate, illiteracy, households with piped water)

# Table 1 Mean values and SD of the selected variables for the Brazilian municipalities (*n*, 2548)

From: Long-term impact of a conditional cash transfer programme on maternal mortality: a nationwide analysis of Brazilian longitudinal data

	Mean (SD) 2004	Mean (SD) 2014	Percentage of change (2004–2014)
PBF coverage	17.83 (12.54)	25.88 (18.87)	45.15
FHP coverage	61.77 (36.87)	70.99 (33.37)	14.93
Income per capita	455.44 (195.21)	624.18 (253.11)	37.05
Poverty rate	27.49 (18.18)	11.37 (13.65)	- 58.64
Illiteracy rate	16.16 (9.95)	12.09 (8.23)	- 25.19
Piped water	78.81 (21.67)	92.53 (13.37%)	17.41
Physicians/hab	0.71 (0.66)	0.80 (0.69)	12.68
Private care coverage	6.15 (8.96)	10.73 (11.62)	74.47
Hospitalisation rates	4.98 (4.47)	3.56 (4.32)	- 28.51
Maternal mortality ratio	60.21 (314.15)	57.89 (308.19)	- 3.85

## Table 2 Fixed-effect models for adjusted associations between average BFP coverage of the last 1, 2, 5, 10 and 11 years—divided in quartiles—and maternal mortality ratio in the municipalities selected (*n*, 2548) for the quality of vital information in Brazil 2004–2014

From: Long-term impact of a conditional cash transfer programme on maternal mortality: a nationwide analysis of Brazilian longitudinal data

Variables	Average BFP coverage 1 year		Average BFP coverage 2 years		Average BFP coverage 5 years		Average BFP coverage 10 years		Average BFP coverage 11 years	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
BFP low	1	–	1	–	1	–	1	–	1	–
BFP intermediate	0.94	(0.85, 1.05)	0.99	(0.89, 1.11)	0.91	(0.83, 0.99)	0.87	(0.80, 0.95)	0.88	(0.81, 0.95)
BFP high	1.01	(0.88, 1.16)	0.99	(0.87, 1.13)	0.87	(0.77, 0.99)	0.84	(0.75, 0.96)	0.84	(0.75, 0.96)
BFP consolidated	0.94	(0.77, 1.15)	1.03	(0.85, 1.24)	0.85	(0.72, 1.00)	0.82	(0.69, 0.97)	0.83	(0.71, 0.99)

Questions?

# Codebook Practical

Year: year of survey

Country:

- 1: Czechia
- 2: Slovakia

ID: Identification Number

Female:

- 0: Male
- 1: Female

Age\_group:

- 1: 20-45 years
- 2: 46-70 years
- 3: >70 years

Employed:

- 1: Yes
- 0: No

Sick\_3mon: Have you been sick in the last 3 months?

- 1: Yes
- 0: No

Heath\_sta: How you rate your health in the last 3 months?

- 0: Poor
- 1: Good/Excellent

Status: Dead or alive in 2024

- 0: Alive
- 1: Dead

Cause: Cause of death

- 1: Heart attack
- 2: Cancer
- 3: Other

Year\_dead: Year of Death