Air pollution and acute cardiovascular events

Sergio, Maija, Rebekka

- Air pollution as an average per week as exposure

- MI (ICD10 I21- I22) as outcome

- Expecting to see a temporal lag

- Spatial epidemiology

Links

- Exposure:
  - https://www.scb.se/en/finding-statistics/statistics-by-subject-area/environment/emissions/emissions-of-atmospheric-pollutants/
  - https://www.smhi.se/en/services/open-data/search-smhi-s-open-data-1.81004
- Outcome:
  - https://www.ucr.uu.se/swedeheart/
- Confounders:
  - https://www.scb.se/en/finding-statistics/

Diabetes and mortality

HPV group

The task

You want to find out if people with type I and type II diabetes are at risk of dying from other causes than people without diabetes. Define exposure and outcomes and formulate one research question which can be answered by yes or no, and describe how register data can be used to design a study to examine this research question?

Research question

1. Are cause-specific mortality rates higher among the diabetes type I patients compared to the general population?

2. Are cause-specific mortality rates higher among the diabetes type II patients compared to the general population?

Exposure: diabetes – type 1 and 2 (1)

Diabetes quality register (Finland):

https://www.vaasankeskussairaala.fi/en/for-professionals/recruitment-education-and-development/perusterveydenhuollon-yksikko/direva---diabetesregister/

Hospital discharge register (Finland):

https://thl.fi/en/web/thlfi-en/statistics/information-on-statistics/register-descriptions/care-register-for-health-care

Exposure: diabetes – type 1 and 2 (2)

Drug prescription register (Finland):

https://www.kela.fi/terveys-ja-laakkeet_laakkeet
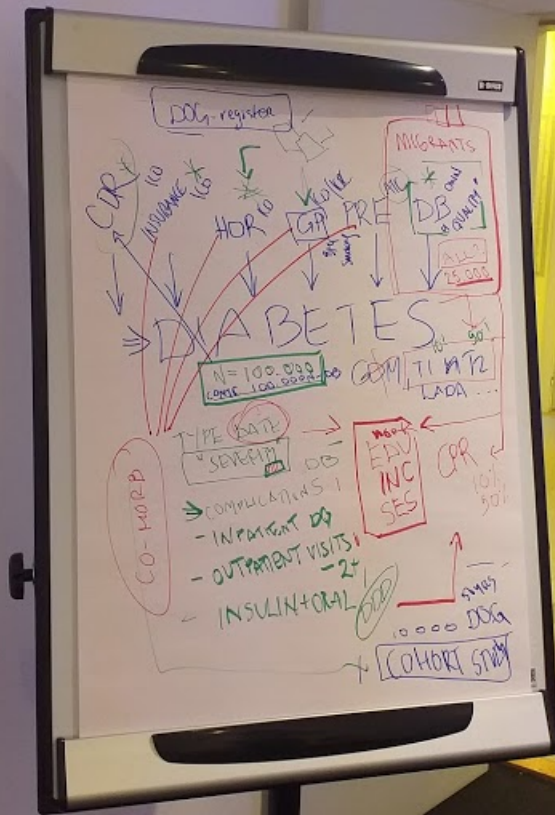
Social insurance register (Finland, information on disability pensions from Finnish Centre for Pensions):

https://www.etk.fi/en/

Outcome: death (any/all cause)

Cause of death register (Finland):

https://www.stat.fi/til/ksyyt/index_en.html

Cause of death for general population and patients admitted to hospital for diabetes complications, who died within a year after admission to hospital (1995-2012, 25+ year-olds, Finland)
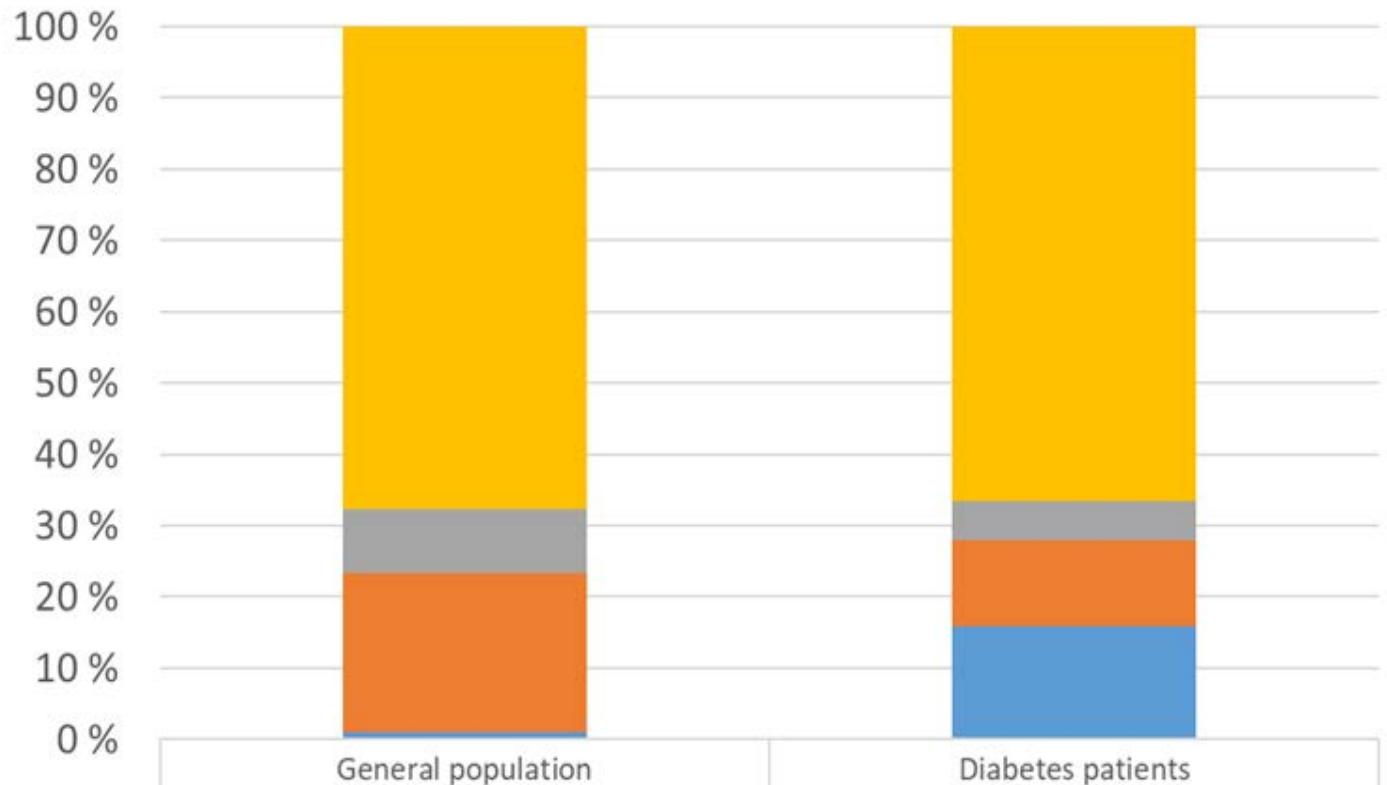
	General population	Diabetes patients
Other causes of death	592321	9827
Dementia, Alzheimers disease	77877	831
Neoplasms	195474	1756
Diabetes	9389	2354

Cause of death ratio (Diabetes/General population

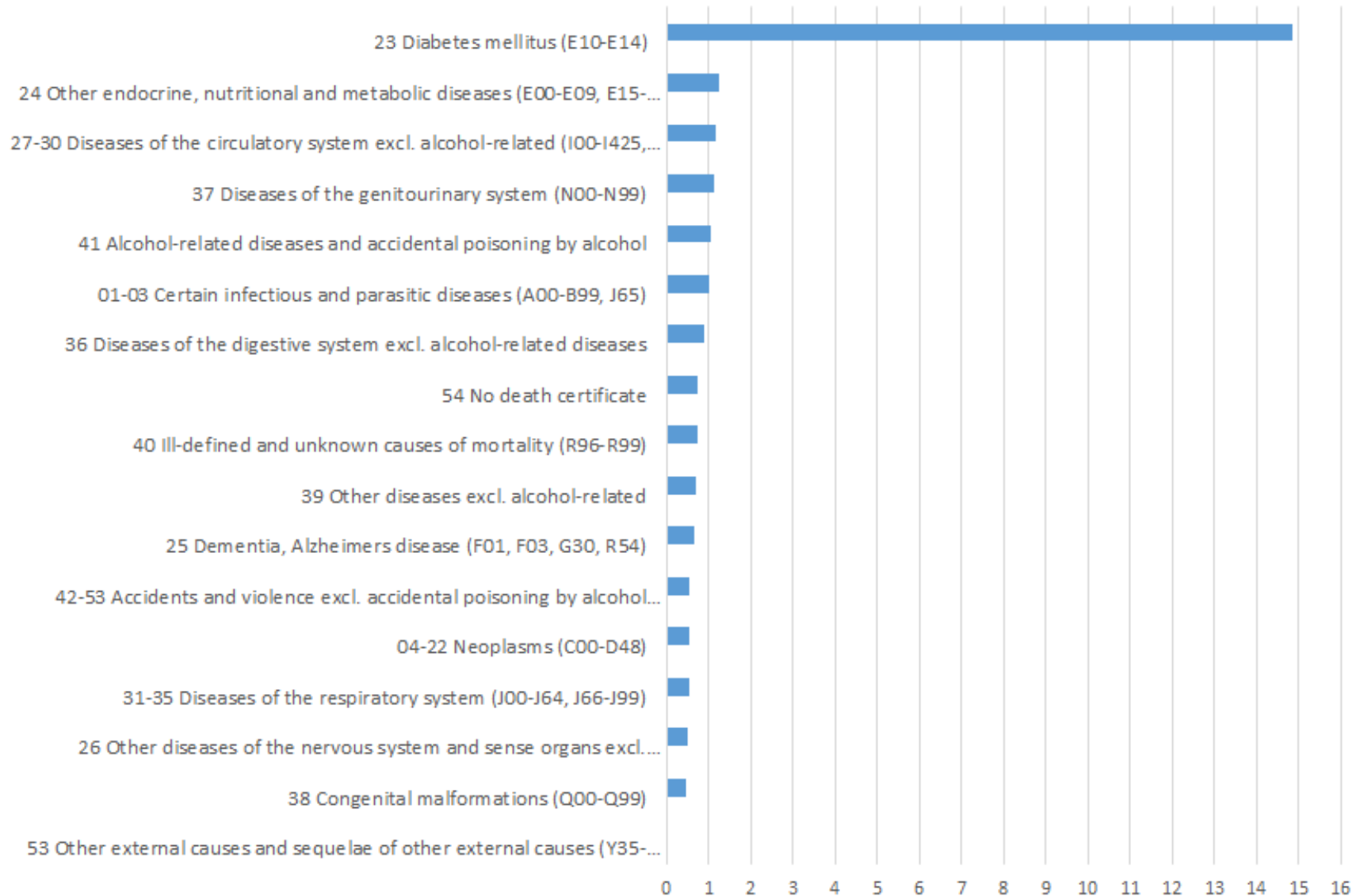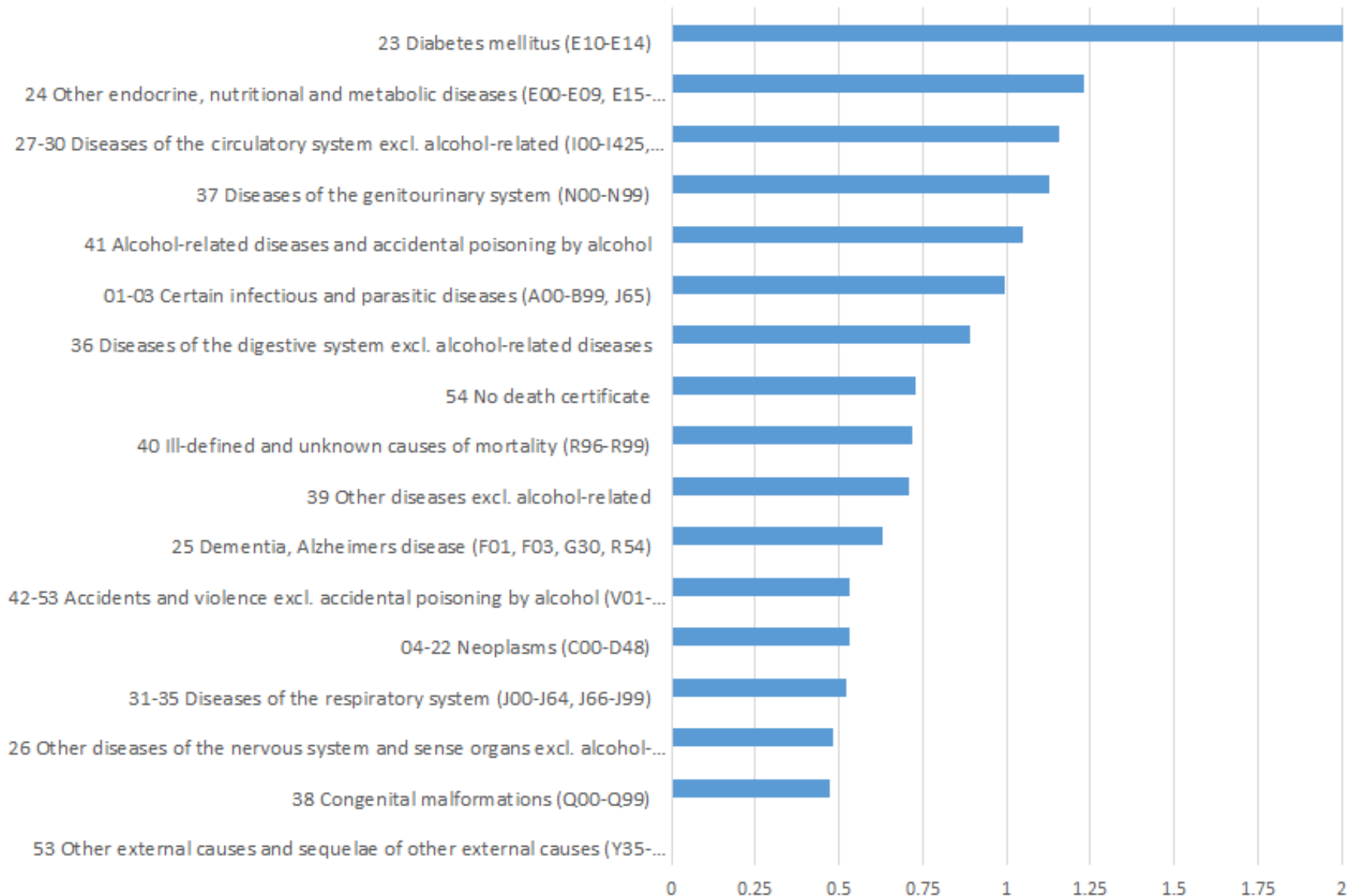| Cause	
23 Diabetes mellitus (E10-E14)	
24 Other endocrine, nutritional and metabolic diseases (E00-E09, E15-...	
27-30 Diseases of the circulatory system excl. alcohol-related (I00-I425,...	
37 Diseases of the genitourinary system (N00-N99)	
41 Alcohol-related diseases and accidental poisoning by alcohol	
01-03 Certain infectious and parasitic diseases (A00-B99, J65)	
36 Diseases of the digestive system excl. alcohol-related diseases	
54 No death certificate	
40 Ill-defined and unknown causes of mortality (R96-R99)	
39 Other diseases excl. alcohol-related	
25 Dementia, Alzheimers disease (F01, F03, G30, R54)	
42-53 Accidents and violence excl. accidental poisoning by alcohol...	
04-22 Neoplasms (C00-D48)	
31-35 Diseases of the respiratory system (J00-J64, J66-J99)	
26 Other diseases of the nervous system and sense organs excl....	
38 Congenital malformations (Q00-Q99)	
53 Other external causes and sequelae of other external causes (Y35-...	

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Cause of death ratio (Diabetes/General population)

Cause	Ratio
23 Diabetes mellitus (E10-E14)	2.0
24 Other endocrine, nutritional and metabolic diseases (E00-E09, E15-...	1.23
27-30 Diseases of the circulatory system excl. alcohol-related (I00-I425,...	1.15
37 Diseases of the genitourinary system (N00-N99)	1.13
41 Alcohol-related diseases and accidental poisoning by alcohol	1.05
01-03 Certain infectious and parasitic diseases (A00-B99, J65)	0.98
36 Diseases of the digestive system excl. alcohol-related diseases	0.88
54 No death certificate	0.72
40 Ill-defined and unknown causes of mortality (R96-R99)	0.71
39 Other diseases excl. alcohol-related	0.70
25 Dementia, Alzheimers disease (F01, F03, G30, R54)	0.63
42-53 Accidents and violence excl. accidental poisoning by alcohol (V01-...	0.53
04-22 Neoplasms (C00-D48)	0.53
31-35 Diseases of the respiratory system (J00-J64, J66-J99)	0.52
26 Other diseases of the nervous system and sense organs excl. alcohol-...	0.48
38 Congenital malformations (Q00-Q99)	0.47
53 Other external causes and sequelae of other external causes (Y35-...	

Axis scale: 0, 0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2

Thank you for your attention!

Links to registries

- Norwegian Prescription Database
  - http://www.norpd.no/
- Norwegian Patient Registry
  - https://helsedirektoratet.no/english/norwegian-patient-registry
- Norsk kommunalt pasient og brukerregister
  - https://helsedirektoratet.no/kommunalt-pasient-og-brukerregister
- The Norwegian Primary Care Research Network
  - https://www.uib.no/en/globpub/117454/norwegian-primary-care-research-network

Number 8 – Death in close family and depression or anxiety

You want to study the impact of death in close family on the risk of depression or anxiety. Formulate a research question that can be answered with yes or no, and design a register-based study that answers this answers.

Adolescents in ungdata

- Exposure: Death of a parent or sibling [sudden death; "expected" death by disease; suicide] – cause of death register DÅR https://www.fhi.no/nettpub/data-fra-helseregistre-store-helseundersokelser-og-biobanker/data-fra-dodsarsaksregisteret/tilgang-til-data-fra-dodsarsaksregisteret/

- Outcome: depression score in ungdata http://www.ungdata.no/Forskning/Den-nasjonale-databasen

Use of painkillers and risk of violent death

Question

- You suspect that use of prescription painkillers is associated with behaviors that increase the risk of dying a violent death (accident, murder or suicide). An ethical and feasible randomized trial seems very difficult. Formulate a research question that can be answered with yes or no, and design a register-based study that answers this questions.

Research question

- Is there an association between precribed pain killers and a violent death
  - Exposure: (4 groups)
    1. Paracetamoul + NSAIDS
    2. Weak opioid agnosits (Codein + tramadol)
    3. Strong opioid agonists
    4. Neuropathic painkillers; prebabalin + gabapentin
  - Outcome
    - Violent deaths
      - Accidents
      - International self-harm
      - Assault

Study design

- Cross-Nordic registry based cohort design
- Reference:
  - General population 16 years or older
- Data sources (Google, collaboration (researcher from each country)
  - Prescription registries (exposure)
  - Population registries (reference) – families
  - Cause of death registries (outcome)
  - Criminal databases (confounding)
  - Edeucation (SES (confounding)
  - Patient registries (drug and alcohol abuse, comobidities) (confounding)
  - Survey (smoking status, health behauvious, alcohol, MRDS delivered face-toface (suicide/depression) (ethical issues here (intention-to-treat), HRT

Links

- **Nordic registry-based cohort studies: Possibilities and pitfalls when combining Nordic registry data**
- https://journals.sagepub.com/doi/full/10.1177/140349481702336