

# Background for defining research questions

## **Number 1 - Diabetes and mortality**

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?

## **Number 2 - Air pollution and acute cardiovascular events**

You wonder if air pollution affects the risk of acute cardiovascular events. Exposing subjects to pollution would be unethical, so conducting a randomized study is out of the question. Define exposure and outcomes and formulate a research question which can be answered by yes or no, and explain how you intend to answer that question using register data. Could other data sources be used to improve your study?

## **Number 3 - Vitamin D and colorectal cancer risk**

You want to find out if low serum vitamin D levels affect the risk of colorectal cancers. A randomized trial is not feasible, and you decide to use data that are already collected. Formulate a research question that can be answered by yes or no, and explain how you intend to answer this using register data in combination with other data.

## **Number 4 - Asthma medication and ADHD**

Montelukast is a leukotriene receptor antagonist drug used in the treatment of asthma. Side effects of the drug include mood changes and sleeping problems and you want to find out whether the drug increases the risk of Attention Deficit Hyperactivity Disorder (ADHD). A randomized study is difficult because the risk of ADHD is low and large sample sized would be needed in a RCT study. Formulate a research question that can be answered by yes or no, and design a register-based study to answer this question.

## **Number 5 - Change of partner and risk of preeclampsia**

Preeclampsia is a condition that affects about 2-8% of pregnant women and causes a life-threatening rise in blood pressure. The only known cure is to end the pregnancy, preferably by giving birth. The risk of preeclampsia is lower among women who have given birth before, and you want to find out if this is also true for women who change partners between their first and second pregnancy. Formulate a suitable research question that can be answered with yes or no, and design a register-based study that answers the question.

## **Number 6 - Childhood cancer and socioeconomic status in adulthood**

You want to investigate the long-term socioeconomic consequences of surviving childhood cancer. A randomized study is difficult to perform. Explain how you would use registry data to conduct this study. What are your outcomes?

#### **Number 7 - Use of painkillers and risk of violent death**

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.

#### **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.

#### **Number 9 - Pierre Robin syndrome and school grades**

Pierre Robin syndrome is a birth defect affecting about one in ten thousand children that is characterized an unusually small mandible (jawbone). This syndrome may cause delayed speech development, and you wonder if this may also lead to worse school grades. Formulate a research question that can be answered with yes or no, and design a register-based study that answers the question. Pay particular attention to power issues.

#### **Number 10 - Long-term use of benzodiazepines and risk of heart attack**

Benzodiazepines are widely used to treat anxiety and insomnia and some persons have long-term use. There has been raised concern of a detrimental effect on the heart including heart attacks by long-term use. Formulate a research question that can be answered with yes or no, and design a register-based study that answers the question.