



science and policy  
for a healthy future

# Linking HBM, health studies and registers in Sweden

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# Outline

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- *Health and administrative registers in Sweden – an overview*
- *Example study 1: B-Pb and school performance or cognitive function; a published study*
- *Example study 2: B-Pb, B-Cd and risk of myocardial infarction, stroke or kidney disease; an ongoing study*



## *Health registers*

- *The Swedish Cancer Register (since 1958)*
- *The National Patient Register (in-patient since 1987, out-patient since 2001)*
- *The Swedish Prescribed Drug Register (since 2005)*
- *The Swedish Medical Birth Register (since 1973)*

## *Other registers:*

- *The Swedish Cause of Death Register (since 1961)*



- *Register over the total population (RTB) (since the 1960s)*
- *The longitudinal integrated database for health insurance and labour market studies (LISA) (since 1990)*
- *Income and taxes register (IoT)*
- *Register of school grades*
- *IQ data from National Service Administration and the Military Archives*

# National quality registers

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## Examples:

- *SWEDHEART; on myocardial infarctions*
- *National Diabetes Register (NDR)*
- *SveDem; on cognitive diseases, dementia*
- *Swedish Renal Register; on renal failure and dialysis*
- *National Register for Breast Cancer*
- *Swedish Fracture Register (SFR)*
- *National Heart Failure Register*
- *National Prostate Cancer Register*
- *National Register for Stroke (Riksstroke)*

# *Personal identification number*

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# *How can researcher get access to register data?*

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*Ethical approval (may take 2-4 months to get?)*

- *Research plan*
- *Consent from participants*

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*Application to the record holder/s*

- *Appointed an administrator at the record holder*
- *The administrator review the ethical approval for linkage*
- *Collaboration between National Board of Health and Welfare and Statistics Sweden for the linkage*



# *Exampel study 1 Sweden*

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*Aim:*

*To assess the association of very low lead exposure in early childhood with teenage cognitive performance*

# Late effects of low blood lead concentrations in children on school performance and cognitive functions

Staffan Skerfving\*, Lina Löfmark, Thomas Lundh, Zoli Mikoczy, Ulf Strömberg

*Division of Occupational and Environmental Medicine, University Hospital, SE-221 85 Lund, Sweden*

*NeuroToxicology 49 (2015) 114–120*

Available: B-Pb in 3176 Swedish children (7-12 years) collected 1978-2007 (Median 30  $\mu\text{g/L}$ , six-fold decrease over time)

Linkage:

- Register of school grades (grade 9) from Statistics Sweden
- IQ measured during military conscription examinations (mainly for boys) from the National Service Administration and the Military Archives

Conclusion: Lead was - at low exposures (B-Pb  $<50 \mu\text{g/L}$ ) - associated with lower cognitive function (neurotoxic effects) in childhood that remained for many years

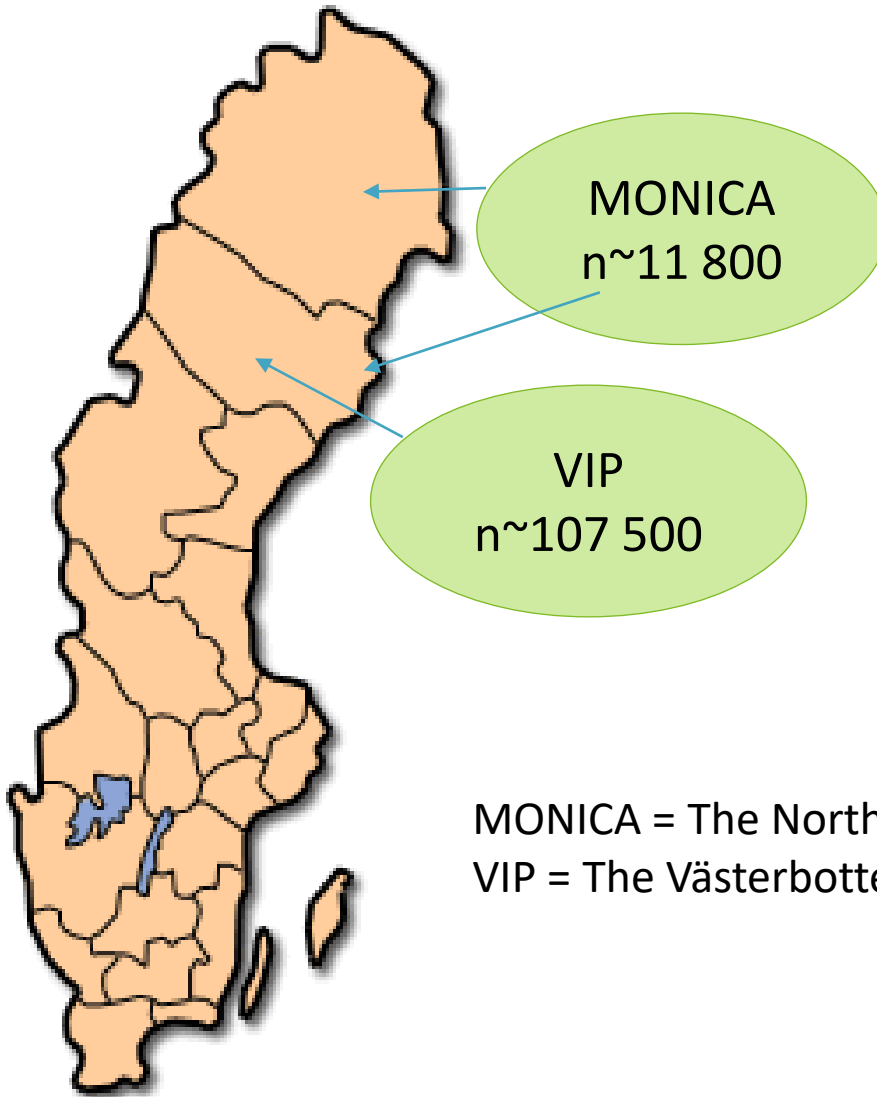
## *Exampel study 2 Sweden*

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*Aim:*

*To study associations between B-Pb or B-Cd and risk of myocardial infarction, stroke or kidney disease later in life*

# The Northern Sweden Health and Disease Study (NSHDS)



- Since mid 1980s
- Adult population (25-74 years)
- Questionnaire data, diet from FFQ
- Medical data
- Blood samples

MONICA = The Northern Sweden MONICA Study  
VIP = The Västerbotten Intervention Program

# *The Environmental Pollutant Cohort within NSHDS*

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= individuals in NSHDS with previously performed chemical analysis on one or several environmental pollutants

Around 2500 with previous analysis on one or several metals in blood

## *What do we have?*

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From Northern Sweden Health and Disease study:

- B-Pb, B-Cd for ~ 2500 participants from 1985-2014
- Background data from questionnaires
- Medical data

# *What do we need?*

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## **OUTCOME DATA:**

Data on who get the disease later in life and who do not for:

- Myocardial infarction
- Stroke
- Kidney disease

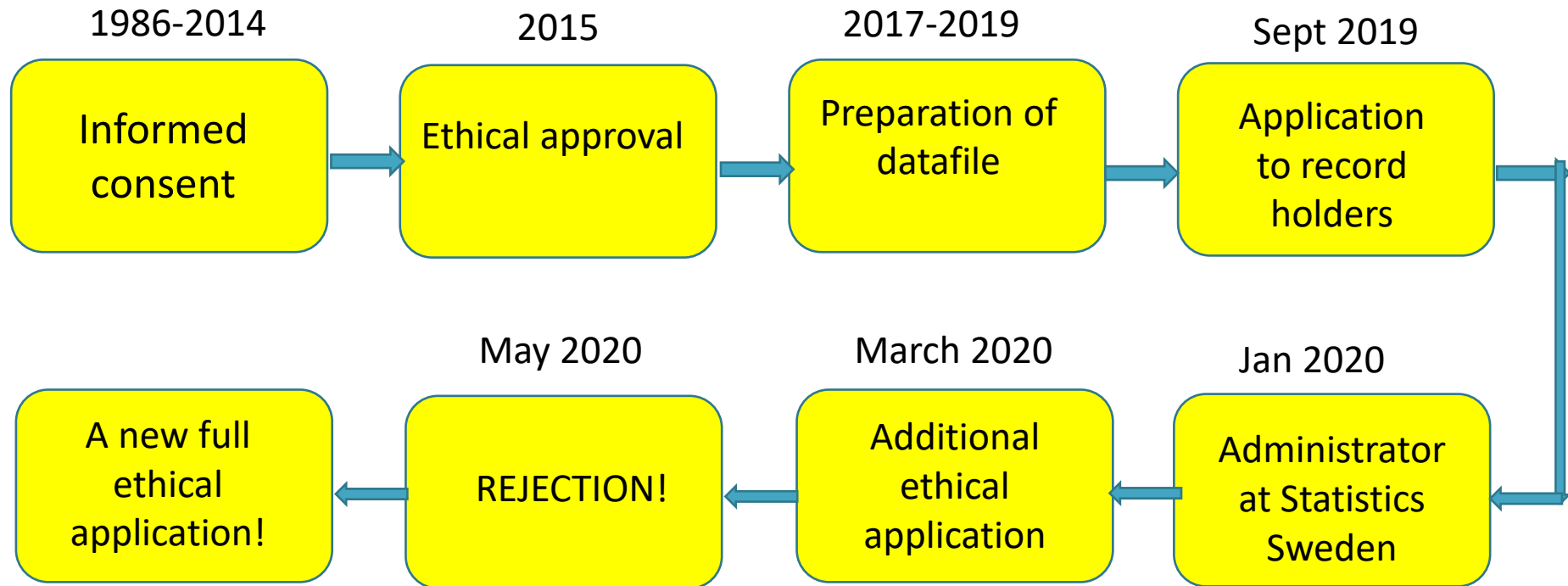
## **From the National Board of Health and Welfare:**

- National Patient Register; (ICD-codes)
- The Swedish Cause of Death Register (ICD-codes)
- Quality registers of MI, stroke and kidney disease?

## **From Statistics Sweden:**

- Occupation from the LISA register
- Income and taxes register

# Timeline example study 2





## *Lesson learned*

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In the ethical application:

Include detailed information on what registers you plan to link with your study cohort and even what variables you plan to apply for!

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*Thank you!*