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Using register data to study socio-economic difference in health, morbidity and mortality

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Aim

- How socioeconomic position is measured?
  - Surveys / Registers or statistics
- Is it possible to do Nordic studies with data from several countries?
  - Even though the register systems in all Nordic countries have a very high quality (completeness, validity), it may not be so easy to perform a study with data from several Nordic countries.
    - High costs, lack of funding
    - Differences in structures (social welfare and health care)
    - Differences in statistical and register systems

Terms

Equality?

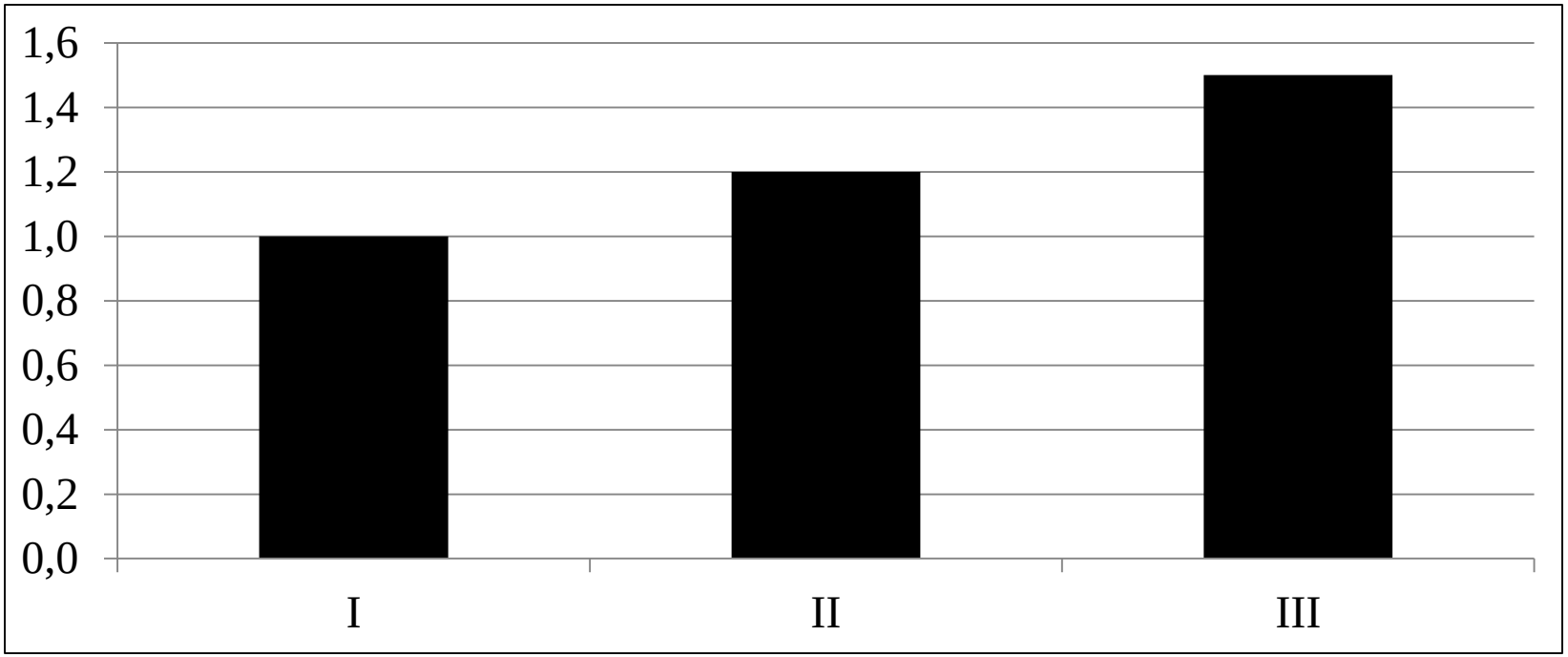
Equity?

Terms (Merriam-Webster)

- Equality: the state or fact of being exactly the same in number, amount, status, or quality.
- Equity: the act or practice of giving to others what is their due.
  - Equity in public health is the absence of systematic disparities in health between groups with different levels of underlying social (dis)advantage, e.g. wealth, power, or prestige. Equity means social justice or fairness.

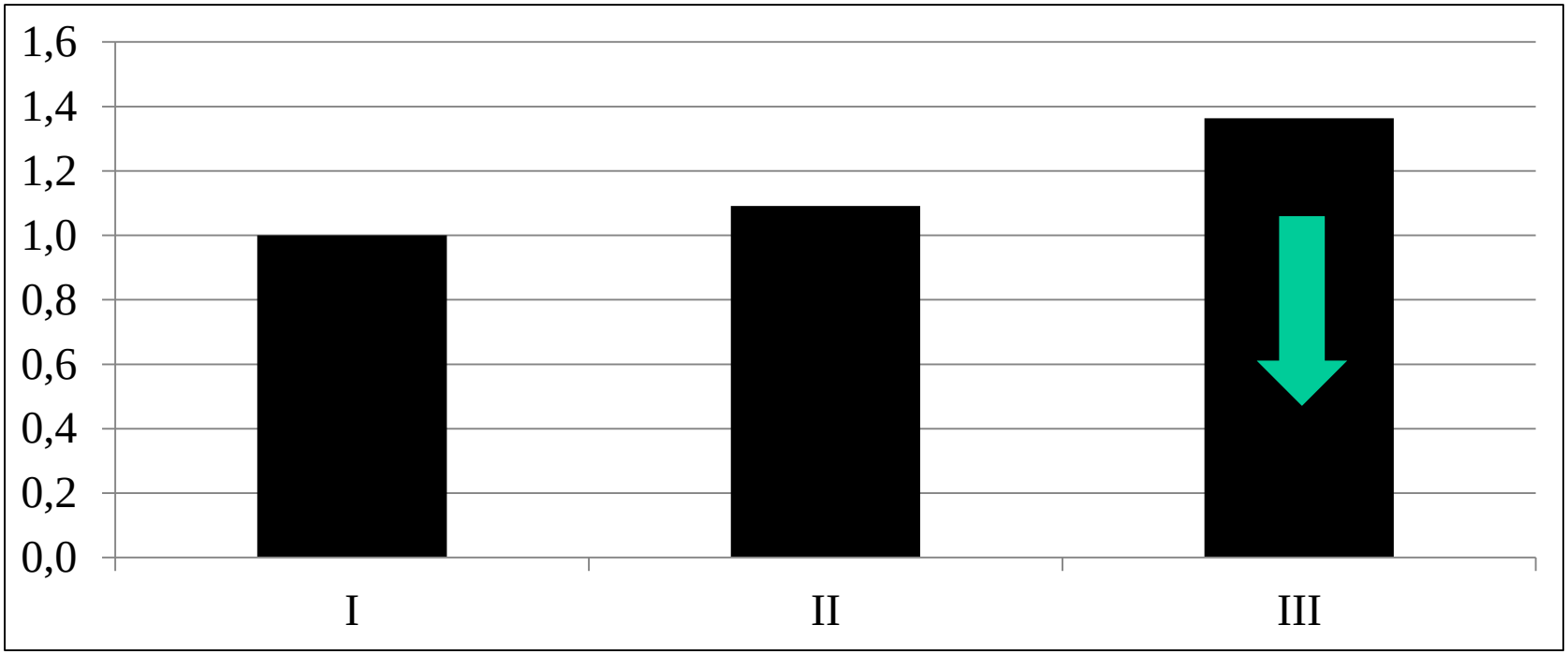
    (Braveman & Gruskin: JECH 2003: doi:10.1136/jech.57.4.254)

RR for mortality in three SES groups



Population	10 000	10 000	10 000
Deaths	1 000	1 200	1 500
Mortality	10%	12%	15%

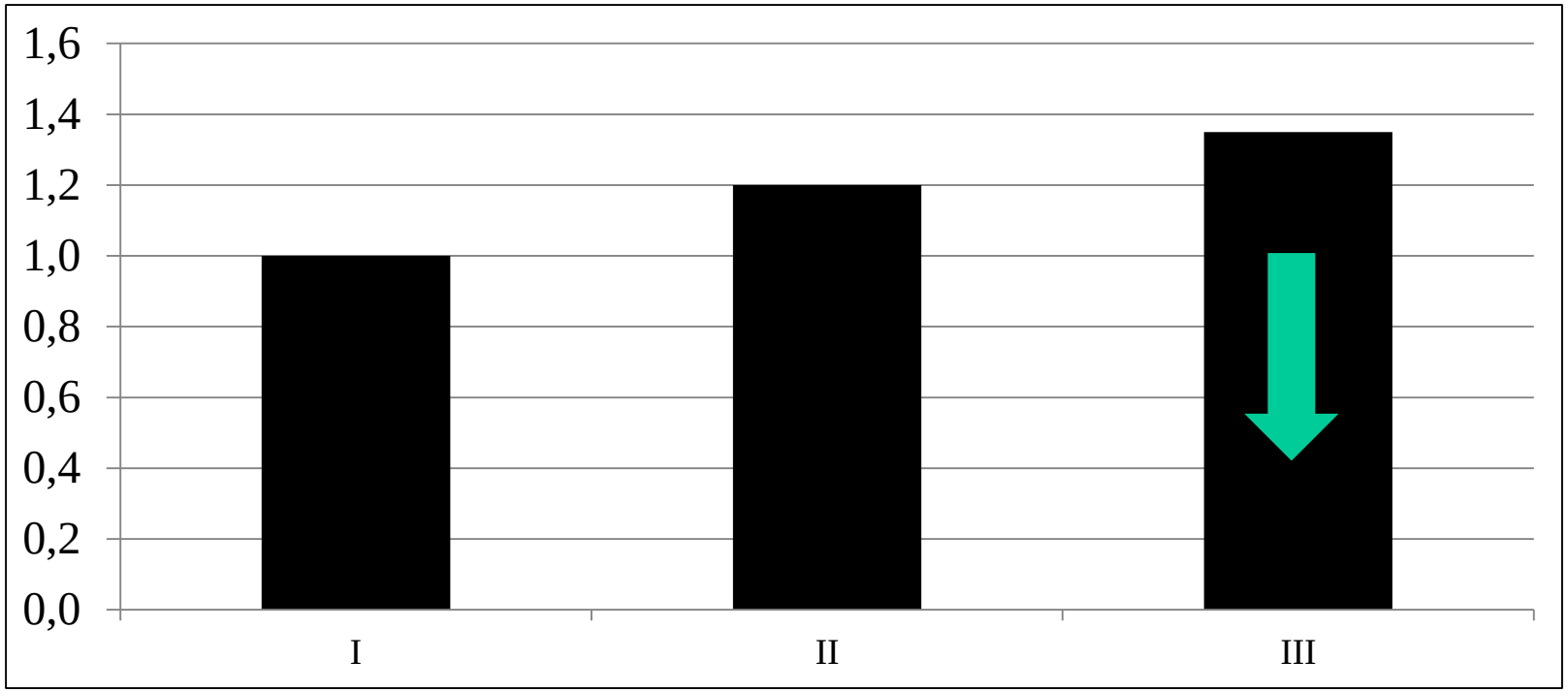
RR for mortality in three SES groups



RR decreased from 1.5 to 1.36

Population	10 000	10 000	10 000	**-28%**
Deaths	1 100	1 200	1 500	
Mortality	11%	12%	15%	

RR for mortality in three SES groups



RR decreased from 1.5 to 1.35

Population	10 000	10 000	10 000	**-30%**
Deaths	1 000	1 200	1 350	
Mortality	10%	12%	13.5%	

How socio-economic position/socio-economic status/social class is measured?

- Registers and statistics
  - Routinely collected register seldom include SES variables
  - Data linkages to other registers
    - Census, Education Register, Income Register etc.
- Health interview/examination surveys
  - You can always ask!
  - Data linkages to other registers (after receiving an informed consent / informing the people)

Socioeconomic position

- Based on occupation
  - Upper white-collar worker
  - Lower white-collar worker
  - Blue-collar worker
  - People outside labour market
- Education
  - Basic education
  - Upper secondary general education
  - Vocational education
  - Polytechnic education
  - University education

Socioeconomic position

- Income before or after taxation
  - Deciles (10%), quartiles (25%) etc.
  - Number of people in the household affects:
    - OECD weight categories **NEW**
      - Person 1 1 **1**
      - Person 2 0.7 **0.5**
      - Child 0.5 each **0.3 each**
- Social assistance
  - Social assistance (social help) and other non-universal social benefits as a proxy of being poor

Socioeconomic position

- There are always a possibility/risk for bias
  - Occupation → at what time?
  - Education → education abroad?
  - Income → non-taxable income?
    black market?

- This is also true for official information systems, not only self-reported
  - Outdated information, incorrect information etc.

Example of register data (Savtschenko et al. 2010)

- Unemployment of disabled people in Finland
  - 50% sample of working-aged people who had received a disability tax relief (between 30% and 100%) in 1996
  - Follow-up until 31 December 2002

Example of register data (Savtchenko et al. 2010)

- Unemployment rate among 25-64 years old
  - Disabled: 13.7%
  - General population: 11.6% **RR=1.18**

Example of register data (Savtchenko et al. 2010)

- Unemployment rate among 25-64 year olds
  - Disabled: 13.7%
  - General population: 11.6% **RR=1.18**

- But the proportion of belong to labour force
  - Disabled: 17%
  - General population: 71% **RR=0.24**

Surrogate variables

- Quality of housing
  - water, sewage, electricity, television, telephone, computer
- Access to services
  - Education, health care services, welfare services
- Insurance
  - Obligatory health insurance
  - Health insurance paid by the employers
  - Voluntary health insurance

An example from UK

If the household lacked the following goods and could not afford it

- Telephone
- Washing machine
- Freezer/fridge
- Dishwasher
- Mobile phone
- Cable/satellite television
- Video recorders
- Central heating
- Tumble drier/washer
- Burglar alarm
- Compact disc player or home computer

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An example on register study:

NorCHASE: Nordic Collaborative project on Health And Social inequalities in Early life

The Welfare State

The Nordic Model: The conditions for the least powerful members of the society (children, immigrants, unemployed etc.)

NorCHASE

Nordic
Collaborative project on Health And Social inequalities in Early life

Funded by NordForsk: Programme for longitudinal epidemiology

Social inequalities in health in early life is an injustice

Social inequality in birth weight and preterm birth may track into socially patterned health inequalities in adults

Nordic children are privileged!

Nevertheless,

We have between countries differences in health

These differences may indicate potentials for improvement

So, how are we doing?

Mortality: Suitable for comparative purposes

- Infant mortality
- Child mortality

Differences in early life health that may track into adult life

- Birth weight
- Preterm birth

The Nordic countries have

- shared ideologies of non-acceptance of health inequalities
- homogeneity in societies and populations
- heterogeneity in public health policies, government steering, health behaviours, and health status
- accessible data on the individual level on health and on socio-economic indicators

As such we may add to the understanding of socially patterned health inequalities

NorCHASE aims

To analyse and understand socio-economic patterns in

- preterm birth
- birth weight
- stillbirth
- infant mortality and its compartments
- mortality from 1 year to 15-20 years

To identify mechanisms and mediating factors explaining the social patterns

NorCHASE data

From Medical Birth Registries and Statistical Bureaus

All children born 1981–2000 in Denmark, Norway and Sweden

All dead children 1987–2000 + 50% population sample of surviving in Finland

Approximately 5 million children

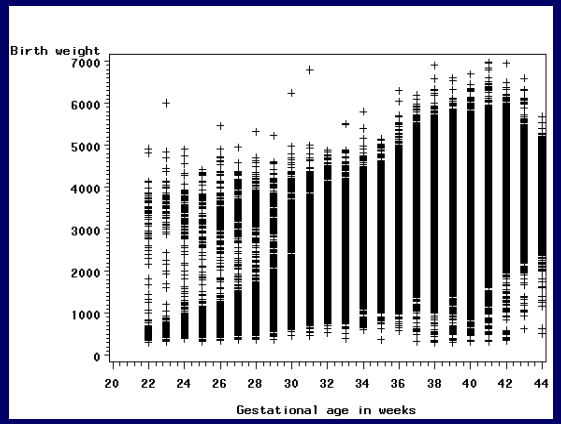
Birth weight, gestational age, plurality, sex, congenital anomalies,

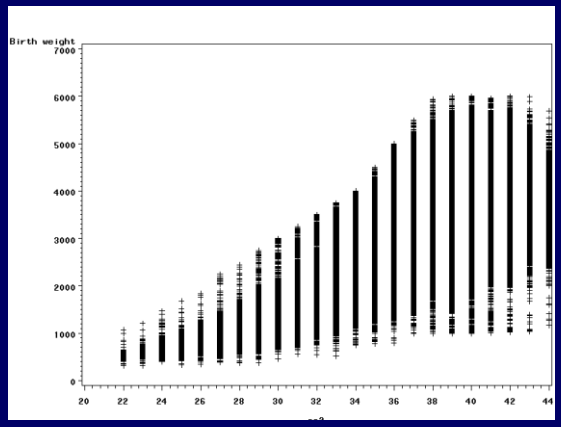
Deaths: Follow-up until 2003: date of death, causes of death

Maternal and paternal: age at birth, ethnicity, income, highest education, occupational status, cohabitation status, parity, social subsidies

Issues in methods

Cleaning of register data



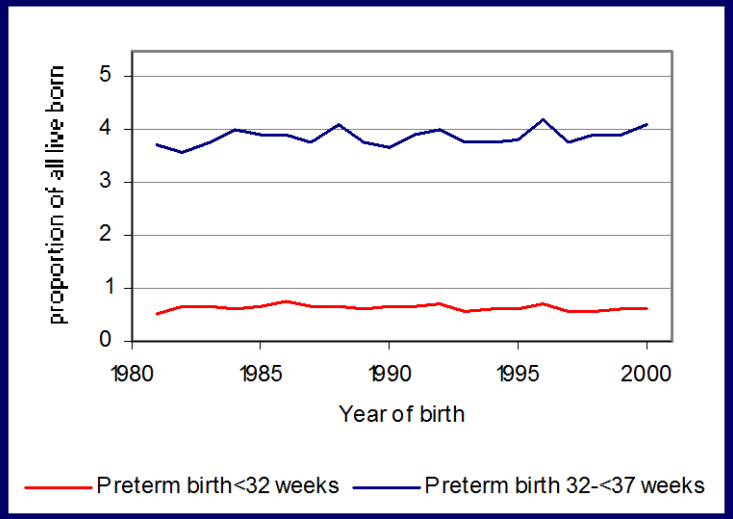


Making data comparable

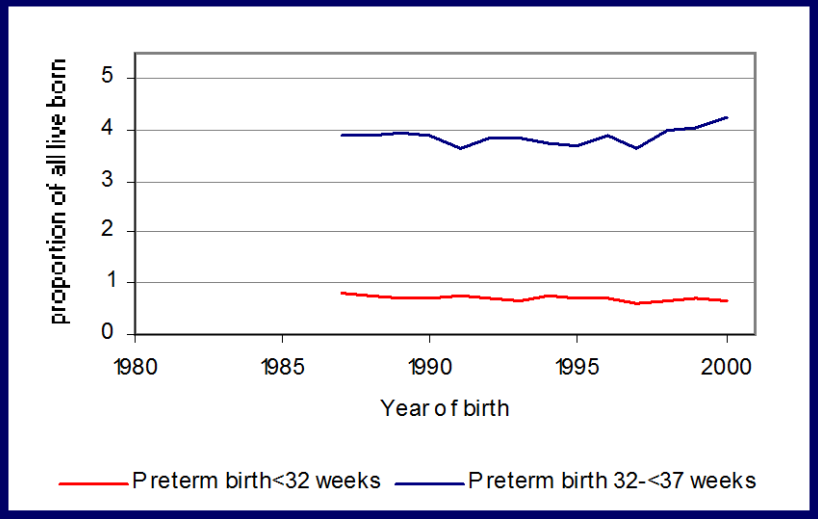
- educational measures: ISCED (<10y, 10-12y, >12y)
- income measures: Adjusted taxable household income
  Percentiles
- occupational status: Labour market attachment

Preterm births, 1981-2000

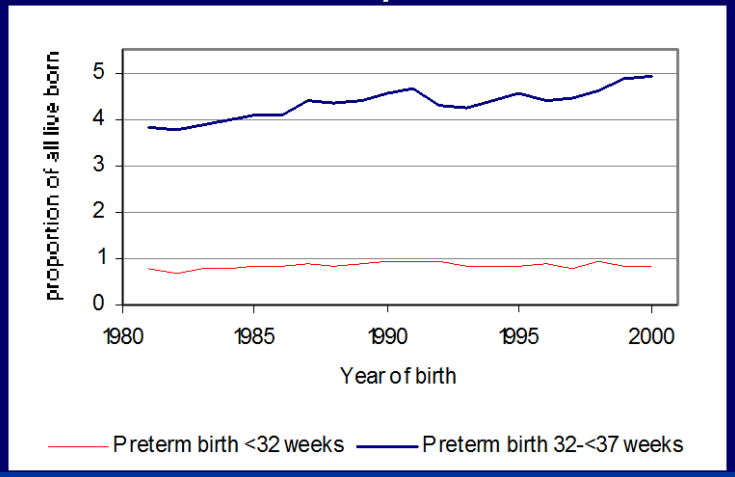
Denmark



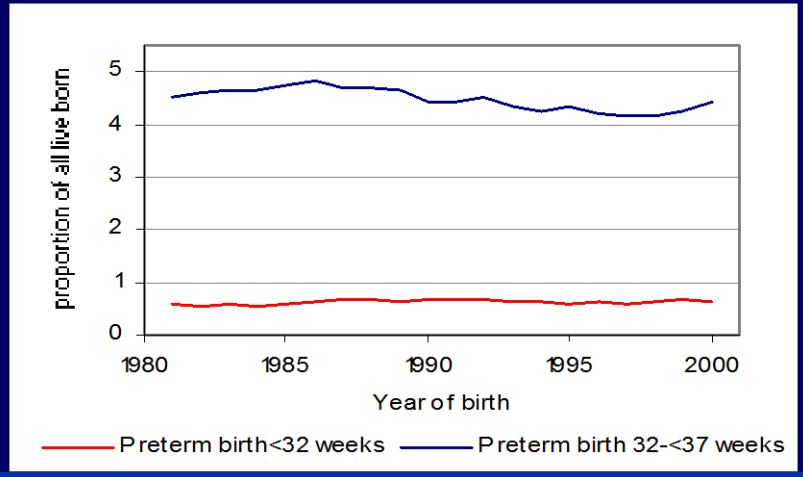
Finland



Norway



Sweden



Infant mortality

Decreasing in all Nordic countries

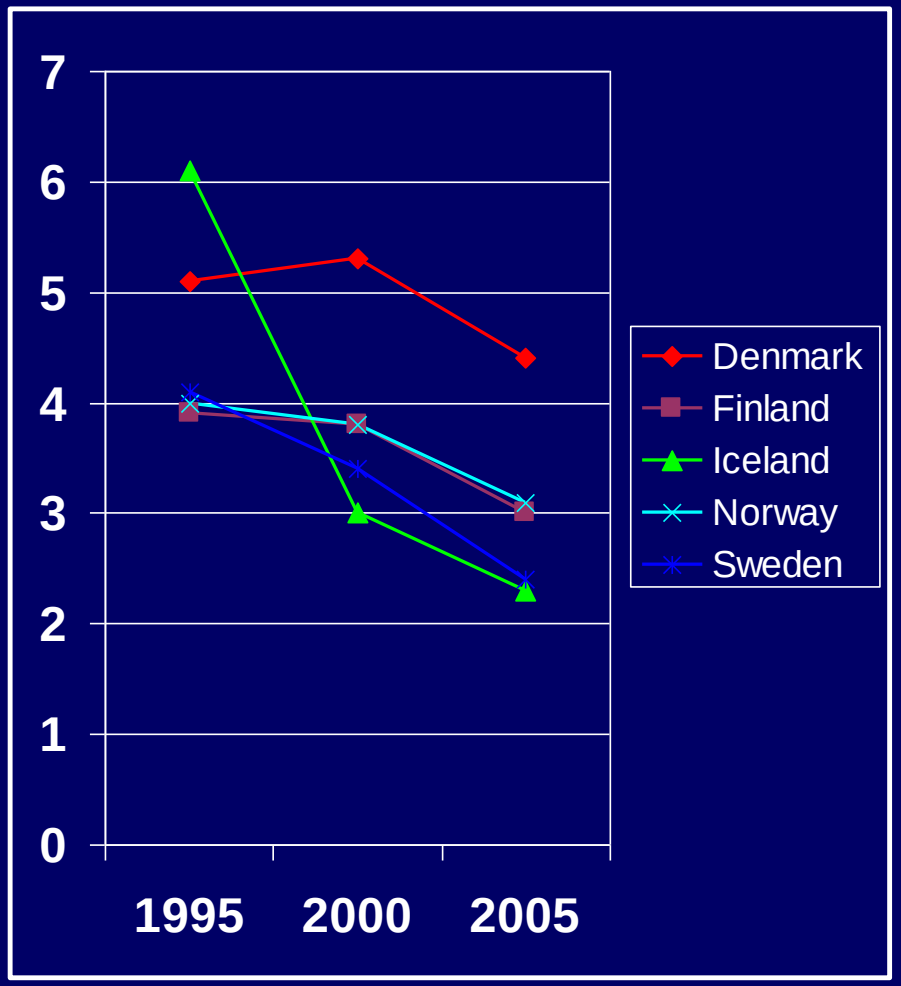
Iceland displays the most dramatic improvement

Denmark is doing substantially worse

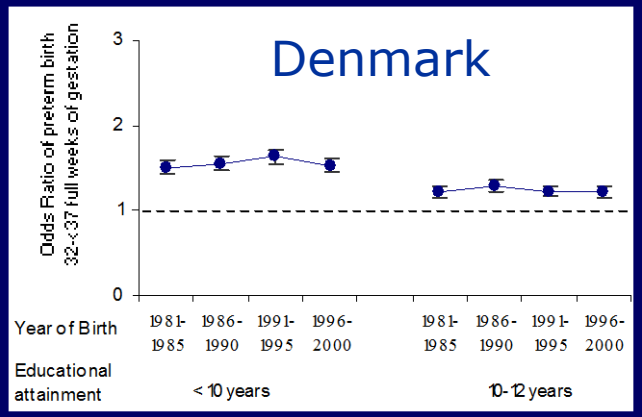
WHY?

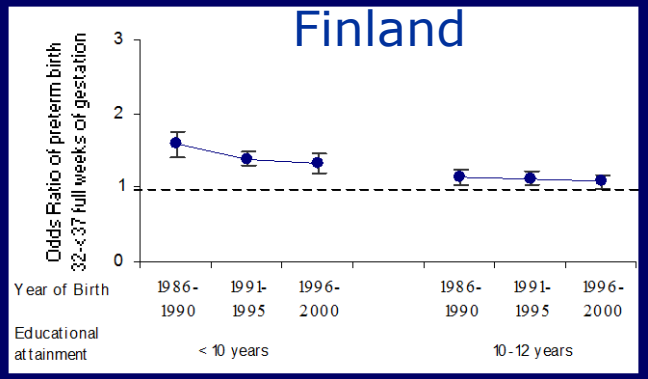
Smoking, alcohol?

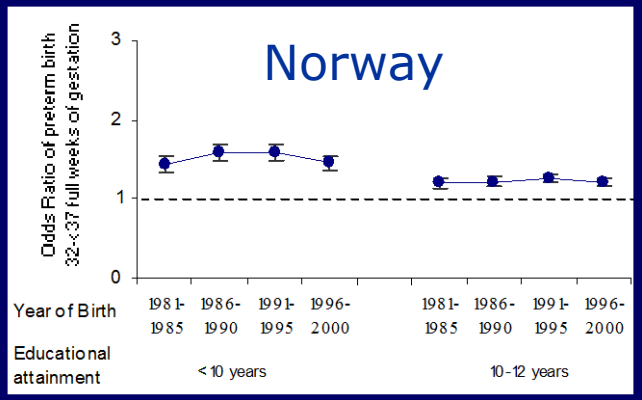
Health care system?

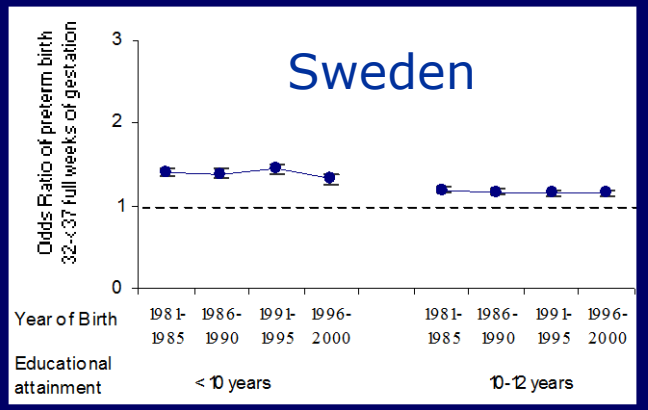


Educational inequalities in preterm birth







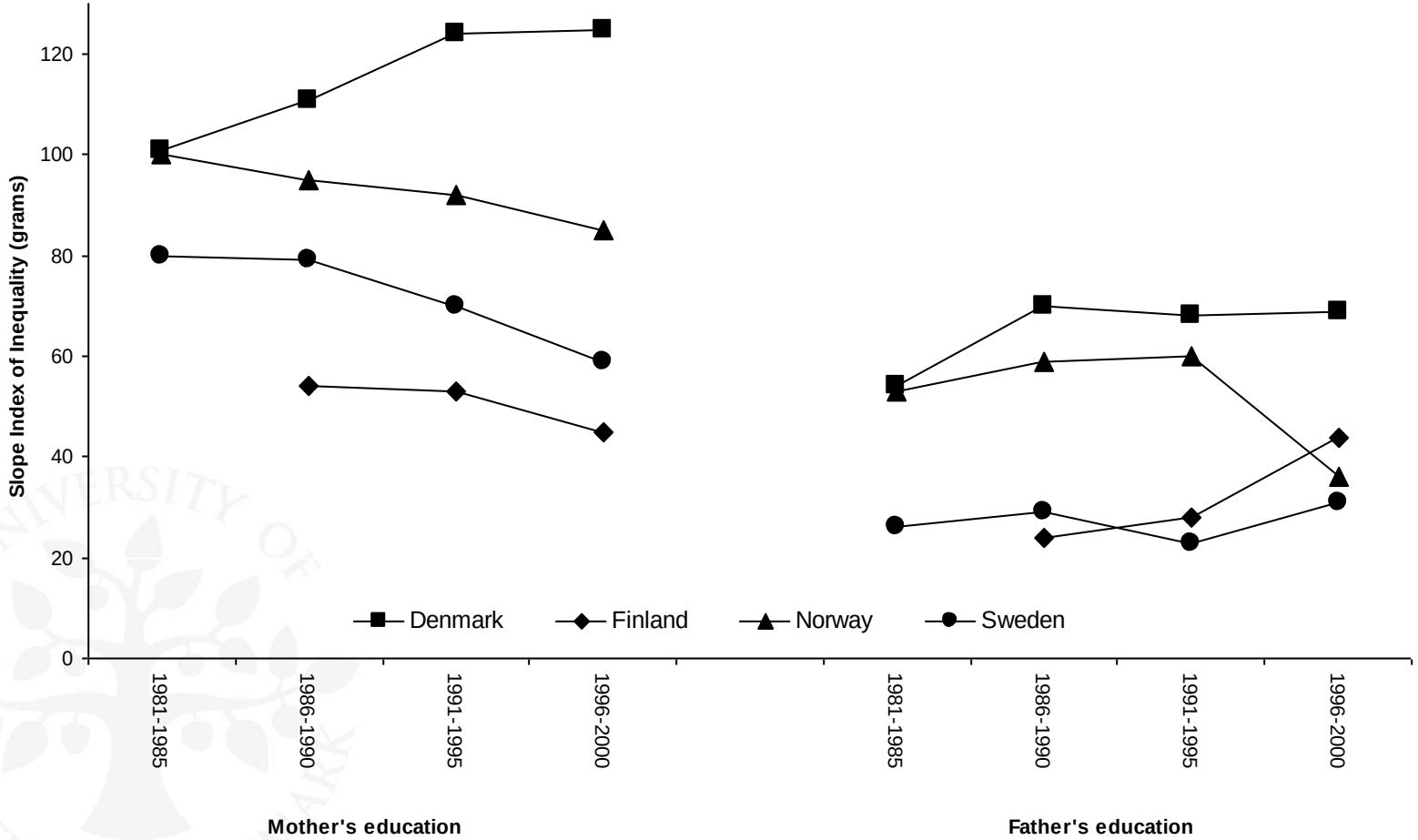


Birth weight and educational level

1996-2000	Denmark	Finland	Norway	Sweden
< 10 years	- 103 g	- 51 g	-89 g	- 68 g
10-12 years	- 34 g	- 6 g	- 35 g	- 17 g
> 12 years	ref	ref	ref	ref
SII	125 g	41 g	85 g	59 g

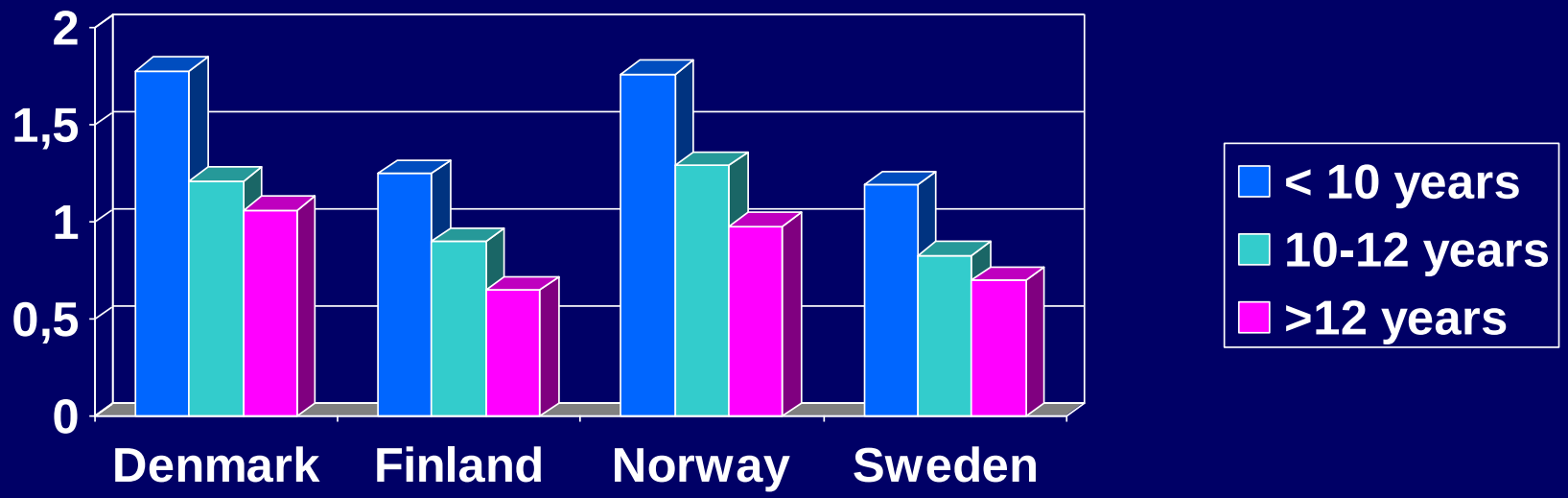
All estimates adjusted for gestational age, parity, mother's age, father's educational level, whether a father was known, and father's age.

Slope index of inequality in birth weight



All estimates adjusted for gestational age, parity, mother's age, whether a father was known, and father's age. Father's education and mother's education were mutually adjusted.

Educational gradient in 1-4 y mortality



Maternal educational level

All cause mortality

Unadjusted rates (events/1000 under risk)

Thank you to collaborators

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STAKES, University of Oulu and University of Helsinki

How about migrants?

The basic problem:

Who is a migrant?

Alternative definitions:

- A person born in another country than the host country.
  - First generation migrants
- A person born with another nationality than the host country's nationality.
  - First generation migrants
- Ethnic and cultural minorities (self-identification)
  - Also second generation migrants
- Asylum-seekers, refugees, “sans papiers”
- Immigrants are not a homogenous group.
  - There are different reasons to emigrate (e.g. family reasons, studies, work, and persecution).

How to get data on migrant health?

- Mortality — registers
- Morbidity — registers, statistics
  interview surveys
  examination surveys
- Symptoms, functional capacity, self-reported health, health behaviour, health experiences:
  interview surveys
  examination surveys

How to get data on migrants' use of health services

- Hospital services — registers
- Other health services: primary health care, preventive medicine, health promotion, access to health care services
  — interview surveys
  — examination surveys
- Health care expenditure and costs:
  — all possible data sources

How to get data on migrant health?

- EU bans the registration on race or ethnic origin, so health care registers cannot be used.
- However, population registers and census can collect information on country of birth, native language and nationality.
  - The researcher has to decide, who is a migrant.
  - Non-nationals using health care services in a country may not be migrants:
    - visitor, temporary resident, seeker of health services, contract with home country and host country etc.

How to get data on migrant health?

- Ask the migrants!
- How to find them?
  - Snow-ball method
  - Through migrant health services and/or programmes, and statistics based on them
  - Population registers: country of birth, nationality at birth / currently, native language

Problems with register studies

- How to define immigrant populations or ethnic groups?
- No information, if the care received meets needs.
- Usually private services are excluded.
- Service utilisation in other countries are excluded.
- Other than “western medicine” excluded.

Problems with health interview and questionnaire studies

- Large samples required (ill-health and morbidity)
- How to form study group(s)?
- Risk for research, selection, recall and reporting bias.
- Limited number of questions: can all ethnic groups be targeted with the same questions?
- Cultural differences in answering.
- Translation and use of other than native language in answering. Interpretation adds costs.
- It may be more difficult to reach certain migrant groups.

Problems with health examination studies

- Large samples required to study ill-health and morbidity.
- Expensive research method.
- Research, selection and participation bias.