INTRAUTERINE GROWTH RESTRICTION AND MORTALITY: AN EXAMPLE OF LINKAGE

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AIM

- To find how important is intrauterine growth restriction for risk of dying in first year of life

SGA (IUGR) vs LGA babies

PROBLEM

- The National Perinatal Information System of Slovenia covers all relevant medical data about pregnancy, delivery and newborn
- Data collection ends at remission from maternity hospital
- Subsequent event must be linked from other data sources

LEGAL ASPECTS

- For all health related data sources there exists „Databases Act in the area of health care“ which defines 75 databases (of which NPIS is one)
- For each of them there is given:
  - title
  - detailed list of items it covers
  - purpose
  - reports
  - who is required to provide data
  - who manage the database
  - means of data exchange (media)
  - time of storage of data

DATA SOURCE: „MEDICAL REPORT ON THE DEATH“

- for deaths before 15 years of age there is required to be additionally included mother‘s and father‘s identity.

IDENTIFIERS

- Basic personal identifier in Slovenia is EMŠO (unique master citizen number), defined as
- DDMMYYYRRZZZC
  - DD day of birth
  - MM month of birth
  - year of birth (without leading thousand)
  - RR region (50; different codes were used for other republics in former Yugoslavia)
  - ZZZ sequential number of birth that day: 0-499 for males, 500-999 for females
  - C control number

- Only recently unique identifier is assigned to newborn immediately after birth. For analysis of older data, NPIS does not contain such identifier.
- Name and Last name of newborn is often not known immediately after birth (or agreed upon).
- Unique identifier of the mother exist only for women who are citizen of Slovenia, while NPIS contains data on births taking place in Slovenia (regardless mother‘s citizenship)

OTHER POSSIBLE IDENTIFIERS

- Health insurance number
- Taxation ID number

LINKING OF TWO DATA SOURCES

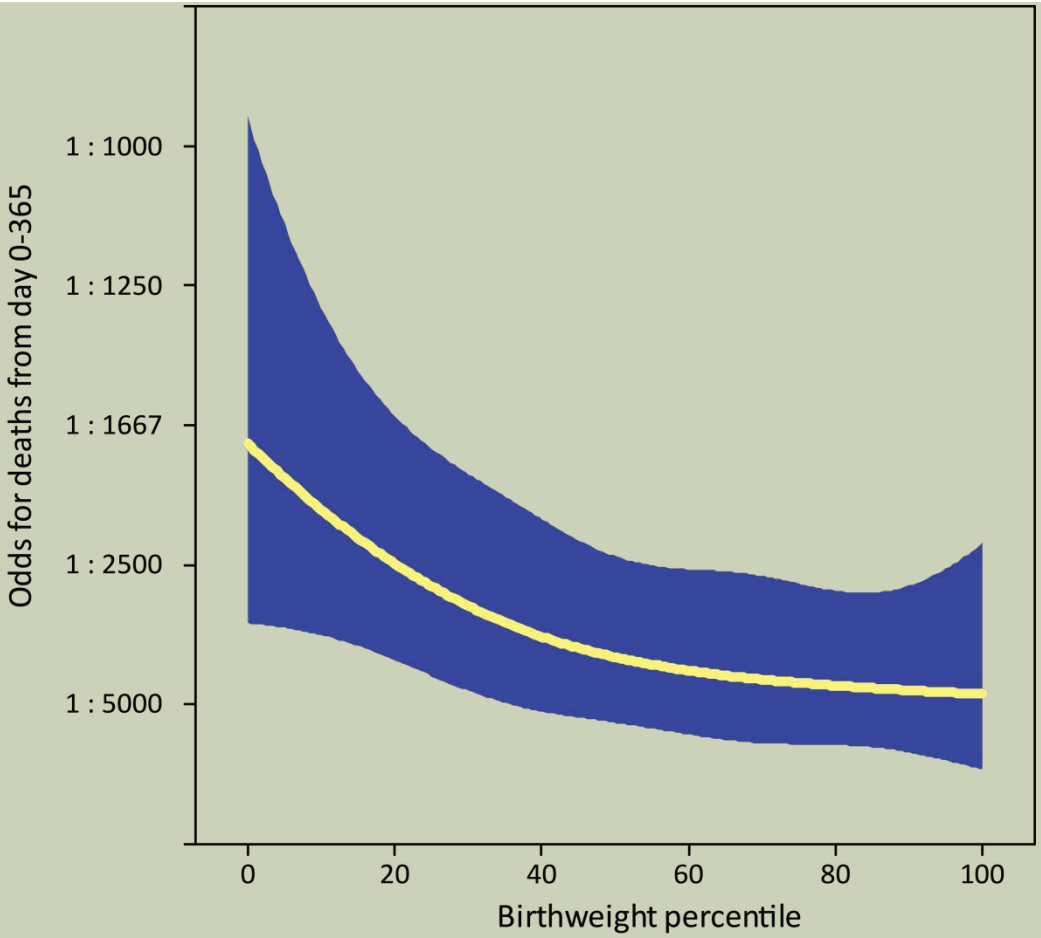
- We used data on 203620 deliveries – all singleton deliveries in Slovenia from 2002-12, after exclusion of stillbirths and neonatal deaths due to congenital malformation – data source NPIS
- We used data on all infants death in the first year of life from 2002 to 2013 (n = 654) – data source „Medical record of death“

ERRORS

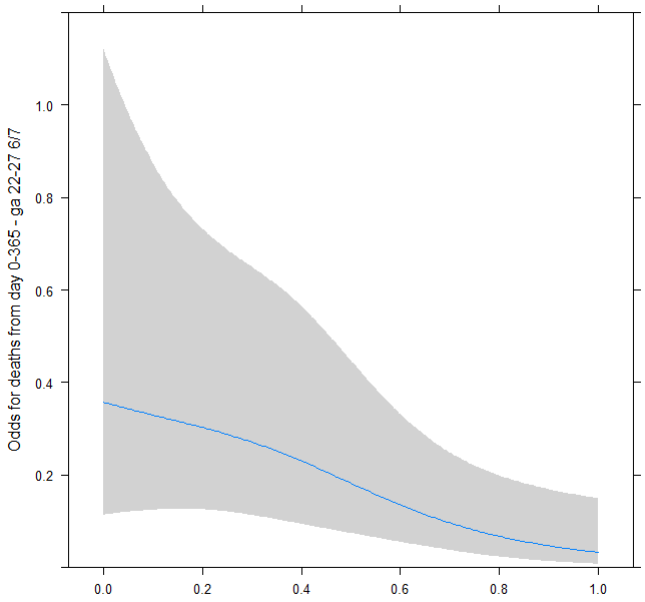
- For approximately 10% of cases, linking was not successful.
- Most of the cases were neonatal deaths recorded in NPIS but not in MRD.
- Few cases were deaths recorded in MRD without corresponding birth.

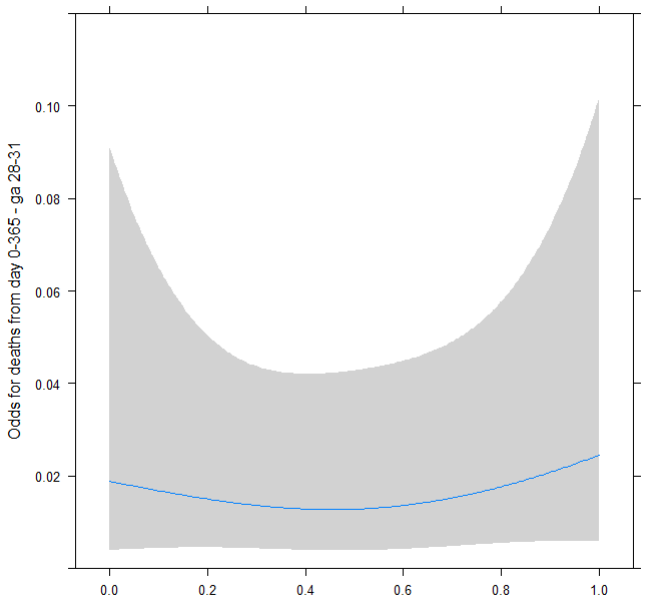
- Main reason was missing data on (mother‘s) unique identifier, wrong dates (usually wrong year).
- By correcting errors by hand, we successfully linked 99% infant deaths to perinatal data. This is possible only for studies with only a handful of cases.

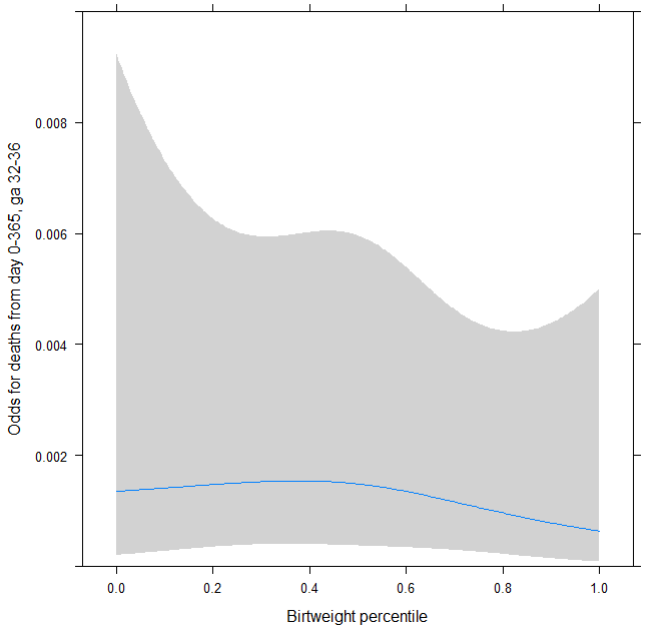
RESULTS

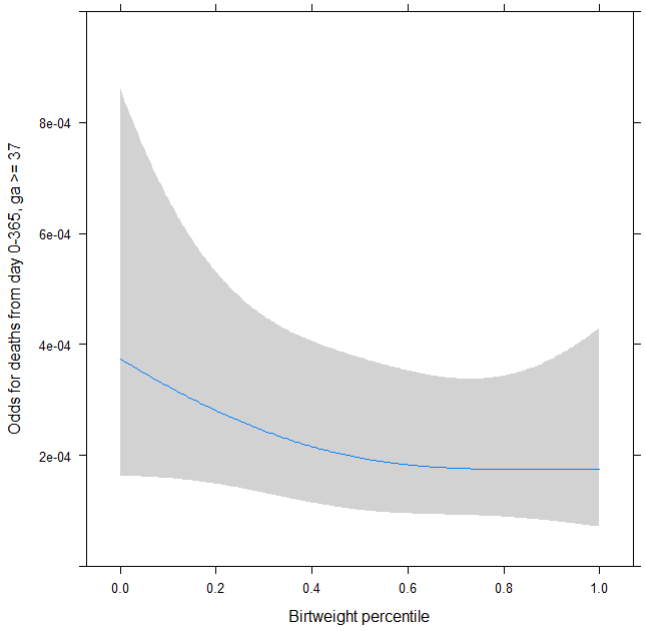


Adjusted for gestational age, mother's age, parity, BMI, smoking, PWG, gender


Odds for deaths from day 0-365 - ga 22-27 6/7
1.0
0.8
0.6
0.4
0.2
0.0
0.2
0.4
0.6
0.8
1.0


Odds for deaths from day 0-365 - ga 28-31
0.10
0.08
0.06
0.04
0.02
0.0
0.2
0.4
0.6
0.8
1.0


Odds for deaths from day 0-365, ga 32-36
0.008
0.006
0.004
0.002
0.0
0.2
0.4
0.6
0.8
1.0
Birtweight percentile


Odds for deaths from day 0-365, ga >= 37
8e-04
6e-04
4e-04
2e-04
0.0
0.2
0.4
0.6
0.8
1.0
Birtweight percentile


Soccer Shots
Soccer Shots
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Soccer Shots

ONGOING EXERCISE ON LINKAGE

- Sports educational charts for establishment, evaluation and monitoring of physical characteristics and motor abilities.
- Measured annually in primary school, secondary school pupils and students
- Participation is voluntary, coverage is 90-95% in primary schools
- Measures: body height, weight, upper arm skinfold, arm plate tapping, standing broad jump, polygon backwards, sit-ups, forward bend, bent arm hang, 60-metre run, 600-metre run.

RESEARCH QUESTION

- Which factors from perinatal period (pregnancy, birth, morbidity ...) are related to motor abilities in school children?
- Linkage of both data sources is problematic due to lack of common identifier.
- Exact Name, Last name and Birthdate yields approximately 50% of successful linkage. With some „massage“ of names we expect to have 75% coverage.

IN HOW MANY WAYS ONE CAN WRITE HIS OWN LAST NAME? A REAL EXAMPLE!

D.FRANIĆ	dr. Franic	dr. Franić
dr. FRANIĆ	Dr. Franić	DR. FRANIĆ
dr. Franič	dr. FRANIČ	DR. FRANIČ
dr. Franić k1	dr. Franić K1	dr. Franić K2
dr. FranićK1	dr. FranićK2	dr.Franić
dr.FRANIĆ	Dr.Franić	DR.FRANIĆ
dr.Franič	DR.Franič	dr.Franić #
dr.Franić k1	dr.Franić K1	Dr.Franić K1
dr.Franič K1	dr.Franić k2	dr.Franić K2
dr.Franić k3	dr.Franić K3	dr.Franić K4
dr.Franić#K1	dr.FranićK1	dr.FranićK1#
dr.FranićK2	Dr.FranićK2	FRANIĆ

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