

Unequal at birth? Unravelling perinatal health inequalities in the Netherlands

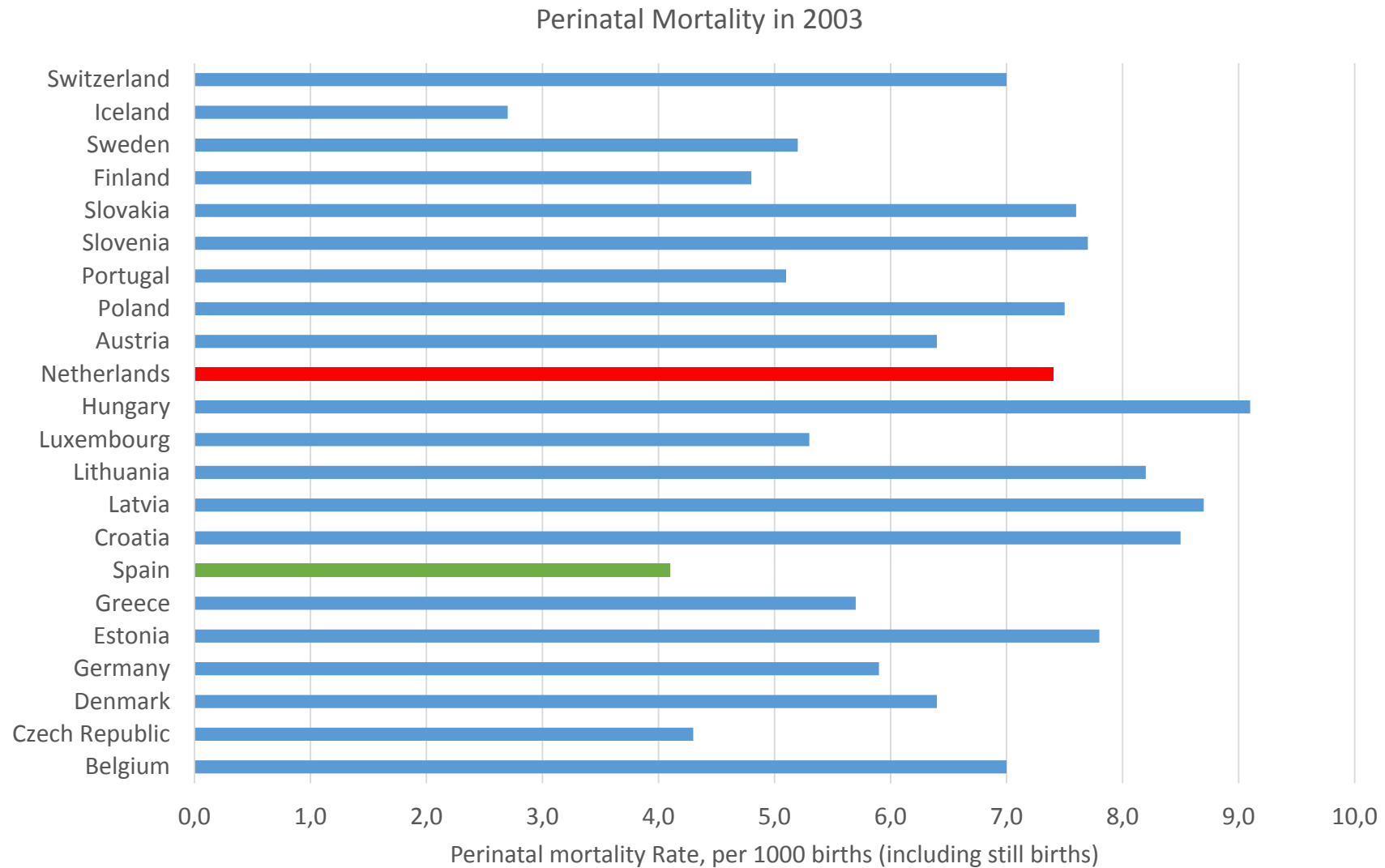
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(joint work with Joaquim Vidiella Martin, Tom Van Ourti and Eddy Van Doorslaer)

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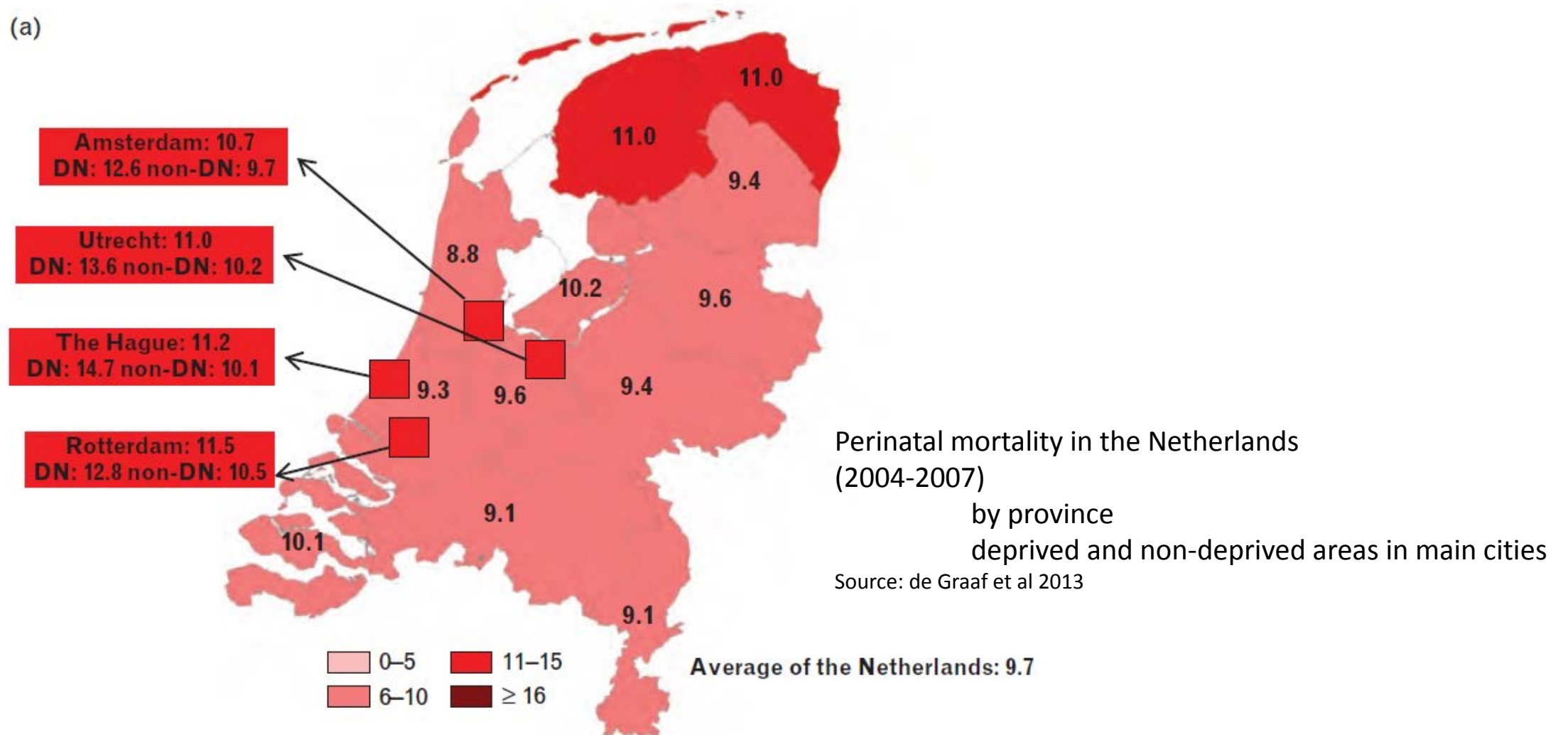
Why perinatal health in the Netherlands?



Source: Eurostat

Why inequalities in perinatal health in the Netherlands?

(a)



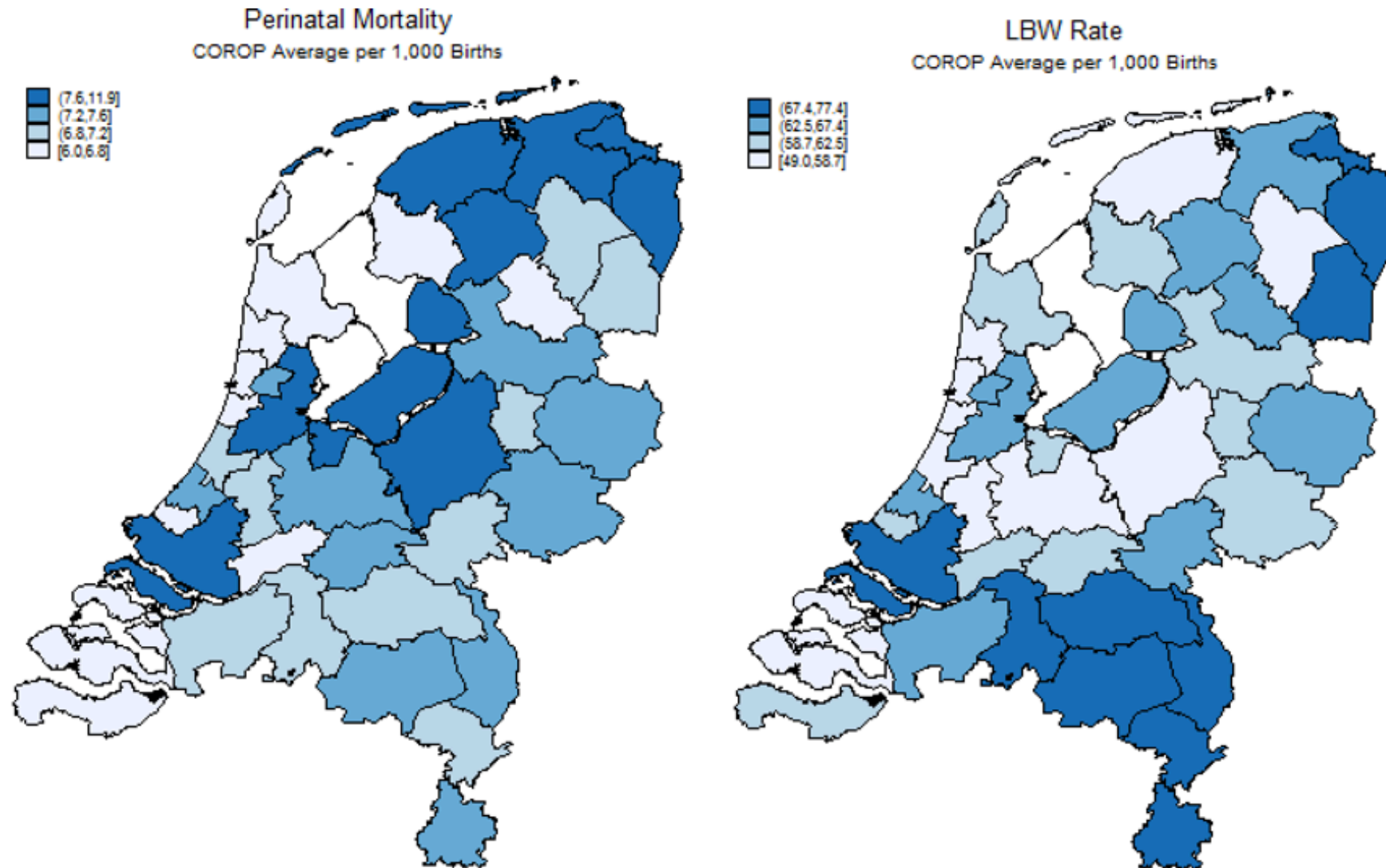
What do we do?

- Descriptive paper
 - Is perinatal health in the Netherlands associated to parental income?
 - Is this association constant over the income distribution?
 - Does this association vary across regions over time?
 - In which regions does income matter most?
 - Does location matter more for low income babies?
 - What are the factors related to the regional variation in this association?
 - Simple correlations between small area characteristics related to maternal behavior, supply of care, environmental factors

Data

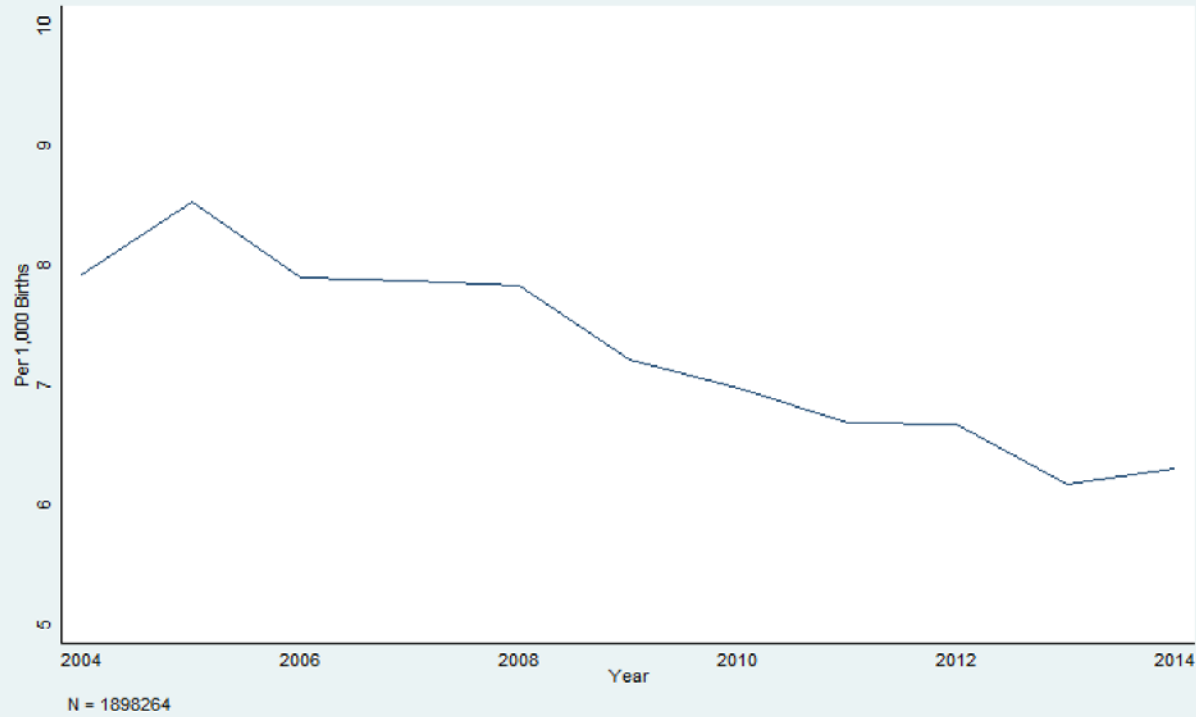
- Perinatal Register 2004-2014
 - 1.6M births
 - Outcome variables: perinatal mortality (stillbirths + 7 days), low birthweight (<2,500g) and small for gestational age (<10th percentile)
- Linked with household parental income
 - Equivalent household income at t-1
 - Use rank (at yearly level using all births in a given year)
- Local area characteristics
 - Every newborn assigned to location of the mother at time of conception

Regional differences in perinatal health (2004-2014)

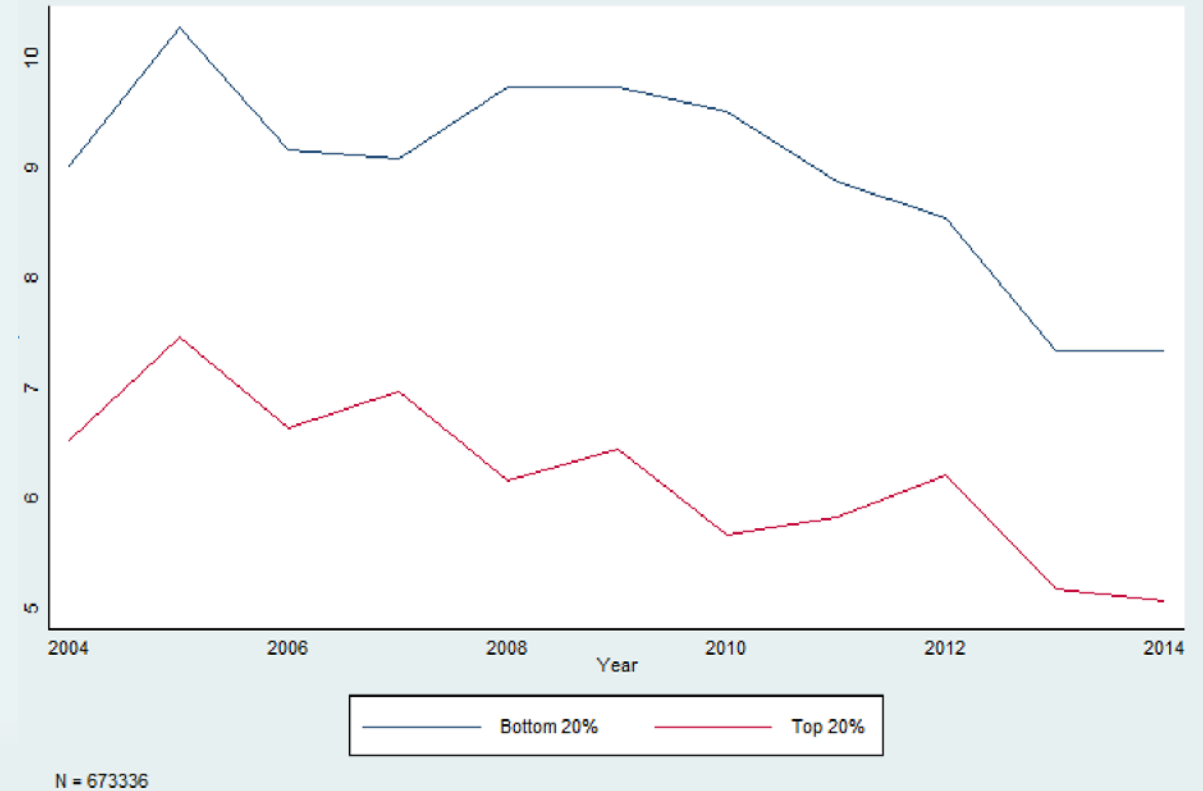


Trends in perinatal health: perinatal mortality

Evolution of Perinatal Mortality
2004-2014

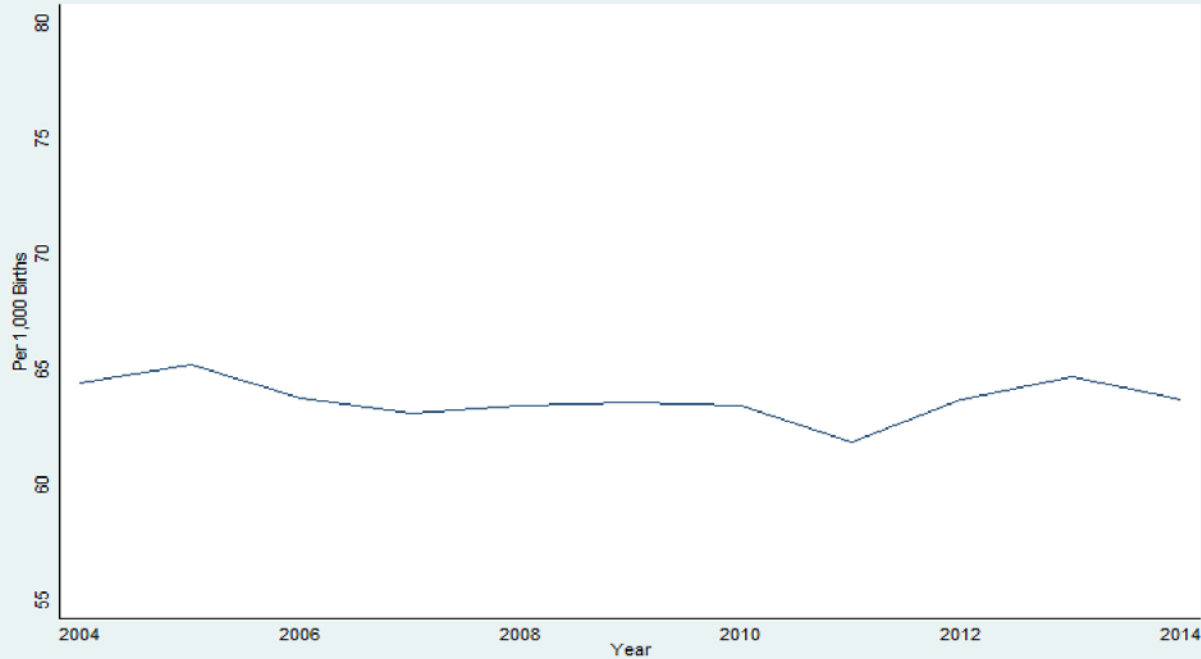


Evolution of Perinatal Mortality by Income Quintile
2004-2014



Trends in perinatal health: low birthweight

Evolution of Low Birthweight
2004-2014



N = 1898264

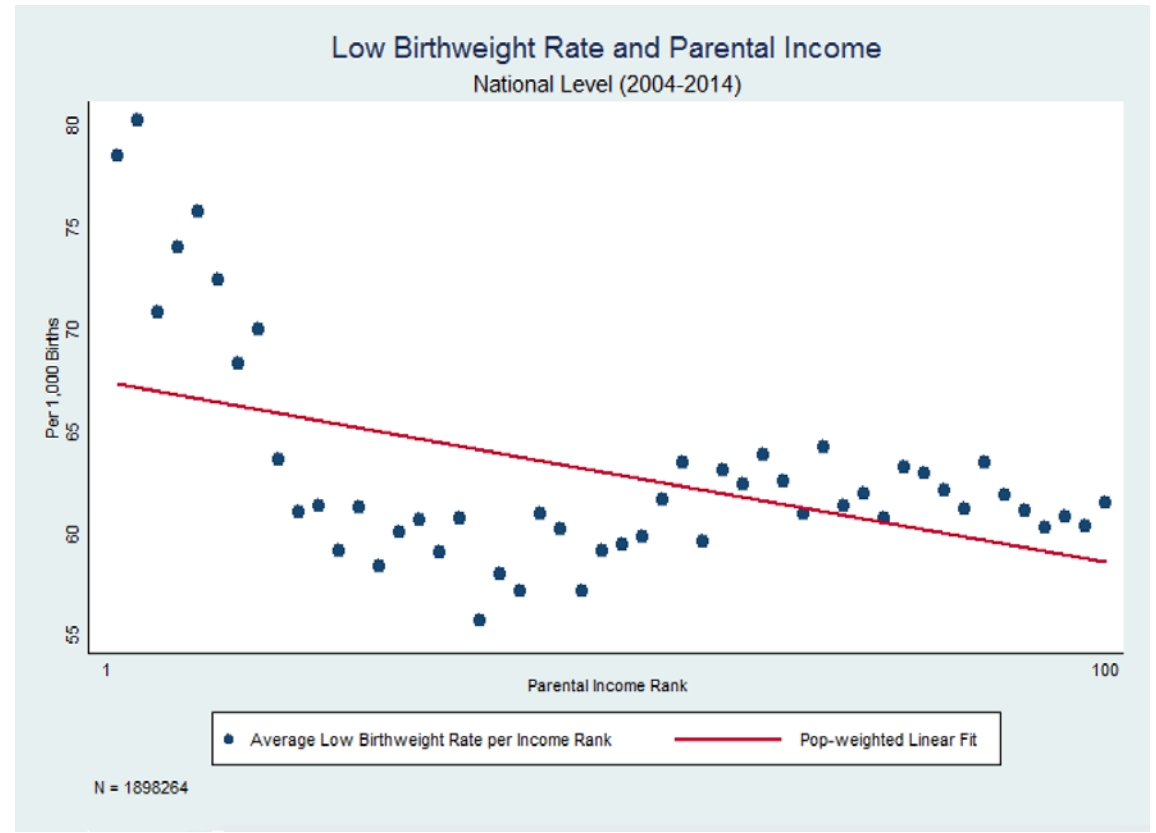
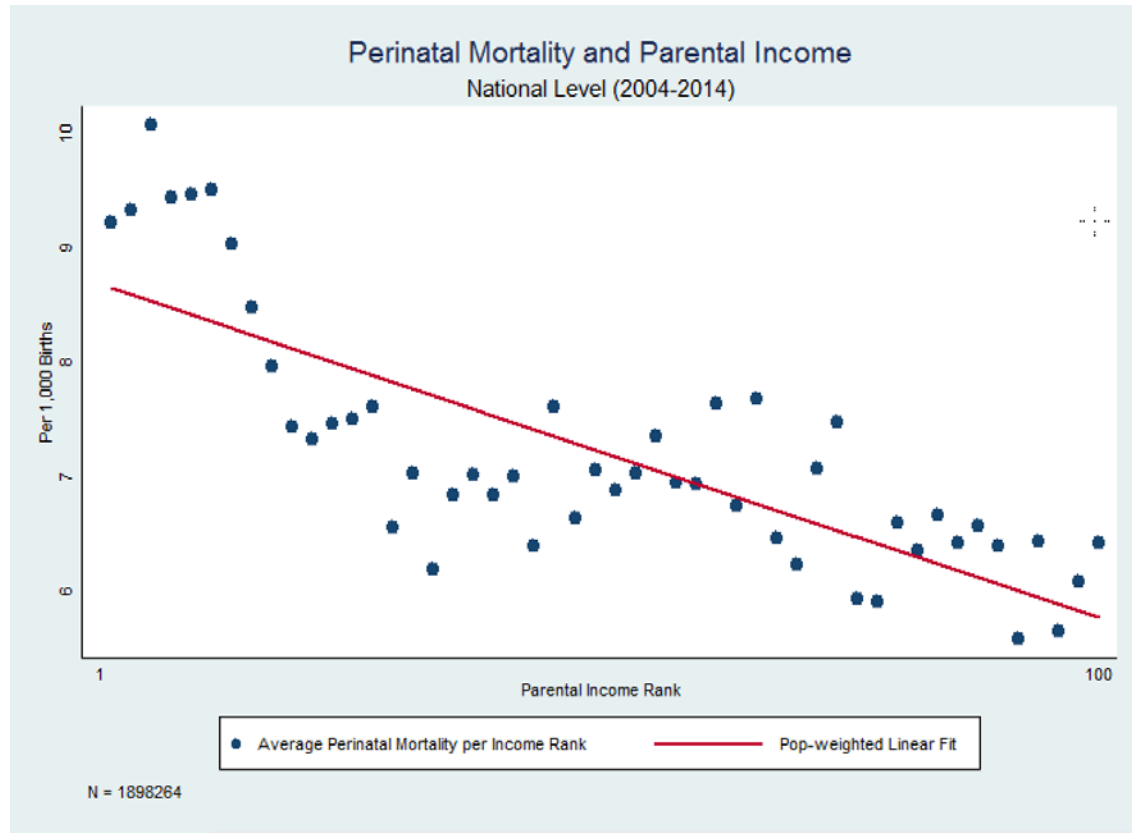
Evolution of Rate of Low Birthweight by Income Quintile
2004-2014



N = 673336

Bottom 20% Top 20%

Is perinatal health in the Netherlands associated to parental income?



Is this association constant over the income distribution?

- Run a piecewise linear regression at national level allowing for a separate intercept and slope for each decile for three time periods (2004-2007, 2008-10, 2011-14)

$$H_{ird} = \alpha_{id} + \beta_d D_i RP_i + \varepsilon_{ird}$$

H_{ird} is perinatal health of newborn i in region r in decile d
 RP_i is the relative position within the decile (0 to 9)

Test for differences in estimated slopes, starting from final decile

$$H_0: \beta_{10} = \beta_9$$

If we do not reject the null hypothesis: $H_0: \beta_{10} = \beta_9 = \beta_8$

...

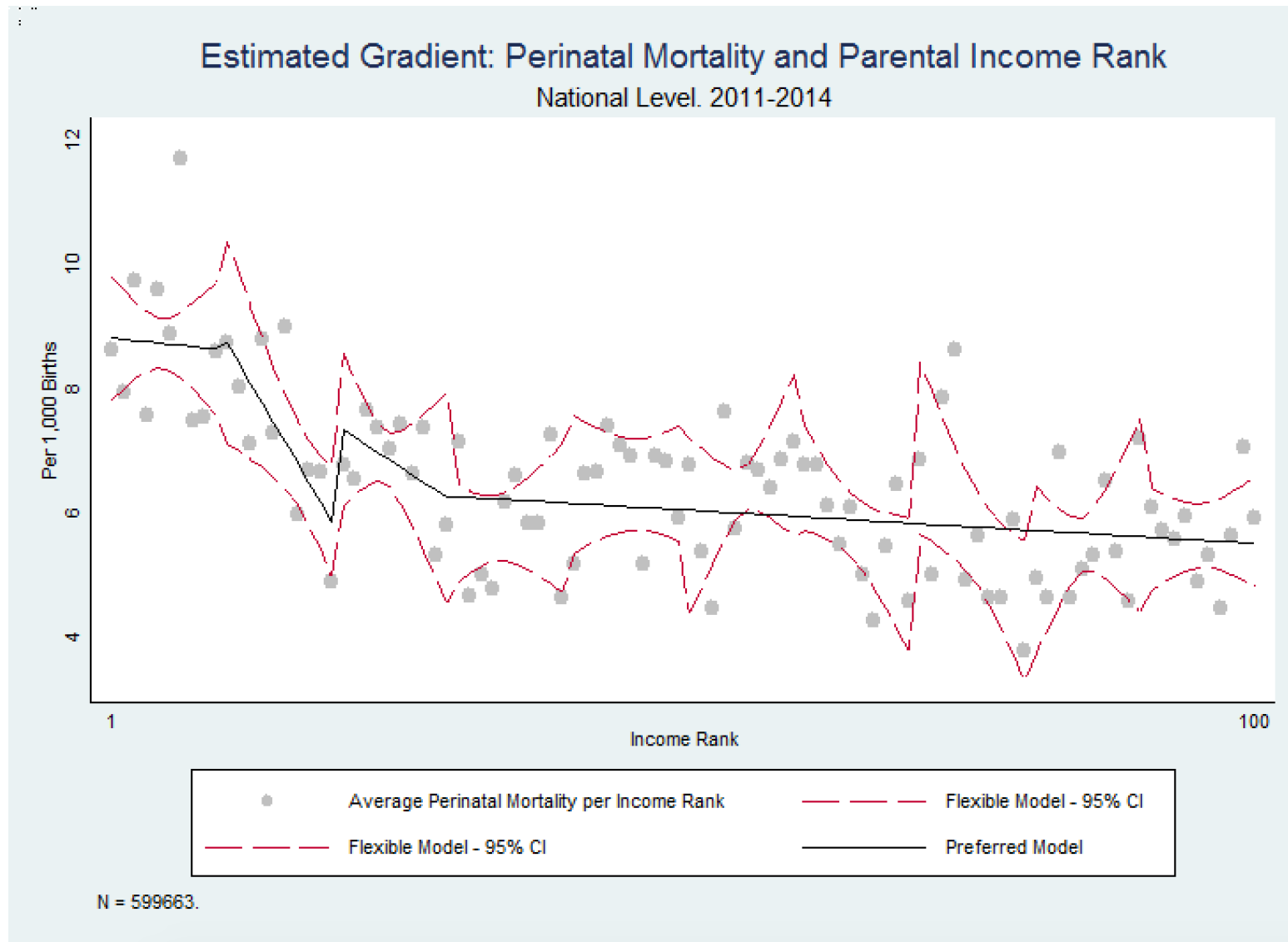
Is this association constant over the income distribution?

Estimated Gradient: Low Birthweight Rate and Parental Income Rank
National Level. 2011-2014



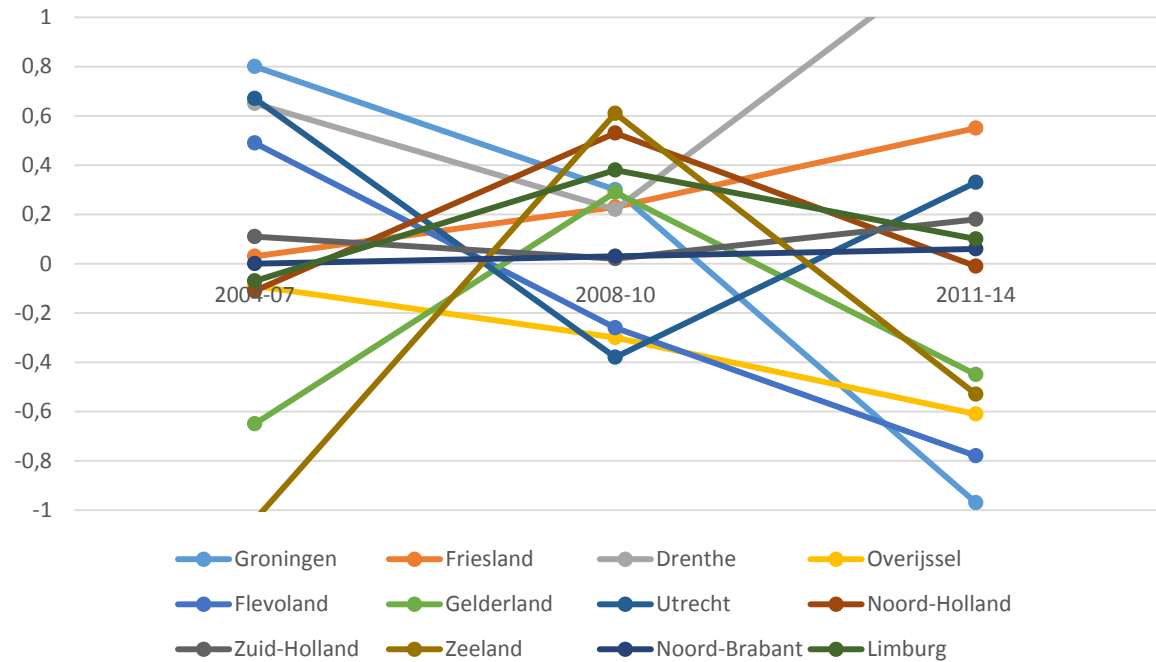
N = 599663.

Is this association constant over the income distribution?

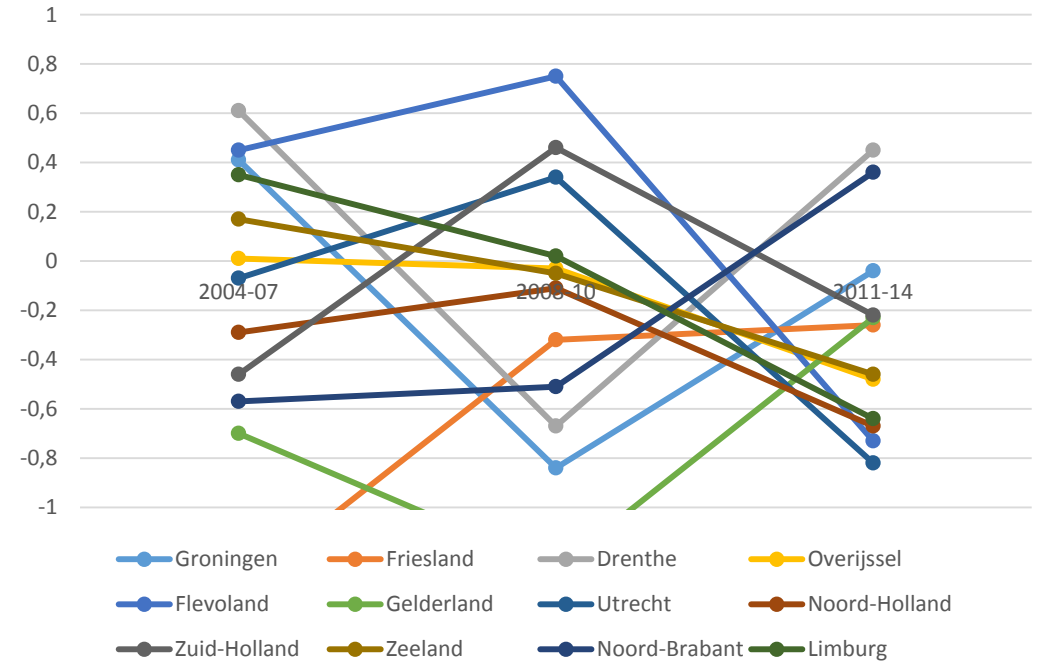


Does this association vary across regions over time?

Perinatal Mortality: Estimated β_1 by region over time

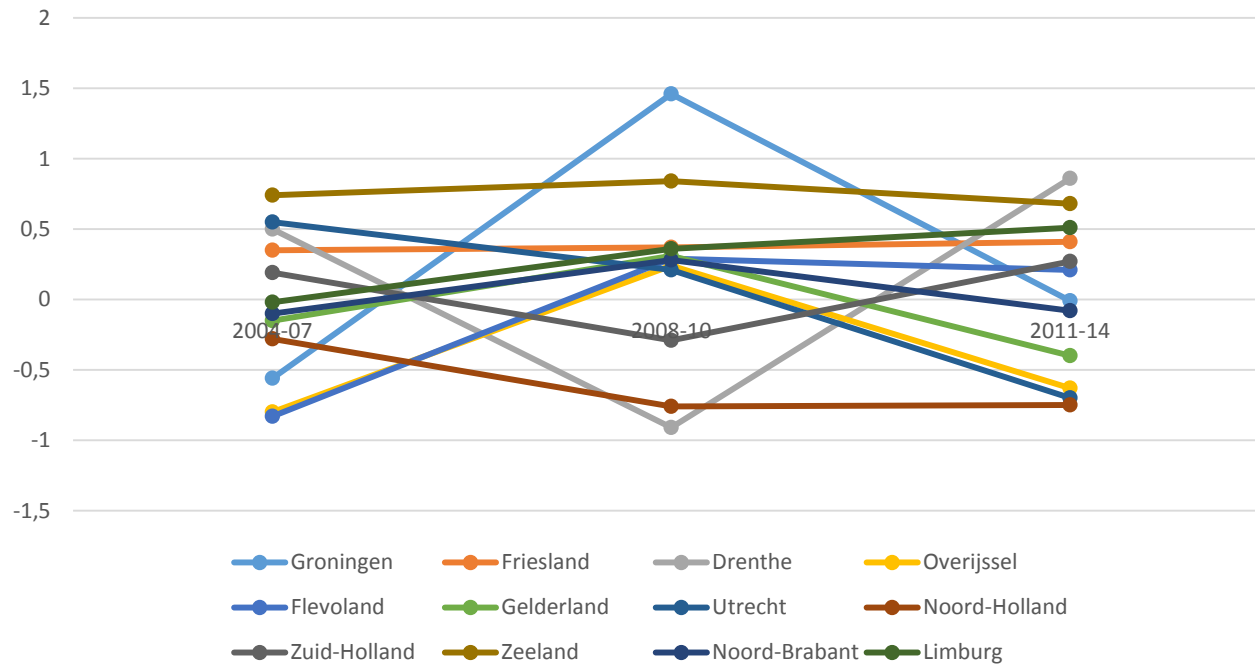


Perinatal Mortality: Estimated β_2 by region over time

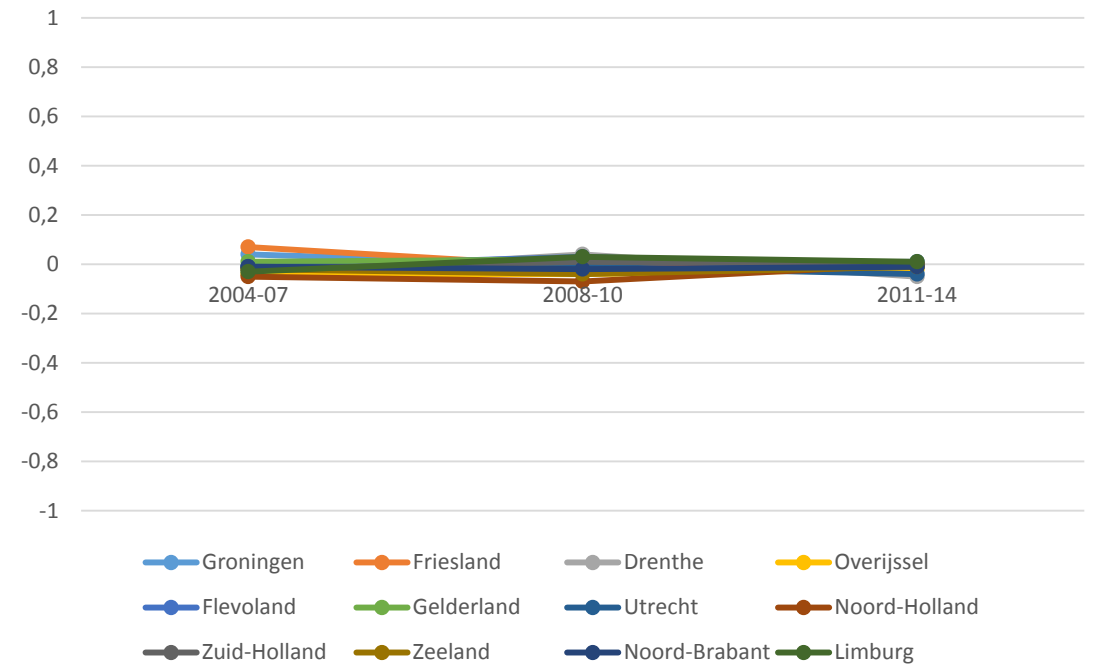


Does this association vary across regions over time?

Perinatal mortality: Estimated β_3 by region over time



Perinatal mortality: Estimated $\beta_4 - \beta_{10}$ by region over time



So far

- Large differences in perinatal health across regions in the Netherlands
- Perinatal health is associated with parental income
 - Association is larger among the bottom deciles, and close to zero for top-60%
 - Policies to improve perinatal health should specially focus on vulnerable income groups
 - Although average perinatal mortality among top-20% still higher than in other EU-countries, like Spain
- The magnitude and evolution of this association over time is different across different regions

Next steps

- What are the regional characteristics associated to better perinatal health at different points of the income distribution?
 - Health behaviors
 - Quality of (access to) health care
 - Environmental factors
 - Income inequality and social cohesion
 - Other
- Several sensitivity analysis:
 - Choice of region
 - Functional form income gradient
- Incorporate your suggestions
- Follow-up paper: causal effects of exposure

Thank you for your attention
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