

# **Markers of perinatal bowel colonization and pediatric Crohn's disease risk**

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- Crohn's disease involves an inappropriate immune response against normal bowel flora
- Disrupted or atypical patterns of microbial colonisation may impair appropriate development of homeostasis and thus increase Crohn's disease risk

- *Perinatal* microbial exposures may be particularly important in stimulating innate immune recognition in intestinal epithelial cells
- The first major microbial colonization occurs in the birth canal
- Birth by caesarean section may represent a risk for atypical patterns of colonization during the critical perinatal period

# Is birth by caesarean section a risk for pediatric Crohn's disease?

- Detailed information on delivery mode has been collected for all births in Sweden since 1990
- Patients with pediatric Crohn's disease were identified through the national Inpatient Register (born 1990-2006)
- Linkage is possible using the unique personal identification number issued to all residents

# Case-control study using *prospectively* collected data

- Cases were matched with 10 controls by delivery unit, week of birth and sex: *746 cases and 7,355 controls*

Mother's age	Number (approx. thirds)	Birth by C section
14-26	2,903	8%
27-30	2,346	10%
31-47	2,852	14%

# Analysis

- Conditional logistic regression: cases compared with controls of the *same sex, born in the same week and delivery unit*
- Analyses adjusted for gestational age, maternal IBD and socioeconomic index
- Stratification by sex, as differences in the prevalence of pediatric Crohn's disease suggest sex-specific risks

# Birth by C section and Crohn's disease risk: odds ratios and 95% confidence intervals

- Boys (n=4,693): **1.54 (1.15 - 2.07)**

A modest risk increase

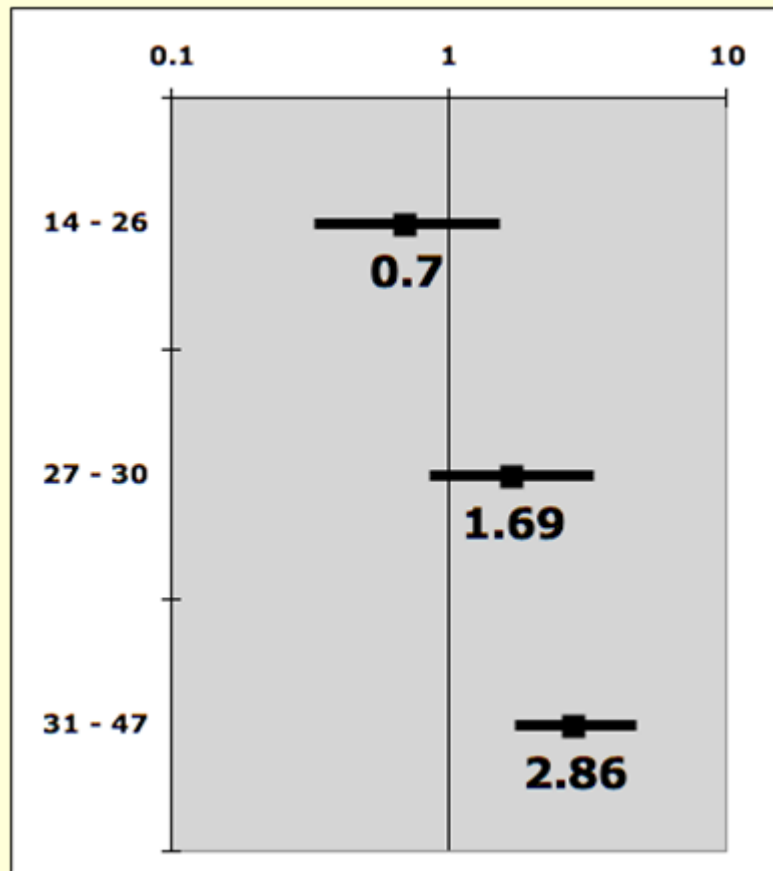
- Girls (n=3,392): **0.89 (0.60 - 1.33)**

No association

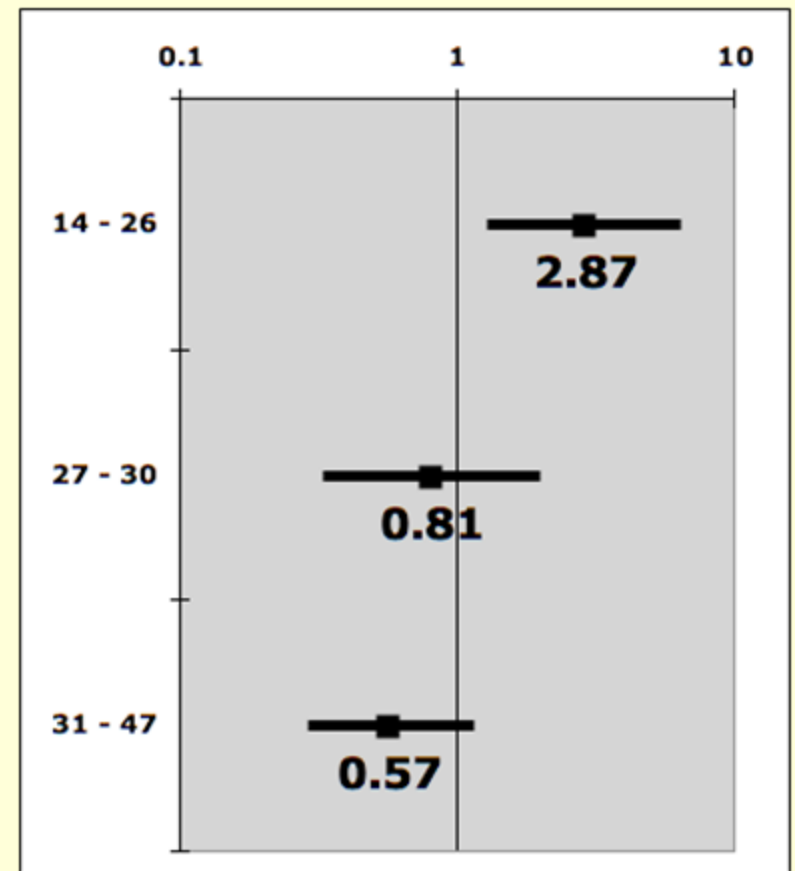
- Are there differences by maternal age at birth by C section?

# Crohn's disease risk by C section and maternal age

Boys



Girls



P for  
Interaction: <math><0.001</math>

0.009

- Differences by maternal age may reflect immunological changes or differences in the reason for C section
- Variation in Crohn's disease risks and prevalence are consistent with sex differences in anti-microbial responses
- Pattern of exposure and initial immune response may interact to determine a colonization intensity and diversity relevant to development of homeostasis

- Overall, birth by C section is not a major risk for pediatric Crohn's disease
- However, sex-specific susceptibility and variation in exposures associated with C section may interact to influence Crohn's disease risk
- An understanding of complex patterns and subtle differences in markers of perinatal exposure patterns may be required to identify Crohn's disease risks and avoid apparently contradictory results