Register-based Studies on Drinking Water Related Health Effects in Sweden

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Creating a register-based cohort

Exposure databases

- Drinking water exposure data

National health care registers

- Medical Birth register, Cancer Register, etc.

National administrative registers

- Longitudinal integrated database for health insurance and labour market studies (LISA), National Register for Regional Divisions Based on Real Estate, etc.
Study aim

Assess if exposure to trihalomethanes (THM), during gestation is associated with risk of small-for-gestational-age, preterm delivery and congenital malformations, and if the association is dependent on the chlorination treatment (hypochlorite or chloramine)
Register based Swedish cohort

Chlorination by-products and fetal development (published)

Methods

• **Exposure**: THM in municipal drinking water
• **Study area**: large Swedish localities (>10 000 inh.)
• **Study population**: births during 2005-2015 among mothers living within the study area
• **Stratified by**: chlorination treatment

Säve-Söderbergh et al., 2020. Environ Health Perspect 128:5
Säve-Söderbergh et al., 2021. Environ Health Perspect 129:9
Register based Swedish cohort

Chlorination by-products and fetal development (published)

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Methods

• Exposure: THM in municipal drinking water
• Study area: large Swedish localities (>10 000 inh.)
• Study population: births during 2005-2015 among mothers living within the study area
• Stratified by: chlorination treatment

→ 600 000 newborns included
Register based Swedish cohort
Chlorination by-products and fetal development (published)

Results – localities with hypochlorite

Increased risk of small-for-gestational-age (aOR=1.20; 95% CI: 1.08, 1.33) comparing >15 μg THM/L to non-chorinated areas

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Säve-Söderbergh et al., 2021. Environ Health Perspect 129:9
Register based Swedish cohort

Chlorination by-products and fetal development (published)

**Results** – localities with chloramine

Increased risk of malformation of the
- nervous system (aOR=1.82; 95% CI: 1.07, 3.12)
- urinary system (aOR=2.06; 95% CI: 1.53, 2.78)
- genitals (aOR=1.77; 95% CI: 1.38, 2.26)
- limbs (aOR=1.34; 95% CI: 1.10, 1.64)

comparing >15 μg THM/L to non-chorinated areas
Creating a register-based cohort

Existing cohort

Exposure databases

- Drinking water exposure data

National health care registers

- Medical Birth register, Cancer Register, etc.

National administrative registers

- Longitudinal integrated database for health insurance and labour market studies (LISA), National Register for Regional Divisions Based on Real Estate, etc.
Existing cohort + register data
*Chorination by-products and bladder-cancer (published)*

**Study aim**

*Assess the association between exposure to THMs in drinking water and incidence on bladder cancer among middle aged to elderly men and women in Sweden.*

Existing cohort + register data

*Chlorination by-products and bladder-cancer (published)*

**Methods**

- **Study population:** two population-based cohorts, parts of the Swedish Infrastructure for Medical Population-Based Life-Course and Environmental Research (SIMPLER).
- **Exposure:** THM in municipal drinking water
- **Study area:** localities (≥1 000 inh.) in three Swedish counties

Existing cohort + register data

*Chorination by-products and bladder-cancer (published)*

**Methods**

- **Study population:** two population-based cohorts, parts of the Swedish Infrastructure for Medical Population-Based Life-Course and Environmental Research (SIMPLER).

- **Exposure:** THM in municipal drinking water

- **Study area:** localities (≥1,000 inh.) in three Swedish counties

→ 50,000 middle aged to elderly men and women, 16 years of follow-up (965,590 person-years)

Cohort: questionnair data + register data
Chorination by-products and bladder-cancer (published)

Results

No association for bladder cancer, aHR 0.90 (95% confidence interval: 0.73 – 1.11) comparing >15 μg THM/L to non-chorinated areas.

Strengths, limitations and reflections for the future

- Inevitable risk of exposure misclassification
- Data originate from medically confirmed cases or validated administrative data, although, some data is self-reported (smoking, etc.)
- Large databases and endless possibilities to link registers → great possibilities, but also responsibilities

Reflections for the future:

- New hazards → registers comes with great possibilities
- Change in the security policy landscape → introduces limitations
Thank you for your attention!

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