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Oral health and child inequalities: A comparison between birth cohorts

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14th Annual INRICH Workshop: Violence against children, from familial to structural, using a global equity and child rights lens

The Royal Children's Hospital Melbourne

Acknowledgement of Country

Background

- Oral health major neglected global population health challenge
  - Nearly 486 million children worldwide with tooth decay
- Tooth decay affects 1 in 3 children by 5 years of age
  - Australia's most common childhood disease
  - A leading cause of hospital admissions
- Can affect health and wellbeing into adulthood
- Children from low-income families more likely to have tooth decay

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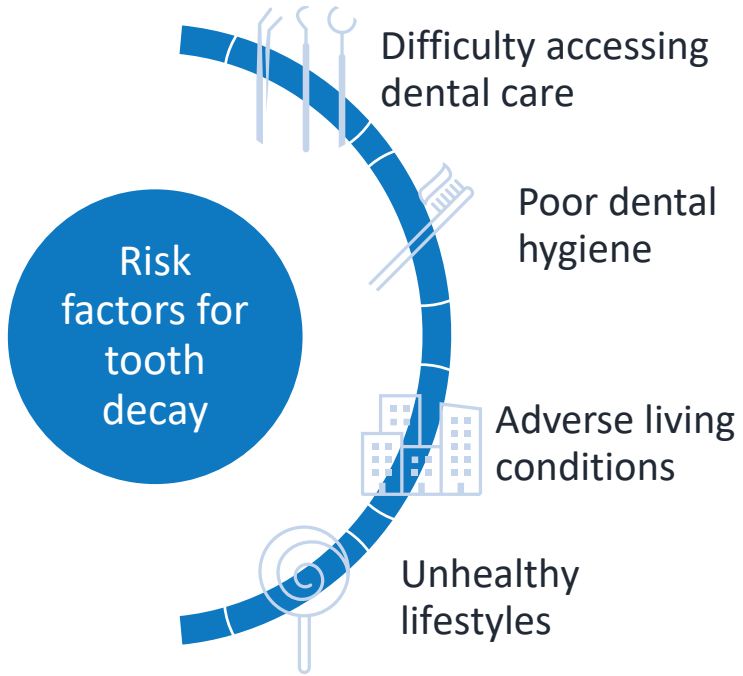
Landmark global strategy on oral health adopted at World Health Assembly 75

Risk factors

- Tooth decay in childhood is preventable

- Risk factors include:
  - Difficulty accessing dental care
  - Poor dental hygiene
  - Adverse living conditions
  - Unhealthy lifestyles



Prevention strategies

- Multiple strategies are thought to be needed to reduce tooth decay
  - Dental care for all children and their parents
  - Targeted strategies to reduce exposure to sugary food and drinks
  - Adequate water fluoridation

Universal access to free dental care

Target children's exposure to sugar

Improve rates of water fluoridation

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EPOCH team in Australia

Dr Fiona Mensah

Details

Role Team Leader / Senior Research Fellow

Research area Population health

Group Intergenerational Health

Kate Francis

Details

Role Biostatistician (Snr Research Officer)

Research area Population health

Group Clinical Epidemiology & Biostatistics (CEBU)

Dr Elodie O'Connor

Details

Role Research Officer

Research area The Centre for Community Child Health

Group Policy and Equity

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Australian study

- Data from Longitudinal Study of Australian Children (N=5,107)
  - Dental caries
    - Measured biennially from 2-3 years to 10-11 years
  - Socioeconomic position
  - Policy modifiable oral health factors
    - Water fluoride level
    - Remoteness
    - Sugary diet
    - Tooth brushing
    - Use of dental services

Open Access | Feature Paper | Article

The Impact of Policy Modifiable Factors on Inequalities in Rates of Child Dental Caries in Australia

by **Sharon Goldfeld**, **Kate Louise Francis**, **Monsurul Hoq**, **Loc Do**, **Elodie O'Connor** and **Fiona Mensah**

Int. J. Environ. Res. Public Health **2019**, *16*(11), 1970; **https://doi.org/10.3390/ijerph16111970** - 03 Jun 2019

Cited by 11 | Viewed by 3446

Abstract *Background*: Poor oral health in childhood can lead to adverse impacts later in life. We aimed to estimate the prevalence and population distribution of childhood dental caries in Australia and investigate factors that might ameliorate inequalities. *Methods*: Data from the nationally **[...] Read more.**

(This article belongs to the Special Issue **Health Inequalities in Children**)

https://doi.org/10.3390/ijerph16111970

Australian study (cont.)

- Children from the most disadvantaged families are:
  - Most likely to have tooth decay
  - Least likely to access dental services

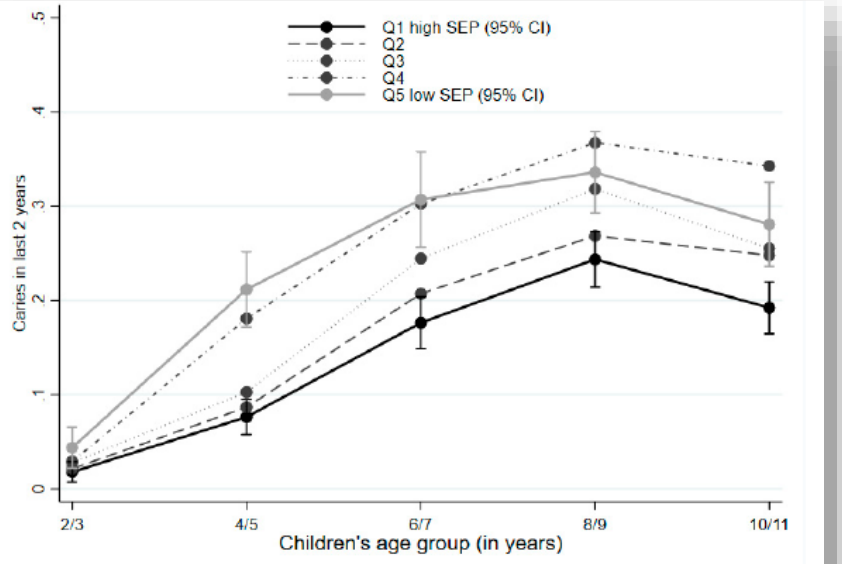

Figure 2. Proportion of children with caries in last two years, according to socioeconomic position.

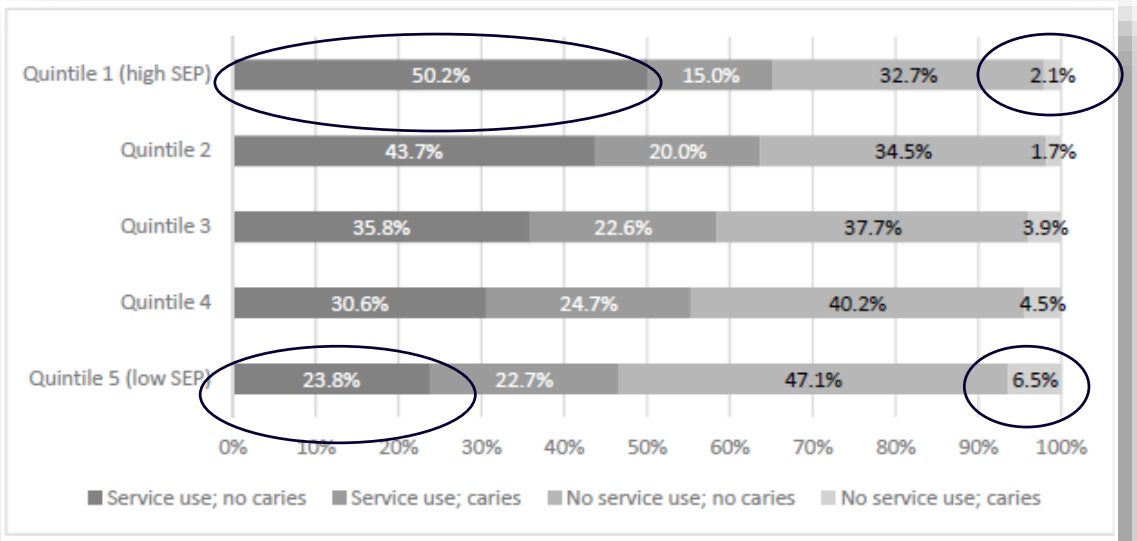

Figure 4. Service use in the previous year with relation to caries experience reported in the previous two years for each SEP quintile at age eight to nine years.

https://doi.org/10.3390/ijerph16111970

Australian study (cont.)

- Water fluoridation can ameliorate the social gradient
  - Odds of having tooth decay lower for children living in areas with fluoridated water supply as infants

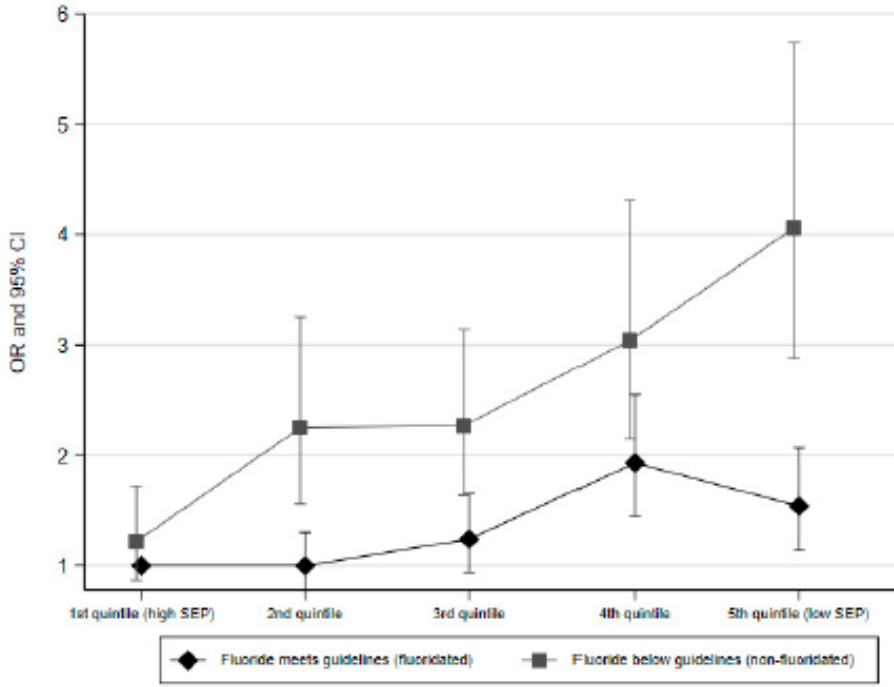

Figure 3. The odds ratio and 95% confidence intervals for each SEP quintile for those who live in fluoridated or non-fluoridated areas.

https://doi.org/10.3390/ijerph16111970

Australian study conclusions

- Tooth decay is prevalent and socially distributed in Australia
- Service inequities appear stark yet unsurprising
- Fluoridation ameliorates the social gradient

https://doi.org/10.3390/ijerph16111970

EPOCH paper

- Compared extent of inequalities in childhood tooth decay across four high-income countries
  - Australia
  - Québec, Canada
  - Rotterdam, Netherlands
  - Southeast Sweden

PLOS ONE

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RESEARCH ARTICLE

Comparative inequalities in child dental caries across four countries: Examination of international birth cohorts and implications for oral health policy

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EPOCH paper (cont.)

Australia

- Tooth decay:
  - Measured at 8-9 years
  - Parent-report
- Socioeconomic position
- Oral health risk factors:
  - Consumption of sugary food and drinks
  - Oral health services
  - Water fluoridation

Québec, Canada

- Tooth decay:
  - Measured at 8-9 years
  - Parent-report
- Socioeconomic position
- Oral health risk factors:
  - Consumption of sugary food and drinks
  - Oral health services
  - Water fluoridation

Rotterdam, Netherlands

- Tooth decay:
  - Measured at 6 years
  - Direct observation
- Socioeconomic position
- Oral health risk factors:
  - Consumption of sugary food and drinks
  - Oral health services
  - Water fluoridation

Southeast Sweden

- Tooth decay:
  - Measured at 5 years
  - Parent-report
- Socioeconomic position
- Oral health risk factors:
  - Consumption of sugary food and drinks
  - Oral health services
  - Water fluoridation

https://doi.org/10.1371/journal.pone.0268899

EPOCH paper (cont.)

	Australia (LSAC)	Quebec, Canada (QLSCD)	Rotterdam, Netherlands (Gen R)	Southeast Sweden (ABIS)
Publicly funded oral health services	Medicare, Australia's publicly funded health system, provides limited oral health coverage Public dental practices have long wait lists	The Régie de l'assurance maladie du Québec only covers a portion of expenses up to age 10 years	Public required to take out basic insurance package to cover costs of medical treatment Children's dental treatment under 18 reimbursed by basic insurance package	Free of charge from birth to 23 years of age Public dentistry predominantly (95-98%) responsible for dental care of school-aged children
Out of pocket expenses	Often left with out-of-pocket expenses as majority of dental reviews are self-funded or paid by a private health fund	In 2015, publicly financed programs covered 6.3% of dental service expenditures; private insurers covered 56.2%, users paid out-of-pocket remaining 36.7%	No	No
Access to dental services	Means-tested *Child Dental Benefits Schedule* allows children aged 2-17 years to benefit from basic dental services, capped at $1000 over 2 years Only 29% of eligible children utilised program during its first year	*Pediatric Dental Care Program* allows access for children under 10 years of age to free selected basic dental services All children from families receiving financial assistance for at least 12 consecutive months also entitled to basic dental care	Dental care is free for children under the age of 18 under the *Dutch health insurance (zorgverzekering)*	For children and young adults up to the age of 23 years, all dental care is free including regular check-ups under *Swedish Public Social Security Insurance*
Access to fluoridated water	Australia mostly has very low levels of naturally occurring fluoride Community water fluoridation means that around 89% of Australians have access to fluoridated drinking water (within the range of 0.6 to 1.1 mg/L)	According to Statistics Canada, 2.49% of the population in Québec has fluoridated systems and about 0.5% has naturally occurring fluoride in well water	Dutch drinking water companies do not add fluoride to the drinking water The natural concentration of fluoride in drinking water varies between 0.05 and 0.25 mg/L[1]	Sweden has never had any added fluoridation in drinking water, but low levels of natural fluoridation can occur in different regions

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EPOCH paper (cont.)

- Children experiencing most disadvantage at greatest risk of tooth decay, across all cohorts
- If the risk of tooth decay was reduced to the risk for the wealthiest family, prevalence of tooth decay would be:
  - 2% lower for Southeast Sweden
  - 16% lower for Australia
  - 34% lower for Rotterdam
  - 36% lower for Québec

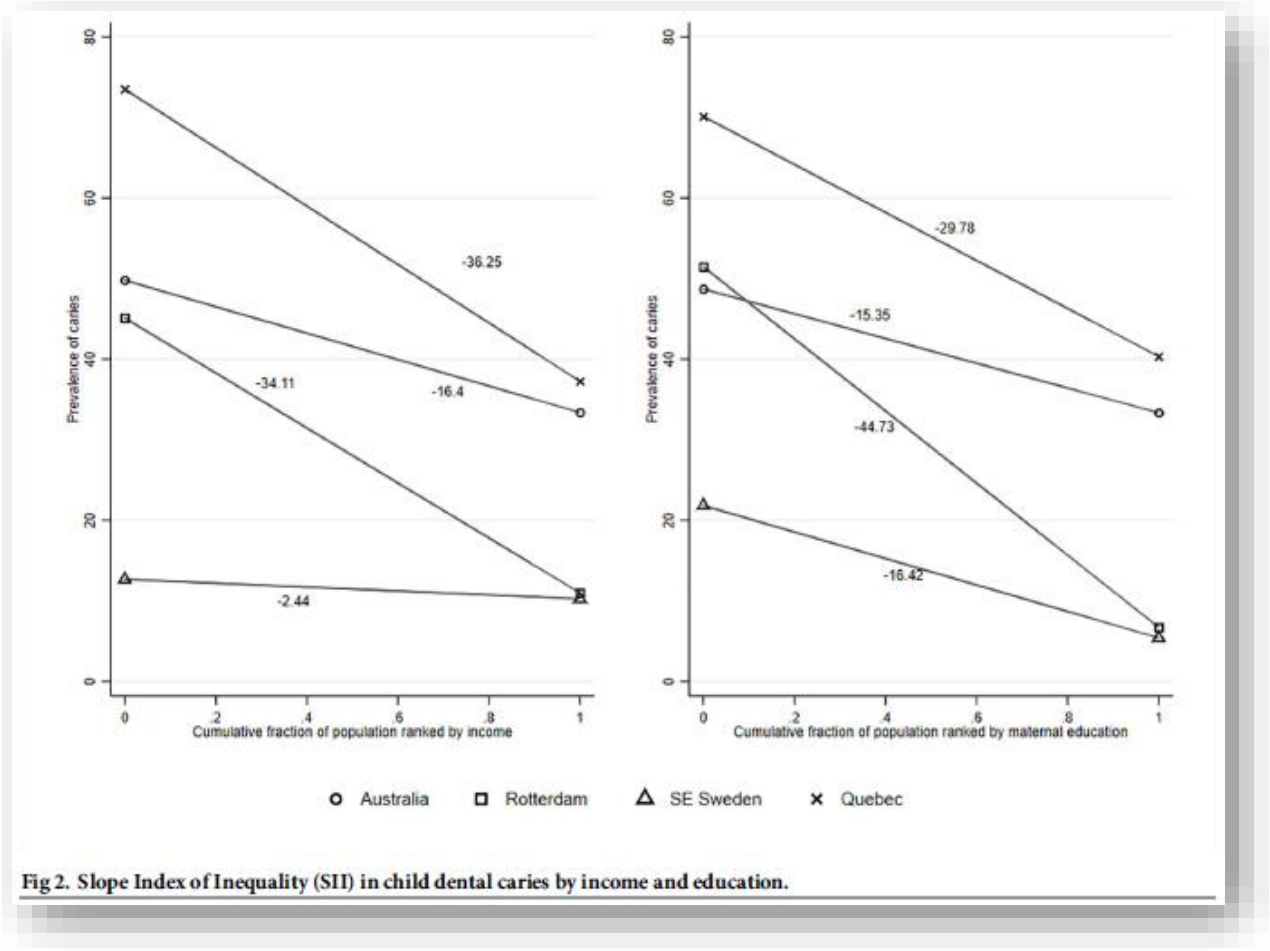

Fig 2. Slope Index of Inequality (SII) in child dental caries by income and education.

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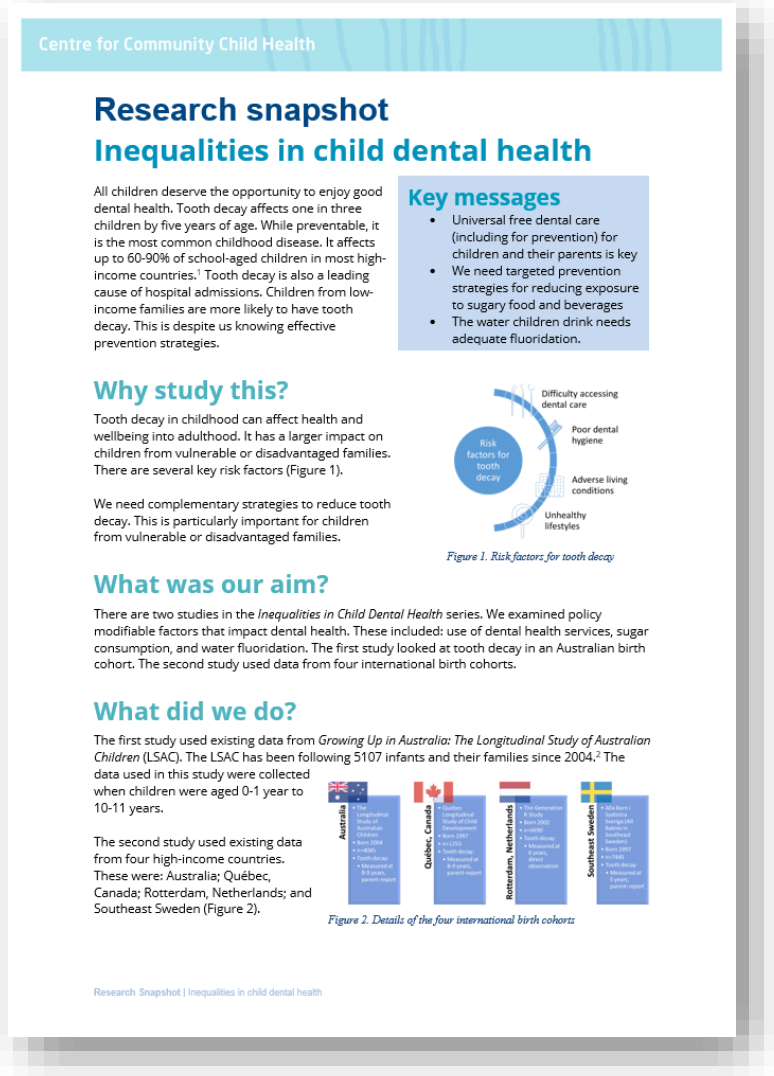
EPOCH paper (cont.)

- A combination of the following seem to ameliorate inequities in childhood tooth decay:
  - Universally available dental care (including for prevention)
  - Naturally fluoridated water or water fluoridation
  - Low consumption of sugar
- Particularly evident in Southeast Sweden

https://doi.org/10.1371/journal.pone.0268899

For further information

- Goldfeld, S., O'Connor, E., Mensah, F., & Francis, K., on behalf of the EPOCH Collaborative Group (*in progress*). Inequalities in child dental health. Centre for Community Child Health. Melbourne, Australia



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Research snapshot

Inequalities in child dental health

All children deserve the opportunity to enjoy good dental health. Tooth decay affects one in three children by five years of age. While preventable, it is the most common childhood disease. It affects up to 60-90% of school-aged children in most high-income countries.[1] Tooth decay is also a leading cause of hospital admissions. Children from low-income families are more likely to have tooth decay. This is despite us knowing effective prevention strategies.

Key messages

- Universal free dental care (including for prevention) for children and their parents is key
- We need targeted prevention strategies for reducing exposure to sugary food and beverages
- The water children drink needs adequate fluoridation.

Why study this?

Tooth decay in childhood can affect health and wellbeing into adulthood. It has a larger impact on children from vulnerable or disadvantaged families. There are several key risk factors (Figure 1).

We need complementary strategies to reduce tooth decay. This is particularly important for children from vulnerable or disadvantaged families.

Figure 1. Risk factors for tooth decay

What was our aim?

There are two studies in the *Inequalities in Child Dental Health* series. We examined policy modifiable factors that impact dental health. These included: use of dental health services, sugar consumption, and water fluoridation. The first study looked at tooth decay in an Australian birth cohort. The second study used data from four international birth cohorts.

What did we do?

The first study used existing data from *Growing Up in Australia: The Longitudinal Study of Australian Children* (LSAC). The LSAC has been following 5107 infants and their families since 2004.[2] The data used in this study were collected when children were aged 0-1 year to 10-11 years.

The second study used existing data from four high-income countries. These were: Australia; Québec, Canada; Rotterdam, Netherlands; and Southeast Sweden (Figure 2).

Figure 2. Details of the four international birth cohorts

Research Snapshot | Inequalities in child dental health

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