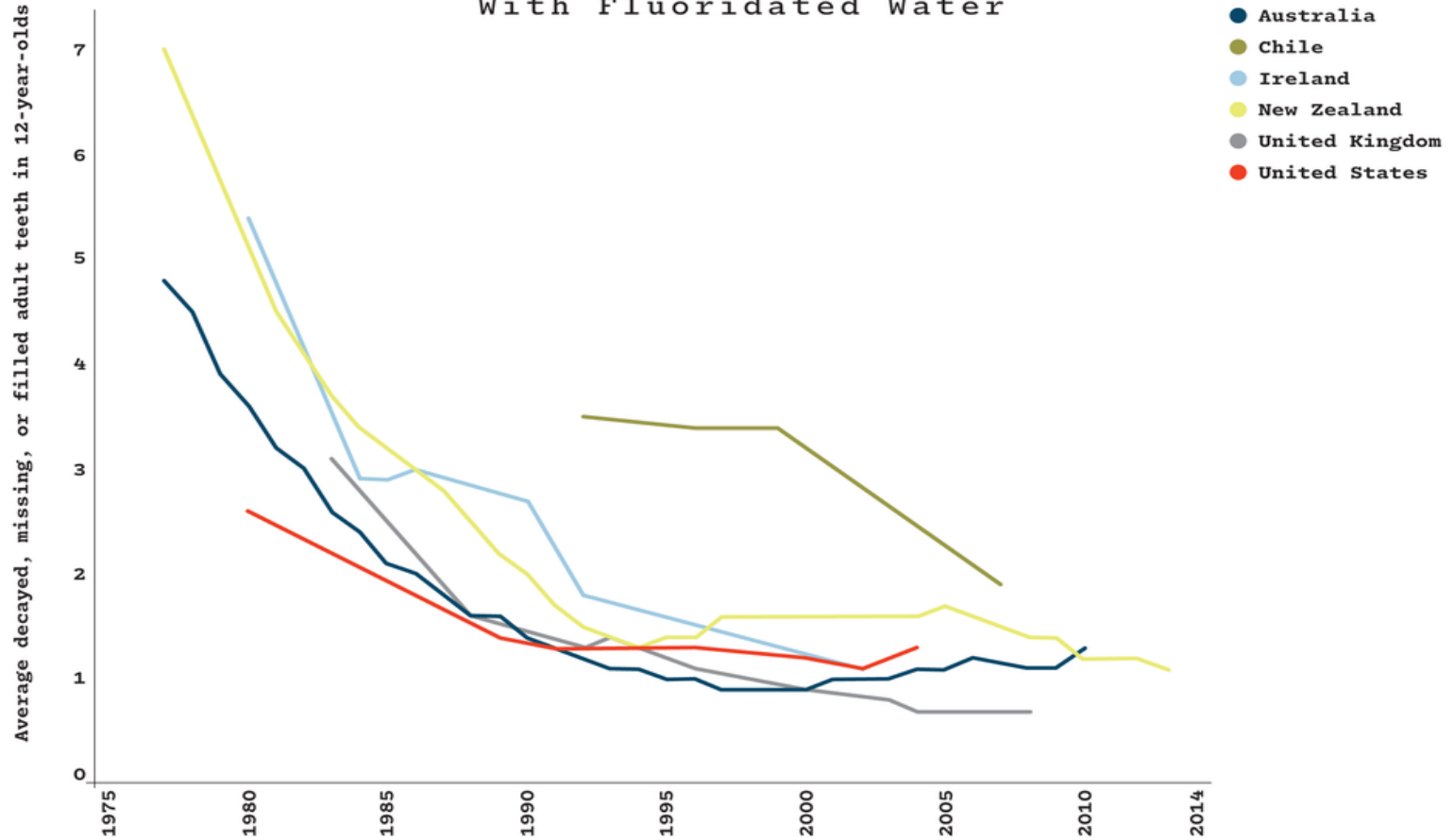
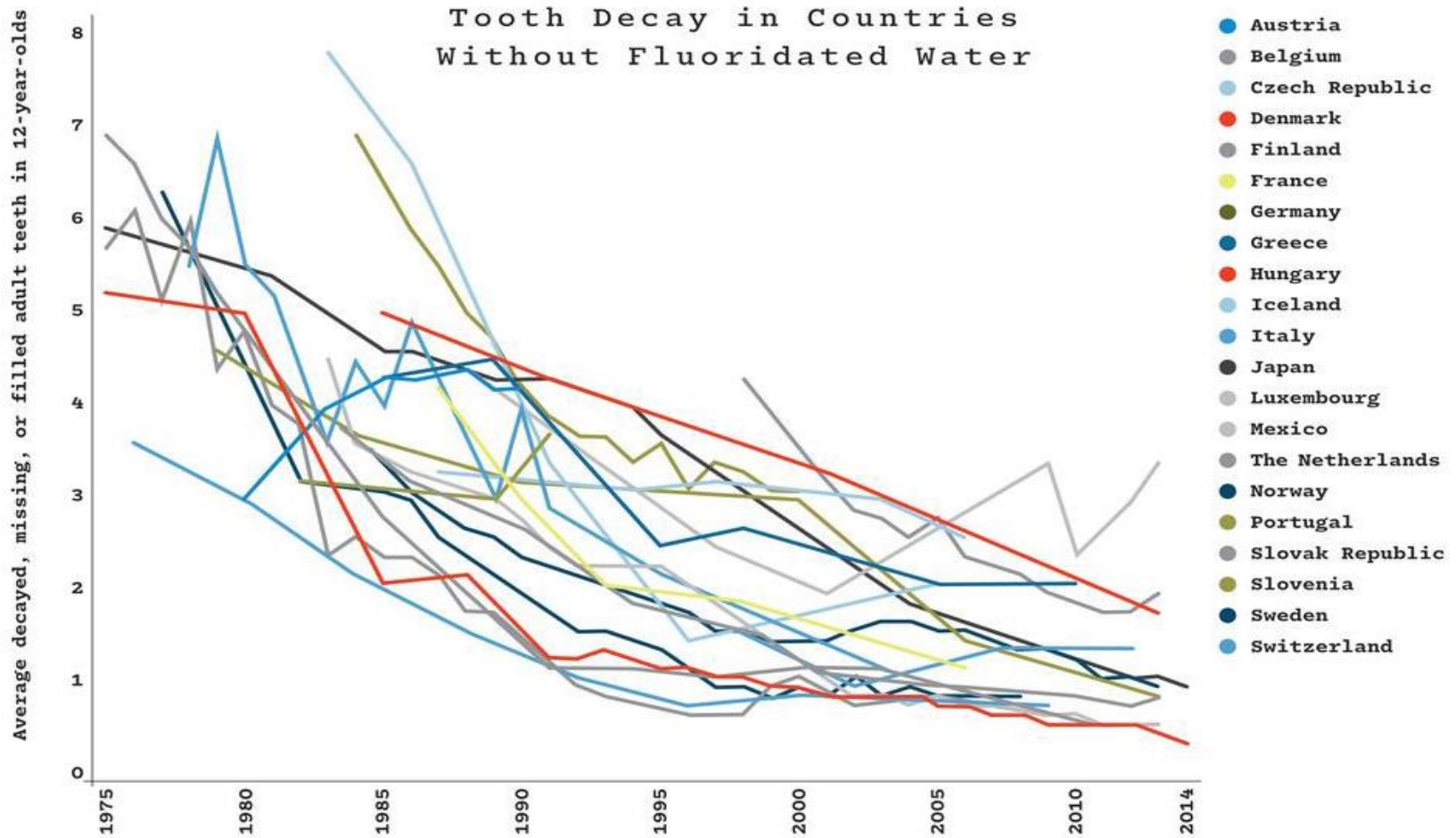


Tooth Decay in Countries With Fluoridated Water




Adapted from *Harvard Public Health Magazine*



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COMMENTARY

Limitations of fluoridation effectiveness studies: Lessons from Alberta, Canada

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Abstract

A paper published in this journal, "Measuring the short-term impact of fluoridation cessation on dental caries in Grade 2 children using tooth surface indices," by McLaren et al had shortcomings in study design and interpretation of results, and did not include important pertinent data. Its pre–post cross-sectional design relied on comparison of decay rates in two cities: Calgary, which ceased fluoridation, and Edmonton, which maintained fluoridation. Dental health surveys conducted in both cities about 6.5 years prior to fluoridation cessation in Calgary provided the baseline. They were compared to decay rates determined about 2.5 years after cessation in a second set of surveys in both cities. A key shortcoming was the failure to use data from a Calgary dental health survey conducted about 1.5 years prior to cessation. When this third data set is considered, the rate of increase of decay in Calgary is found to be the same before and after cessation of fluoridation, thus contradicting the main conclusion of the paper that cessation was associated with an adverse effect on oral health. Furthermore, the study design is vulnerable to confounding by caries risk factors other than fluoridation: The two cities differed substantially in baseline decay rates, other health indicators, and demographic characteristics associated with caries risk, and these risk factors were not shown to shift in parallel in

caries risk factors other than fluoridation: The two cities differed substantially in baseline decay rates, other health indicators, and demographic characteristics associated with caries risk, and these risk factors were not shown to shift in parallel in Edmonton and Calgary through time. An additional weakness was low participation rates in the dental surveys and lack of analysis to check whether this may have resulted in selection biases. Owing to these weaknesses, the study has limited ability to assess whether fluoridation cessation caused an increase in decay. The study's findings, when considered with the additional information from the third Calgary survey, more strongly support the conclusion that cessation of fluoridation had no effect on decay rate. Consideration of the limitations of this study can stimulate improvement in the quality of future fluoridation effectiveness studies.

KEYWORDS

caries, epidemiology, fluoridation, public health policy, study design

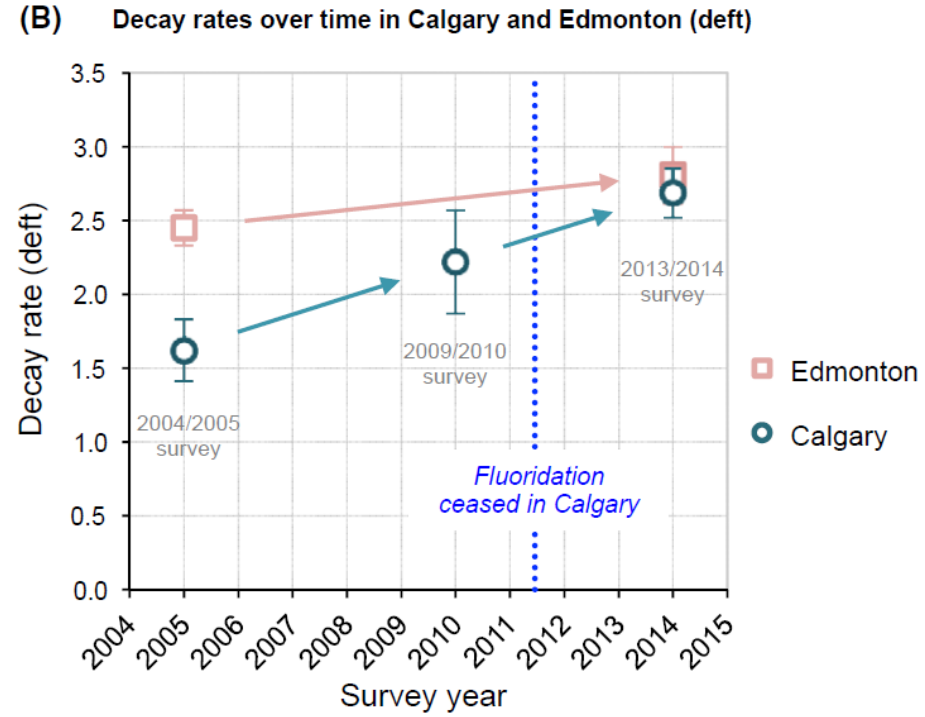
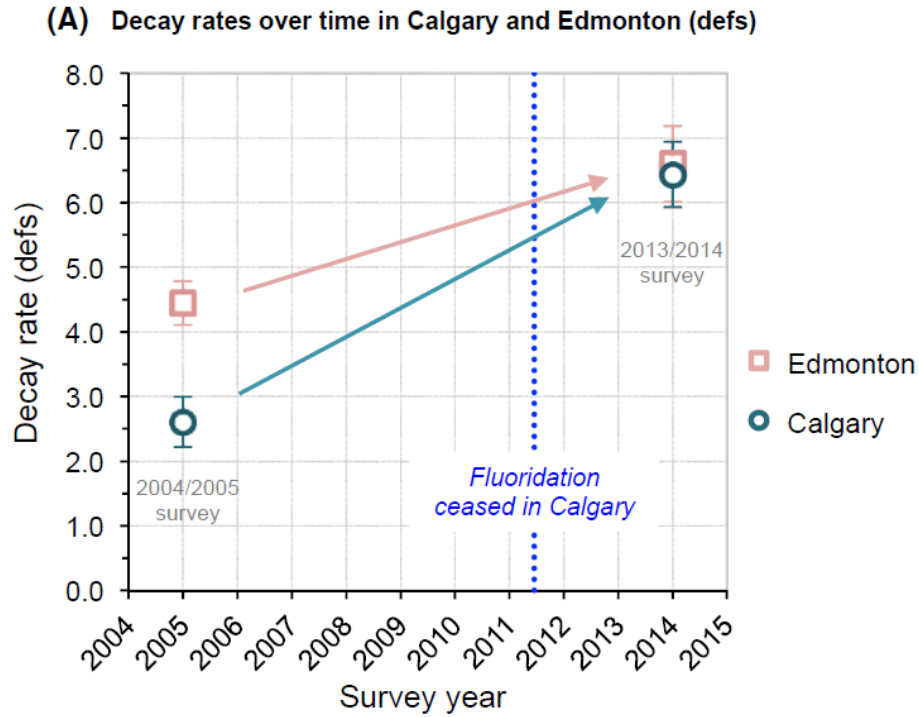
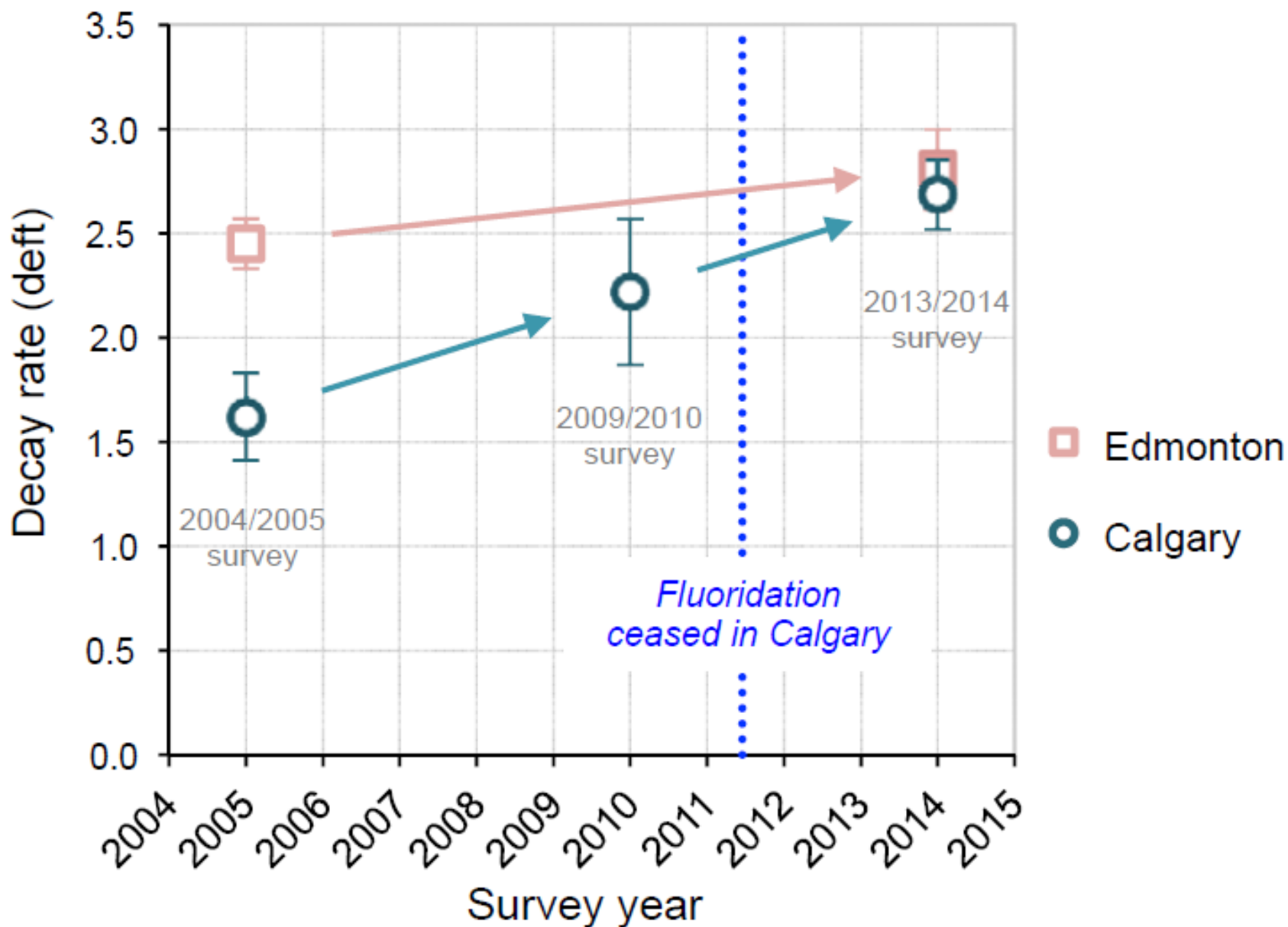


FIGURE 1 Dental decay rates by two measures: (A) defs, (B) deft. All data, including Calgary 2009/2010 data, provided by study author (personal communication, McLaren, February 25, 2016). Weighted values. Error bars indicate 95% CIs. Arrows rather than continuous lines are used to connect points to emphasize they are not regression lines. No data are available for any times other than the survey dates.

(B) Decay rates over time in Calgary and Edmonton (left)



What Does the Precautionary Principle Mean for Evidence-Based Dentistry?

Journal of Evidence Based Dental Practice 2006

Joel Tickner, ScD,^a Melissa Coffin, BA,^b From the Department of Community Health and Sustainability (a) and Lowell Center for Sustainable Production (b), University of Massachusetts Lowell, Lowell, MA

Some issues that make fluoridation ripe for applying a precautionary approach include the following:

**“In the face of uncertain evidence
it is important to act in a
manner that protects public health.”**

Is Fluoride Potentially Neurotoxic?

David C. Bellinger, PhD, MSc

Environmental epidemiology is a field replete with controversies, but the intensity of the debate inspired by the fluoridation of municipal water supplies to reduce dental caries is perhaps unrivaled. Governments, as well as individuals, differ in their assessments of water fluoridation as public policy. The Centers for Disease Control and Prevention consider water fluoridation to be one

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measured. Because individuals were classified into exposure groups based solely on community of residence, some mis-

Decision to Publish Study on Maternal Fluoride Exposure During Pregnancy

Editor's Note

Editor's Note

Decision to Publish Study on Maternal Fluoride Exposure During Pregnancy

Dimitri A. Christakis, MD, MPH

This decision to publish this article was not easy.¹ Given the nature of the findings and their potential implications, we subjected it to additional scrutiny for its methods and the presentation of its findings. The mission of the journal is to ensure that child health is optimized by bringing the best available evidence to the fore. Publishing it serves

Editorial

disseminating the best science based entirely on the rigor of the methods and the soundness of the hypotheses tested, regardless of how contentious the results may be. That said, scientific inquiry is an iterative process. It is rare that a single study provides definitive evidence. This study is neither the first, nor will it be the last, to test the association between prenatal fluoride exposure and cognitive development. We hope that purveyors and consumers of these findings are mindful of that as the implications of this study are debated in the public arena.



“So when I first saw this title, my initial inclination was **‘What the hell?’**”
- Dr. Christakis

“The effect size is really quite large.... The results are really startling.”
- Dr. Rivara

Conclusion:

Fetal development is a critical period of concern for neurotoxicity.

- There are 3 well-conducted prospective birth cohort studies: Bashash et al. 2017; Valdez-Jiménez et al. 2017; Green et al. 2019
- All report adverse effects of fetal exposure to fluoride vs. no prenatal studies showing safety

Dental Fluorosis

- Excess fluoride in children known to result in dental fluorosis
- Condition in which the teeth enamel becomes irreversibly damaged and permanently discolored, displaying a white or brown mottling pattern and forming brittle teeth that break and stain easily
- Can range from mild to severe
- Considered the first sign of fluoride toxicity



Photos from David Kennedy and are used with permission from victims of dental fluorosis



Dental Fluorosis

