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**ML** MIDDLESEX-LONDON  
HEALTH UNIT


# Fluoridation of Drinking Water

## Public Participation Meeting Civic Works Committee January 25, 2012

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A photograph of a two-lane asphalt road stretching into the distance, flanked by lush green trees. The sky is bright blue with scattered white clouds. A white dashed line runs down the center of the road. A black rectangular sign with a white background is positioned in the center of the road, with a black vertical line extending from its bottom edge down to the road surface.

Reputable Medical  
and Dental  
Organizations

# Reputable Medical and Dental Organizations

- Supported by ~ 90 reputable medical and dental organizations:
  - World Health Organization
  - Centers for Disease Control and Prevention (CDC)
  - Health Canada
  - Canadian Medical Association
  - Canadian Dental Association
  - Canadian Paediatric Society

# How Does Fluoride Work?

- To prevent decay
  - After tooth erupts
  - Fluoridated water bathes the tooth
  - Fluoride incorporated into the tooth as it repairs itself from “acid attacks”
  - Fluoride incorporated into the surface of the tooth makes it more resistant to acid

# How Does Fluoride Work?

- Fluorosis
  - White to brown spots or pitting of teeth
  - In mild or very mild form, only noticeable by dental health professional
  - Before tooth erupts
  - Less than 6 years of age; 22-26 months highest risk period

## Percent brushing teeth at least twice a day

- 73%
- 76% higher income
- 72% middle income
- 66% lower income




## Percent of Canadians with no dental insurance

- 32%
- 20% higher income
- 36.5% middle income
- 50% lower income

## Percent avoiding a dental visit in past year due to cost

- 17%
- 9% high income
- 20% middle income
- 35% low income

A photograph of a two-lane asphalt road stretching into the distance under a bright blue sky with scattered white clouds. The road is flanked by lush green trees and grass. A white dashed line runs down the center of the road. A black rectangular sign with a white background is positioned in the middle of the road, supported by a black vertical post. The sign contains the text "Effectiveness Systematic Reviews" in a black, sans-serif font.

Effectiveness  
Systematic Reviews

# Systematic Reviews

- Published literature retrieved
- Reviewed for quality
- Summarized by experts
- Results synthesized to draw conclusions by groups of experts

# Systematic Reviews

- 2000, UK - University of York
  - <http://www.york.ac.uk/inst/crd/fluores.htm>
- 2001, US - Centers for Disease Control and Prevention
  - <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm>
- 2007, Australia - Government of Australia
  - <http://www.nhmrc.gov.au/guidelines/publications/eh41a>
- 2010, Canada - Health Canada
  - <http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2011-fluoride-fluorure/index-eng.php>



# Effectiveness

## Systematic Reviews Conclude

- Fluoride prevents tooth decay
- Still effective when other sources of fluoride available, although effect less pronounced
- For every 100 children, approximately 14 more children with no cavities in fluoridated areas
- Also prevents cavities in adults



Safety  
Systematic Reviews

# Safety

## Systematic Reviews Conclude

- Dental fluorosis
- At very high levels, skeletal fluorosis
- At the levels used to fluoridate water, evidence does not indicate increased risk of any other health concerns including:
  - cancer, impact on IQ, thyroid problems, fractures, skeletal fluorosis

## Percent with fluorosis in children ages 6 -11 years

- No severe fluorosis and numbers of moderate fluorosis too low to allow reporting
- 4% mild fluorosis
- 12% very mild fluorosis
- 
- NOTE : mild and very mild fluorosis is generally only noticeable by a dental professional

# Can Infant Formula be Prepared with Fluoridated Water?


- Yes. *Health Canada*
- Suggest the continued use of powdered or liquid concentrate infant formulas, while being cognizant of potential risk of enamel fluorosis. *American Dental Association*
- Yes. To lessen the chance of fluorosis, parents can use low-fluoride bottled water some of the time to mix infant formula; these bottled waters are labeled as de-ionized, purified, demineralized, or distilled. *CDC*

**Health Canada:** [http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/health-sante/faq\\_fluoride-fluorure-eng.php](http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/health-sante/faq_fluoride-fluorure-eng.php) Accessed January 22, 2012

**American Dental Association,** The Journal of the American Dental Association January 2011 vol. 142 no. 1 79-87  
<http://jada.ada.org/content/142/1/79.full#sec-18>

**Centers for Disease Control and Prevention (CDC)** [http://www.cdc.gov/fluoridation/safety/infant\\_formula.htm](http://www.cdc.gov/fluoridation/safety/infant_formula.htm). Accessed January 22, 2012





Board of Health  
unanimous support  
for ongoing  
fluoridation

# Board of Health Support – February 17, 2011

Recommendation received unanimous support:

*That the Board of Health support the ongoing fluoridation of the City of London's drinking water supply as a measure to achieve optimal dental / oral health for all residents, which is an important component of total health.*

- Toronto Board of Health and Peel Regional Council also supported ongoing fluoridation in April 2011



US National  
Research Council  
Report Review

# **Purpose of US National Research Council Report**

## **Fluoride in Drinking Water**

### **A Scientific Review of EPA's Standards**

- To review levels of natural fluoride in the U.S. currently set at 2 – 4 mg/L
- Not to address adjusted fluoride in water (0.7 mg /L) for prevention of tooth decay



# National Research Council Report Conclusions

- “In light of the collective evidence on various health end points and total exposure to fluoride, the committee concludes that the 4 mg/L should be lowered.”
- No recommendations about 2 mg/L



# MLHU Review Conclusions

- **Dental Fluorosis** – known risk
- **Skeletal Fluorosis** – known risk at much higher levels
- **Fractures** – likely increased risk at 4 mg/L, particularly in some subpopulations
- **Thyroid and IQ** – needs further research - higher doses; developing countries; weak studies which don't control for other factors
- **Osteosarcoma** – tentative and mixed and therefore inconclusive

# MLHU Review Conclusions

- Many of the studies used higher doses limiting applicability to London
- Many studies done in developing countries with many differences in living conditions
- Many studies weak so difficult to draw conclusions



Research

# The Long Term Effects of Water Fluoridation on the Human Skeleton 2010

Authors: Chachra E, Limeback H et al

“In this study, no effects of fluoride on mineralization and no substantive negative effects of fluoride administration on bone mechanical properties were observed.”

# **An Assessment of Bone Fluoride and Osteosarcoma 2011**

**Authors: Kim FM.... Douglass CW... The National  
Osteosarcoma Etiology Group**

**“This study did not demonstrate an  
association between fluoride levels in  
bone and osteosarcoma.”**



# California Cancer Identification Committee – Proposition 65

- Considered whether to add fluoride to the list of known carcinogens (800 on list)
- On October 12, 2011, the California Proposition 65 Carcinogen Identification Committee unanimously voted to not list fluoride as a carcinogen.
- Reference: Consumer Health Care Products Association <http://www.chpa-info.org/issues/Fluoride.aspx>; Accessed January 22, 2012

## Proposition 65

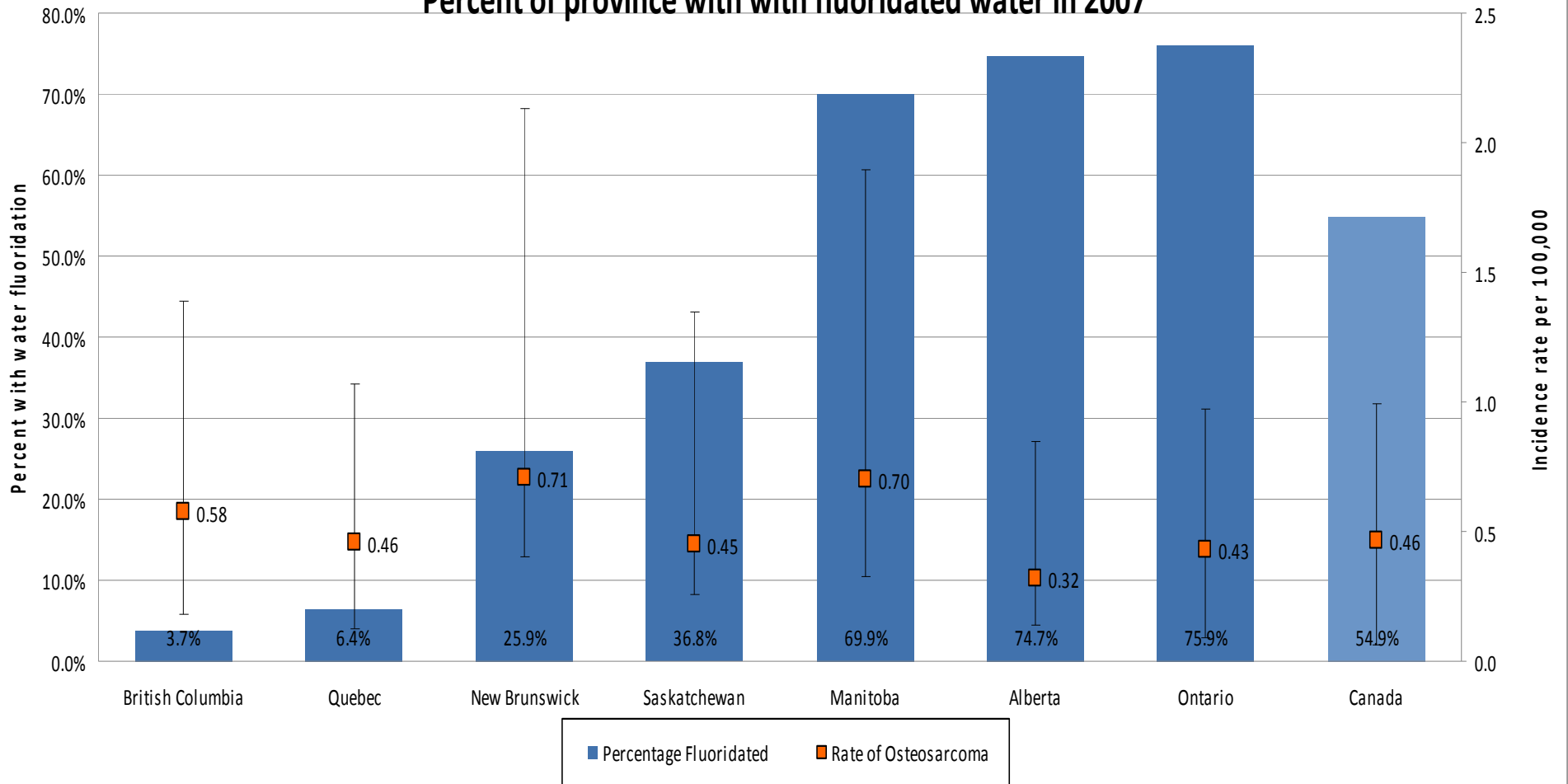
# SCIENCE ADVISORY BOARD CARCINOGEN IDENTIFICATION COMMITTEE

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# Standardized incidence rates of Osteosarcoma per 100,000 males, aged 00-19, 1998-2007 combined, by province

And

## Percent of province with with fluoridated water in 2007

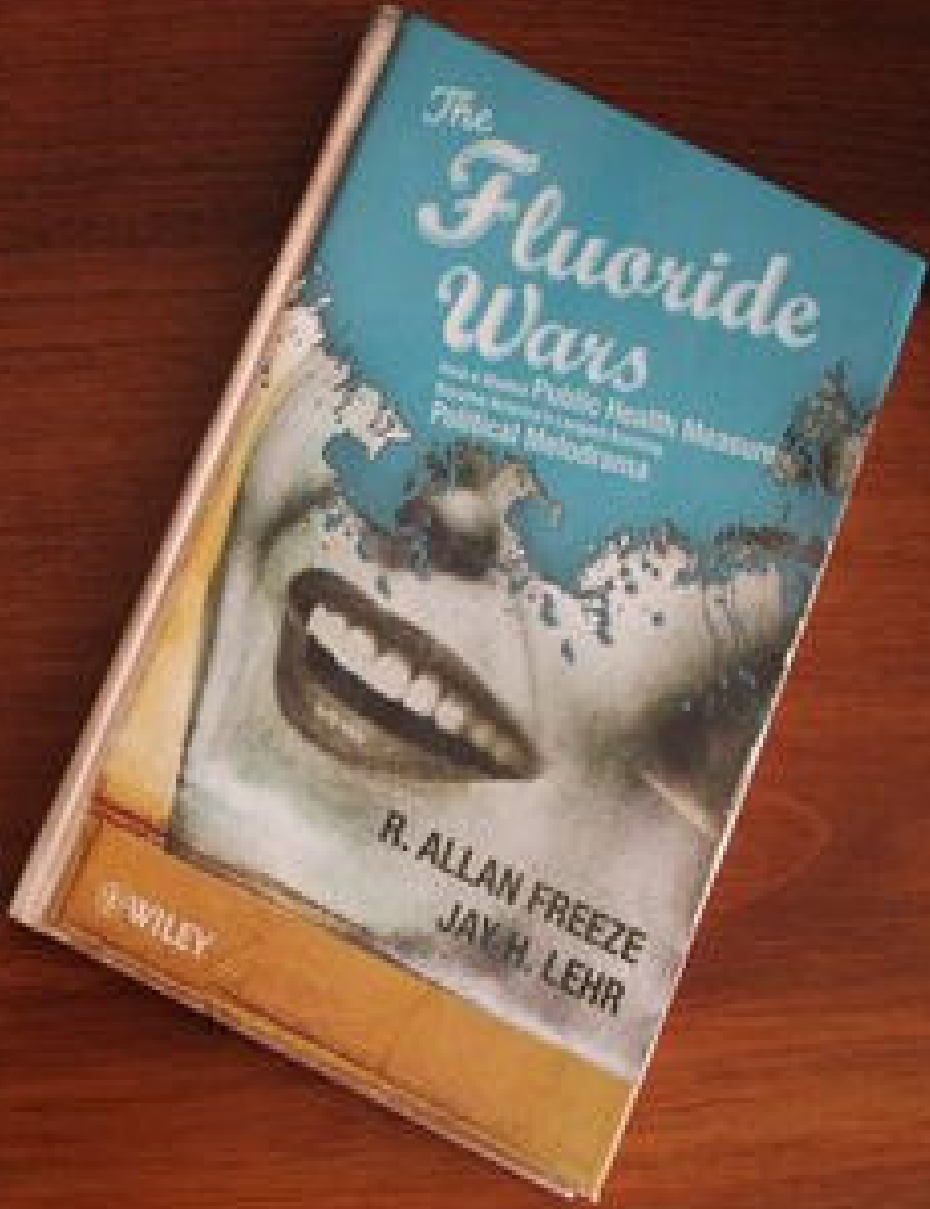
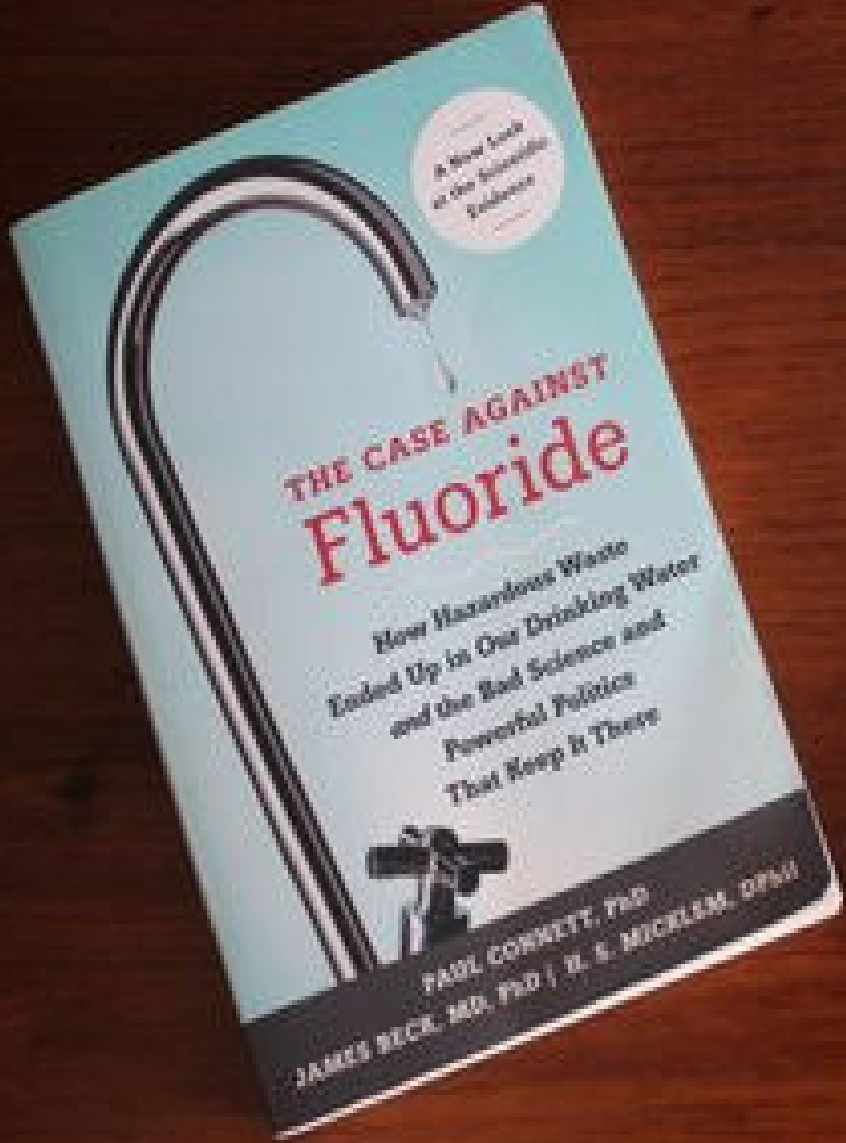


Note: Data for Newfoundland/Labrador, Nova Scotia, Northwest Territories, Nunavut, PEI and Yukon not shown due to small sample size

The data contained in this table were provided to the Middlesex-London Health Unit from the Canadian Cancer Registry database at Statistics Canada with the knowledge and consent of the provincial and territorial cancer registries which supply the data to Statistics Canada. Their cooperation is gratefully acknowledged.



Books



# The Fluoride Wars

“ ...at this point in time, no other delivery vehicle provides the **safety, efficacy, cost-effectiveness, and social equity** of public water fluoridation.

The **entire community benefits** regardless of age, educational attainment, or socioeconomic status.

The benefits are derived **without any direct action on the part of each citizen and without dependence on professional dental services or the ability to afford them.**”