

Community Water Fluoridation: Begin a Legacy of Healthy Teeth in Orillia

Presentation to:
Orillia Public Works Department
November 24, 2011



Why we're here

- SMDHU is responsible for public health issues and is providing health advice to the City of Orillia on Community Water Fluoridation (CWF) during its public consultation process
- Orillia has never had Community Water Fluoridation
 - Among the 10 largest communities in Simcoe Muskoka, **elementary school children in Orillia have the most severely decayed teeth** (SMDHU screening data, 2009-2010)
- Fluoridation is a **proven safe and effective way to improve oral health** by reducing tooth decay and cavities
- Fluoridation is a challenging, polarizing issue
 - ***Our goal: Address any misconceptions and provide accurate, up-to-date information***

What is fluoride?

- Fluoride **naturally occurs** in rocks, soil, air and water
- **Most natural water sources in Ontario have less fluoride than municipal fluoridated water systems (too low to protect teeth)**
- Some areas: At much greater concentrations (>5x average levels) – but none in Ontario

How does fluoride work?

- **Fluoride makes the outer layer of teeth (the enamel) stronger**
- When the outer layer is strong, teeth are less likely to develop cavities
- Fluoride protects teeth in two ways. Water fluoridation does both:
 - **Topical:** delivered to the surface of the teeth.
 - **Systemic:** fluoride is ingested into the body and is incorporated into the tooth structures

What is community water fluoridation?

- It is the process whereby fluoride is added to the water supply and adjusted to a level that will **optimize dental benefits while avoiding adverse effects**
- Fluoride additives are **required to meet rigorous standards** of quality and purity before they can be used and the process is **carefully monitored and controlled**
- The current Maximum Acceptable Concentration of fluoride in drinking water is 1.5 parts per million (ppm) and **Health Canada recommends an optimal level of 0.7 ppm for dental benefits**
- In **Ontario**, it is recommended that drinking water systems that fluoridate maintain a range of **0.5 to 0.8 ppm fluoride**

Water fluoridation in Ontario

- In Ontario, **76%** of the population receives fluoridated community water (Health Canada, 2007)
 - District of Muskoka: **51%**
 - Simcoe County: **2%**
 - Simcoe-Muskoka combined: **7%**
- Opposition in Waterloo & Calgary resulted in the discontinuation of fluoridation
- Recent challenges to fluoridation in Toronto, Peel, Hamilton, Muskoka, Tottenham, Lethbridge and Cape Breton
 - **All have reaffirmed their commitment to CWF**

CWF reduces tooth decay

- Studies show that community water fluoridation **reduces tooth decay by 20% to 40%**¹
- **Beneficial to all ages**, in both primary and permanent teeth
- Effect is seen **in addition** to personal dental care (brushing/flossing/dental care)
- **Particularly needed for vulnerable, low-income populations**



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¹ Newbrun E. Effectiveness of water fluoridation. J. Public Health Dent 1989; 49(5):279-89 and Brunelle JA, Carlos JP. Recent trends in dental caries in US children and the effect of water fluoridation. J Dent Res 1990; 69(Spec Iss): 723-7

Poor oral health can impact more than just the teeth

- Recent Ontario study: there are **more ER visits for non-traumatic dental problems than for diabetes and high blood pressure diseases**¹
- Dental and other infections – not only affect teeth and gums, but there's **potential for spread to other parts of mouth and face**
- Studies have shown that **poor oral health impacts children's development:**
 - Limits food choices
 - Impairs speech development
 - Repeated absences from school
 - Trouble concentrating or learning
 - Loss of self-esteem (appearance and poor school performance)

¹Community Dentistry and Oral Epidemiology, August 2009

Community water fluoridation safety

- Systematic reviews conclude that community water fluoridation **does not cause** any of the following: *cancer, bone fractures, reduced intelligence, kidney failure, immunotoxicity, reproductive and developmental toxicity, DNA toxicity, neurotoxicity or environmental impacts*¹
- Levels of fluoride added in water are carefully monitored to an optimal level of 0.7 ppm. At this level, risk of fluorosis is exceedingly low.
 - Fluorosis (mild): fine white striations across the crowns of teeth
- Issue in children: inadvertent ingestion of toothpaste



Vermont Department of Health

¹ Issues raised by those opposed to fluoridation

Major scientific research and reviews

- [Health Canada Expert Panel, 2007](#)
- [Oral Health in America](#): A Report of the Surgeon General, 2000
- [Systematic Review of Water Fluoridation](#). UK/International study, 2000
- [Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States](#). US CDC, 2001
- [Forum on Fluoridation](#). Ireland, 2001
- [A Systematic Review of the Efficacy and Safety of Fluoridation](#). National Health and Medical Research Council, Australian Government, 2007

Who supports CWF?

Orillia

- **Simcoe Muskoka District Health Unit Board of Health**
- **Leadership Council of the North Simcoe Muskoka LHIN**
- **Board of Directors, Orillia Soldiers' Memorial Hospital**
- **Department of Family Medicine, Orillia Soldiers' Memorial Hospital**
- **Department of Paediatric and Neonatal Medicine, Orillia Soldiers' Memorial Hospital**
- **Medical Advisory Committee, Orillia Soldiers' Memorial Hospital**

Ontario

- **Ontario Association of Public Health Dentistry**
- **Royal College of Dental Surgeons of Ontario**
- **Chief Medical Officer of Health of Ontario**
- **Ontario Medical Association**
- **Association of Local Public Health Agencies (alPHA)**
- **Ontario Dental Association**
- **Ontario College of Dental Hygienists**

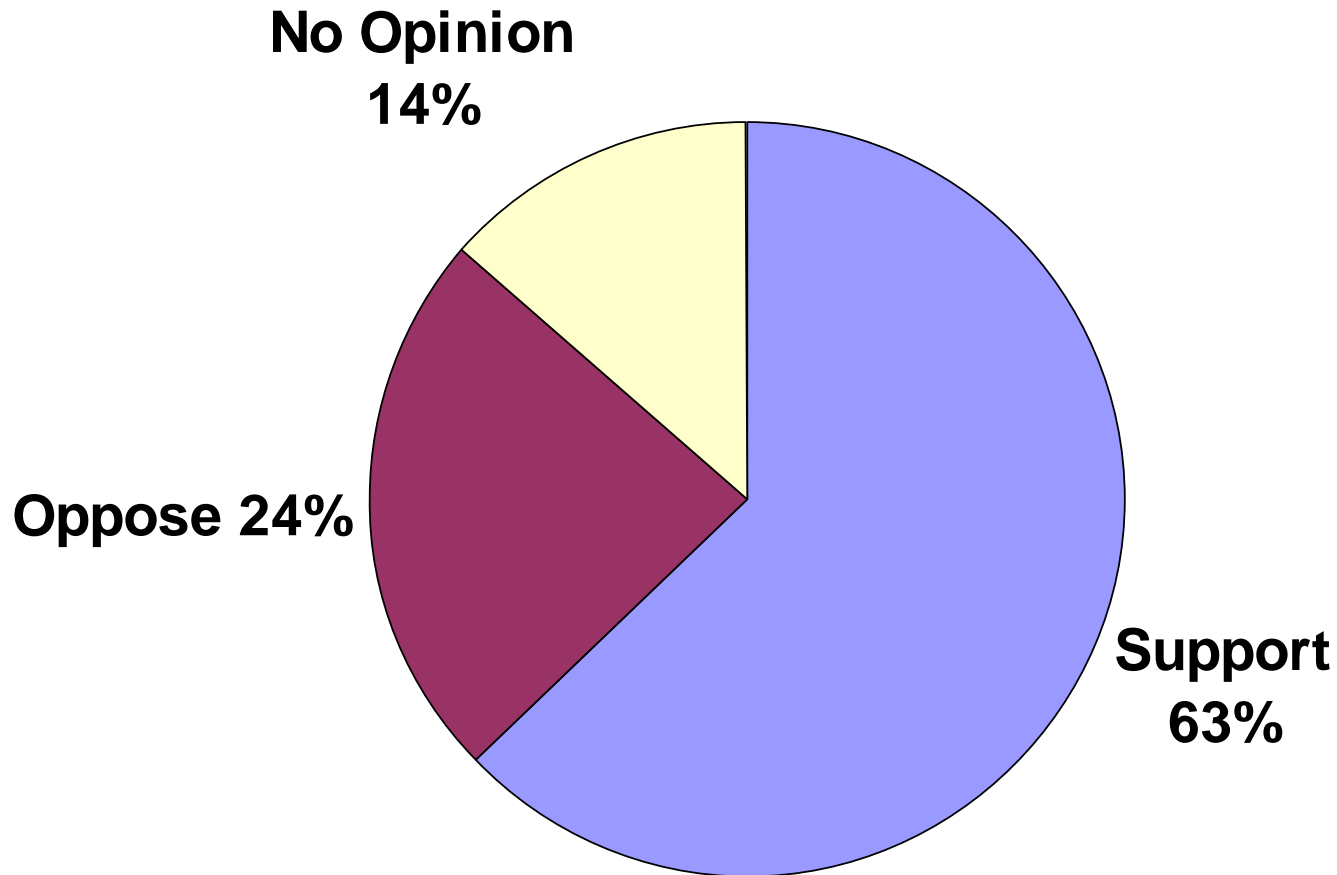
Canada

- **Health Canada**
- **Canadian Association of Public Health Dentistry**
- **Canadian Dental Association**
- **Canadian Public Health Association**
- **Canadian Pediatric Society**
- **Canadian Cancer Society**

International

- **World Health Organization (WHO)**
- **Pan American Health Organization (PAHO)**
- **Centers for Disease Control and Prevention (CDC)**
- **Recent US Surgeon General's Report**
- **Federation Dentaire Internationale (FDI)**
- **American Cancer Society**
- **American Medical / Dental Associations**

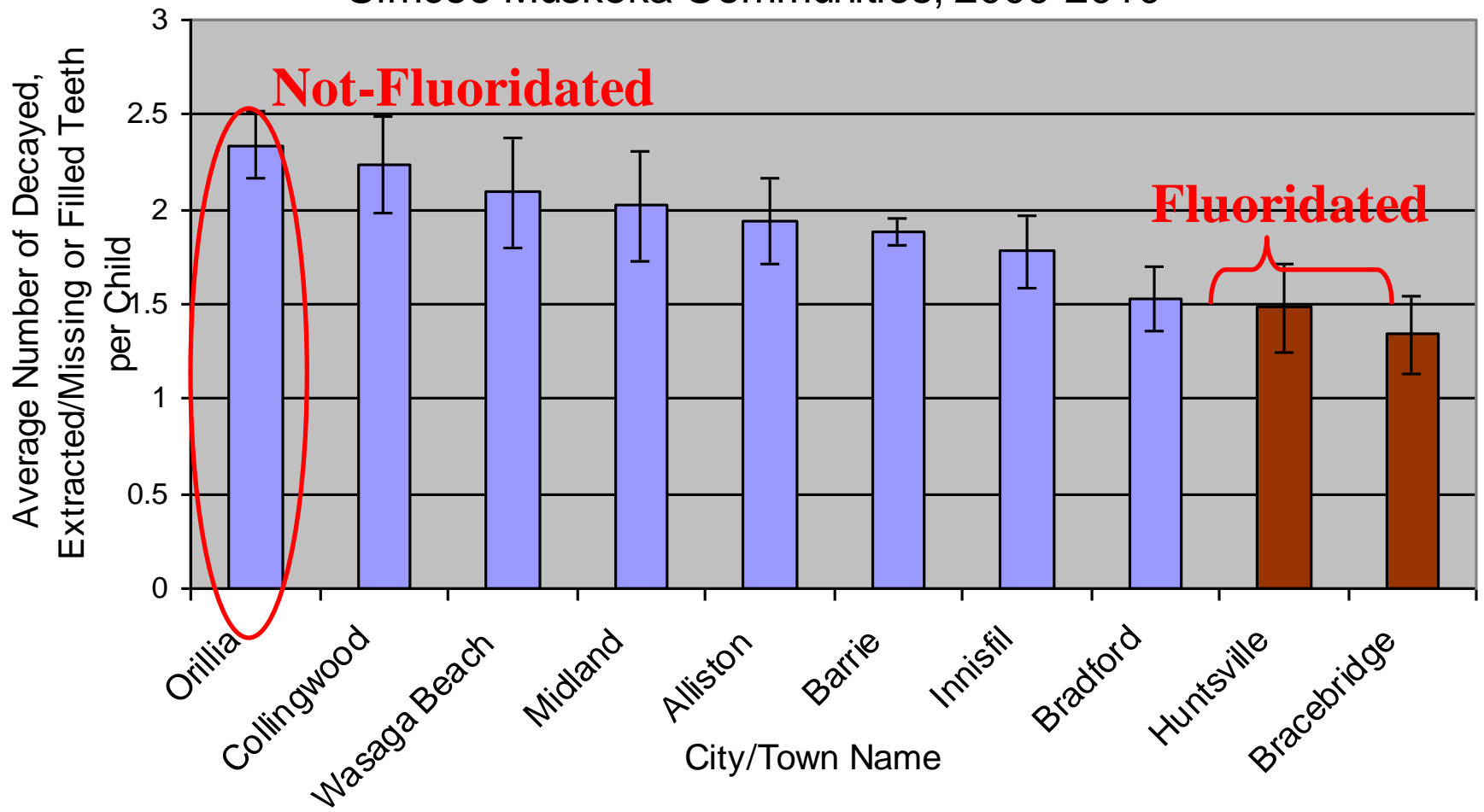
Public support for adding fluoride to municipal water in Orillia, 2009



Data source: Rapid Risk Factor Surveillance System (RRFSS), Simcoe Muskoka District Health Unit, Cycles 1-3 (2009)

Children in communities in Simcoe Muskoka with water fluoridation have fewer cavities

Average Number of Decayed, Extracted/Missing or Filled Teeth in Screened Children (grades JK, SK, 2 and 8) for 10 Largest Simcoe Muskoka Communities, 2009-2010



Fluoridation makes a difference: Simcoe Muskoka compared to other areas in Ontario

Fewer Decayed Teeth & More Cavity-Free Teeth

Region	7-Yr deft/DMFT (Decayed Teeth)	7-Yr % Caries Free (Healthy Teeth)
Halton (90% Fluoridated)	1.96	58
Simcoe Muskoka (7% Fluoridated)	3.02	44.6
Ontario (76% Fluoridated)	2.49	47.8

CWF reduces dental program costs

Data: Spending for Dental Programs: Health Unit and Municipal Costs
(2009)

Health Unit	Halton 90% Fluoridated	Simcoe Muskoka 7% Fluoridated
CINOT Spending (25% Municipal dollars)	\$357,965 (\$89,491)	\$824,750 (\$206,188)
OW Dental <18 Yr Spending (20% Municipal dollars)	\$109,280 (\$21,856)	\$421,075 (\$84,215)
OW Dental Adult Spending (20% Municipal dollars)	\$225,107 (\$45,021)	\$357,501 (\$71,500)
OW Adult dentures (20% Municipal dollars)	\$160,360 (\$32,072)	\$654,603 (\$130,921)
Total Spending (Municipal Dollars)	\$852,712 (\$188,440)	\$2,257,929 (\$492,824)

CINOT = Children in Need of Treatment (Dental Program); OW = Ontario Works (Dental Program)

Benefits of CWF

- **Evidence of both safety and benefits extremely strong**
- Similar responsibility to:
 - *Treating water with chlorine to provide safe drinking water*
 - *Adding vitamin D to milk to prevent rickets and ensure healthy bones*
 - *Adding iodine to salt to ensure healthy physical and mental development*
- US Centers for Disease Control has recognized water fluoridation as **one of 10 great public health achievements of the 20th century**
- **Every \$1 invested in community water fluoridation yields about \$38 in savings each year from fewer cavities treated¹**

Conclusions

- The value of community water fluoridation should not be underestimated – it is **one of the greatest preventive measures we have in the fight against dental decay**
- It is a **safe and effective public health measure that addresses inequalities in health, and benefits all members of the community**
- It **helps contain the costs of health and dental care services**
- For more information, visit the health unit's website at:
www.simcoemuskokahealth.org

Early fluoridation history

- **1901-1933:** research by F. McKay into the cause of a form of mottled teeth called “Colorado Brown Stain” which were also cavity-free
- **1933-45:** research focused on the relationships between F concentration, fluorosis and tooth decay established that 1 ppm (1mg/L) F was associated with substantially fewer cavities and a mild increase in fluorosis but of no medical or cosmetic concern

More fluoridation history

- **1945 to Present:** Focused on adding F to community water supplies
 - **1945:**
 - In January added to **Grand Rapids, Michigan** water system
 - First Canadian City – **Brantford, Ontario**
 - **1945- 1962:** Brantford – Stratford – Sarnia study
 - **By 1950:** CWF was official USPHS policy
 - **By 1960:** 50 million Americans were on CWF
 - **By 2006:** 69% of U.S. population on CWF (includes 3% on naturally fluoridated municipal water); 62% of the total population

Social history

- **1950s and early 60s:** Generally thought of as high points of scientific optimism and faith in experts. Reality was growing anxiety about medical and scientific progress and expert opinion
 - Concerns over nuclear fallout
 - DDT and other pesticides
 - Doctors and dentists might be influenced by large corporations
 - Further research would show more dangers not yet known
 - Also a persistent interest in alternative medicine
 - CWF was a flashpoint and cities across the U.S. and Canada debated whether or not to do it
- **Late 1960s and early 1970s:**
 - Revolt against experts more pronounced
 - Political arguments had appeal for people on both the right (e.g. individual rights) and the left (e.g. environmentalists)

1950s opposition

- **Health Allegations:** F accumulates in the body; people are allergic; it causes cancer, heart disease, kidney disease, damages intelligence, skeletal fluorosis; environmental toxicity; etc.
- **Industrial Allegations:** It's a "*toxic hazardous waste product of the aluminum industry*"; it's a means for the aluminum industry to get rid of toxic waste which was very expensive to get rid of properly
- **Civil Libertarian Issues:** a conflict between individual rights and the common good; forced "medication" without consent (legal challenges raised)
- **Led by:** (a few) doctors, dentists, researchers; alternative medical practitioners; health food store operators; members of religious and political minority groups

Opposition today

- Same issues and people
- Key opposition we heard from in Muskoka and in Ontario generally:
 - an Optometrist,
 - an Orthomolecular Nutritionist,
 - a Bachelor of Physical and Health education
 - a small number of anti-fluoridation scientists

Why are we confident

- **Science:**
 - Use a systematic approach in reviewing evidence
 - Do not “cherry pick” evidence
 - Can only report and draw conclusions from what has been observed
- **65 years of observation** on approximately **300 million people** at a time
- **Not likely something was missed!**

Orillia history

- **1966:**
 - June 1st: Passed a by-law authorizing CWF
 - November 7th: Passed a by-law putting the question to voters pursuant to the Fluoridation Act:
 - *Are you in favour of the discontinuance of the fluoridation of the public water supply of this municipality?*
 - November 15th: Passed a by-law to provide for the taking of the vote
 - Yes – 4,223 No – 1,838
- **Late 1970's - 1980's:** Council may have discussed CWF again but did not pursue it
- **2009:** Simcoe Muskoka District Health Unit report on the state of Oral Health gets Council attention; Council approved a public consultation
- **2011:** In June Council reaffirmed that it would hold a public consultation

Fluoridation is inexpensive

Municipality	Total Water Treatment Costs	Fluoridation Costs	% of Total Costs	Per Capita Costs for Water Treatment	Per Capita Costs for Fluoridation
Muskoka	\$2,120,000	\$43,200	2%	\$36.83	\$0.75
Huntsville	\$424,000	\$17,500	4%	\$23.20	\$0.96

Communications with A.J. White, Commissioner of Engineering and Public Works,
District Municipality of Muskoka

Alternative costs of delivering fluoride to at risk populations

Program Delivery	Population	Staff	Staffing & Operating Costs	Capital Costs	Total Costs
Public Health	180,332 All children seniors + LICO (low income cut off)	36 FTE	\$5,973,518	\$9,016,600	\$14,990,118
Public Health	30,967 Pop. under LICO	6 FTE	\$1,000,910	\$1,500,000	\$2,500,910
Private Office	180,332 All children seniors + LICO	1.5 FTE	\$17,234,5000	\$81,600	\$17,316,100
Mail Brushes and Fluoride Toothpaste	224,705 All private dwellings	3 FTE	\$1,870,985	\$163,200	\$2,035,185

Questions?