THE REGIONAL MUNICIPALITY OF PEEL
COMMUNITY WATER FLUORIDATION COMMITTEE

AGENDA CWFC - 6/2016

DATE: Thursday, November 24, 2016
TIME: 8:30 AM – 9:30 AM
LOCATION: Regional Council Chamber, 5th Floor
Regional Administrative Headquarters
10 Peel Centre Drive, Suite A
Brampton, Ontario

MEMBERS: F. Dale; J. Downey; A. Groves; M. Palleschi; C. Parrish; K. Ras;
J. Sprovieri; J. Tovey

Chaired by Councillor C. Parrish or Vice-Chair Councillor J. Sprovieri

1. DECLARATIONS OF CONFLICTS OF INTEREST

2. APPROVAL OF AGENDA

3. DELEGATIONS

4. REPORTS

4.1. Sources of Fluoride Intake (Oral)

Presentation by Dr. E. de Villa, Medical Officer of Health

4.2. Updated Review of Evidence on the Effectiveness and Safety of Community Water

Fluoridation (For information) (Deferred from the October 13, 2016 CWFC

meeting)

Presentation by Dr. E. de Villa, Medical Officer of Health

4.3. Oral Health Program Reinvestment (Oral) (Referred from the October 27, 2016

Regional Council meeting)
5. COMMUNICATIONS

5.1. Christine Massey, Spokesperson, Fluoride Free Peel, E-mail dated October 3, 2016, Regarding Disclosure of Information Related to a Delegation at the January 21, 2016 Special Regional Council meeting (Receipt recommended)

6. IN CAMERA MATTERS

7. OTHER BUSINESS

8. NEXT MEETING

Thursday, February 23, 2017, 8:30 a.m. - 9:30 a.m.
Regional Council Chamber, 5th Floor
Regional Administrative Headquarters
10 Peel Centre Drive, Suite A
Brampton, Ontario

9. ADJOURNMENT
DEFERRED FROM COMMUNITY WATER FLUORIDATION COMMITTEE
October 13, 2016

4. REPORTS

4.1 Updated Review of Evidence on the Effectiveness and Safety of Community Water Fluoridation

Deferred to next CWFC meeting
OBJECTIVE

The objective of this report is to present findings from research evidence and community water fluoridation (CWF) decisions across Ontario.

REPORT HIGHLIGHTS

- Peel Public Health utilizes a systematic and objective process to review research evidence on all matters of public health significance, including the effectiveness and safety of community water fluoridation (CWF).
- A review of the research evidence on CWF found the following:
  - Effectiveness: Statistically significant reductions in rates and severity of tooth decay in children and adults.
  - Dental Fluorosis: A small increased risk of fluorosis of aesthetic concern.
  - Safety: The evidence does not support a link between fluoride in drinking water at the optimal concentration of 0.7mg/L and any adverse health effects.
- In Ontario, the most recent estimate indicates that approximately 67.3 per cent of the population lives in a community with a fluoridated water system.
- CWF decisions are made at the local level and may be influenced by various matters such as technical feasibility, financial considerations, and resident/community input. The spectrum of CWF decisions may range from starting CWF, maintaining the practice, changing the fluoridation additive that is used, discontinuing or not starting CWF.
- As directed by Council in 2012 and aligned with a commitment to evidence-informed decision making, Peel Public Health will continually monitor the scientific literature on fluoridation and advise of any changes to the evidence base.

DISCUSSION

1. Background

In May 2012, Council directed the Medical Officer of Health to monitor the scientific literature on community water fluoridation (CWF) and advise of any changes to the evidence base. In April 2014, a review of the published evidence was conducted and provided to Council.
In March 2016, the Community Water Fluoridation Committee endorsed a work plan that requested staff to bring forward high quality and relevant research evidence to inform discussions. As per direction, an updated review of the evidence was conducted, and supplemented with a scan of the practice of CWF across Ontario.

2. Monitoring and Reviewing Evidence

There is extensive published literature on the subject of water fluoridation; however, the literature varies in design and quality, and the findings may not always be relevant to the context of Peel where CWF is practiced within the optimal concentration range (0.5 – 0.8 mg/L) to protect against tooth decay. Peel Public Health (PPH) utilizes a systematic and objective process to review research evidence on all matters of public health significance, including the effectiveness and safety of CWF. This process involves a series of predetermined, replicable, and transparent steps. In summary, these steps include:

- comprehensive searches of electronic databases by a trained librarian - to ensure any and all published evidence is identified;
- the systematic and explicit application of relevance criteria to the identified studies;
- critical appraisal of relevant studies using validated tools; and
- two independent reviewers conducting all the review procedures (including screening citations, data abstraction and critical appraisal).

3. Scope of Review

a) Nature of Evidence

The current evidence review investigates the relationship between CWF with fluoride concentrations within the range of 0.5-1.2 mg/L and any potential health effects. As a result of assessing health effects at this range, toxicological studies are not within scope of this nature of evidence review. Generally, most toxicological studies in animal models involve examining impacts at exposures much higher than the community exposure associated with fluoridation of drinking water.

Relevant toxicological and epidemiological studies are considered by Health Canada as part of the development of the Guidelines for Canadian Drinking Water Quality, and referenced within the technical document. Health Canada conducts the health risk assessments through a weight-of-evidence approach, using credible scientific studies published in recognized peer-reviewed journals. Guidelines are developed using a rigorous scientific process which involves a review of the research on health effects and exposure that assess dose and potential adverse impact(s). This also includes a comprehensive peer-review process with international experts in relevant fields and approval by the Federal/Provincial/Territorial (FPT) Committee on Drinking Water and the FPT Committee on Health and Environment. According to Health Canada’s Guidelines for Canadian Drinking Water Quality: Guideline Technical Document - Fluoride, “the Maximum Acceptable Concentration for fluoride (1.5 mg/L) was established based on the segment of the population most at risk of developing dental fluorosis, children 1-4 years old”. Health Canada also takes total fluoride consumption from all sources into consideration when developing such guidelines.
b) Water Fluoridation Additive – Specific Studies

Concerns related to specific fluoridation additives are not directly addressed in the review. NSF International, an independent accredited global organization, administers the testing and certification of additives, and develops standards in consideration of the relative risk of products for human health. Full disclosure of each residual detected in the additive tested is mandatory under the standard, and a toxicological evaluation is required to determine if the concentrations of any detected residuals have the potential to cause adverse human health effects. The standard also requires NSF International to confirm through testing that any residuals in the water due to fluoridation additives remain well below allowable thresholds (i.e. less than 10 per cent of allowable levels).

c) Randomized Controlled Trials

Members of Council have also questioned the lack of randomized control trials on CWF. Research experts have confirmed that the nature of the research question makes randomized control trials unfeasible. Such trials would require a group of people who have never been exposed to CWF in the past to ensure past exposure did not introduce bias. There are ethical concerns regarding allocation of individuals to the non-fluoridated group given documented evidence of effectiveness. Furthermore, to ensure a quality randomized control trial, 100 per cent of the water consumed would need to be provided by the research team and the required length of observation would be a significant obstacle in the feasibility and cost of conducting such a study.

4. Evidence Review Results

The evidence review (Appendix I) summarizes findings from research in the following three areas: effectiveness, dental fluorosis, and safety.

a) Effectiveness

- Two systematic reviews (total of 50 single studies) reported beneficial effects when comparing children living in fluoridated and low/non-fluoridated communities. When comparing children living in fluoridated (0.5-1.2 parts per million [ppm]) to low/non-fluoridated (<0.4 ppm) areas findings included:
  - 35 per cent reduction in cavities in baby teeth (pooling of nine studies = 44,268 children)
  - 26 per cent reduction in cavities in permanent teeth (pooling of 10 studies = 78,764 children)
  - 15 per cent increase in children with no cavities (pooling of 18 studies = 93,504 children)

- Two recent, strong quality single studies assessed equity and both found the benefits of CWF to be equally distributed across socioeconomic groups, with some benefits being more pronounced in children of low income families.
b) Dental Fluorosis

- One systematic review of 40 studies (59,630 children) reported that in a community where water is fluoridated to 0.7 ppm, an estimated 12 per cent of children would be expected to have fluorosis of aesthetic concern; at a water fluoride level of 0.1 ppm, eight per cent of children would have fluorosis of aesthetic concern.
- A recent, strong quality single study reported 55 per cent of children in the fluoridated community had fluorosis (of any level) versus 27 per cent of children living in the non-fluoridated area.

c) Safety

- One systematic review of 30 studies and six strong single studies reported on safety. Across these studies, 19 safety outcomes were assessed: cancer of all causes, thyroid cancer, bone cancer/osteosarcoma, intelligence, congenital malformations, dementia, still births, Down syndrome, sudden infant death syndrome, mental retardation, skeletal fluorosis, bone fracture, hip fracture, osteoporosis, goitre, urinary stone disease, coronary heart disease/mortality, and all-cause mortality.
- Studies assessing the safety of CWF do not support a link between fluoride in drinking water at the optimal concentration (0.7mg/L) and any adverse health effects.

5. Community Water Fluoridation Across Ontario

Currently, there is no national-level coordination to monitor and report on community water fluoridation. In Ontario, the most recent estimate indicates that approximately 67.3 per cent of the population lives in a community with a fluoridated water system. Consultation with the Ministry of the Environment and Climate Change indicates that as of January 11, 2016, approximately 75 municipal residential drinking water systems in Ontario fluoridate the water. Since 2010, some drinking water systems have discontinued fluoridation and one drinking water system has added fluoridation.

Discontinued

- Huntsville (Fairyview) Drinking Water System, District Municipality of Muskoka
- Birch Glen (Baysville) Drinking Water System, District Municipality of Muskoka
- City of Windsor Drinking Water System, City of Windsor
- Amherstburg Drinking Water System, Town of Amherstburg
- Kirkland Lake Drinking Water System, Town of Kirkland Lake
- Town of Lakeshore Drinking Water System - Stoney Point, Town of Lakeshore
- Region of Waterloo Drinking Water System – Waterloo, Regional Municipality of Waterloo
- Parry Sound Drinking Water System, Town of Parry Sound
- Nairn Centre Drinking Water System, Township of Nairn and Hyman
- City of Cornwall (decision pending)

Added

- Port Severn (Lone Pine) Drinking Water System, District Municipality of Muskoka
The Ministry of the Environment and Climate Change does not record the rationale for these decisions as these are typically multi-faceted and made at the local level. In general, there are three types of decisions made related to community water fluoridation:

- Start or not-start CWF;
- Discontinue or maintain/continue CWF; and
- Change the fluoridation additive.

The rationale for these decisions varies by jurisdiction and may be influenced by internal and external factors, such as consideration of health effects, technical/financial aspects related to the delivery of fluoride, cost of infrastructure and/or fluoride additives, and resident/community input. In addition to the jurisdictions choosing to discontinue CWF indicated above, the following are a few examples of jurisdictions that have made other decisions related to CWF:

<table>
<thead>
<tr>
<th>Not start</th>
<th>Maintain/Continue Fluoridation</th>
<th>Change of Fluoridation Additive*</th>
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<tbody>
<tr>
<td>- Town of Kingsville</td>
<td>- City of Toronto</td>
<td>- City of Toronto</td>
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<td>- City of Hamilton</td>
<td>- Region of Durham</td>
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<td>- Region of Halton</td>
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<td>- City of London</td>
<td>- Smiths Falls</td>
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<td></td>
<td>- Town of Bracebridge</td>
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* The above mentioned are examples of jurisdictions that have changed to a hydrofluorosilicic acid additive derived from calcium fluoride.

CONCLUSION

A current review of evidence finds that children and adults living in fluoridated communities have lower levels and severity of tooth decay than those living in low/non-fluoridated communities. The risk of dental fluorosis is slightly higher in fluoridated communities; however, only a small portion of people experience fluorosis of aesthetic concern. Studies assessing the safety of CWF do not support a link between fluoride in drinking water at the optimal concentration (0.7 mg/L) and any adverse health effects.

Jurisdictions across Ontario continue to make decisions on CWF. Over 70 municipal residential drinking water systems in Ontario fluoridate the water. Since 2010, some drinking water systems have discontinued fluoridation and one drinking water system has added fluoridation. A few jurisdictions have changed their fluoridation additive to a hydrofluorosilicic acid additive derived from calcium fluoride.
As directed by Council in 2012 and aligned with a commitment to evidence-informed decision making, Peel Public Health will continually monitor the scientific literature on fluoridation and advise of any changes to the evidence base.

Janette Smith, Commissioner of Health Services

Eileen de Villa, MD MBA MHSc CCFP FRCPC
Medical Officer of Health

Approved for Submission:

D. Szwarc, Chief Administrative Officer

APPENDICES

Appendix I: Summary of Research Evidence Reviewed
Appendix II: References

For further information regarding this report, please contact Olha Dobush, Director, Chronic Disease and Injury Prevention ext. 2617.

Authored By: Sharanjeet Kaur, Manager, Chronic Disease and Injury Prevention
## Summary of Research Evidence Reviewed (2006-2016)

Note: ppm represents parts per million

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Outcome</th>
<th>Study Description</th>
<th>Fluoride Exposure parts per million (ppm)</th>
<th>Key Findings</th>
<th>Quality Rating of Study Methodology</th>
</tr>
</thead>
</table>
| Archer et al. (2016) | Osteosarcoma | • Type: Case Control  
• Population: Children and adolescents  
• Country: United States  
• Sample: 1,510 | • Concentration range = 0.1 to 5.5 ppm | • No relationship was found between fluoride in public drinking water and childhood/adolescent osteosarcoma  
• There was no difference in the odds of childhood osteosarcoma due to fluoride source (natural vs. fluorosilicic acid) | Strong |
| Armfield et al. (2013) | Tooth decay/infections/dentition | • Type: Cross-sectional /ecological  
• Population: Children  
• Country: Australia  
• Sample: 16,508 | • Fluoridated: 0.5 to 1 ppm  
• Non-fluoridated: Not reported | • In children, tooth decay was significantly associated with consuming sugar-sweetened beverages  
• For children with more than 50% lifetime exposure to fluoridated water there was no association between sweetened drink consumption and decayed, missing, or filled permanent teeth  
• For children with lower lifetime exposure (< 50%), the number of decayed, missing or filled permanent teeth was 46% higher in children consuming 3 or more sweetened drinks/day than for children who were not consuming sweetened drinks | Strong |
## APPENDIX I
UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION

<table>
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<tr>
<th>Author (year)</th>
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</thead>
</table>
| Bassin et al. (2006) | Osteosarcoma | • Type: Case-control  
• Population: Children/adolescents 0 to 20 years  
• Sample: 103 | • High versus low ppm | - High versus low fluoride level exposure in drinking water was associated with higher incidence of osteosarcoma among males 0 to 14 years but not females  
- The association peaked at 6-8 years of age; Seven year old males with high fluoride exposure were 5.5 times more likely to have osteosarcoma (odds ratio= 5.46; 95% CI: 1.50 to 19.9) | Poor |
| Blakely et al. (2014) | Osteosarcoma and Ewing Sarcoma | • Type: Cross-sectional/ ecological  
• Population: Children and adults  
• Country: United Kingdom  
• Sample: 4,216 | • Fluoridated: <1.5 ppm  
• Non-fluoridated: Not reported | - In children and adults there was no association between fluoridated drinking water and osteosarcoma risk, Ewing sarcoma risk | Strong |
| Blinkhorn et al. (2015) | Tooth decay | • Type: Ecological  
• Population: Children 5-7 years;  
• Country: Australia  
• Sample: 2,129 | • Not reported | - Children 5-7 years of age living in the fluoridated area had significantly lower DMFT scores (1.40) in comparison to those in the pre-fluoridated (2.02) and non-fluoridated (2.09) areas  
- The proportion of caries free children were higher in the fluoridated area (62.6%) compared to pre-fluoridated (50.8%) and non-fluoridated area (48.6%) | Moderate |
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</table>
| Broadbent et al. (2014) | Intelligence Quotient (IQ) | • Type: Cohort  
• Population: Children and adults  
• Country: New Zealand  
• Sample: 1,037 | • Fluoridated: 0.85 ppm  
• Non-fluoridated: 0.0 to 0.03 ppm | • Children followed from birth living in fluoridated communities did not differ in IQ than those in non-fluoridated communities. This held true at 38 years of age  
• There was no significant difference in IQ between those who had or had not used fluoride toothpaste or used fluoride tablets | Strong |
| Cho et al. (2014)a    | Tooth decay            | • Type: Cross-sectional/ ecological  
• Population: Children 6, 8 and 11 years  
• Country: South Korea  
• Sample: 1,485 | • Not reported | • Children 11 years of age living in a water fluoridated-ceased area who ingested fluoridated water for ~ 4 years after birth had 12% lower caries rates than those living in a non-fluoridated area  
• There were no significant differences in caries rates in 6 and 8 year olds | Poor |
| Cho et al. (2014)b    | Tooth decay            | • Type: Cross-sectional/ ecological  
• Population: Children 11 years  
• Country: Korea  
• Sample: 1,446 | • Not reported | • Children living in fluoridated areas had a lower rates of caries across different socio-economic groups compared to children living in non-fluoridated areas | Poor |
| Choi et al. (2012)    | Intelligence           | • Type: Systematic review  
• Population: Children 4 to 16 years  
• Country: China and Iran  
• # of studies: 27 single studies | • Range: 0.4 to 11.5 ppm | • Pooled analysis of 27 studies: Children living in high-fluoride areas in rural China and Iran (up to 11.5 ppm) had significantly lower IQ scores than those who lived in low-fluoride areas  
• Authors acknowledged that “each of the [studies] reviewed had deficiencies, in some cases rather serious, which limit the conclusions that can be drawn.” (pg.1367); and the difference in IQ scores between the high- and low-fluoride groups “may be within the measurement error of IQ testing.”(pg. 1366) | Moderate |
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</table>
| Crocombe et al. (2015)  | Tooth decay/infections/dentition | Type: Cross-sectional/ ecological  
Population: Adults 15-46 years  
Country: Australia  
Sample: 466 | Fluoridated: 0.3-0.7 ppm;  
≥0.7 ppm  
Non-fluoridated: <0.3 ppm | Rural adults 15-46 years of age with 50% or higher lifetime exposure to fluoridated water had significantly lower decayed, missing or filled permanent teeth (mean=6.01) and lower numbers of filled teeth (4.08) than adults with 50% or less lifetime exposure (mean= 9.14; number of filled teeth=7.06) | Strong                               |
| Do et al. (2014)        | Tooth decay         | Type: Cross-sectional/ ecological  
Population: Children 8-12 years  
Country: Australia  
Sample: 2,611 | Not reported | Children 8-12 years of age having a higher percentage of 3-year lifetime exposure to fluoridated water had significantly lower rates and severity of caries  
Children having a higher percentage of 3-year lifetime exposure to fluoridated water had higher rates of mild fluorosis | Moderate                             |
| Do & Spencer (2015)     | Tooth decay         | Type: Cross-sectional/ ecological  
Population: Children 5-14 years  
Country: Australia  
Sample: 5,400 | Not reported | Children 5-8 years of age living in fluoridated areas had 39% lower risk of caries compared to children living in non-fluoridated areas  
Children 9-14 years of age living in fluoridated areas had 37% lower risk of caries compared to children living in non-fluoridated areas | Moderate                             |
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<tbody>
<tr>
<td>Elmer et al. (2014)</td>
<td>Tooth extraction related to tooth decay</td>
<td>Type: Hospital chart review&lt;br&gt;Population: Patients 0-19 years&lt;br&gt;Country: England&lt;br&gt;Sample: NOT REPORTED</td>
<td>Not reported</td>
<td>In 0-19 year-olds, rates of hospital admissions for the extraction of decayed teeth was significantly lower in areas with a fluoridated water supply than non-fluoridated. Note: the results were adjusted for levels of deprivation using the Index of Multiple Deprivation. Among the most deprived areas, rates of admission in the West Midland’s (fluoridated) varied between 4.17 and 4.91 per 10,000 while similar deprived areas in the North West (non-fluoridated) had rates between 51.51 and 112.58 per 10,000.</td>
<td>No validated tool available to appraise this type of study</td>
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<tr>
<td>Grandjean &amp; Landrigan (2014)</td>
<td>Intelligence/ neurotoxicity</td>
<td>Type: Non-systematic literature review&lt;br&gt;Population: Children and adults&lt;br&gt;# of studies: 1 systematic review</td>
<td>Not reported</td>
<td>Based on the findings from Choi et al. (2012) systematic review, the authors recommend to classify fluoride as a neurotoxin. &lt;br&gt;Note: see notes on Choi et al. (2012) above</td>
<td>Poor</td>
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<tr>
<td>Hashizume et al. (2013)</td>
<td>Tooth decay</td>
<td>Type: Cross-sectional/ ecological&lt;br&gt;Population: Children 8-10 years&lt;br&gt;Country: Brazil&lt;br&gt;Sample: 441</td>
<td>Not reported</td>
<td>The widespread use of fluoride in the public water supply and dentifrices decreased the prevalence of hidden caries (using x-rays) by 13.5% in Brazilian children; hidden caries was 26.4% in 1975 and 12.9% in 1996</td>
<td>Poor</td>
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<tr>
<td>Iheozor-Ejiofor et al. (2015)</td>
<td>Tooth decay</td>
<td>Type: Systematic review of prospective controlled studies&lt;br&gt;Population: Children&lt;br&gt;# of studies: 19 single studies</td>
<td>Fluoridated: 0.5 to 1.2 ppm&lt;br&gt;Non-fluoridated: &lt;0.4 ppm</td>
<td>Pooling of single studies comparing children living in fluoridated to low/non-fluoridated areas showed: &lt;br&gt;• 35% reduction in baby tooth decay (n=9; 44,268 children) &lt;br&gt;• 26% reduction in permanent tooth decay (n=10; 78,764 children)</td>
<td>Strong</td>
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</table>
|               | Dental fluorosis | Type: Systematic review of prospective controlled studies  
Population: Children  
# of studies: 40 single studies | Fluoride in the water: 0.1, 0.4, 0.7 ppm | - 15% increase in children with no tooth decay  
(n=18; 93,504 children)  
At a fluoridation level of 0.7 ppm, it was estimated that about 12% of people would have fluorosis of aesthetic concern  
At 0.4 and 0.1 ppm 10% and 8% would have fluorosis of aesthetic concern | Poor |
| Johnson et al. (2014) | Tooth decay | Type: Before-after  
Population: Children 4-15 years  
Country: Australia  
Sample: 324 | Not reported | In children 4-15 years of age, seven years of initiating water fluoridation reduced the caries rate and severity by 37%  
This reduction was most noticeable in younger children (4-9 years); with caries rates decreasing by 50% | Poor |
| Klivitsky et al. (2015) | Tooth decay | Type: Cross-sectional/ecological  
Population: Children <18 years  
Country: Israel  
Sample: 1,413 | Fluoridated: >0.7 ppm  
Non-optimally fluoridated: <0.5 ppm | Children younger than 18 years of age living in non-optimally fluoridated cities were two times more likely to report hospitalizations for dental infections than children living in optimally fluoridated cities  
This effect was more noticeable in populations of lower socio-economic status | Moderate |
| Koh et al. (2015) | Tooth decay | Type: Before-after  
Population: Children 4-9 years  
Country: Australia  
Sample: 457 | Fluoridated: 0.6 to 0.8 ppm  
Non-fluoridated: NR | In low socio-economic status children 4-9 years of age, 36 months of water fluoridation lowered caries rates and experience by 12% and 19%, respectively | Poor |
| Levy et al. (2012) | Osteosarcoma | Type: Cross-sectional/ecological  
Population: Children | Concentration range 0.7 to 4.0 ppm | In children living in the continental U.S., CWF was not associated with osteosarcoma rates  
Note: Water fluoridation status was categorized | Strong |
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<tr>
<td>Levy et al. (2014)</td>
<td>Bone density</td>
<td>Type: Cohort</td>
<td>Not reported</td>
<td>In children 15 years of age there was no association between fluoride intake and bone density</td>
<td>Moderate</td>
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<td></td>
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<td>Population: Children 15 years</td>
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<td></td>
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<td>Sample: 358</td>
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<tr>
<td>Malin &amp; Till (2015)</td>
<td>Attention Deficit Hyperactivity Disorder (ADHD)</td>
<td>Type: Cross-sectional/ecological</td>
<td>Not reported</td>
<td>Parents of 4-17 year olds living in U.S. states with a greater proportion of people receiving fluoridated water reported higher rates of ADHD in their children</td>
<td>Poor</td>
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<tr>
<td></td>
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<td>Population: Children 4-17 years</td>
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<td>Country: United States</td>
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<td>Sample: 79,264</td>
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</table>
| McDonagh et al. (2000) | Tooth decay | Type: Systematic review | Fluoridated: 0.7 to 1.2 ppm Non-fluoridated: <0.7 ppm | Pooling of single studies comparing children living in fluoridated to low/non-fluoridated areas showed:  
  o Less decayed, missing or filled primary/permanent teeth by 2.25 teeth  
  o 15% increase in caries free children | Strong |
|               |         | Population: Children and adults |                   |              |                                   |
|               |         | Country: International (30 Countries) |                   |              |                                   |
|               |         | # of studies: 26 single studies |                   |              |                                   |

5.25 ppm as low (≤ 30%) or high (≥ 85%) according to the percentage of the population receiving fluoridated water.

- Parents of 4-17 year olds living in U.S. states with a greater proportion of people receiving fluoridated water reported higher rates of ADHD in their children.
- Each 1% increase in artificial fluoridation prevalence in 1992 was associated with approximately 67,000 to 131,000 additional ADHD diagnoses from 2003 to 2011.
- There is some evidence that water fluoridation reduces the inequalities in decayed, missing or filled primary/permanent teeth across social classes in 5 and 12 year-olds. This effect was not seen in the proportion of caries-free children among 5 year-olds. The data for the
### APPENDIX I
UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION

<table>
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</tr>
</thead>
</table>
|               | Dental fluorosis | Type: Systematic review  
Population: Children  
# of studies: 88 single studies | Fluoridated: 0.6 to 1.2 ppm  
Low natural fluoride in the water: <0.3 ppm  
High natural fluoride in the water: 4-7 ppm | The prevalence of fluorosis at a water fluoride level of 1.0 ppm was estimated to be 48% and for fluorosis of aesthetic concern it was predicted to be 12.5% |  |
|               | Bone fracture or development | Type: Systematic review  
Population: Children and adults  
# of studies: 29 single studies | Range: <0.3 to 8.0 ppm | There is no association between bone fracture or bone health and water fluoridation |  |
|               | Cancer | Type: Systematic review  
Population: Children and adults  
# of studies: 26 single studies | Range: <0.3 to 8.0 ppm | There is no association between all cancer incidence or mortality (including osteosarcoma, bone/joint and thyroid cancers) and water fluoridation |  |
|               | Other safety outcomes: Down syndrome, mortality, senile dementia, goitre | Type: Systematic review  
Population: Children and adults  
# of studies: 33 single studies | Range: <0.3 to 8.0 ppm | Insufficient evidence to reach a conclusion |  |
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</thead>
</table>
| McGrady et al. (2012) | Dental caries /infections/ Dentition | - Type: Cross-sectional/ecological  
- Population: Children  
- Country: United Kingdom  
- Sample: 1,783 | - Fluoridated: 1.0 ppm  
- Non-fluoridated: Not reported | - Children living in the fluoridated community had significantly less decayed, missing or filled teeth (mean=2.94) than those living in the non-fluoridated community (mean=4.48)  
- This benefit was observed across socio-economic groups  
- The odds for developing mild fluorosis was 3 times higher in the fluoridated community than the non-fluoridated community (odds ratio=3.3) | Strong |
| McLaren et al. (2013) | Tooth decay /infections/ dentition | - Type: Cross-sectional/ecological  
- Population: Children  
- Country: Canada  
- Sample: 1,017 | - Not reported | - Children living in fluoridated communities had significantly reduced odds (coefficient= -0.44) of having 3 more decayed, missing or filled baby or permanent teeth versus 0 decay than those living in non/low fluoridated communities  
- This benefit was observed across socio-economic groups and children with the lowest socio-economic status benefited most | Strong |
| McLaren et al. (2016) | Dental caries | - Type: Cross-sectional/ecological  
- Population: Children  
- Country: Canada  
- Sample: 12,581 | - Not reported | - There was an increase in dental caries on smooth surfaces in grade two children living in both Calgary and Edmonton between 2004/05 and 2013/14  
- This increase in caries was larger and more consistent in Calgary where CWF cessation occurred  
- Change over time in mean primary tooth decay surfaces in Calgary = 2.87; and in Edmonton = 1.60. Difference in change over time between cities was statistically significant | Moderate |
| McLaren et al. (2016) | Dental caries | - Type: Uncontrolled | - Not reported | - Among grade 2 children living in Calgary, | Moderate |
### APPENDIX I
**UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION**

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</tr>
</thead>
</table>
| al. (2016)   | and inequities | before-after  
- Population: Children  
- Country: Canada  
- Sample: 3,787 |  | absence of dental insurance was associated with higher mean permanent decayed, missing or filled teeth in 2013/14 after fluoridation was discontinued (Relative Risk = 1.56), but not in 2009/10 (Relative Risk = 0.87)  
- There were no statistically significant differences in mean primary tooth decay  
- Absence of dental insurance was associated with greater likelihood of having two or more instances of untreated decay (primary or permanent), in both 2009/10 (Odds ratio = 1.76), and 2013/14 (Odds ratio = 2.0) | |
| McLaren & Singhal (2016) | Tooth decay | Type: Systematic review  
- Population: Children and adults  
- Country: North America, South America, Europe, Asia and the Caribbean  
- # of studies: 15 single studies | Not reported | Results from published studies are mixed, but pointed more to an increase in dental caries in children post-CWF cessation  
- Of the 9 studies with at least moderate methodological quality, 5 reported an increase in caries post-cessation, 3 studies did not report an increase and one reported mixed results | Moderate |
| Mullen et al. (2012) | Tooth decay/infections/dentition | Type: Cross-sectional/ecological  
- Population: Children  
- Country: United Kingdom  
- Sample: 1,403 | Fluoridated: 0.5 to 1 ppm  
Non-fluoridated: 0 to 0.3 ppm | Children living in fluoridated communities had significantly less decayed, missing or filled permanent teeth (mean=2.54) and restorations (mean=2.01) than those living in non-fluoridated communities (mean=3.63; restorations mean=3.11)  
- Children were also categorized into four lifetime exposure categories: No exposure | Strong |
### Updated Review of Evidence on the Effectiveness and Safety of Community Water Fluoridation

<table>
<thead>
<tr>
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<th>Key Findings</th>
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</tr>
</thead>
</table>
| Nasman et al. (2013) | Hip fracture | Type: Cohort  
Population: Older adults  
Country: Sweden  
Sample: 473,277  
Range: 0.1 to 2.7 ppm | | Children with the highest lifetime exposure to fluoridated water (81-100%) had significantly less decayed, missing or filled permanent teeth (mean=2.42) than those with no/zero exposure (mean=3.61)  
There were also significantly fewer restorations in both the high exposure group (mean 1.98) and medium exposure (mean=2.33) compared to the no exposure group (mean=3.10) | Strong |
| National Research Council (2006) | Outcomes related to the endocrine system | Type: Non-systematic literature review  
Population: Children and adults  
# of studies: NR | | Thyroid  
- Some human and animal studies suggest abnormal thyroid function and/or goitre may be associated with higher levels of fluoride, particularly when iodine levels are low. Most of the human studies were conducted in developing countries. The human studies conducted in developed countries did not report an effect on goitre (two studies) or thyroid function (one study)  
Parathyroid  
- Some animal and human studies reported high levels of fluoride may have an impact on calcium and/or parathyroid function  
Thyroid parafollicular | Poor |
<table>
<thead>
<tr>
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<th>Quality Rating of Study Methodology</th>
</tr>
</thead>
</table>
| O’Sullivan et al. (2015) | Tooth decay | • Type: Cross-sectional/ ecological  
• Population: Adults >50 years  
• Country: Ireland  
• Sample: 4,977 | • Fluoridated: 0.6 to 0.8 ppm  
• Non-fluoridated: Not reported | • Some studies involving people with skeletal fluorosis or workers exposed to high levels of fluoride reported associations with increased calcitonin levels (i.e., inhibition of bone resorption)  
Pineal gland  
• One animal study reported high doses of fluoride have some effects on melatonin production and sexual maturation. The human studies showed no effect  
Glucose intolerance  
• A small number of animal studies in diabetic and normal animals suggest that high doses of fluoride may trigger glucose intolerance. A few human studies involving populations with high exposures to fluoride reported impaired tolerance of glucose. Other studies reported no effect | Moderate |
| Peckham et al. (2015)   | Hypothyroidism | • Type: Cross-sectional/ ecological  
• Population: Age not reported  
• Country: England  
• Sample: 7,935; | • Not reported | • The odds of a general practitioner practice recording high levels of hypothyroidism was 37% higher in areas with maximum fluoride of >0.3 and ≤0.7 ppm and 62% higher in areas with >0.7 ppm, than practices in areas with maximum fluoride ≤0.3 ppm | Poor |
## APPENDIX I
UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION

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</tr>
</thead>
<tbody>
<tr>
<td>Perez-Perez et al. (2014)</td>
<td>Dental fluorosis</td>
<td>Participating Physicians’ practices</td>
<td>Fluoridated tap water: 0.7 ppm, Well water: 0.43 ppm, Bottled water: &lt; 1.5 ppm</td>
<td>In children 8-14 years of age there was no association between fluoridated water and the level of fluorosis</td>
<td>Moderate</td>
</tr>
<tr>
<td>Peterson et al. (2015)</td>
<td>Arsenic from fluoridation</td>
<td>Type: Cross-sectional/ ecological Population: drinking water samples from Ontario Country: Canada Sample: 2,658</td>
<td>Fluoridated: mean = 0.53 mg/L Non-fluoridated: 0.12 mg/L</td>
<td>Drinking water treatment was found to reduce arsenic levels in water in both fluoridated and non-fluoridated systems by 0.2 ug/L (0.0002 mg/L) Fluoridated drinking water systems were associated with an additional 0.078 ug/L (0.000078 mg/L) of arsenic in water when compared to non-fluoridated water systems</td>
<td>Strong</td>
</tr>
</tbody>
</table>
| Ran & Chattopadhyahet (2016) | Economic evaluation of fluoridation | Type: Systematic review of economic studies Population: Children and adults Country: International # of studies: 10 single studies | Not reported | This updated review included 10 studies, four reporting CWF benefits only, and six reporting both costs and benefits (Note: the previous review was conducted in 2002 and included nine studies) All included studies reported CWF to be a value-for-money intervention, and its benefits increased with community population size
  - The four benefit-only studies reported lower dental costs in fluoridated vs. non-fluoridated communities
  - In the six cost-benefit studies, per capita annual fluoridation costs ranged from $0.11 to $4.92, and benefits | Moderate |
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</thead>
</table>
| Rugg-Gunn & Do (2012) | Tooth decay                 | - Type: Non-systematic literature review  
- Population: Children ≥ 12 years  
- # of studies: 59 single studies                                                                 | 4.2-21                                    | ranged from $5.49 to $93.19 for communities with at least 1,000 population. Benefit-cost ratios ranged from 1.12:1 to 135:1, and these ratios were positively associated with community population size | Poor                                |
| Schwartz (2014)     | Eye cancer                  | - Type: Cross-sectional/ecological  
- Population: Children and adults of all ages  
- Country: United States  
- Sample: Census data from 44/55 states                                                   | Not reported                             | Studies conducted after 1990 report lower effect in caries reduction than studies before 1990  
Reductions in recent studies are still substantial                                                                                                                    | Moderate                            |
| Slade et al. (2013) | Tooth decay/infections/dentition | - Type: Cross-sectional/ecological  
- Population: Adults  
- Country: Australia  
- Sample: 3,779                                                                                   | Fluoridated: 0.5 to 1 ppm  
Non-fluoridated: NR                                                                              | Australian adults with prolonged lifetime exposure to CWF versus negligible exposure had 12% lower decayed, missing or filled permanent teeth in the pre-1960 cohort and 11% lower in the 1960-1990 cohort | Strong                              |
| Yeung (2008)        | Tooth decay                 | - Type: Systematic review; non-randomized trial; before-after; time series; cohort; cross-             | Fluoridated: 0.7 to 1.0 ppm  
Non-fluoridated:                                                                                       | Pooling of single studies comparing children living in fluoridated to non-fluoridated areas showed:  
14% reduction in tooth decay (n=9; number of children not reported)                                                                                       | Strong                              |
### APPENDIX I
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dental fluorosis</td>
<td>sectional/ecological</td>
<td>Population: Children # of studies: 31 studies</td>
<td>&lt; 0.4 ppm</td>
<td>Three times more likely to have improvements in baby/permanent teeth (n=9; number of children not reported)</td>
</tr>
<tr>
<td></td>
<td>Dental fluorosis</td>
<td>Type: Systematic review; before-after; case control; cross-sectional/ecological</td>
<td>Population: Children # of studies: 77 studies</td>
<td>Fluoridated: 0.7 ppm Non-fluoridated: 0.4 ppm</td>
<td>In fluoridated areas, there was 4-5% increase in fluorosis than non-fluoridated areas. Increase in water fluoride level from 0.4 ppm to 0.7 ppm would lead to one additional person with fluorosis of aesthetic concern for every 55 people consuming fluoridated water.</td>
</tr>
<tr>
<td></td>
<td>Bone fracture or Osteoporosis</td>
<td>Type: Systematic review; cohort; case-control; cross-sectional/ecological</td>
<td>Population: Children and adults # of studies: 30 single studies</td>
<td>Range: 0.25 to 8.0 ppm</td>
<td>No association between water fluoridation (1.0 ppm) and bone fracture or osteoporosis</td>
</tr>
<tr>
<td></td>
<td>Cancer (All-cause, Bone/Joint, Osteosarcoma and Thyroid)</td>
<td>Type: Systematic review; before-after; case control; cross-sectional/ecological</td>
<td>Population: Children and adults # of studies: 30 single studies</td>
<td>Fluoridated: 1.0 ppm Non-fluoridated: various levels or lowest ppm</td>
<td>No association between water fluoridation (1.0 ppm) and cancer of all-cause, bone/joint cancer, osteosarcoma, thyroid cancer or mortality</td>
</tr>
<tr>
<td></td>
<td>Other Health Outcomes: Dementia, Still Births,</td>
<td>Type: Systematic review; before-after; cohort; case control; cross-sectional/</td>
<td></td>
<td>Fluoridated: 1.0 ppm Non-fluoridated:</td>
<td>Insufficient evidence to suggest an association between fluoridation and 12 adverse health outcomes</td>
</tr>
<tr>
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<tr>
<td></td>
<td>Congenital Malformations, Down syndrome, Sudden Infant Death Syndrome, Mental Retardation, IQ, Skeletal Fluorosis, Goitre, Urinary Stone Disease, Coronary Heart Disease and Mortality</td>
<td>ecological • Population: Children and adults • # of studies: 30 single studies</td>
<td>different levels or lowest ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young et al. (2015)</td>
<td>Hip fracture, Down syndrome, all-cancer, all-cause mortality and osteosarcoma</td>
<td>• Type: Cross-sectional/ecological • Population: Children and adults • Country: United Kingdom • Sample: 32,482</td>
<td>Fluoridated: 1.0 to 1.5 ppm • Non-fluoridated: Not reported</td>
<td>• In children and adults, there was no association between CWF and hip fractures, Down syndrome, all-cancer, all-cause mortality or osteosarcoma • People living in fluoridated areas had a 8% lower incidence rate for renal stones and bladder cancer, respectively, than those living in non-fluoridated areas</td>
<td>Strong</td>
</tr>
<tr>
<td>Zohoori et al. (2014)</td>
<td>Fluoride intake</td>
<td>• Type: Cross-sectional/ecological • Population: Infants 1-12 months • Country: United</td>
<td>Fluoridated, mean ingestion: 0.107 mg/kg body weight</td>
<td>• Mean total daily fluoride intake of infants living in fluoridated and non-fluoridated areas was 0.107 and 0.024 mg/kg body weight per day, respectively • Total daily fluoride intake of 79% of infants</td>
<td>Poor</td>
</tr>
</tbody>
</table>
### Appended review of evidence on the effectiveness and safety of community water fluoridation

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<tbody>
<tr>
<td>Kingdom</td>
<td></td>
<td>• Sample: 38 communities (n=19 fluoridated community; n= 19 non-fluoridated community) • Non-fluoridated: 0.024 mg/kg body weight</td>
<td>living in the fluoridated area exceeded the fluoride intake threshold of 0.07 mg/kg body weight per day. • Total daily fluoride intake of 95% of infants living in the non-fluoridated areas were below the lower threshold of the suggested ‘optimal’ fluoride intake (0.05 mg/kg body weight per day)</td>
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</tr>
</tbody>
</table>
References


APPENDIX II
UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION


APPENDIX II
UPDATED REVIEW OF EVIDENCE ON THE EFFECTIVENESS AND SAFETY OF COMMUNITY WATER FLUORIDATION


Review of Evidence and Community Water Fluoridation Across Ontario

Community Water Fluoridation Committee
October 13, 2016

Eileen de Villa, MD, MBA, MHSc, CCFP, FRCPC
Medical Officer of Health
Review of Research Evidence

(Part 1)
There is extensive published evidence on the subject of CWF. The purpose of this evidence review is to provide:

- an up-to-date **summary** of the published research
- a **synthesis** of the large amounts of data presented in research
- an **analysis** of the results of the research
Approach to Evidence-Informed Decision Making

Comprehensive Search

- Search of electronic databases by a trained librarian;
- Automated database alerts to immediately identify newly published studies;
- Review any study requested by members of Council or their constituents

Relevance Criteria

- Studies were included if they were:
  - published in English;
  - were systematic reviews, experimental or observational studies; and
  - assessed the effect of CWF within the range of 0.5 - 1.2 mg/L on any health outcome

- Studies were excluded if they were:
  - outside of the range, in vitro or performed on animals;
  - non-systematic (literature) reviews, opinion notes, editorials;
  - if the study methodology was not reported

Critical Appraisal

- Validated critical appraisal tools were selected according to the type of study design, such as:
  - Health-Evidence Quality Assessment of Reviews Tool
  - Cochrane Effective Practice and Organisation of Care Risk-of-Bias Tool
  - Critical Appraisal Skills Programme Cohort Study Checklist
  - 11 Questions to Help You Make Sense of Descriptive/Cross-sectional Studies Tool

- Two experienced reviewers independently appraised the methodological quality of all included studies
Evidence Review Focus

Topic Area:
Evidence on the Effectiveness and Safety of Community Water Fluoridation

Process
Is the process undertaken by study researchers:
- Reliable?
- Replicable?

Results
Are the results reported by study researchers relevant?
How do the results relate to existing evidence?
Results of Evidence Review

Safety

• One systematic review of 30 studies and six strong single studies reported on safety. Across these studies, 19 safety outcomes were assessed: cancer of all causes, thyroid cancer, bone cancer/osteosarcoma, intelligence, congenital malformations, dementia, still births, Down syndrome, sudden infant death syndrome, mental retardation, skeletal fluorosis, bone fracture, hip fracture, osteoporosis, goitre, urinary stone disease, coronary heart disease/mortality, and all-cause mortality.

• Studies assessing the safety of CWF do not support a link between fluoride in drinking water at the optimal concentration (0.7mg/L) and any adverse health effects.
Results of Evidence Review

Effectiveness

- Two systematic reviews (total of 50 single studies) reported beneficial effects when comparing children living in fluoridated and low/non-fluoridated communities. When comparing children living in fluoridated (0.5-1.2 parts per million [ppm]) to low/non-fluoridated (<0.4 ppm) areas findings included:
  - 35 per cent reduction in cavities in baby teeth (pooling of nine studies = 44,268 children)
  - 26 per cent reduction in cavities in permanent teeth (pooling of 10 studies = 78,764 children)
  - 15 per cent increase in children with no cavities (pooling of 18 studies = 93,504 children)

- Two recent, strong quality single studies assessed equity and both found the benefits of CWF to be equally distributed across socioeconomic groups, with some benefits being more pronounced in children of low income families.
Results of Evidence Review

Dental Fluorosis

- One systematic review of 40 studies (59,630 children) reported that in a community where water is fluoridated to 0.7 ppm, an estimated 12 per cent of children would be expected to have fluorosis of aesthetic concern; at a water fluoride level of 0.1 ppm, eight per cent of children would have fluorosis of aesthetic concern.

- A recent, strong quality single study reported 55 per cent of children in the fluoridated community had fluorosis (of any level) versus 27 per cent of children living in the non-fluoridated area.

- In Canada, 16% of children aged 6-12 years have fluorosis at very mild-mild levels. Moderate–severe levels are so low, they are not reportable.
Toxicological Analysis

• For fluoridation additives and residuals

• For fluoride
  – Health Canada position, based on approximately 430 studies:
    • Health Canada has established the guideline for fluoride in drinking water as a maximum acceptable concentration of 1.5 milligrams per litre. Water containing fluoride at, or below, this maximum acceptable concentration does not pose a risk to human health.
Community Water Fluoridation across Ontario

(Part 2)
Purpose of Jurisdictional Review

The purpose of this jurisdictional evidence review is to:

- Provide a **summary of best-available information** on community water fluoridation across jurisdictions

- **Better understand the rationale** for decisions on community water fluoridation
Approach to Jurisdictional Review

- In the absence of national-level coordination to monitor and report on CWF, staff relied on:
  
  - Consultations with the Ministry of the Environment and Climate Change (MOECC)
  
  - Online scan of council documents and relevant media
  
  - Direct contact with key informants within jurisdictions of interest, when possible
Types of Decisions related to CWF

• Decisions are typically multi-faceted and made at the local level. In general, there are three types of decisions made related to community water fluoridation:

  - Start or Not Start
  - Continue or Discontinue
  - Change Fluoridation Additive

• Decisions may be influenced by various factors, such as:
  - Health considerations
  - Technical (e.g., equipment)
  - Financial
  - Resident/community input
  - Water system operator decisions
Results of Jurisdictional Review

- In Ontario, as of January 11, 2016, there were approximately 75 municipal residential drinking water systems in Ontario with fluoridation.

- In 2012, approximately 67.3 per cent of the population lived in a community with a fluoridated water system.
## Examples of Decisions Across Ontario

<table>
<thead>
<tr>
<th>Start</th>
<th>Not Start</th>
<th>Continue</th>
<th>Discontinue</th>
<th>Change Additive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Port Severn (Lone Pine) Drinking Water System(^1) (DWS)</td>
<td>• Town of Kingsville</td>
<td>• City of Toronto</td>
<td>• Huntsville (Fairyview) DWS(^1)</td>
<td>• City of Toronto</td>
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<tr>
<td></td>
<td></td>
<td>• City of Hamilton</td>
<td>• Birch Glen (Baysville) DWS(^1)</td>
<td>• Region of Durham</td>
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<td>• Region of Halton</td>
<td>• City of Windsor</td>
<td>• Region of Norfolk</td>
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<td>• City of London</td>
<td>• Town of Amherstburg</td>
<td>• Smiths Falls</td>
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<td></td>
<td></td>
<td>• Town of Bracebridge(^1)</td>
<td>• Town of Kirkland Lake</td>
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<td>• Town of Lakeshore</td>
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<td>• Region of Waterloo</td>
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<td></td>
<td>• Town of Parry Sound</td>
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<td>• Township of Nairn and Hyman</td>
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<td></td>
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<td>• City of Cornwall (decision pending)</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Local municipalities within the District Municipality of Muskoka
Summary

- Research evidence continues to confirm that CWF is effective and safe, when practiced within the optimal range.

- Jurisdictions across Ontario continue to discuss and make local decisions about CWF.
From: Christine Massey [mailto:cmssyc@gmail.com]
Sent: 2016/10/03 10:29 AM
To: de Villa, Eileen <Eileen.deVilla@peelregion.ca>
Cc: Dale, Frank <frank.dale@mississauga.ca>; Johanna.Downey@calendon.ca; Annette.Groves@calendon.ca; Palleschi, Michael - Councillor <Michael.Palleschi@brampton.ca>; Carolyn Parrish <carolyn.parrish@mississauga.ca>; Karen Ras <karen.ras@mississauga.ca>; Sprovieri, John Councillor <John.Sprovieri@brampton.ca>; Tovey, Jim <jim.tovey@mississauga.ca>
Subject: disclosure of Jan. 21 fluoridation presenter’s close ties to province

Dear Dr. de Villa,

Members of the Community Water Fluoridation Committee have been copied on this message.

I am concerned that toxicologist David Juurlink may have been, on your recommendation, chosen to present to Council and many Regional Staff Members at the closed fluoridation meeting of January 21st under the guise that he was unbiased and had no prior opinion on water fluoridation until he reviewed the issue for the Region, even though this is not the case.

My reasons for this concern are given below.

In 2004, David Juurlink was appointed by Premier Dalton McGuinty to a Ministry of Health and Long Term Care committee (see page 2, here: http://www.ontla.on.ca/library/repository/mon/28002/243515.pdf).

I understand that this was not disclosed at the fluoridation meeting, even though the province is currently being sued over artificial water fluoridation and would obviously be displeased with David Juurlink should he ever express anything other than "safe and effective" in regards to fluoridation.

Further, a quick Internet search revealed this webpage of the Ontario Drug Policy Research Network (ODPRN) indicating that "Core Academic Unit Member" David Juurlink is currently "a member of the Ontario Ministry of Health and Long-Term Care Committee to Evaluate Drugs": http://odprn.ca/about-the-odprn/core-academic-unit-members/


ICES, where David Juurlink is a "Senior Core Scientist", provided me the following information: "ICES is an independent not-for-profit corporation that receives core funding from the Ontario Ministry of Health and Long-Term Care." (email available upon request)

This June 2015 report states that "... David Juurlink received grant funding from the Ministry of Health and Long-term Care":


Apparently David Juurlink - who has twice ignored my polite emails requesting that he provide his January 21st presentation to the people of Peel Region - has a long and close association with the province, which I have only started to explore.
Further, please note that this pro-fluoridation article published in the August 1991 Nova Scotia Medical Journal (see page 126) was authored by “David Juurlink, BSc, PhD”: https://dalspace.library.dal.ca/xmlui/bitstream/handle/10222/50527/NSMJ%201991%20Vol.70%284%29%20101-131_OCR_150dpi_PDFA1b.pdf?sequence=1&isAllowed=y (Note that David Juurlink received a degree in Medicine in 1994 and started his career as an MD.)

David Juurlink is also the staff editor of a 2011 document for University of Toronto medical students which in one breath says infants should be given fluoride, and in the next that fluoride should be spit out by children under the age of 3. There is also a pro-fluoridation statement at the very end of this document: https://archive.org/stream/NelsonEssentialsOfPediatrics5E/The_Toronto_Notes_for_Medical_Students_2011_djvu.txt

Dr. de Villa, why did you not ensure that David Juurlink's continuing close ties to the very province that is being sued over fluoridation and wishes to maintain the public's "safe and effective" perception of it were not disclosed at the fluoridation meeting given that this is clearly relevant information?

And did you disclose to the Community Water Fluoridation Committee David Juurlink's previously stated position on fluoridation (of 1991 and 2011) when he was being discussed as a potential presenter for the January 21st meeting?

Best wishes,

Christine Massey
ADDITIONAL MATERIALS
DISTRIBUTED AT MEETING
November 16th, 2016

Re: Request to Make a Delegation before the CWFC.

To
Chair Councilor Carolyn Parrish
Vice Chair Councilor Sprovieri
and
All Community Water Fluoridation Committee Members:
2016/11/16

Dear Madam/Sir,

On March 31\textsuperscript{st} 2016, I sent a request to make a delegation before your committee. Unfortunately that time I decided to withdraw delegation as I became very sick with cancer.

It is my understanding that you are in the final process of collecting the evidence in support and in opposition of artificial water fluoridation. Therefore I would like to request for the opportunity to resubmit my delegation for your consideration so that I shall be permitted to make a presentation before you at your next meeting on Thursday, November 24\textsuperscript{th}.

Please be kind to let me know at your earliest, so that I can prepare myself for the presentation.

In this regard I like to mention that I have completed my delegation form and it has been sent to the appropriate department.

I thank you

Sincerely,
Dr. Raymond Ray
Request for Delegation

Attention: Regional Clerk
Regional Municipality of Peel
10 Peel Centre Drive, Suite A
Brampton, ON L6T 4B9
Phone: 905-791-7800 ext. 4582 Fax: 905-791-1693
E-mail: council@peelregion.ca

FOR OFFICE USE ONLY

MEETING DATE YYYY/MM/DD
2016/11/24

MEETING NAME
CWFC

REQUEST DATE YYYY/MM/DD
2016/11/16

NAME OF INDIVIDUAL(S)
Dr. Raymond Ray D.Sc.

POSITION/TITLE
Retired biochemist and nuclear physicist

NAME OF ORGANIZATION

E-MAIL

TELEPHONE NUMBER

EXTENSION

FAX NUMBER

NAME OF INDIVIDUAL(S)

POSITION/TITLE

NAME OF ORGANIZATION

E-MAIL

TELEPHONE NUMBER

EXTENSION

FAX NUMBER

REASON(S) FOR DELEGATION REQUEST (SUBJECT MATTER TO BE DISCUSSED)
It is imperative for you to receive the information I will present in opposition to fluoridation as all Municipal Councillors are the decision makers on the purchase and the addition of the toxic chemical in question, Hydrofluorosilic Acid, that is neither safe or effective and is governed by many laws which are being violated. Prominent political leaders have received my information and have been put on notice.

I AM SUBMITTING A FORMAL PRESENTATION TO ACCOMPANY MY DELEGATION

☐ YES  ✗ NO

IF YES, PLEASE ADVISE OF THE FORMAT OF YOUR PRESENTATION (ie POWERPOINT)

Note:
Delegates are requested to provide an electronic copy of all background material / presentations to the Clerk’s Division at least seven (7) business days prior to the meeting date so that it can be included with the agenda package. In accordance with Procedure By-law 100-2012, as amended, delegates appearing before Regional Council or Committee are requested to limit their remarks to 5 minutes and 10 minutes respectively (approximately 5/10 slides).

Once the above information is received in the Clerk’s Division, you will be contacted by Legislative Services staff to confirm your placement on the appropriate agenda. Thank you.

Notice with Respect to the Collection of Personal Information
(Municipal Freedom of Information and Protection of Privacy Act)

Personal information contained on this form is authorized under Section IV-4 of the Region of Peel Procedure By-law 100-2012 as amended, for the purpose of contacting individuals and/or organizations requesting an opportunity to appear as a delegation before Regional Council or a Committee of Council. The Delegation Request Form will be published in its entirety with the public agenda. The Procedure By-law is a requirement of Section 238(2) of the Municipal Act, 2001, as amended. Please note that all meetings are open to the public except where permitted to be closed to the public under legislated authority. All Regional Council meetings are audio broadcast via the internet and will be video broadcast on the local cable television network where video files will be posted and available for viewing subsequent to those meetings. Questions about collection may be directed to the Manager of Legislative Services, 10 Peel Centre Drive, Suite A, 5th floor, Brampton, ON L6T 4B9, (905) 791-7800 ext. 4462.