

Taken from: Attachment #1, MO-01-12 – Water Fluoridation in Halton Region

### Evidence-Based Decision-Making? Or, Decision-Based Evidence-Finding?

“The human understanding when it has once adopted an opinion...draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these either neglects and despises, or else by some distinction sets aside and rejects, in order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate.”

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Francis Bacon, *Novum Organum* (1620), as quoted by Michael Shermer, *The Believing Brain* (New York, Times Books, Henry Holt and Company, 2011), 294. Shermer's quotation, for sake of brevity leaves out "or else... rejects," this phrase being added from the full quotation at [http://www.todayinsci.com/B/Bacon\\_Francis/BaconFrancis-Quotations.htm](http://www.todayinsci.com/B/Bacon_Francis/BaconFrancis-Quotations.htm).

What is the difference between looking at the evidence and then making a decision, versus making a decision and then selecting evidence to support it? How does one distinguish a heartfelt worry from a set agenda based on a fixed, pre-existing belief?

People have a right to worry and to receive answers from governments that deliver or regulate the things that are causing worry. But what distinguishes a person with a genuine worry from a person who has a fixed agenda to cause a government to stop doing a certain thing, no matter what evidence the government or anyone else presents?

The person with a genuine worry wants information—which is not yet in his or her possession—that will answer a specific question. Is it safe? What will it do for me? Will it harm me? The person is open to the answers and is hoping to be reassured. He or she does not ask the questions having already made up his or her mind. The facts he or she gathers will help form his or her subsequent belief.

The person with the set agenda wants to convince government that it is wrong and will use many different methods to persuade government to change its mind, whether in and of itself or through public pressure. As such, any government or expert answer is found faulty or rejected unless it happens to support the preset agenda. Arguments that have been shown by government or experts to be false or weak are nevertheless presented over and over again with the knowledge that sheer repetition can make something appear to be true. Old arguments that have already been shown to be faulty are dusted off and brought back, as if new, to new and old audiences. The person with the fixed agenda gathers information in order to sort through it and select those items that confirm his or her preset belief and ignore or argue away those that do not support his or her belief. This sets evidence-based decision making upside down, creating instead decision-based evidence finding.

Every one of the following anti-fluoridation arguments already has a perfectly adequate response, whether through common sense, ethical reasoning, legal frameworks, or high-level scientific evidence. Yet that won't stop the person with an anti-fluoridation agenda from making the arguments sound new and unanswered.

- **Bad Science** – Said of any scientific statement that does not support the anti-fluoridation agenda. In reality, the quality of science is properly ascertained through careful critical appraisal, which is something that is done as part of the standard methods for high-level, systematic reviews and meta-analyses, which anti-fluoridationists usually downplay or fault as being biased (see “Bias”).
- **Don’t Quote Health Canada: Prove It Yourself** – With this line of argument all the very credible reports and recommendations from the most respected and credible organizations get thrown out the window even though this is the evidence that has been collected, critically analyzed, and synthesized in the most structured, systematic, and reproducible way. This argument is clearly meant to draw attention away from the best evidence and to cause resources and time to be consumed in the repetition of already excellent work. At the same time this strategy places a very difficult burden on to the local public health unit, which does not have the same resources to study this issue as do organizations such as Health Canada, the US Centers for Disease Control and Prevention, and the World Health Organization.
- **No Evidence** – “There is no evidence that...” goes the argument. In fact, there is plenty of good evidence on all aspects of the safety and effectiveness of fluoridation. This anti-fluoridationist argument is made with the hope and knowledge that repeating a lie often enough will make it sound true.
- **Controversy** – Anti-fluoridationists want everyone to think that there is controversy. There is no real controversy—the science is quite clear—but the word makes one think there are two, more-or-less equal sides (see “Balance”).
- **Balance** – A word used by opponents of fluoridation to make one think that all opinions, no matter how unsubstantiated by rigorous scientific method, should be given equal time and credence, and that instead of representing a tiny fraction of scientific opinion, anti-fluoridation scientists represent something like a half (see “Controversy”).
- **Bias** – Used by anti-fluoridationists to attempt to discredit public health officials and dentists. But would one accept that, for example, a cancer specialist is biased and therefore should not be relied upon for information about the diagnosis, staging, and treatment of cancer? The best way to avoid bias is to find systematic reviews and meta-analyses that have used well-defined, reproducible, scientifically-accepted methods to identify, critically appraise, and synthesize all the peer-reviewed, published research on the subject of interest. Ironically, these types of reviews are typically dismissed or underplayed by anti-fluoridationists, while cherry-picked studies are trumpeted—an approach most susceptible to bias.
- **Conflict of Interest** – Vague allusions about dentists profiting from fluoridation via cosmetic treatment of dental fluorosis. In reality, fluoridation decreases the bread and butter business of dentistry, which is the prevention and treatment of cavities. But that is fine because dentists want you to have good oral health just like physicians want you to have good health. Mild and very mild dental fluorosis, to which water fluoridation at 0.7 mg/L only contributes in small part, is hardly noticeable (see “Dental Fluorosis”) and would not require any treatment.

- Conspiracy – Anti-fluoridationist position that governments, experts, dentists, public health professionals—anyone speaking in favour of fluoridation—are part of a fluoride-industry-led conspiracy, therefore in the pay of industry and lying on its behalf, or too ignorant or stupid to recognize the conspiracy. Given that the vast majority of scientifically credible organizations and individuals endorse drinking water fluoridation—which in reality they do on the basis of the true scientific evidence—this would be an enormous conspiracy involving untold thousands of people. Yet no conspirator has ever broken ranks and come forth with factual information on such a massive conspiracy. It stretches all credulity to the breaking point.
- Corruption – See “Conspiracy”
- Fraud – See “Conspiracy”
- Government Power – See “Conspiracy”
- Dental Lobby – See “Conspiracy” and “Conflict of Interest”
- Ignorance – An alternative argument if the conspiracy one isn’t sticking: If public health officials are *not* in a conspiracy, then these officials are saying what they are saying because they don’t actually know the truth (see “Conspiracy”).
- Snow-jobbed – Another alternative argument: Public health officials themselves have been conned and only anti-fluoridationists are capable of seeing the truth (see “Conspiracy”).
- Stupidity – Yet another alternative argument: Public health officials are too stupid to recognize the truth (see “Conspiracy”).
- Forced Medication – An anti-fluoridationist argument that tries to cause unease because it might make one think of mind-control (see “Mind-Control”), ignores that a mineral that occurs naturally in water doesn’t make for a good comparison with drugs, and also ignores that additives to salt (iodine), milk (vitamin D), and flour (iron, B vitamins, folic acid) have long, positive public health histories in Canada.
- Ethics – The individual right to choose should always trump other rights. This ignores that we live in a society in which greater good comes about because individuals contribute to the whole, the society often choosing measures that further the health and safety of *all* its members. Wearing seatbelts is an example as is protecting people from second hand smoke. Also, we must remember that it is children that receive a significant benefit from water fluoridation, just as they do from other measures such as protecting their eyes with an antibiotic application at birth and vaccinations, and that it would be unfair for children to lose this benefit on the basis of individual objections of a few adults. See also “Forced Medication”.
- Freedom – See “Ethics” and “Individual Rights”.
- Individual Rights – Cavities don’t kill anyone and they are not contagious, so this issue isn’t important enough to trump my individual rights. This argument sets up a number of false premises. It is misleading to make one think that dental disease has no important consequences. In fact, dental health is very important to every person, both to be pain free and to be able to nourish oneself properly, but also because poor dental health is an impediment to being successful in our society. Furthermore, though research in this area is still evolving, there is fair evidence to

show that poor dental health increases the risk of death by increasing risk of cardiovascular disease and of certain cancers, which are not oral cancers. There is also the very small, but non-zero, risk of death as a result of general anaesthesia, which is sometimes required when treating dental problems, particularly in young children. Finally, bacteria that cause dental caries are transmissible, in particular from mother to infant, though the presence of these bacteria does not on its own mean there will be dental disease. See also “Ethics”.

- How Dare You... – Used when other arguments are failing, for example, “How dare you say that my daughter’s [very mild] dental fluorosis is not a health issue?” Mild or very mild dental fluorosis has little impact on oral health-related quality of life. By way of an analogy, medical doctors would readily say “yes, a small-pox vaccination scar should not be a health or mental health issue, just like anything else that isn’t even noticed by the majority of people who have it and causes no impairment” (see “Dental Fluorosis”).
- We Represent the Public – In fact, when asked in telephone surveys, the majority of the public is in favour of drinking water fluoridation. Anti-fluoridationists, who are in actuality very small in number, represent primarily themselves.
- This Disease; If Not, Then That Disease; If Not, Then Any Disease – Because none of the claims for causing adverse individual effects are credible, anti-fluoridationists have kept adding diseases or adverse effects—even while keeping the old ones on their lists—knowing that this will cause anxiety. The bottom line is that the credible scientific evidence does not support a link between fluoride in drinking water at 1.5 mg/L and *any* adverse health effects. Water fluoridation may be responsible for approximately 10% of dental fluorosis, which is very mild to mild, but this is not an adverse health effect and is not a sign of any other problems (see also “How Dare You” and “Dental Fluorosis”).
- Specific Cancer; If Not, Then Any Cancer – An argument that is clearly designed to frighten, which is brought back repeatedly even though there is no credible evidence supporting this assertion. Fluoridation has not been causally linked to any specific cancer (e.g., bone or thyroid) or to cancers in general. Anti-fluoridationists like to repeatedly refer to a single 2006 exploratory analysis that found an increased risk associated with fluoride of the bone cancer osteosarcoma in young males only, even though co-authors of this study have themselves cautioned not to over-interpret the results of this study. The weight of evidence of studies before and after this 2006 exploratory analysis does not link osteosarcoma, which is a rare cancer, to fluoride. Aside from links to therapeutic radiation for a previous different cancer, certain cancer predisposition syndromes, and Paget’s disease of the bone, the risk factors for osteosarcoma have not been found, but it is reasonable to conclude, looking at the totality of the evidence, that fluoride won’t suddenly emerge as a risk factor.
- Animal Studies – Animal studies that demonstrate the safety of fluoridation are ignored, but ones whose results question fluoride’s safety are quoted repeatedly. Such studies, even when not methodologically flawed, may be extremely limited in their application to humans. For example, in one study that is often quoted by anti-fluoridationists, rats were provided with fluoridated water at 75 to 175 ppm, which has little relevance to human exposures at 0.7 ppm (the study had other

limitations in addition). In terms of the hierarchy of evidence, animal studies become more important when human studies are not available, which is not the case regarding fluoridation. Evidence from human studies carries much more weight than evidence from animal studies, which can miss potential problems in humans entirely or find problems that do not occur in humans because of differences in anatomy, physiology, metabolism, pharmacokinetics, reproduction, etc.

- Hypersensitivity – Another last resort argument: 0.7 mg/L may be fine for the majority of people, but not for me because I have a hypersensitivity. There is no credible evidence that the fluoride ion can be associated with hypersensitivity or other immunological effects. Fluoride is found naturally in foods and water, and is found naturally in all humans.
- Intelligence Quotient – Picked to really scare parents, but based primarily on studies from rural China in which it is difficult to interpret the results given all the other of the huge range of things that can affect IQ scores and where natural fluoride in water can be five or more times higher than the recommended range. Even so, one of the marginally better of these studies showed that the group of children with mild dental fluorosis (out of none, questionable, very mild, mild, and moderate) had the highest mean IQ and lowest percentage of IQs less than 90. But using the results in this way would be the same as the anti-fluoridationist strategy of picking and choosing studies (or even from within studies) instead of systematically understanding the whole picture.
- Specific Hormonal; If Not, Then Any Hormonal – Thyroid function is often given as an argument against fluoridation. However, optimal levels of fluoride in drinking water have not been shown to affect thyroid function nor any other hormonal function.
- Development – Another argument chosen to frighten: Who wouldn't want to do everything possible for a healthy pregnancy? The facts though show that even concentrations up to 4 mg/L—well above the 0.7 mg/L used for drinking water fluoridation—have not been found to cause reproductive or developmental health effects.
- Bone Fracture – Fluoride is taken up by bones so it contributes to bone fracture say the anti-fluoridationists, but this is not at all supported by the sum of the studies looking at this very question, which shows that drinking water fluoridation has no effect on bone fracture risk and does not cause skeletal fluorosis.
- People With Decreased Kidney Function – A variation on the “Bone Fracture” argument. The fact is that people with decreased renal function do not have to worry about fluoridation of their drinking water. There is no evidence that fluoride intake from sources other than water fluoridation, such as fluoride supplements, rinses and toothpastes, pose any risk to patients with renal disease, once the normal precautions (e.g., avoid swallowing toothpaste) applying to the use of these products are carried out. Water used specifically for peritoneal dialysis must meet a number of requirements in terms of mineral content/removal; fluoride is not special in this regard.
- Dental Fluorosis (White Patches) – Anti-fluoridationists are quick to claim that dental fluorosis is a major problem. Dental fluorosis can be categorized into

normal (none), questionable, very mild, mild, moderate, and severe. Very mild and mild fluorosis have no effect on tooth function. The majority of those who have the milder forms of fluorosis are unaware of this condition. In a study in Quebec in which parents were asked whether they liked the colour of their children's teeth, there was no difference in parents of children with or without fluorosis, again demonstrating that milder forms of fluorosis have little visual impact. A 2010 literature review on aesthetic perceptions of dental fluorosis found that mild fluorosis was not a concern with regard to impact on quality of life and that mild fluorosis was sometimes associated with improved oral health-related quality of life. See also "How Dare You" and "Too Much Fluoride".

- Too Much Fluoride – Raised to make it sound like community water fluoridation is the biggest risk factor for dental fluorosis. In reality, fluoride at 0.7 mg/L in drinking water minimizes the risk of moderate dental fluorosis while still achieving a reduction in dental caries. In 1994 it was estimated that water fluoridation would account for only 13% of all dental fluorosis. Swallowing toothpaste at young ages is a far bigger risk factor.
- Infants, Pregnant Mothers, Athletes – Sometimes exaggerated claims are made about how much water various groups consume. At 0.7 mg/L fluoride no groups are at risk of excessive fluoride intake, and even for infants fed with water reconstituted formula there is only a small contribution to the risk of very mild to mild dental fluorosis, which would not be a health risk (see "Dental Fluorosis" and "How Dare You").
- Not an Essential Nutrient – This argument is somewhat of a red herring. While it is true that an absence of fluoride should not cause any deficiency disease, it would decrease the health and longevity of our teeth. The World Health Organization (Nutrients in Drinking Water, 2005) states the following about mineral elements: "Calcium, Na, K, Cl, Mg, Fe, Zn, Cu, Cr, I, Co, Mo and Se are unequivocally essential for human health.... A second group of elements that have some beneficial health effects, include F in the prevention of dental caries and B, Mn, Ni, Si and Va, that may be considered essential for humans based on emerging information." Furthermore, the question of whether fluoride is actually essential for the initiation of normal enamel crystal formation is still open because it would be difficult to set up an animal model laboratory experiment in which fluoride is totally absent given fluoride's normal presence in foods, soil, and other natural products.
- Water Quality – We care about water quality and don't want it degraded by adding artificial chemicals, goes the argument. Public health and public works departments have their century-old roots in caring about water quality to prevent disease, whether from infectious agents or contaminants, and to protect piping, plumbing, and other infrastructure. One couldn't deliver distilled water through community water distribution systems: water pH, mineral content, and residual disinfection have to be adjusted to protect piping, prevent leaching, and prevent disease. Fluoride is found naturally in all water, sometimes in concentrations that are too high and often in concentrations that are too low to help prevent dental decay. It too can be adjusted for optimal public health benefits.

- Not Natural – This argument has such little merit, yet it is trotted out repeatedly. Fluoride is found naturally in all water, is in foods, and is a normal component of the human body. In water it is naturally found at much higher concentrations than 0.7 mg/L in many localities across the world. In Stratford, Ontario, for example, average fluoride readings from their various sources in 2010 ranged from 1.58 to 2.24 mg/L. Stratford was used as a naturally fluoridated comparator community in a study reported in 1956 that compared a non-fluoridated community (Sarnia), to a community that newly added fluoride (Brantford). Before and after surveys showed that in 6- to 8-year-old children, decayed, missing, or filled permanent teeth stayed high in Sarnia (1.60 first survey and 1.88 second survey), remained low in Stratford (0.41 and 0.67), and fell in Brantford (1.41 to 0.69). The same study noted that a small percentage of Stratford children had mild mottling of the enamel, which was only detected by an experienced examiner and was in no case unsightly.
- Different Sources of Fluoride Are More Toxic – This argument would hold only if people were exposed to the concentrated forms, but we are not. Whether fluoride is dissolved from minerals in bedrock, or is dissolved from sodium fluoride or hydrofluorosilicic acid makes no difference in the end. Dissolved fluoride ions are the same no matter what their source. At the pH of drinking water, all of the hydrofluorosilicic acid dissolves completely and none of the original compound remains. See also “Toxic Chemicals”.
- Toxic Chemicals – This argument is fear mongering because it doesn’t point out that all things are toxic if the dose is high enough (that includes salt and even water!) and it also mixes up the issue of being exposed to the concentrated form versus the fully dissolved, highly diluted, end product (see “Different Sources of Fluoride Are More Toxic” and “Impurities”). By analogy, when we drink water from the tap we do not have to worry that the chlorine which disinfects our drinking water comes from chlorine gas, which is extremely hazardous!
- Industrial Waste – An argument to conjure up the worst images! But does it tell one anything about the quality and purity of the product? Fluorosilicic acid is formed in water when the gases silicon tetrafluoride and hydrogen fluoride are passed through scrubbers after their formation in the manufacture of wet-process phosphoric acid and other phosphate fertilizers when phosphate rock, the raw material that contains fluoride and silica, is treated with sulphuric acid. There are many substances of high quality and purity in use today that have origins that one may find surprising: for example, pregnant mare horse urine for a pharmaceutical, pharmaceutical building blocks from refined petroleum, food colours from petroleum. A substance’s safe use is dependent on the substance itself and its purity, not on its original source.
- Impurities – This is also pure fear mongering because of the exceedingly tiny amounts concerned. Impurities in the concentrated hydrofluorosilicic acid, such as lead or arsenic, are strictly regulated to not exceed certain concentrations. These concentrations are very low to begin with and when the hydrofluorosilicic acid concentrate is diluted and dissolved in water (1 mL of the concentrate is dissolved in 500,000 mL of water), the impurities added through the fluoridation process, which start off in parts per million in the concentrate, become so small

(parts per trillion) that the increase is well below testing detection levels and well below established regulatory limits. See also “Toxic Chemicals”.

- **Increases Uptake of Undesirable Water Contaminants** – Claims are made about increased body uptake of lead when drinking fluoridated water. This has been investigated and no credible evidence has been found that lead solubility, bioavailability, or bioaccumulation is affected by water fluoridation.
- **Bad for the Environment** – A scare tactic used to try to influence people who care about the environment. The effect of drinking water fluoridation on the environment has been extensively reviewed in North America and in Europe with the same conclusions: the adding of fluoride to drinking water at concentrations between 0.8 mg/L and 1.5 mg/L does not result in unacceptable risk to water organisms.
- **Other Cities/Jurisdictions** – Look at the other places that are getting rid of fluoridation; look at the other places that don't have fluoridation, goes the argument. If one does look carefully at these other places, there is always much more information than revealed by the anti-fluoridationists. For example a decision to discontinue may actually be a decision to not expand because of unaffordable costs or infrastructure needs. And if one looks closely at dental health in many places that do not fluoridate and do not have the societal means to make up for it in other, usually more expensive ways, one finds worse dental health. For example, according to the results of the 1998–1999 study on the oral health of Quebec students aged 5–6 and 7–8, Quebec kindergarten children have 40% more caries than their counterparts in Ontario and the United States. A 2008–2009 Health Canada dental health survey in Nunavut found that over 85% of Inuit preschoolers have cavities or other kinds of decay with an average of eight of their baby teeth affected. A study report, “Dental Caries in Rural Alaska Native Children – Alaska, 2008”, showed that while there was a high overall prevalence and severity of dental caries, children living in communities with fluoridated water had fewer and less severe dental caries than those living in communities without fluoridation.
- **Not Effective** – Might as well add this to the list of objections, because if it is said often enough it might be believed. Or, say that a 20% reduction is too small a reduction to be worthwhile. In truth, effectiveness of water fluoridation has been shown for all age groups, and 20% (it may actually be higher) across millions of people makes for a lot of prevented cavities, misery, and dental costs. Fluoride in drinking water continues to be shown to be effective. For example, a 2010 study in Denmark of the effect of natural levels of fluoride in drinking water confirmed previous findings of an inverse relation between fluoride concentration in the drinking water and dental caries in children. This correlation was found in spite of the extensive use of fluoridated toothpaste and caries-preventive programs implemented by the municipal dental services in Denmark. Dental caries in both 5-year-olds and 15-year-olds decreased over the study period. An inverse relation between the risk of dental caries and fluoride concentration in drinking water was found in both primary and permanent teeth. The risk was reduced by approximately 20% already at the lowest level of fluoride exposure (0.125–0.25 mg/L). At the highest level of fluoride exposure (>1 mg/L), a reduction of



approximately 50% was found. Similar results were obtained if analysis was limited to children residing in the same place during the entire study period.

- **Cost** – This is raised to make it look like there is an issue. In reality, with costs under a dollar per person per year, community water fluoridation is the most cost-effective method of delivering fluoride for the prevention of tooth decay. Furthermore, every dollar spent on community water fluoridation saves much more than a dollar in dental treatment costs.
- **Wastage** – The anti-fluoridationists point out that most of fluoridated water goes down the drain, but so do your toothpaste, fluoride rinses, and fluoride applications at the dentist (rinse and spit). Because of economies of scale related to large drinking water systems, community water fluoridation is inexpensive and the most cost-effective. See also “Cost”.
- **Other Sources** – The argument is that fluoride is now available in more ways than it was 50 years ago and therefore we would be receiving too much if it was also in water. Health Canada and the other agencies that have assessed water fluoridation have taken into account all the potential sources of fluoride and have set the amount recommended in drinking water so that no one, including infants, would be receiving too much fluoride and that the only risk, if any at all, is a small risk for dental fluorosis that is mild or less (see “Dental Fluorosis”).
- **Other Ways to Apply Fluoride** – While there are other ways to get the benefits of fluoride (supplements, toothpaste, rinses, dentist applications), these are more expensive, often considerably so, and present other barriers such as problems in access and the required time and diligence of the person or parent. Drinking water fluoridation remains the least expensive, most efficient, and most equitable mode of fluoride delivery.
- **Topical, Not Ingested** – Anti-fluoridationists claim that the US Centers for Disease Control and Prevention has changed its position on the value of fluoride that is swallowed versus fluoride that is applied to the surface of teeth. CDC constantly re-evaluates its previous findings based on new evidence. While less prominence is now given to fluoride that is built into the enamel during the growth of the tooth and to the fluoride in saliva, these are still important mechanisms that contribute to dental health and provide an additional benefit beyond only topically applied fluoride (see “Not Effective”). CDC still states: “Although all of these products [toothpaste, mouth rinse, supplements, professional applications] reduce tooth decay, combined use with fluoridated water offers protection greater than any of these products used alone.” (<<http://www.cdc.gov/fluoridation/other.htm>>) New evidence continues to be supportive of this conclusion. A study, published in 2009, of US children found that molar teeth with fluorosis are more resistant to caries than are molars without fluorosis.
- **Means Other Than Fluoride** – An example is the claim that vitamin D can provide adequate dental health, this hypothesis being entirely speculative and unproven. Drinking water fluoridation, on the other hand, consistently shows additional benefits for communities, no matter what other factors are in play regarding dental health, especially when it comes to decreasing inequities in dental health (see “Not Effective”).

- Provide Social Programs for Individuals – While it is easy to say this, what won't be said at the same time is that such social programs cost so much more than drinking water fluoridation that they likely won't be implemented at all, or, if implemented, will be too small in scope. However, even when social programs are in place, they usually miss a significant portion of the priority population for a variety of reasons and as a result are less successful in decreasing socio-economically-based gaps than a universally-applied program such as drinking water fluoridation.
- People Can Look After Themselves – In truth not everyone is in the same position in life or has the same resources or abilities. Community water fluoridation helps all people regardless of income or other limiting factors and actually helps to reduce disparities in tooth decay prevalence (see also "Ethics").
- Other Arguments – No list is complete because the anti-fluoridationist will always find a new argument or bring out one that had disappeared. Looking for evidence for such arguments has to this point in time always had the same result: the arguments fall apart either under their own lack of logic or for lack of credible scientific evidence.

Put out enough of these arguments, and at least one is sure to resonate with almost any listener. When an individual argument is responded to (which they all have been), claim the response is faulty, for example, because of bias, pick another even more trivial component and demand further response, bring forth other arguments from the list, and keep repeating the initial argument because if people hear things often enough they begin to think that there must be something behind it.

(There is an unfortunate sidebar here about our own warnings about the false claims of the anti-fluoridationists. A 2005 study showed that for some people, who are more likely to be older adults, telling them that a certain claim is false can, with respect to their long-term memories, make them misremember it as true.)

The person with an agenda, though presenting him/herself simply as a resident, will often belong, formally or informally, to a group that takes its agenda to jurisdictions outside of where the individual actually lives. Such group members go to conferences organized by persons with the same agenda (their costs may be paid), share information, use various communications media, the news media, and, especially, the internet with considerable skill, and proclaim their and each others' "victories." Their agenda is sweeping: "to bring about our common goal of ending fluoridation worldwide" as stated by the Executive Director of Fluoride Action Network, who calls these colleagues "fluoridation fighters" and "activists."

Compare the Fluoride Action Network's "to bring about our common goal of ending fluoridation worldwide" with the desire to want to maximize the public's health through public policy measures based on the best available scientific evidence. Which attitude seems biased?

The American Public Health Association (APHA) comments on water fluoridation opponent techniques as well as ethical considerations in its Policy Statement, "Community Water Fluoridation in the United States" (10/28/2008, available at <<http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1373>>). It is worthwhile quoting some of their observations.

#### APHA on anti-fluoridationist methods:

Water fluoridation opponents are said to use multiple techniques to undermine the scientifically established effectiveness and safety of water fluoridation. The materials they use are often based on Internet resources or published books that present a highly misleading picture of water fluoridation. Despite an extensive body of literature, both studies and results within studies are often selectively reported, giving a biased portrayal of water fluoridation effectiveness. Positive findings are downplayed or trivialized, and the population implications of these findings misinterpreted. Ecological comparisons are sometimes used to support spurious conclusions. Opponents of water fluoridation frequently repeat that water fluoridation is associated with adverse health effects and studies are selectively picked from the extensive literature to convey only claimed adverse findings related to water fluoridation.

#### APHA on Ethics of Community Water Fluoridation (CWF):

Several reviews have considered the ethics of CWF. The reviews rely on the preponderance of scientific evidence of benefit and lack of harm and have concluded that CWF is ethical, in part, because it leads to the reduction of health inequalities and the reduction of ill health, particularly among vulnerable groups, and provides an economic benefit to both society and to individuals. With water fluoridation, a whole area either receives fluoridated water or does not. Populations do not remain static, as people move to and from an area. In practical terms, it would therefore not be feasible to seek individual consent. The most appropriate way of deciding whether fluoride should be added to water supplies is to rely on democratic decisionmaking procedures, with public input informing those empowered by the public to make such public health decisions (e.g., local health board, city council, water board, or state legislature). These procedures should be implemented at the local and regional, rather than national, levels because the need for and perception of water fluoridation varies in different areas. Account should be taken of relevant evidence and of alternative ways of achieving the intended benefit in the area concerned. Whatever policy is adopted, dental health and any adverse effects of fluoridation should be monitored. The Nuffield Council found there is a need for better and more balanced information for the public and policymakers.

From an ethical perspective, fluoridating water supplies can be seen as replicating the benefits already conferred on those communities receiving water naturally containing 1 part per million of fluoride. Moreover, the greatest benefit of all goes

to that section of the population least able to help themselves—children. Drinking fluoride-free water is not a basic human right but a question of individual preference. In a society where people come together for mutual benefit, it is a question of balancing such personal preferences against the common good arising from less disease, less pain, less suffering, and better health that fluoridation brings.

We recommend an on-line, easy-to-read article from *Quackwatch*, which, given its roots in a book from 1993 on quackery in America, shows that anti-fluoridation rhetoric and misinformation have continued over the last two decades with the same methods. Please go to <http://www.quackwatch.com/03HealthPromotion/fluoride.html> to read “Fluoridation: Don’t Let the Poisonmongers Scare You” by Bob Sprague, Mary Bernhardt, and Stephen Barrett, M.D.

For a scholarly article on the topic of anti-fluoridationist strategies, we strongly recommend reading:

Armfield, JM. When public action undermines public health: a critical examination of antifuoridationist literature. *Australia and New Zealand Health Policy*. 2007, 4:25 doi:10.1186/1743-8462-4-25.

The article is available at: <http://www.anzhealthpolicy.com/content/4/1/25>. A copy of the article is included in the Councillors’ Bundles.