

Appendix H

TOTAL FLUORIDE EXPOSURE/DOSAGE

Mother's milk is 0.004 ppm (NRC 2006) and is a good indication of nature's protection of the infant from fluoride. To protect our most vulnerable, the American Dental Association, Centers for Disease Control, and many state health departments recommend fluoridated water should not be used to make formula. Without question, fluoridating communities are exposing infants to too much fluoride.^{1 2 3 4 5 6} Even the highest breast feeding state, Oregon, has three out of four infants receiving water and formula made with water.

When fluoridation was first considered, fluoridated toothpaste, fluoride dental products and treatments, fluoride medical products and treatments, fluoride pesticides, fluoride post-harvest fumigants, and many other fluoride products were not in use or known. There has never been an authorized agency or organization responsible for evaluating the total exposure or dosage people are getting.

I. HOW MUCH WATER ARE WE DRINKING?

“Some subpopulations consume much greater quantities of water than the 2 L per day that EPA assumes for adults, including outdoor workers, athletes, and people with certain medical conditions, such as diabetes insipidus.” NRC 2006 P 23

And

“Average per capita ingestion of community or municipal water is estimated to be 927 mL/day (EPA 2000a; see Appendix B6). The estimated 90th percentile of the per capita ingestion of community water from that survey is 2.016 L/day. P 23.

The Washington Board of Health must be protective of everyone, 100%, not the 90th or 99th percentiles. When the city uses police powers to medicate everyone, then the city is responsible for the dosage of fluoride and risks from the fluoride for everyone.

In Appendix B, Table B-4, page 376, the NRC 2006 lists water consumption at the 99th percentile with several groups close to 5 liters of water a day and one is 5.356 L/day. At 1 ppm of fluoride, water alone for these people provides about 5 mg of fluoride per day.

TABLE B-4 Estimated Average Daily Water Ingestion (mL/day) from Community Sources During 1994-1996, by People Who Consume Water from Community Sources

Population	Mean	50th Percentile	90th Percentile	95th Percentile	99th Percentile	Sample Size	Population
All consumers	1,000	785	2,069	2,600	4,273	14,012	242,641,675
<0.5 year	529	543	943	1,064	1,366	111	1,062,136
0.5-0.9 year	502	465	950	1,122	1,529	135	1,449,698
1-3 years	351	267	719	952	1,387	1,625	10,934,001
4-6 years	454	363	940	1,213	1,985	1,110	11,586,632
7-10 years	485	377	995	1,241	1,999	884	14,347,058
11-14 years	641	473	1,415	1,742	2,564	759	14,437,898
15-19 years	817	603	1,669	2,159	3,863	777	16,735,467
20-24 years	1,033	711	2,175	3,082	5,356	644	17,658,027
25-54 years	1,171	965	2,326	2,926	4,735	4,599	106,779,569
55-64 years	1,242	1,111	2,297	2,721	4,222	1,410	19,484,112
≥ 65 years	1,242	1,149	2,190	2,604	3,668	1,958	28,167,077
Males (all)	1,052	814	2,164	2,733	4,616	7,082	118,665,763
<1 year	462	441	881	1,121	1,281	118	1,191,526
1-10 years	444	355	934	1,155	1,731	1,812	18,847,070
11-19 years	828	595	1,673	2,058	3,984	768	15,923,625
≥ 20 years	1,242	1,038	2,387	3,016	4,939	4,384	82,703,542
Females (all)	951	747	2,005	2,482	3,863	6,930	123,975,912
<1 year	560	542	967	1,122	1,584	128	1,320,308
1-10 years	426	329	940	1,109	2,014	1,807	18,020,621
11-19 years	638	457	1,382	1,774	2,598	768	15,249,740
≥ 20 years	1,116	943	2,165	2,711	4,268	4,227	89,385,243
Lactating women	1,665	1,646	2,959	3,588	4,098	34	971,057
Pregnant women	872	553	1,844	2,588	3,448	65	1,645,565
Women aged 15-44 years	984	756	2,044	2,722	4,397	2,176	55,251,477

Source: EPA 2000a.

Total exposure is a complicated issue and FDA approval for fluoridation would include an evaluation of total fluoride exposure.

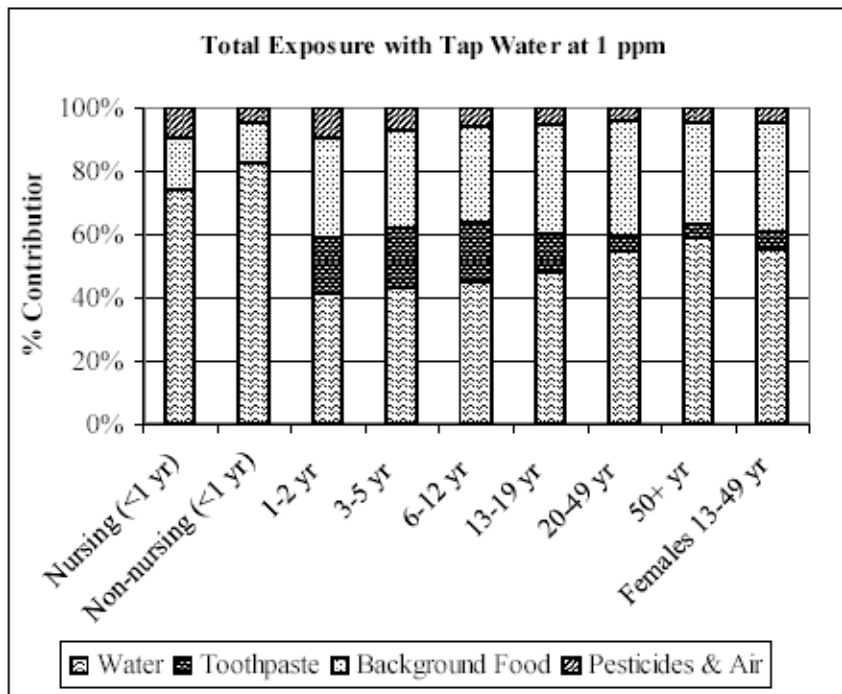


FIGURE 2-1 Source contribution to total inorganic fluoride exposure, including fluoride at 1 mg/L in tap water. The estimated chronic inorganic fluoride exposures from the various routes are presented in Tables 2-9 and 2-10. No fluoride supplement is included for any population subgroup. The total exposures as presented in Table 2-11 for the population subgroups are: 0.030 mg/kg/day (nursing infants), 0.087 mg/kg/day (non-nursing infants), 0.066 mg/kg/day (1-2 years old), 0.060 mg/kg/day (3-5 years old), 0.040 mg/kg/day (6-12 years old), 0.028 mg/kg/day (13-19 years old), and 0.031 mg/kg/day for adults (20 to 50+ years old) and women of child-bearing age (13-49 years old).

II. MAJOR SOURCES OF FLUORIDE EXPOSURE P 49 NRC 2006 Report

A. “It was found that 42% of the (fruit juice) samples had more than 1 ppm of fluoride.”⁷ “Children’s ingestion of fluoride from juices and juice-flavored drinks can be substantial and a factor in the development of fluorosis.”⁸

a. “Fluoride concentrations ranged from 0.01 to 8.38 micrograms of fluoride per gram, (ppm) with the highest fluoride concentrations found in infant foods containing chicken.”⁹

b. “Fluoride levels (in carbonated soft drinks) exceeded 0.60 ppm for 71 percent of the products.”¹⁰

c. “The water-extractable F content of five brands of California raisins varied from 0.83 to 5.20 ppm (mean 2.71 ppm). Elevated F levels in these wines and raisins appear to result from pesticide use of cryolite (Na₃AlF₆) in the vineyards.”¹¹

B. The CDC in one place reports the incidence of dental fluorosis has increased from 22 to 32% in children¹² and more recently suggested approximately 41% of adolescents aged 12 to 15 and 36% aged 16 to 19 years had enamel fluorosis.

Moderate and severe fluorosis was observed in less than 4% in both age groups.”¹³ “On a per-body-weight basis, infants and young children have approximately three to four times greater exposure than do adults,”¹⁴ a significant sign many are ingesting too much fluoride.

C. NO practical method of removing fluoride from water is available to households, placing everyone at risk. Neither boiling nor home water filters remove fluoride. Bottled water is not labeled for fluoride content, and all contain some fluoride with some exceeding EPA MCL (maximum contaminant level) limits even for adults.

D. The lowest socioeconomic group in fluoridated communities suffer the greatest financial burden as well as the greatest barriers to purchasing, supplying, or transporting non-fluoridated water. In practical terms this represents an unreasonable requirement for low income parents without a car, using public transportation or walking, carrying babies, groceries, and now adding bottled water.

E. Fluoride accumulates over a lifetime, and better lifetime exposure estimates as well as average daily exposure estimates have not been and must be determined.

F. “Fluorosis (*fluoride damage to teeth*) prevalence increased significantly with higher water fluoride levels; however, caries prevalence did not decline significantly.”¹⁵

III. OTHER SOURCES OF FLUORIDE: NRC 2006

“TOTAL EXPOSURE TO FLUORIDE

A systematic estimation of fluoride exposure from pesticides, background food, air, toothpaste, fluoride supplement, and drinking water is presented in this section. The estimated typical or average chronic exposures to inorganic fluoride from nonwater sources are presented in Table 2-9. The exposures from pesticides (sulfuryl fluoride and cryolite), background food, and air are from a recent exposure assessment by EPA (2004). The background food exposure is corrected for the contribution from powdered or dried tea by using the appropriate residue concentration of 897.72 ppm for instant tea powder instead of the 5 ppm for brewed tea used in the EPA (2004) analysis. It should be noted that the exposure from foods treated with sulfuryl fluoride is not applicable before its registration for post-harvest fumigation in 2004.” Page 45

Note the Table 2-9 below shows other sources of fluoride exposure.

TABLE 2-9 Total Estimated Chronic Inorganic Fluoride Exposure from Nonwater Sources

Population Subgroups	Average Inorganic Fluoride Exposure, mg/kg/day						
	Sulfuryl Fluoride ^a	Cryolite ^a	Back-ground Food ^a	Tooth-paste ^b	Air ^a	Total Nonwater	Supplement ^c
All infants (<1 year)	0.0005	0.0009	0.0096	0	0.0019	0.0129	0.0357
Nursing	0.0003	0.0004	0.0046	0	0.0019	0.0078 ^d	0.0357
Nonnursing	0.0006	0.0012	0.0114	0	0.0019	0.0151	0.0357
Children 1-2 years	0.0013	0.0031	0.0210	0.0115	0.0020	0.0389	0.0192
Children 3-5 years	0.0012	0.0020	0.0181	0.0114	0.0012	0.0339	0.0227
Children 6-12 years	0.0007	0.0008	0.0123	0.0075	0.0007	0.0219	0.0250
Youth 13-19 years	0.0004	0.0003	0.0097	0.0033	0.0007	0.0144	0.0167
Adults 20-49 years	0.0003	0.0004	0.0114	0.0014	0.0006	0.0141	0
Adults 50+ years	0.0003	0.0005	0.0102	0.0014	0.0006	0.0130	0
Females 13-49 years ^e	0.0003	0.0005	0.0107	0.0016	0.0006	0.0137	0

^aBased on the exposure assessment by EPA (2004). Background food exposures are corrected for the contribution from powdered or dried tea at 987.72 ppm instead of 5 ppm used in EPA analysis.

^bBased on Levy et al. (1995a), assuming two brushings per day with fluoride toothpaste (0.1% F) and moderate rinsing. The estimated exposures are: 0 mg/day for infants; 0.15 mg/day for 1-2 years; 0.25 mg/day for 3-5 years; 0.3 mg/day for 6-12 years; 0.2 mg/day for 13-19 years; 0.1 mg/day for all adults and females 13-49 years. The calculated exposure in mg/kg/day is based on the body weights from EPA (2004). For most age groups, these doses are lower than the purported maximum of 0.3 mg/day used for all age groups by EPA (2004).

^cBased on ADA (2005) schedule (Table 2-8) and body weights from EPA (2004). Note that the age groups here do not correspond exactly to those listed by ADA (2005). The estimated exposures are: 0.25 mg/day for infant and 1-2 years; 0.5 mg/day for 3-5 years, and 1 mg/day for 6-12 years and 13-19 years.

^dIncludes the estimated 0.0006 mg/kg/day from breast milk. Using the higher estimated breast milk exposure from a fluoridated area (approximately 0.0014 mg/kg/day) results in 0.0086 mg/kg/day for total nonwater exposure.

^eWomen of childbearing age.

Based on Table 2-9, the NRC estimates the average person ingests from non-water inorganic sources: a 10 Kg child averages 0.39 mg., a 20 Kg child 0.68 mg., a 70 kg adult about 1 mg.

1 liter of water at 4 ppm is the same amount of fluoride as 4 liters of water at 1 ppm. When reviewing the graphs below, keep in mind that some people drink 5 liters of water a day, receiving about 5 times the 1 ppm. A quick evaluation of the graphs for them (the 99th percentile) is to look at the 4 ppm column.

Table 2-11 we see the total fluoride exposure from all sources.

TABLE 2-11 Total Estimated (Average) Chronic Inorganic Fluoride Exposure (mg/kg/day) from All Sources, Assuming Nontap Water at a Fixed Concentration^a

Population Subgroups	Concentration in Tap Water (fixed nontap water at 0.5 mg/L)						
	With F supplement		Without F supplement		1 mg/L	2 mg/L	4 mg/L
	0 mg/L	0.5 mg/L	0 mg/L	0.5 mg/L			
All infants (<1 year)	0.061	0.083	0.025	0.047	0.070	0.117	0.209
Nursing ^b	0.049	0.057	0.013	0.021	0.030	0.046	0.079
Non-nursing	0.065	0.094	0.029	0.058	0.087	0.144	0.258
Children 1-2 years	0.062	0.074	0.043	0.055	0.066	0.090	0.137
Children 3-5 years	0.060	0.071	0.038	0.049	0.060	0.082	0.126
Children 6-12 years	0.049	0.057	0.024	0.032	0.040	0.055	0.086
Youth 13-19 years	0.033	0.039	0.016	0.022	0.028	0.039	0.063
Adults 20-49 years	0.017	0.024	0.017	0.024	0.031	0.046	0.076
Adults 50+ years	0.015	0.023	0.015	0.023	0.031	0.047	0.079
Females 13-49 years ^c	0.016	0.024	0.016	0.024	0.031	0.046	0.075

^aThe estimated exposures from fluoride supplements and total nonwater sources (including pesticides, background food, air, and toothpaste) are from Table 2-9. The estimated exposures from drinking water are from Table 2-10. For nonfluoridated areas (tap water at 0 and 0.5 mg/L), the total exposures are calculated both with and without fluoride supplements.

^bThe higher total nonwater exposure of 0.0086 mg/kg/day that includes breast milk from a fluoridated area (footnote in Table 2-9) is used to calculate the exposure estimates for the “without supplement” groups that are exposed to fluoride in water at 1, 2, and 4 mg/L.

^cWomen of childbearing age.

The 99th percentile adult with Seattle fluoridated water would be ingesting about 6 to 8 mg of fluoride.

Figure 2-8 of the NRC 2006 report, page 70, has a summary graph using the assumed “optimal” fluoride level of 0.05 to 0.07 mg/kg/day showing non-nursing infants at highest risk of consuming excess fluoride. And these numbers are average water consumption at 1 L/day of water and average fluoride food exposure rather than based on protection of all at perhaps 5 liters of water/day or high fluoride diets.

IV. FLUORIDE IN FOODS

Let’s get specific with various foods. The USDA national fluoride data base can be helpful for the amount of fluoride in foods. However, those numbers are again “averages” and are not consistent. For example, beef might seem low in fluoride at a mean of 22 mcg/100g, but can be higher at 72 mcg/100 g and even higher for mechanically deboned meat which has greater amounts of bone meal high in fluoride. A Big Mac hamburger can have over 1 mg of fluoride. Raisons, grapes and grape jelly are high in fluoride.

A breakfast of raison bran, grape jelly and toast with herb tea and milk can exceed 2 mg of fluoride.

Lunch with mechanically deboned beef burger, fries (with skins) and pint of diet Coke can also have more than 2 mg of fluoride.

Dinner of rice, beets, beans, fish/beef and pudding can again exceed 2 mg of fluoride.

V. SULFURYL FLUORIDE: POST-HARVEST FUMIGANT

After foods have been harvested, they must rapidly get to market and have a long shelf life. In the past bromine gas was used as a post-harvest fumigant to preserve the foods, but bromine has been discontinued from my understanding due to environmental concerns. Sulfuryl fluoride is replacing the bromine. As a food producer, Chez Gourmet veggie patties, we use fresh vegetable products, grains and dairy all year round. The shelf life for each is critical. Throwing away a moldy or wilted bag of produce at home is nothing compared to throwing away cases, totes, truck loads, silos, or ship loads of products which have gone moldy or infested with bugs.

The advertisement for ProFume gas (DowAgro Science) with a good looking cookie below:



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A new label for ProFume® gas fumigant expands the list of labeled uses and simplifies the fumigation process. Now, more market segments, including food processing facilities, can use ProFume.

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FUMIGATING WITH
PROFUME® GAS FUMIGANT

DEADLY POISON

ALL PERSONS ARE WARNED TO KEEP AWAY

The fluoride residue permitted on foods is significant and can increase the total fluoride exposure. In speaking with a representative of DowAgroSciences, LLC, I was told not all of the foods would have the maximum fluoride permitted residues although some of the product might contain the maximum. Here are a few of the many foods which may have permitted fluoride residue concentrations:

Fig, plum, prune, grape, raisin, fruit 5 ppm
Almond, barley grain, rice grain 10 ppm
Pecan 23 ppm
Walnut 30 ppm
Wheat grain 25 ppm
Wheat germ 98 ppm
Refined oil 3 ppm
Egg 850 ppm
Dried egg 900 ppm

As can be seen from these examples, many common staples may contain considerable amounts of fluoride. Much of the dried egg is consumed in schools and rest homes.

VI. FLUORIDE FOR INFANTS .

“For water from all sources (direct, mixed with formula, etc.), the intake of fluoride by infants (Levy et al. 1995b) ranged from 0 (all ages examined) **to as high as 1.73 mg/day** (9 months old). . . . For ages 1.5-9 months, approximately **40% of the infants exceeded a mass-normalized intake level for fluoride of 0.07 mg/kg/day**; for ages 12-36 months, about 10-17% exceeded that level (Levy et al. 2001b).” NRC 2006.

And a dosage of 0.07 and even 0.05 mg/kg/day results in dental fluorosis, skeletal fluorosis, thyroid damage and neurological damage. Those promoting fluoridated water must explain why our goal for infants should not be the same as mother’s milk and upper limit of 0.02 mg/kg/day. They must provide data and explanation why mother’s milk is deficient and defective.

The most comprehensive NRC 2006 Table (Table 2-12 below) summary of fluoride exposure finds children under the age of 6, on average, are consuming more than 0.05 mg/kg/day of fluoride. Note, this graph is based on “average” rather than the 99th percentile water consumption. At the 99th percentile, all are consuming too much fluoride.

TABLE 2-12 Total Estimated (Average) Chronic Inorganic Fluoride Exposure (mg/kg/day) from All Sources, Assuming the Same Specified Fluoride Concentration for Both Tap and Nontap Waters^a

Population Subgroups	Concentration in All Water					
	1 mg/L	2 mg/L	4 mg/L	1 mg/L	2 mg/L	4 mg/L
	Modeled water intake ^b			EPA default water intake ^c		
All infants (<1 year)	0.082	0.151	0.289	0.113	0.213	0.413
Nursing	0.034	0.060	0.111	0.109	0.209	0.409
Non-nursing	0.100	0.186	0.357	0.115	0.215	0.415
Children 1-2 years	0.070	0.102	0.164	0.139	0.239	0.439
Children 3-5 years	0.063	0.093	0.151	NA	NA	NA
Children 6-12 years	0.042	0.062	0.103	NA	NA	NA
Youth 13-19 years	0.030	0.045	0.075	NA	NA	NA
Adults 20-49 years	0.034	0.053	0.093	0.043	0.071	0.128
Adults 50+ years	0.034	0.054	0.096	0.042	0.070	0.127
Females 13-49 years ^d	0.033	0.053	0.092	0.042	0.071	0.128

^aThe estimated exposures from nonwater sources (including pesticides, background food, air, and toothpaste) are from Table 2-9. No fluoride supplement is included in the total fluoride exposure estimates.

^bThe component of drinking water exposure is estimated from DEEM-FCID.

^cThe EPA default daily water intake rate is 1 L for a 10-kg child and 2 L for a 70-kg adult. NA: not applicable based on EPA's default body weight.

^dWomen of childbearing age.

Keep in mind these three numbers:

1. Mother's milk: **0.001 mg/kg/day** or 0.004 ppm (nature's choice for fluoride exposure)
2. IOM suggest upper tolerable limit is **0.7 mg/day** for infants
3. And **0.05 mg/kg/day** fluoridation proponents choice for fluoride exposure

The NRC 2006 p 44 provides valuable information and our emphasis is in bold for those who like to skim the material. Almost all reported intakes "AVERAGE" more than the **0.05 mg/kg/day** considered "optimal".

"A number of authors have reviewed fluoride intake from water, food and beverages, and dental products, especially for children (NRC 1993; Levy 1994; Levy et al. 1995a,b,c; Lewis and Limeback 1996; Levy et al. 2001b). Heller et al. (1999, 2000) estimated that a typical infant less than 1 year old who drinks fluoridated water containing fluoride at 1 mg/L **would ingest approximately 0.08 mg/kg/day from water alone.** Shulman et al. (1995) also calculated fluoride intake from water, obtaining an estimate **of 0.08 mg/kg/day for infants** (7-9 months of age), with a linearly declining intake with age to 0.034 mg/kg/day for ages 12.5-13 years. Levy et al. (1995b,c; 2001b) have estimated the intake of fluoride by infants and children at various ages based on questionnaires completed by the parents in a longitudinal study. For water from all sources (direct, mixed with formula, etc.), the intake of fluoride by infants (Levy et al. 1995b) ranged from 0 (all ages examined) **to as high as 1.73 mg/day** (9 months old). Infants fed formula prepared from powdered or liquid concentrate had fluoride intakes **just from water in the formula of up to 1.57 mg/day.** The

sample included 124 infants at 6 weeks old and 77 by 9 months old. Thirty-two percent of the infants at 6 weeks and 23% at age 3 months reportedly had no water consumption (being fed either breast milk or ready-to-feed formula without added water). **Mean fluoride intakes for the various age groups ranged from 0.29-0.38 mg/day**; however, these values include the children who consumed no water, and so are not necessarily applicable for other populations. For the same children, mean fluoride intakes from water, fluoride supplement (if used), and dentifrice (if used) **ranged from 0.32-0.38 mg/day**

(Levy et al. 1995c); **the maximum fluoride intakes ranged from 1.24 (6 weeks old) to 1.73 mg/day (9 months old)**. Ten percent of the infants at 3 months old **exceeded an intake of 1.06 mg/day**.

For a larger group of children (about 12,000 at 3 months and 500 by 36 months of age; Levy et al. 2001b), mean fluoride intakes from water, supplements, and dentifrice combined ranged from 0.360 mg/day (12 months old) to 0.634 mg/day (36 months old). The 90th percentiles ranged from 0.775 mg/day (16 months old) to 1.180 mg/day (32 months old). Maximum intakes ranged from 1.894 mg/day (16 months old) to 7.904 mg/day (9 months old) and were attributable only to water (consumption of well water with 5-6 mg/L fluoride; about 1% of the children had water sources containing more than 2 mg/L fluoride). **For ages 1.5-9 months, approximately 40% of the infants exceeded a mass-normalized intake level for fluoride of 0.07 mg/kg/day; for ages 12-36 months, about 10-17% exceeded that level (Levy et al. 2001b).** . . .

Lewis and Limeback (1996) estimated total **daily fluoride intakes of 0.014-0.093 mg/kg** for formula-fed infants and 0.0005-0.0026 mg/kg for breast-fed infants (up to 6 months). For children aged 7 months to 4 years, the estimated daily intakes from food, water, and household products (primarily dentifrice) **were 0.087-0.160 mg/kg** in fluoridated areas and 0.045-0.096 mg/kg in nonfluoridated areas. Daily intakes for other age groups were 0.049-0.079, 0.033-0.045, and 0.047-0.058 mg/kg for ages 5-11, 12-19, and 20+ in fluoridated areas, and 0.026-0.044, 0.017-0.021, and 0.032-0.036 mg/kg for the same age groups in nonfluoridated areas.” P 45 NRC 2006 report.

VII. HOW CAN WE REDUCE FLUORIDE EXPOSURE?

Based on exposure levels, confirmed with increases of dental fluorosis, many are ingesting too much fluoride.

When fluoridation started, we did not have fluoridated toothpaste, fluoridated mouth washes, fluoride pesticides, fluoride post-harvest fumigants, fluoride pots and pans (Teflon), fluoride polishes and lubricants, and few fluoride medications.

With ever increasing amounts of fluoride exposure, it is time we must consider where to start reducing the excess fluoride exposure.

Topical fluoride in toothpaste, mouthwashes and dental products appear to have some benefit. Fluoride medications (antibiotics, organic products) can save lives. Fluoride pesticides reduce crop loss. Fluoride post-harvest fumigants preserve food to keep product fresh for longer shelf life.

The most logical and reasonable place to reduce total fluoride exposure is a cessation of water fluoridation which does nothing to improve the water or food. Water fluoridation has no other purpose than decay reduction. Fluoride from most other sources has additional benefits or permits freedom of choice.

And yes, most developed countries have come to the same conclusion and no longer fluoridate their water. Even Russia and Cuba stopped fluoridation. China disposes of their fluoride waste product in the USA water supplies rather than in their own water.

¹ <http://www.ada.org/prof/resources/pubs/adanews/adanewsarticle.asp?articleid=2212>

http://www.ada.org/prof/resources/positions/statements/fluoride_infants.asp NRC 2006 p. 36, Pediatrics May 1998 Vol. 95, Number 5 RE9511 CDC and ODHS 12/2006

² A major effort should be made to avoid use of fluoridated water for dilution of formula powders."

Ekstrand J. (1996). Fluoride Intake. In: Fejerskov O, Ekstrand J, Burt B, Eds. *Fluoride in Dentistry*, 2nd Ed. Munksgaard, Denmark. P40-52.

³ "[I]nfant formulas reconstituted with higher fluoride water can provide 100 to 200 times more fluoride than breastmilk, or cows milk." Levy SM, Guha-Chowdhury N. (1999). Total fluoride intake and implications for dietary fluoride supplementation. *J. of Pub Hea Dent* 59: 211-23

⁴ "[P]arents of children using powdered infant formula should be warned by their medical practioners to use unfluoridated or defluoridated water to reconstitute the formula." Diesendorf M, Diesendorf A. (1997). Suppression by medical journals of a warning about overdosing formula-fed infants with fluoride. *Accountability in Research* 5:225-237

⁵ Our analysis shows that babies who are exclusively formula fed face the highest risk; in Boston, for example, more than 60 percent of the exclusively formula fed babies exceed the safe dose of fluoride on any given day." *Environmental Working Group*, "EWG Analysis of Government Data Finds Babies Over-Exposed to Fluoride in Most Major U.S. Cities", March 22, 2006

⁶ "[M]ore than 50 percent of infants are currently formula fed by 1 month of age, and these infants are likely to be continuously exposed to high intakes of fluoride for 9 or 10 months - a circumstance quite rare in the 1960s and early 1970s." Fomon SJ, Ekstrand J. (1999). Fluoride intake by infants. *Journal of Public Health Dentistry* 59(4):229-34

⁷ **Stannard JG et al.** Fluoride levels and fluorides contamination of fruit juices. *Journal of Clinical Pediatric Dentistry*; 16:38-40, 1991.

"Forty-three ready-to-drink fruit juices were examined for fluoride ion concentration. The fluoride levels of the juices ranged from 0.15 to 6.80 (Gerber White Grape juice). It was found that 42% of the samples had more than 1 ppm of fluoride. Given that increasing numbers of people are consuming beverages instead of water, fluoride supplementation should not be based solely upon the concentration of the drinking water, but should also consider the amount of different beverages consumed and their fluoride content."

⁸ **Kiritsey, MC et al.** Assessing fluoride concentrations of juices and juice-flavored drinks. *Journal American Dental Association*; 127: 895-901, 1996. "In this study, the authors analyzed 532 juices and juice drinks for fluoride. Fluoride ion concentration ranged from 0.02 to 2.80 parts permillion. Children.s ingestion of fluoride from juices and juice-flavored drinks can be substantial and a factor in the development of fluorosis."

⁹ **Heilman, JR et al.** Fluoride concentrations of infant foods. *Journal American Dental Association*; 128: 857-63, 1997. In this study, the authors analyzed the fluoride concentration of 238commercially available infant foods. Fluoride concentrations ranged from 0.01 to 8.38 microgramsof fluoride per gram, (ppm) with the highest fluoride concentrations found in infant foods containing chicken.

¹⁰ **Heilman, JR et al.** Assessing fluoride levels of carbonated soft drinks. *Journal American Dental Association*; 130: 1593-99, 1999. The authors examined the fluoride concentrations of 332 soft drinks. The fluoride levels of the products ranged from 0.02 to 1.28 ppm, with a mean level of 0.72. Fluoride levels exceeded 0.60 ppm for 71 percent of the products.

¹¹ **Burgstahler, AW et al.** Fluoride in California wines and raisins. *Fluoride*; 30: 142-146, 1997.

¹² http://www.cdc.gov/fluoridation/safety/infant_formula.htm

¹³ **Prevalence of Enamel Fluorosis Among 12-19 Year-Olds, U.S., 1999-2004**

http://iadr.confex.com:80/iadr/2007orleans/techprogram/abstract_92598.htm

Table below presents percentages (standard errors) and prevalence of fluorosis, including very mild or higher severity.

Cycle:	1999-2000		2001-2002		2003-2004		1999-2004	
	12-15	16-19	12-15	16-19	12-15	16-19	12-15	16-19
Unaffected & questionable	60.63 (4.66)	66.25 (4.32)	65.95 (3.18)	70.57 (3.33)	51.58 (3.78)	55.10 (4.59)	60.12 (2.28)	64.55 (2.40)
Very Mild	26.17 (2.99)	21.16 (2.94)	24.82 (2.62)	20.63 (2.32)	34.58 (2.65)	31.96 (3.75)	27.98 (1.61)	24.10 (1.76)
Mild	8.67 (1.49)	6.98 (0.84)	6.57 (1.14)	6.47 (1.05)	10.31 (1.57)	9.67 (0.88)	8.34 (0.81)	7.58 (0.53)
Moderate & severe	4.53 (1.22)	5.61 (1.44)	2.66 (0.40)	2.33 (0.61)	3.52 (0.85)	3.27 (0.94)	3.56 (0.51)	3.78 (0.64)
Prevalence	39.37 (4.66)	33.75 (4.32)	34.05 (3.18)	29.43 (3.33)	48.42 (3.78)	44.90 (4.59)	40.60 (2.23)	36.29 (2.45)

¹⁴ . " NRC 2006 Summary p. 4

¹⁵ Dental caries and fluorosis in relation to water fluoride levels L. HONG¹, et al. ¹University of Missouri -Kansas City, USA, http://iadr.confex.com/iadr/2006Orld/techprogram/abstract_73811.htm