



Water Fluoridation: Confronting the Myths

Pablo Alvarado & Earl Callender
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D206

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Why This Topic?



- ❖ There is a lot of misguided information on fluoride and fluoridated water, therefore it is important to communicate and educate the public on the benefits of fluoride.

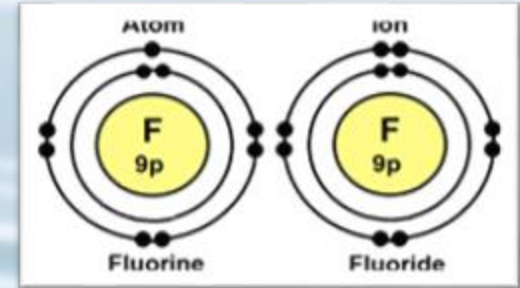
People often think that by ingesting fluoridated water, one can lower their IQ levels and/or suffer adverse effects such as arthritis, hip fractures, and fluorosis.²



- **What is Fluoride?** Derived from the element fluorine, fluoride is a naturally occurring mineral that is found in nature.¹²
- The regulation of fluoride is overseen by government agencies.
 - The “1974 Safe Water Drinking Act” gave the EPA control over fluoride levels in tap water.¹⁴
 - The “Federal Food, Drug, and Cosmetic Act” also gives the FDA control over the fluoride in bottled water.¹⁴
 - **0.7 to 1.2 ppm (mg/L)** of fluoride is the optimal range for water fluoridation. This helps decrease the chances of developing fluorosis.

- ❖ **Our Hypothesis:**

In this presentation, we are going to attempt to prove that both social media and non-credible sources create fluoride fear in society today.



<https://scientianovem.wordpress.com/chemistry>
<https://www.ada.org/en/public-programs/advocating-for-the-public/fluoride-and-fluoridation/5-reasons-why-fluoride-in-water-is-good-for-communities>

Importance of Community Water Fluoridation (CWF)



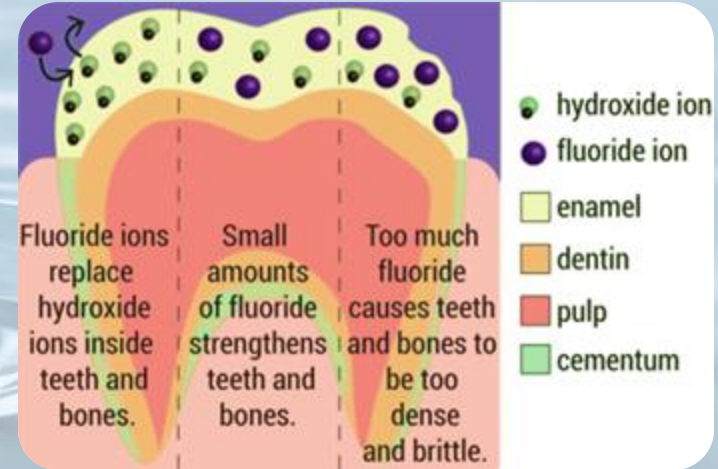
- ❖ **Its cost-effective for people and the healthcare system.**

- According to the **CDC**, “Studies continue to show that widespread community water fluoridation prevents cavities and saves money, both for families and the health care system... Per capita annual costs for community water fluoridation ranged from **\$0.11 to \$24.38**, while per capita annual benefits ranged from \$5.49 to \$93.19.”⁸

- ❖ **Fluoride helps with delay the tooth demineralization process and promote remineralization on incipient surfaces.**¹²

- ❖ **Lowers the risk of caries across different age groups.**

- According to the **WHO**, “Studies suggest that, when fluoride is ingested during the period of tooth development, it makes teeth more resistant to subsequent caries development”.¹²



<https://berkeleysciencereview.com/2017/01/fluoride-drinking-water-friend-foe/>



Community Water Fluoridation Online: An Analysis of the Digital Media Ecosystem¹³

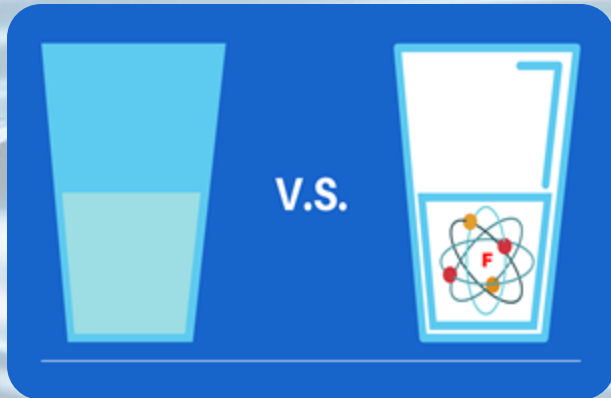
Mohammad Helmi, Mary Kate Spinella,
& Brittany Seymour

Contents Searched August 1, 2015
Publication Accepted March 30, 2018

Purpose & Methods of Study



- ❖ **Purpose:** To better understand why there are people online who believe that fluoride is toxic via a **quantitative longitudinal study**.



- ❖ **Methods:**

- Media Cloud gathered a total of **980** stories from **325** different sources, and split them into **9** different types of media:
 - Mainstream media
 - Advocacy groups
 - Blogs
 - Scientific groups
 - Government organizations
 - User generated content (e.g., YouTube)
 - Naturalists
 - Academic groups
 - Other
- The authors analyzed their findings statistically by taking the total number of media sources (325) and separated them into pro or anti-fluoride. Then they took those numbers and turned it into percentages.

Results



❖ Media Types

Out of 325 sources:

- **68 or (20.9%) = Pro-Fluoridation**
 - It is worth noting that *77.8% of scientific groups* were pro-fluoride
- **71 or (21.8%) = Anti-Fluoridation (See Table I)**
 - The biggest contributors were advocacy groups, user generated content, blogs.
- **175 or (53.8%) = Neutral**
- **11 or (3.4%) = Missing**
 - Broken links, duplicated links in different languages, links not able to be translated.

Variable	Pro-Fluoride	Anti-Fluoride	Neutral	Missing	Total
Media Type	N%	N%	N%	N%	N%
Mainstream Media	0 (0%)	20 (14%)	122 (85.3%)	1 (0.7%)	143 (44%)
Advocacy Group	25 (30%)	22 (44%)	13 (26%)	0 (0%)	50 (15%)
Blog	5 (14.7%)	12 (35.3%)	16 (47%)	1 (2.9%)	34 (10.4%)
Scientific Group	21 (77.8%)	1 (3.7%)	4 (14.8%)	1 (3.7%)	27 (8.3%)
Government	20 (80%)	0 (0%)	4 (16%)	1 (4%)	25 (7.7%)
Other	2 (12.5%)	3 (18.7%)	10 (62.5%)	1 (6.2%)	16 (4.9%)
User Generated	1 (7.7%)	5 (38.4%)	4 (30.8%)	3 (23.1%)	13 (4%)
Natural	0 (0%)	8 (100%)	0 (0%)	0 (0%)	8 (2.4%)
Academic	4 (66.7%)	0 (0%)	2 (33.3%)	0 (0%)	6 (1.8%)
Not typed	0 (0%)	0 (0%)	0 (0%)	3 (100%)	3 (0.9%)
			175		
Total	68 (20.9%)	71 (21.8%)	175 (53.8%)	11 (3.4%)	325 (100%)

Table I. Descriptive Characteristics of Study Sample (N = 325)

Results & Conclusion



❖ Inlink Comparisons

- **367 or (57.4%) = Pro-Fluoridation**
 - CDC, NCBI, ADA, etc.
- **138 or (21.6%) = Anti-Fluoridation**
 - Fluoridealert.org, Fluoridation.com, collectiveevolution.com, etc (See Table II)
- **127 or (19.9%) = Neutral**
- **7 or (1.1%) missing/broken**

❖ Conclusion:

- Despite the numerous credible and evidence based sources that support CWF, misinformation continues to be spread on the internet
 - Anti-fluoridation sites had little to no credible sources, while pro-fluoridation sites had mounds of credible sources from big governmental agencies and organizations.
- They report that the reason the misinformation keeps spreading among these media types is due to a lack of successfully spreading evidence based online.

Community Name	Color	Links to Pro-Fluoridation Sources	Links to Anti-Fluoridation Sources	Links to Neutral Sources	Total # of inlinks
US government/US advocacy	Blue	241 (67%)	60 (16.6%)	55 (15.3%)	360 (56.3%)
Scientific/Peer-review	Red	86 (62%)	35 (25%)	15 (10.8%)	139 (21.7%)
UK/Australia scientific/Mainstream media	Green	36 (36.7%)	20 (20%)	42 (42.9%)	98 (15.3%)
Conspiracy/Natural	Purple	3 (11%)	23 (85%)	1 (3.7%)	27 (4.2%)
US local news	Yellow	1 (6.6%)	0 (0%)	14 (93.4%)	15 (2.3%)
Total		367 (57.4%)	138 (21.6%)	127 (19.9%)	639 (100%)

Table II. Comparing Percentages and Numbers of Sources' and Inlinks' Sentiments for 235 Sources in the Five Major Sub-Communities



Fluoride-Related YouTube Videos: A Cross-Sectional Study of Video Content by Upload Sources²

Corey H. Basch, Elizabeth B. Blankenship, Mary
Elizabeth Goff, et al.

Content Searched October 20, 2016
Submitted for Publication March 20, 2018
Publication Accepted July 7, 2018

Purpose & Methods of Study



- ❖ YouTube's contribution to the dispersing of user-generated information on CWF, plays a vital role in how we as a people receive that information in 2020.
- ❖ **Purpose:** To describe and compare the characteristics of the most widely-viewed, fluoride-related English-speaking videos on YouTube according to the type of uploaded source and the frequent topics mentioned.
- ❖ **Methods:**
 - **Cross-Sectional Design**⁵
 - Research was done on **100** of the most frequent, widely viewed fluoride-related English-speaking videos and documented according to three sources:
 - *Consumer*
 - *Media*
 - *Professionals*



<https://www.mymix991.com/youtube-announces-a-big-change/>

<https://phys.org/news/2016-07-fluoride-safe.html>



Results

- ❖ Out of the 100 most frequent widely-viewed, fluoride-related English-speaking videos:
 - 68 = consumer videos
 - 18 = media videos
 - 14 = professional videos
- ❖ This **table** provides the frequencies that each upload source mentioned specific content.
- ❖ Lack of emphasis:
 - The need to train healthcare professionals on fluoride-related issues.
 - How much parents need to be educated on the safety and proper use of fluoride in their children to prevent dental caries.
- **Limitations:** Research **ONLY** accounted for English-speaking videos.

Table II. Frequencies (and column percentage) of each binary content category of the 100 most widely watched English language fluoride-related YouTube videos by source category.

Content category	Source of Upload (n(% of column N))			
	Consumer (n=68)	Professional (n=14)	Media (n=18)	Total (n=100)
Discusses community water fluoridation programs	58 (85)	14 (100)	17 (94)	89 (89)
Mentions fluoridation of toothpaste	31 (46)	13 (93)	8 (44)	52 (52)
Mentions the need for training of health personnel	5 (7)	4 (29)	2 (11)	11 (11)
Mentions the need for parent awareness	4 (6)	1 (7)	1 (6)	6 (6)
Mentions fluoride supplements	2 (3)	1 (7)	0 (0)	3 (3)
Mentions benefits of fluoride on teeth	26 (38)	12 (86)	6 (33)	44 (44)
Mentions that fluoride does not benefit teeth	13 (19)	5 (36)	2 (11)	20 (20)
Mentions that too much fluoride is negative	23 (34)	9 (64)	8 (44)	40 (40)
Mentions dangers of fluoride	48 (71)	12 (86)	15 (83)	75 (75)
Mentions specific dangers to the body	31 (46)	10 (71)	9 (50)	50 (50)
Mentions danger in children 1-5 years old	19 (28)	8 (57)	4 (22)	31 (31)
Mentions that fluoride is poisonous	35 (51)	8 (57)	12 (67)	55 (55)
Mentions a conspiracy theory	24 (35)	4 (29)	4 (22)	32 (32)
Mentions treatment of fluorosis	25 (37)	0 (0)	4 (22)	29 (29)
Mentions removing fluoride from body	19 (28)	1 (7)	2 (11)	22 (22)

*If all videos belong to one category of contents (i.e., all "Yes"s or all "No"s), then the other category has zero cell count.

Conclusion



- ❖ Among the **100** most frequent widely-viewed, fluoride-related English-speaking videos on YouTube:
 - More uploads were by consumers rather than professionals.
 - There is an anti-fluoridation point of view on social media, focusing on the dangers of fluoride rather than its benefits.
- ❖ Both consumers and media receive more views due to their videos being more attractive and appealing to the average user.
- ❖ As a result, health professionals have a difficult time finding balance in producing videos promoting the benefits of CWF, while also accumulating more views from their desired audience.

Importance for Dental Hygiene



- ❖ As future hygienists, we must bring patient awareness to correctly-sourced information from professional/governmental resources (such as the CDC, ADA, ADHA, etc.) that will be helpful for them to find out more about CWF and medical/dental questions. We also have a duty to inform the public that fluoride is beneficial when consumed in properly regulated amounts.
 - Fluoride toxicity can only occur when it is not regulated.¹¹
- ❖ According to the **Center for Disease Control**, “Community water fluoridation is one of the 10 great public health achievements of the 20th century”.⁶
 - The reason for this is because fluoride has properties that strengthen your enamel, while protecting our teeth from forming cavities at a cost-effective price.⁶
- ❖ Lastly, by implementing a better social media presence, dental hygienists can lessen the anti-fluoridation sentiment on social media. This will create a better understanding for the fluoridation of water and its benefits.

Importance for Dental Hygiene



- ❖ Here is a short video by an american digital media network called **Seeker**¹⁶, with a great demonstration on how to provide actual fact-based information about fluoride, while engaging its audience.



<https://www.youtube.com/watch?v=XuMxAB9q92E>



THANK YOU FOR LISTENING!



<https://www.dentalcare.com/en-us/patient-education/patient-materials/dental-care-for-children>

The End.

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