

The Dean Study

National Pure Water Association, in its response to the UK Department of Health's (DoH) 2012 consultation on fluoridation proposals, included the critique – *The Dean Study*, from the 2010 book – *The Case Against Fluoride* (left). *The Dean Study* demolishes the very foundation of fluoridation and is reproduced below with the kind permission of the authors.

For its consultation, the DoH published three documents including an *Equality Analysis* which states in its introduction:

“Virtually all water supplies contain some fluoride and it was from noticing different patterns of dental decay in areas of naturally fluoridated water that the benefits of fluoride were first observed.”

The reference given is *One in a Million (OIAM)*, 3rd edition, published in March 2012 by UK fluoridation

promoter – the British Fluoridation Society, probably to coincide with the passage of the Health and Social Care Act 2012, which amended the existing fluoridation legislation.

There is no mention of the early observations on fluoride in water supplies in *OIAM*, 3rd edition but in *OIAM*, 2nd edition, published in 2004, there is a mention of researchers during the 1930s and of Trendley Dean's involvement in establishing the Grand Rapids fluoridation trial in the USA that began in 1945.

The BFS's account of the early history fails to mention that the 1930s research which spawned the fluoridation hypothesis centred mainly on environmental consequences of fluoride pollution and the undeniable harm it and water borne fluoride can cause – dental fluorosis. Dean's earliest research on fluoride began with investigations into dental fluorosis. Dean, with others, went on to publish their famous two-part, twenty-one-city study in 1942.^{1,2} without which it is unlikely fluoridation would have began. *The Dean Study* demolishes the twenty-one-city study by Dean et al using research by the late Rudolf Ziegelbecker Snr and his son, Rudolf Ziegelbecker Jr.

The Dean Study, is part of the chapter – *The Early Evidence Reexamined* that was co-authored by Peter Meiers and its introduction quotes Benjamin Nesin, director of the New York State Water Laboratories, who in 1956 stated, **“It must be emphasized that the fluoridation hypothesis in its entirety rests on a very narrow base of selected experimental information. It is this very base which is vulnerable to scientific criticism. And it is upon this very narrow base that the impressive array of endorsement rests like an inverted pyramid.”**³

The introduction continues – In actual fact, that **“impressive array of endorsements”** began in 1950, long before these trials, which began in 1945, were completed in 1955. Proponents really didn't need to have very much data available once the U.S. Public Health Service (PHS) endorsed fluoridation in 1950, halfway through the trials (see chapter 9).

The Case Against Fluoride... is required reading for anyone with an interest in fluoridation.

The Dean Study

In describing Dean's early work, the Centers for Disease Control and Prevention (CDC) stated in 1999, "Dean compared the prevalence of fluorosis with data collected by others on dental caries prevalence among children in 26 states (as measured by DMFT) and noted a strong inverse relation. This cross-sectional relation was confirmed in a study of 21 cities in Colorado, Illinois, Indiana, and Ohio."⁴ This raises the question, if Dean had access to data from twenty-six states, why did he use data from only twenty-one cities from four states in this critical two-part report? Did he select the cities that best supported his hypothesis? Dean's twenty-one-city plot is shown in figure 7.1.

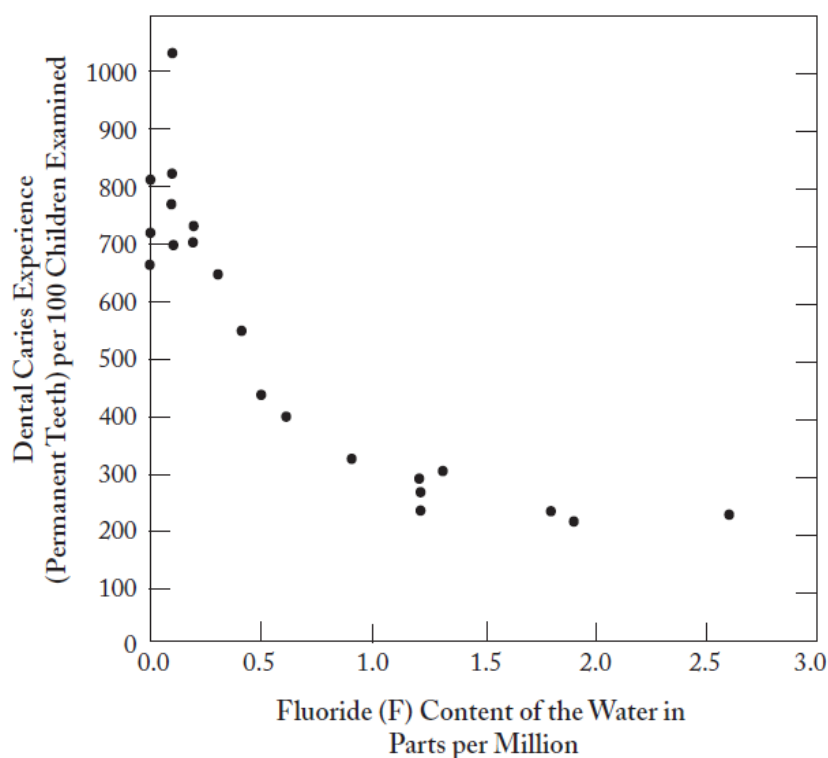


Figure 7.1. Dean's twenty-one-city graph. The original caption read, "Relation between the amount of dental caries (permanent teeth) observed in 7257 selected 12–14 year old white school children of 21 cities of 4 states and the fluoride (F) content of the public water supply." Source: Adapted from Dean, Arnold, and Elvove, 1942.⁵

Dean claimed that he limited the cities to those for which he had evidence that the water supply had been a constant source of natural fluoride for twenty years or more. However, according to Dr. Fred Exner, a well-known radiologist and prominent critic of fluoridation, during cross-examination in court (*Schuringa v. Chicago*, 1960), Dean admitted that some of the cities did not meet that criterion.⁶

The late Rudolf Ziegelbecker, an Austrian statistician, pursued this issue. When he added in all the data he could find from the United States and Europe that compared prevalence of tooth decay with natural fluoride levels in the water, the inverse relationship reported by Dean was absent (see figure 7.2). However, when he examined the same data for dental fluorosis, he found a robust direct relationship—that is, as the level of fluoride in the water increased, so did the prevalence of dental fluorosis (see figure 7.3). One relationship (between fluoride levels and dental fluorosis) holds up over the “background noise”; the other (between fluoride levels and dental decay) does not.⁷

In a subsequent study Ziegelbecker and his son examined tooth decay data collected by the World Health Organization (WHO) in several individual countries, and again they found no relationship between tooth decay and levels of natural fluoride in drinking water.⁹

Ziegelbecker Senior further elaborated on his critique of Dean’s twenty-one-city study and the practice of fluoridation in general in a submission he made to Codex Alimentarius in 2003.¹⁰

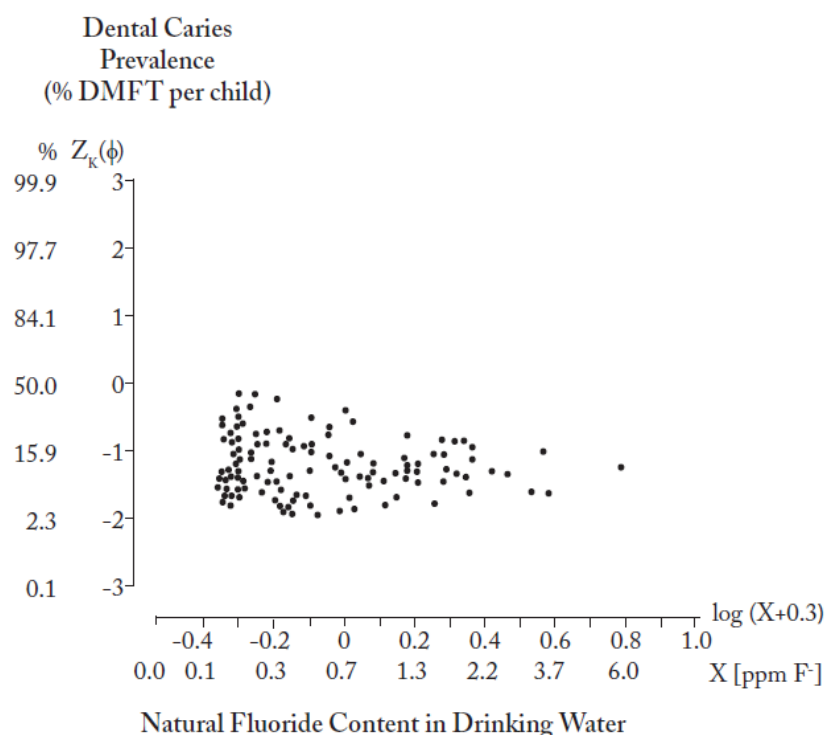


Figure 7.2. Ziegelbecker’s plot of prevalence of tooth decay versus water fluoride levels. Tooth decay is plotted as the probit values of the percentages of the average DMFT in each community (the Z scale). The probit transformation is a standard procedure for making percentage data linear and more amenable to statistical analysis. The fluoride water levels (X ppm) in each community are plotted on a logarithmic scale as $\log (X + 0.3)$. The addition of 0.3 is Ziegelbecker’s adjustment for other sources of fluoride in addition to water. Source: Reproduced from Ziegelbecker, 1981.⁸

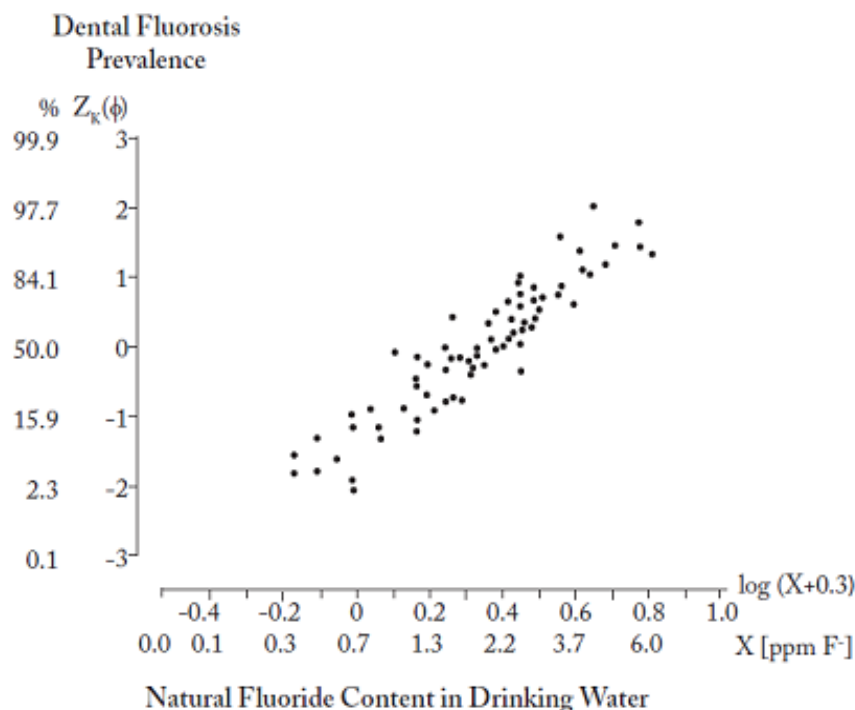


Figure 7.3. Ziegelbecker's plot of the prevalence of dental fluorosis versus water fluoride levels. Dental fluorosis is plotted as the probit values of the percentages of the children in each community with this condition (the Z scale). The scale used in the horizontal axis is explained in the legend to Figure 7.2. Source: Reproduced from Ziegelbecker, 1981.¹¹

References

1. H. T. Dean, F. A. Arnold Jr., and E. Elvove, "Domestic Water and Dental Caries. II. A Study of 2,832 White Children, Aged 12 to 14 Years, of 8 Suburban Chicago Communities, Including *Lactobacillus Acidophilus* Studies of 1,761 Children," *Public Health Reports* 56 (1941): 761–92, www.ncbi.nlm.nih.gov/pmc/articles/PMC2108536/pdf/pubhealthreporig01621-0004.pdf
2. H. T. Dean, F. A. Arnold Jr., and E. Elvove, "Domestic Water and Dental Caries. V. Additional Studies of the Relation of Fluoride Domestic Waters to Dental Caries Experience in 4425 White Children, Age 12-14 Years, of 13 Cities in 4 States," *Public Health Reports* 57, no. 32 (1942): 1155–79, www.ncbi.nlm.nih.gov/pmc/articles/PMC1968063/pdf/pubhealthreporig01481-0001.pdf
3. B. C. Nesin, "A Water Supply Perspective of the Fluoridation Discussion," *Journal of the Maine Water Utilities Association* 32 (1956): 33–47.
4. Centers for Disease Control and Prevention, "Achievements in Public Health, 1900–1999: Fluoridation of Drinking Water to Prevent Dental Caries," *Mortality and Morbidity Weekly Review* 48, no. 41 (October 22, 1999): 933–40, www.cdc.gov/mmwr/preview/mmwrhtml/mm4841a1.htm Note: The authors of this report were Scott Tomar and Susan Griffin, as cited in Tomar's curriculum vitae, paper number 27 on page 27, www.fluoridealert.org/wp-content/uploads/tomar.scott_cv_ref_27.pdf
5. H. T. Dean et al., "Domestic Water and Dental Caries. V" (n. 2 above).
6. F. B. Exner, "Analytical Commentary on the 1960 Testimony of Dr. H. Trendley Dean in the Suit to Enjoin Fluoridation of Chicago's Water, Part II," in *Fluoridation: Its Moral and Political Aspect; A New and Comprehensive Study* (New York), The Greater New York Committee Opposed to Fluoridation (undated).
7. R. Ziegelbecker, "Fluoridated Water and Teeth," *Fluoride* 14, no. 3 (1981): 123–28, www.fluorideresearch.org/143/files/FJ1981_v14_n3_p098-146.pdf#page=30
8. Ibid.
9. R. Ziegelbecker and R. C. Ziegelbecker, "WHO Data on Dental Caries and Natural Fluoride Levels," *Fluoride* 26, no. 4 (1993): 263–66, www.fluorideresearch.org/264/files/FJ1993_v26_n4_p237-298.pdf
10. R. Ziegelbecker, "Comments and Scientific Critique on the Report of the Working Group to Consider Section 3.1 Essential Composition in the Proposed Draft Revised Standard for Infant Formula at (Step 3)," submitted to Codex Alimentarius Commission FAO/WHO, Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU), March 30, 2003.
11. R. Ziegelbecker, "Fluoridated Water and Teeth" (n. 7 above).

