

Editor's Note: In September 2004 Professor John Spencer of the Australian Research Centre for Population Oral Health began circulating a one-page mimeo statement to various dental health units about criticisms by Dr Mark Diesendorf of his fluoride caries claims. Only recently, however, has the statement come to the attention of Dr Diesendorf, whom Professor Spencer accused of mis-interpreting and mis-using his and other research on fluoride and dental caries. To help readers understand the points at issue, the mimeo statement is printed below^a along with Dr Diesendorf's response. Professor Spencer was invited to comment, but as of this writing (November 17, 2006), he has not acknowledged or replied to our invitation to do so.

DENTAL RESEARCH ON FLUORIDATION MISUSED

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Australia's leading anti-fluoridationist, Mark Diesendorf, is misleading NSW coastal residents about our research.

His claim is that a recent paper by us¹ showed that there was no benefit for oral health from water fluoridation.

Let's examine this claim.

As the title of the paper indicates the purpose of this study was to analyse the impact on decay of drinking non-public water, i.e., tank or bottled water. The study showed that those children who substituted tank or bottled water as drinking water in fluoridated areas had significantly more decay in their first deciduous teeth, and there was a positive trend to more decay in their adult or permanent teeth.

The reasons for the positive trend in permanent teeth not being stronger, seemed to lie with tank or bottled water occupying a neutral ground for many adolescents: they did not receive the benefit from drinking of fluoridated water but neither did they have a strong risk of decay such as with soft drinks. In the paper we also discuss the possible mixing of effects with use of other fluoride sources.

Mark Diesendorf misrepresents the study as an analysis of the benefits of water fluoridation which it was not. He also misinterprets the study's indirect evidence on the benefits of water fluoridation on decay. This is the sort of misrepresentation or misinterpretation that earned Mark Diesendorf the condemnation of the National Health & Medical Research Council (NHMRC) in 1991.²

^aThe mimeo has been typeset to the style used in *Fluoride* with the first reference being placed after the text rather than within it and the second reference being added. Additional biographical information on Professor Spencer has been added in the footnote.

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It is also somewhat ironic that the study of tank or bottled water was only possible because we have conducted a larger 'parent' study of the benefits of water fluoridation. The larger study of children in South Australia and Queensland has, in a series of research papers, supported the benefits of water fluoridation in both cross-sectional and longitudinal analyses and provided valuable comment on the importance of pre-eruptive exposure to fluoride of the developing tooth. Any careful reading of the latest paper makes this very apparent. Yet Diesendorf chooses to tell only some of the story, and even then he misrepresents it.

We remain active researchers on what affects child oral health and our work has repeatedly found support for the benefits of water fluoridation. We are not sideline critics. We remain engaged in learning about how best to invest in improved oral health for Australian children.

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RESPONSE TO JOHN SPENCER'S OBFUSCATION OF THE RESULTS OF HIS OWN PAPER

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In 2004, a leading Australian proponent of fluoridation, Professor John Spencer, co-authored a paper¹ with Jason Armfield that compared dental caries prevalence in children ingesting public (fluoridated) and nonpublic (nonfluoridated) water in South Australia. For deciduous teeth, a small apparent benefit of fluoridation was observed. But for permanent teeth, the results were that (quoting from the abstract) 'The effect of consumption of nonpublic water on permanent caries experience was not significant.' I have previously commented on this study in *Fluoride*² and in the media, pointing out that it is consistent with other studies that find that fluoridation is ineffective in permanent teeth.

In my comments in *Fluoride*, I also pointed out that Armfield and Spencer's attempts to explain away the above result are inconsistent with their other results published in their paper. In particular, their attempt to invoke the halo effect (children in nonfluoridated areas ingesting fluoridated soft drinks) does not explain the difference in results between deciduous and permanent teeth. A strong halo effect is also inconsistent with their other result that there were no benefits from fluoridation in either deciduous or permanent teeth for children ingesting less than 100% of drinking water fluoridated at 1 ppm.

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Dated 26 September 2006.

I have just discovered that, since 2004, Spencer has been disseminating a one-page mimeo³ claiming that I am misleading people about the results of his study. More specifically Spencer claims incorrectly that:

1. I have misrepresented the purpose of the study.
2. I should have mentioned that the study found 'a positive trend to more decay' in the nonfluoridated group. (Apparently he considers this to be misrepresentation by omission.)
3. I have misrepresented the 'indirect evidence' on the alleged benefits of fluoridation. (But Spencer does not explain what he means by 'indirect evidence'.)
4. I was condemned by the National Health & Medical Research Council (NHMRC) for misrepresentation.

Let's examine each of these claims in turn.

1. My public comments have focused on the results of his study, not the purpose, which is often irrelevant to the results. Scientific advances are often made when unexpected results appear. Apparently Spencer does not understand this fundamental aspect of scientific discovery.
2. In science, the usual meaning of the word 'trend' denotes a change over time. Spencer's use of the word 'trend' here is misleading, because his study was a cross-sectional study, which means that the authors compared fluoridated and nonfluoridated communities *at a fixed point in time*. There could be no trend. Statisticians sometimes use the word 'trend' to describe a dose-response curve. However, in this case there was no dose-response curve and hence no trend. Perhaps Spencer is trying to apply the word 'trend' inaccurately to a correlation that was not statistically significant. If so, he should state that clearly and openly. However, in science there is no requirement on someone who cites a study to mention correlations that are not statistically significant.
3. In my reading, the paper by Armfield and Spencer has supplied no indirect evidence on the alleged benefits of fluoridation, apart from citing authors who obtain results from other studies (none of which is A-grade) that claim benefits from fluoridation. In commenting on Spencer's study, there is no requirement for me to cite all his citations. That would be a ridiculous waste of space. However, in my view Armfield and Spencer should have cited in their study the refereed publications by other authors such as Colquhoun who also found similar results to them, i.e., no benefit from fluoridation to permanent teeth.⁴⁻⁸

Instead, Armfield and Spencer speculated in their paper on several alleged reasons why they didn't obtain the result they expected. None was the obvious possibility that there may be no benefit from fluoridation in permanent teeth. I suspect that Spencer considers his speculations to comprise 'indirect evidence'. If so, he and I have different understandings

of the requirements of good science. None of Spencer's speculations was backed up by evidence or analysis, so there is no requirement for me to reproduce these speculations and there is certainly no misrepresentation on my part.

4. In its 1991 report, the profluoridation NHMRC made the following *ex cathedra* statement about data on dental caries in Australian capital cities that I had submitted to it: 'The Working Group's view is that Dr Diesendorf's analysis of these data was inadequate and was essentially a descriptive analysis of tabulated and graphed data, without formal statistical evaluation'.⁹ This does not justify Spencer's charge of misrepresentation. Many proponents of fluoridation publish comparisons of average dental caries prevalence when campaigning to fluoridate a community. Furthermore, statistical evaluation, by scientists with doubts about the effectiveness of fluoridation, is impossible, when the raw data on dental caries are controlled by proponents of fluoridation such as Spencer. Only the averages and (occasionally) the standard deviations are available to the public.

The data I presented to NHMRC showed clearly and consistently that, for each of several age groups, the average tooth decay in nonfluoridated Brisbane in 1987 was the same as in fluoridated Adelaide and Perth and less than in fluoridated Melbourne.⁸ The data further showed that there had been a large reduction in average tooth decay in nonfluoridated Brisbane from 1977 to 1987 at the same time as there were also large reductions in the fluoridated capital cities.⁸ This suggests that a mechanism other than fluoridation was the common cause of the reductions. NHMRC did not back up its criticism of my results with a published statistical analysis of the raw data (not averages). My information is that it attempted the analysis, but did not find sufficiently clear results to refute mine in a scientific manner as opposed to the rhetorical attack that it chose.

In conclusion, not one of Spencer's claims, that I misrepresented the Armfield and Spencer study, stands up to examination. Instead, it is Spencer's statements about his own study that fail close examination. The purpose of the study is irrelevant to its results. In his mimeo, Spencer uses the terms 'trend' and 'indirect evidence' without precision; furthermore neither term exists in his study in the context of comparing fluoridated and nonfluoridated populations. He even misrepresents the NHMRC report. In my view the choice of these tactics is not compatible with the principles and methods of scientific discovery.

Spencer is in the awkward situation of trying to promote fluoridation while simultaneously adding to his list of scholarly publications a study whose results support earlier papers by others that question the effectiveness of fluoridation. His dissemination of his mimeo, *Dental research on fluoridation misused*, can be understood in that context. It has the effect of obscuring the main result of the 2004 study by Armfield and Spencer, but only achieves this obfuscation among some people who haven't read the paper.

My own hypothesis is that the damage to dental enamel of permanent teeth of some children caused by fluoridation in so-called 'moderate' and 'severe' dental fluorosis entails that there is actually slightly more dental caries on average in fluoridated compared with nonfluoridated regions. This is not seen in the results of the Armstrong and Spencer and other authors, because of examiner bias. Dentists and dental therapists who collect the raw data on children's teeth always know whether children are from a fluoridated or nonfluoridated region. This unconsciously biases their results, a well-known phenomenon in science and medicine. It is avoided in testing the effectiveness and safety of pharmaceutical drugs by randomised controlled trials, in which both experimenters and subjects are unaware who is receiving the tested product and subjects are allocated randomly to test and control groups. Unfortunately such trials have never been carried out for fluoridation, and so the scientific basis of this mass medication is flimsy.

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