

## **WATER FLUORIDATION IN NEW ZEALAND: AN ANALYSIS AND MONITORING REPORT**

Public Health Commission Rangapu  
Hauora Tumatanui, Wellington 1994

Reviewed by Bruce Spittle  
Dunedin, New Zealand

In introducing this 128 page report,<sup>1</sup> published in July 1994, Dr Gillian Durham, Chief Executive of the Public Health Commission (PHC), notes that fluoridation of public water supplies, as a means of promoting dental health, continues to be a contentious public health issue in New Zealand as well as other countries such as Australia and the United States. The PHC considered that it was time to review the evidence concerning the safety and effectiveness of fluoridation so that water supply authorities, and the communities they serve, could make informed decisions about fluoridation. Public submissions were invited on an initial draft entitled *Fluoridation of Water Supplies: Draft Policy Statement*<sup>2</sup> released in May 1993. It had been prepared for the PHC by E Treasure, B Drummond, H Buchan, M Beasley, M Henaghan and B Nicholas. Dr Nicholas Wilson considered the 82 submissions received on the draft and prepared the final report. He acknowledged that the review had been essentially written by only one person with experience in only particular areas, primarily public health medicine, epidemiology and clinical medicine, so that it was not possible to achieve the depth of analysis required in all the fields involved such as clinical dentistry, toxicology, environmental health, immunology, risk assessment, public health dentistry, risk perception psychology, sociology and public health ethics. It was also necessary, because of the vast literature on fluoride and health, to place some reliance on the quality of the previous reviews that had been conducted. It was acknowledged that there were limitations with some of these and that they in turn may have tended to place unwarranted weight on the findings of previous expert reviews. Emphasis was placed on several key reviews including *Health Effects of Ingested Fluoride* by the National Research Council in the USA,<sup>3</sup> *Review of Fluoride: Benefits and Risks* by the US Public Health Service,<sup>4</sup> and *The Effectiveness of Water Fluoridation* by the National Health and Medical Research Council of Australia.<sup>5</sup> A total of 1592 listings and abstracts from the Medline database for the 1989-1993 time period were obtained. The books critical of fluoridation that were examined included *Fluoridation: The Great Dilemma* by Waldbott, Burgstahler and McKinney,<sup>6</sup> and *Fluoride: The Freedom Fight* by Moolenburgh.<sup>7</sup>

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Dr Bruce Spittle, Department of Psychological Medicine, Medical School, University of Otago, PO Box 913, Dunedin, New Zealand.

The Executive Summary in the report reviews the health and non-health benefits and costs of water fluoridation. The report acknowledged that an unequivocal assurance that fluoridation was safe could no longer be given. An earlier 1957 New Zealand *Report of the Commission of Inquiry on the Fluoridation of Public Water Supplies*<sup>8</sup> had found that fluoridation was a public health measure that was not merely beneficial but also safe, and that no harmful effects on health would follow the fluoridation of water supplies. In contrast the 1994 report found that it was possible that there was a small increased risk of hip fracture associated with water fluoridation and that the possibility of a similar increased risk of osteosarcoma in young men could not be ruled out. It was acknowledged that fluoridation encroached on the individual freedom of those who did not wish to consume fluoridated water with some people having to purchase bottled water or use expensive filters. Although fluoridation was seen to possibly degrade the spiritual value of water for some Maori, it appeared, from the limited evidence available, that if some access to "pure water" was maintained, Maori favoured fluoridation overall for its benefits to dental health. It was considered that aspects of the controversy over water fluoridation had probably led to some loss of public trust in public health authorities and dental professionals. It was estimated that the lifetime benefit for the average New Zealander drinking fluoridated water was the prevention of a total of 2.4 to 12.0 decayed, missing or filled teeth. Water fluoridation was seen to also contribute to equity of health outcomes with the benefit of dental caries prevention being greater for those in lower socioeconomic groups, Maori and children. Prevention occurred also of dental abscesses and more rarely serious infections such as infective endocarditis. At the present level of coverage of the population with 50% receiving fluoridated water, the net savings for New Zealand society were seen to be in the range of \$1.4 to \$14.3 million per year, representing between 58,000 and 267,000 decayed, missing or filled teeth in New Zealand per year.

Comparing the health benefits and costs was seen as difficult as the levels of risk involved were not all known. It was considered that, with the current state of knowledge, most health professionals put significant weight on the overall benefits of water fluoridation for improving oral health and achieving equity of health status outcomes. However it was seen that members of the public may have more concern for individual rights and the unknown risks. A high degree of informed public input into deciding about water fluoridation was seen to be critical for democratic reasons and the necessity for value judgements about possible but unknown risks. Achieving informed citizen participation was seen to be more likely with citizen's panels or mixed citizen/expert panels rather than referenda. A high

requirement for further information on the benefits and costs of fluoridation was seen to remain, to ensure a properly informed debate and to minimise the levels of uncertainty.

It is likely that supporters of fluoridation will find reassurance in the report and consider that an impartial and objective review of the evidence in 1994 vindicates the judgement and vision of those responsible for its introduction. Those with doubts about the safety, efficacy and ethical correctness of fluoridation may not be persuaded to change their minds. The reassurance that, apart from hip fracture, osteosarcoma and mottled enamel, there is no scientific basis for concern about other health effects from exposure to fluoridated water at the level of one part per million (ppm), may not be convincing. Critics are presented as being somewhat naive and gullible with Waldbott described as admitting that he had no formal research training and that his studies were not double-blind but relied on personal intuition. This does not seem to be in accordance with the published literature where double-blind studies are described.<sup>9</sup> It suggests a tendency to denigrate the stature of critics rather than to look objectively at the arguments presented. It is perhaps symbolic of the lack of familiarity with Waldbott's pioneering work that the first mention of his name in the report on page 6 is misspelt as "Walbott". The claim by Moolenburgh's group of a double blind test for intolerance to fluoridated water<sup>10</sup> is doubted because no evidence was presented that the subjects could not distinguish between samples by taste. The finding by Susheela *et al*<sup>11</sup> that fluoride in water, at levels comparable to those used in fluoridation, may cause gastrointestinal symptoms is rejected because of the lack of a comparison group with very low fluoride levels and the high prevalence of other gastrointestinal diseases in India. No reference is made to an earlier paper by Susheela *et al*,<sup>12</sup> where a comparison group using water with a lower fluoride level of  $0.36 \pm 0.19$  ppm, who were screened for ova, cysts and worms, was described. No reference is made to the scanning electron microscopic studies done in rabbits and humans.<sup>12,13</sup> No critique is made of the arguments presented in *Fluoride: The Aging Factor*.<sup>14</sup>

Thus *Water Fluoridation in New Zealand* may be seen as sound and scientific, or superficial and selective, depending in large part on the prior position of the reader. This reviewer inclines towards the latter view.

### References

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- 9 Spittle BJ. Psychopharmacology of fluoride: a review. *International Clinical Psychopharmacology* 9 79-82 1994.
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- 12 Susheela AK, Das TK, Gupta IP *et al*. Fluoride ingestion and its correlation with gastrointestinal discomfort. *Fluoride* 25 (1) 5-22 1992.
- 13 Susheela AK, Das TK. Chronic fluoride toxicity: a scanning microscopic study of duodenal mucosa. *Clinical Toxicology* 26 467-476 1988.
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