



Recent media coverage of the local government debates surrounding community water fluoridation has frequently referred to possible hazards associated with this process. One hazard that has been mentioned is that children drinking fluoridated water are at higher risk of developing an extremely rare form of bone cancer called osteosarcoma.¹

At this time there is no evidence that this is true.

What is fluoride?

Fluorine is a naturally occurring element found in the air, soil, fresh water, plants and many foods. Fluorine containing compounds (two or more elements combined) are known as fluorides. The levels of naturally occurring fluorides in drinking water will be different depending on the type of soil and rock that the water flows through. In New Zealand there are low levels of naturally occurring fluoride in water (around 0.56 milligrams/litre).

Why add fluoride to drinking water?

Fluoride is used by the body to strengthen teeth. Community water fluoridation (CWF) programmes have consistently been shown to prevent and reduce tooth decay across the whole population. Community water fluoridation provides the greatest benefit to children and people who may be at high risk of tooth decay because of poor diet and inability to access dental care. There is clear evidence that long-term exposure to a safe level of fluoride results in lower levels of dental caries (holes in the teeth) in both children and adults.² The increased use of fluoride toothpaste has reduced the difference in the rate of tooth decay between communities with and without CWF.³ Community-based public health programmes are encouraged to maintain a constant low level of fluoride in as many people as possible (WHO).⁴ This can be achieved by community water fluoridation. Water fluoridation is therefore an important public health action.⁵

What happens if there is too much fluoride in the water?

In some parts of the world, such as areas in India, China and the United States, very high levels of naturally occurring fluoride are found in some drinking water sources (greater than 1.5 milligrams/litre and up to 69 milligrams/litre).⁶ Over time, drinking this water can cause changes to both teeth and bone as fluoride builds up in them. This is known as dental and skeletal fluorosis. In many of these places processes to remove fluoride from the drinking water (down to 1.5 milligrams/litre) have been implemented. Dental fluorosis (staining or pitting of the teeth) can be mild or can become severe. Skeletal fluorosis (build-up of fluoride in the bones) leads to joint pain and stiffness. In severe cases, it can affect muscle function and alter the bone structure. A small group of people experience slight white mottling of their teeth even at very low levels of fluoridation such as the levels used for community water fluoridation in New Zealand (0.7-1.0 milligrams/litre).

1. National Fluoridation Information Service, 2013. Community water fluoridation and Osteosarcoma - Evidence from Cancer Registries . <http://www.rph.org.nz/content/16498a10-6ea5-44e5-8ccb-e010d4746273.cmr>
2. WHO. Risks to oral health and intervention. http://www.who.int/oral_health/action/risks/en/index1.html
3. NFIS, 2011. Review of Scientific Reviews Relating to Water Fluoridation Published between January 2000 and July 2010. <http://www.rph.org.nz/content/2702c4c2-b679-4d96-ac08-8249f7025a63.html>
4. WHO. Risks to oral health and intervention. http://www.who.int/oral_health/action/risks/en/index1.html
5. WHO. Effective use of fluorides for the prevention of dental caries in the 21st century: the WHO approach. http://www.who.int/oral_health/publications/cdoe-319to321/en/index.html

This is not the same as severe dental fluorosis caused by high fluoride levels. While mild fluorosis can affect the appearance of the teeth it does not affect their strength or function (in fact the enamel is stronger). There is no evidence that rates of dental fluorosis are increasing in New Zealand or that it is more common in areas with CWF compared with areas without CWF.⁷

Is there a link between fluoride and bone cancer (Osteosarcoma)?

No. At this time there is no evidence that community water fluoridation programmes cause osteosarcoma. A number of studies have looked at whether there has been an increase in osteosarcoma following the introduction of fluoride to community drinking water. Studies have been published looking at communities in Ireland and the United States. These studies have not been able to show any changes. As the levels of fluoride in New Zealand are similar to those used in these countries, similar findings are likely to be found here as well.

Osteosarcoma is a very rare cancer in New Zealand with only around 14 cases diagnosed each year. The peak age is between 10 and 19 years in both boys and girls. To date there has been no change to the numbers of cases diagnosed each year as recorded by the New Zealand Cancer register.⁸ If there was a relationship between community water fluoridation and osteosarcoma, a change in the number of cases reported each year would be expected by now (after 50 years of CWF in some communities) when comparing areas with CWF with those without CWF.

The National Fluoridation Information Service was established by the Ministry of Health to review the national and international scientific literature relevant to its CWF policy.

This review process is on-going. Detailed lists of all articles can be found here:

<http://www.rph.org.nz/content/2702c4c2-b679-4d96-ac08-8249f7025a63.html>.

To date no new evidence has emerged to suggest the Ministry should change the current CWF policy in relation to osteosarcoma or any other health risk.

6. WHO, 2006. Fluoride in Drinking-water. Chapter 7, Country data on dental and skeletal fluorosis associated with exposure to fluoride through drinking-water. http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water/en/index.html

7. <http://www.health.govt.nz/publication/our-oral-health-key-findings-2009-new-zealand-oral-health-survey>

8. NFIS, 2013. Community water fluoridation and Osteosarcoma – Evidence from Cancer Registries <http://www.rph.org.nz/content/16498a10-6ea5-44e5-8ccb-e010d4746273.cmr>

For further information see:

National fluoridation Information Service
www.NFIS.org.nz

American Cancer Society

<http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/water-fluoridation-and-cancer-risk>

Cancer Council Western Australia

<http://www.cancerwa.asn.au/resources/cancer-myths/fluoride-cancer-myth>