

# **Water Fluoridation FAQs**

## **About the research paper and report**

### **Why we are exploring fluoridation of water**

The possibility of fluoridating Manx water was last explored in 2008, and discussed further in 2014. At this time, it was decided against. In the meantime, further research has been completed on water fluoridation so this new research paper will help to bring the evidence up-to-date so that Tynwald can make an informed decision about what to do next.

### **About the research paper and its publication date**

Many jurisdictions have already undertaken the process of adding fluoride to their water systems, so we will study any peer-reviewed research on the topic to gather evidence of the effect it may have if introduced into Manx drinking water. The aim will be to provide sufficient evidence for Tynwald to determine whether it would be a more efficient and effective way of preventing tooth decay in children than targeted fluoride varnish application.

When the research paper is released, we will also share our search strategies for people who might be interested in carrying out their own search in the same way.

### **Research paper completion date**

The research paper and report will be published on the Register of Business in the coming months.

## **About Fluoride and water fluoridation**

### **About fluoride**

Fluoride is a mineral that helps to prevent tooth decay, and brushing your teeth thoroughly with fluoride toothpaste twice a day is one of the most effective ways of preventing tooth decay. Children and adults in the Isle of Man are recommended to use family fluoride toothpaste (1,350 - 1,500 parts per million fluoride – ppmF) for maximum cavity control.

### **Places with fluoride in the water**

Fluoride is naturally occurring from soils and rock, and all natural water contains some level of natural fluoride. Manx water currently contains very low levels of natural fluoride (around 0.05 mg/l), and drinking water is not artificially fluoridated. The World Health Organization guideline value for fluoride is 1.5mg/l.

In many parts of the world, including some parts of England, fluoride is artificially added to the water to increase the level of fluoride in line with this guideline value.

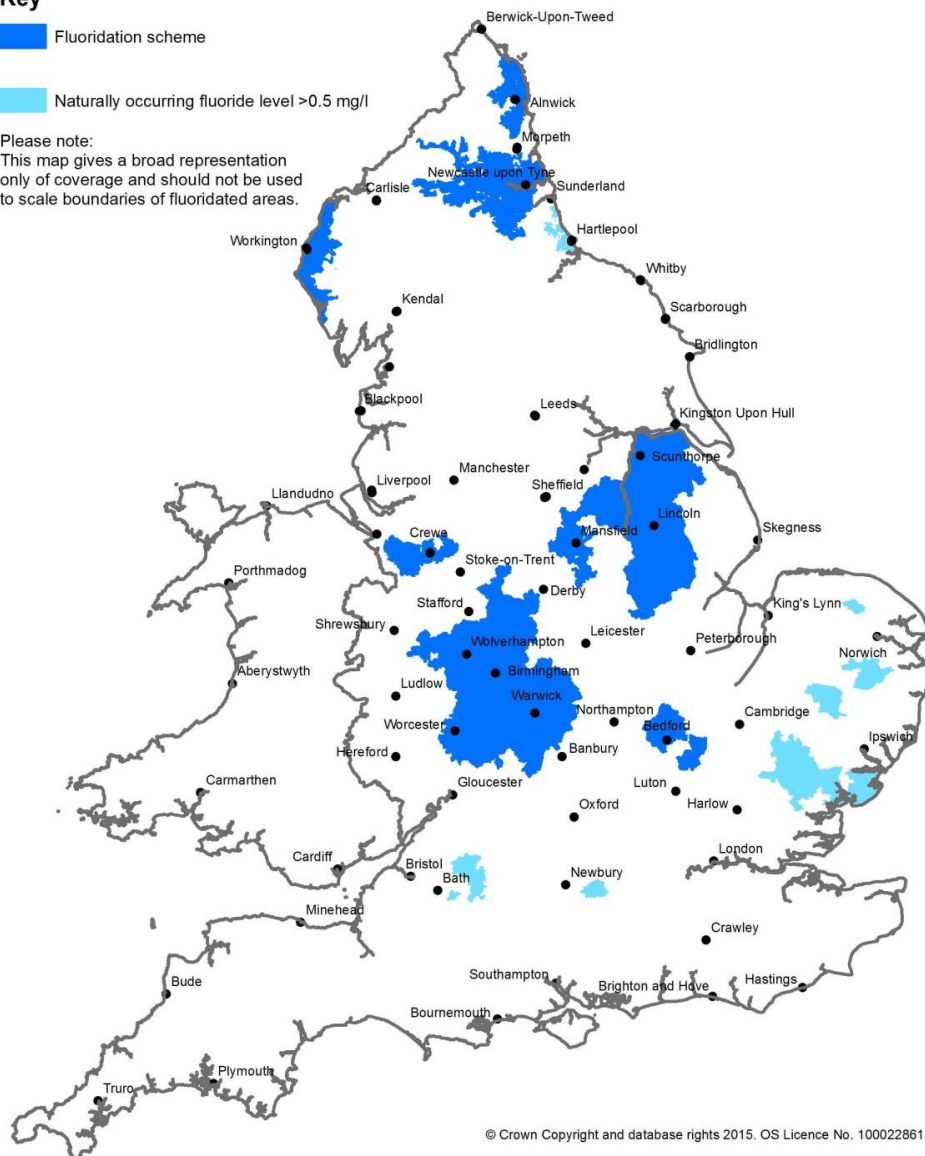
### Areas of fluoridation schemes and of naturally occurring fluoride >0.5mg/l during 2014

**Key**

 Fluoridation scheme

 Naturally occurring fluoride level >0.5 mg/l

Please note:  
This map gives a broad representation only of coverage and should not be used to scale boundaries of fluoridated areas.



[To view a text version of the above map, please click here](#)

[Source: UK Parliament, Water fluoridation and dental health](#)

**Common questions about fluoride are addressed below**

## **Does fluoride calcify part of the brain (pineal gland)?**

**Answer:** The pineal gland is found in the brain and is responsible for producing melatonin, a hormone which regulates the body's circadian rhythm or sleep wake cycle. It is normal for the pineal gland to have some level of calcification, and it is thought that calcification is associated with ageing. It is suggested that excessive levels of calcification can cause the pineal gland to not work properly, however more research on the relationship between calcification and functioning of the gland is required to establish this relationship fully.

It is known that fluoride can bind to calcium (which is why some are worried about the role of fluoride in calcification), however there has been no robust evidence to suggest that fluoride exposure causes calcification and affects pineal gland function. Some research has indicated that fluoride could be associated with calcification, however the research has been early animal studies and there is no evidence of a relationship in humans.

Therefore there is no good evidence that fluoride causes calcification of the pineal gland, or that calcification, when it occurs, causes any health related problem.

## **Are dangerous chemicals added to water as part of a water fluoridation scheme?**

**Answer:** Fluoride is a naturally occurring mineral found in all natural water supplies in some concentration. The levels of fluoride found in water vary according to the geology of the area. In areas of low natural fluoride, fluoride can be added to the water to gain the benefits of the reduction in tooth decay.

Water fluoridation in England is achieved by adding hexafluorosilicic acid or its sodium salt, disodium hexafluorosilicate to water supplies. These chemicals are manufactured carefully to ensure that they meet quality standards and purity specifications. When added to the water supply they mix in the water which results in the fluoride ions being available to reduce dental decay.

Levels of fluoride within the water supply are carefully monitored to ensure that they are within the desired range. As with most, if not all chemicals, very high levels of fluoride can be toxic, however no significant health risks have been found in relation to water which is fluoridated within the recommended levels.

## **Is water fluoridation effective in preventing tooth decay?**

**Answer:** Water fluoridation schemes have been in operation in the US since the 1940s and in England since the 1950s, and since its introduction evidence has been collected on the effectiveness. Although the levels of tooth decay reduction vary between countries and over

time, water fluoridation is understood to reduce levels of decay in primary teeth by 35% and in permanent teeth by between 26-70%.

Dental caries has reduced worldwide in areas both with, and without, systematic fluoridation schemes including water fluoridation. Such reduction is due to a combination of factors including the more widespread use of fluoride bases toothpastes. However tooth decay is still seen less in areas that are fluoridated compared to non-fluoridated areas (with low levels of natural fluoride), and in areas where water fluoridation schemes have been withdrawn, levels of decay have risen.

### **Have there been any randomised control trials for water fluoridation, and if not how can it be determined to be effective?**

**Answer:** Randomised controlled trials (RCTs) are considered the gold standard approach to determine the effectiveness and safety of new treatments such as drugs. However RCTs are not considered the best approach to evaluate complex public health interventions. It is not feasible to conduct RCTs on water fluoridation because of complex practical, ethical and financial factors. Therefore evidence is drawn from a variety of other scientific methods using varying research designs. Given that water fluoridation has been introduced in areas since the 1940s in the US and the 1950s in England (as well as other countries around the world), lots of data has been collected which has enabled the safety and effectiveness of water fluoridation to be established.

### **Will it cost £2 million to add fluoride to our water?**

**Answer:** Initial cost estimates have been provided by Manx Utilities for both the setting up and on-going costs relating to water fluoridation, however such costs would be subject to further investigation through a feasibility study. It has been estimated that the initial cost of setting up water fluoridation could be in the region of £1-1.5 million, with ongoing costs of approximately £50-£75,000 per year.

Water fluoridation has been found to be cost effective in other countries, however many factors affect the cost-effectiveness including set up costs, current levels of decay and population size. To establish accurate return on investment, further work would need to be carried out.

### **Does adding fluoride violate our human rights and contravene the IOM Human Rights Act 2001?**

**Answer:** No, it does not. Water fluoridation schemes have operated in England since 1964, and are in place in other countries in Europe (including the Republic of Ireland). The Isle of Man's human rights legislation is derived from legislation operating in the UK and

internationally, and we do not have any additional human rights which are not in place elsewhere. As water fluoridation is compliant with human rights legislation in these other jurisdictions, it would also be compliant in the Isle of Man.

Additionally, the Article 27 of the UNESCO 2005 declaration on human rights makes a specific exemption for laws which are for the protection of public health. Water fluoridation is a public health intervention, and therefore any aspect of water fluoridation which could be considered to conflict with the other articles, would be exempted.

### **Does the majority of Europe oppose water fluoridation?**

**Answer:** Many areas of Europe do not have water fluoridation, but have other schemes for fluoridation including salt and milk. The question of water fluoridation has not been posed in all European countries, and often the policy has not been explored, so there is no way to understand whether it would be supported or not.

### **Will we lose our biosphere status if we add fluoride to the water?**

**Answer:** UNESCO Biosphere embraces science and research to explore the best options for a sustainable community for both people and nature. The European Union Scientific Committee on Health and Environmental Risks (SCHER) (see references) conducted research into the environmental impact of water fluoridation and found that fluoridation within the recommended levels does not cause negative impacts for the environment. Other areas which have biosphere status have water fluoridation schemes in place, and UNESCO (who grant Biosphere Status) have specifically exempted public health interventions, such as water fluoridation, from contravening human rights under Article 27 of the 2005 declaration. Therefore if fluoride was added to our water it is unlikely to affect our biosphere status.

### **Could we give fluoride drops instead?**

**Answer:** Within the report consideration is given to alternative forms of fluoride delivery, but more exploration is required. One of benefits of water fluoridation is that it does not require a dental professional to prescribe or administer (as is required by some other forms of fluoride delivery such as varnish or drops), and therefore is able to reach the whole community, not just those with access to a dentist.

### **Do children drink enough tap water to have the desired effect?**

**Answer:** A recent questionnaire study carried out by the Isle of Man Public Health Directorate found that the majority of children in school years Reception and Year 1 (aged 4-6) drink more than three glasses of tap water per day. Many schools and early years' settings provide tap water to children whilst in their care. Tap water is also used in cooking,

which adds to the consumption. The results of this questionnaire indicate that children consume enough tap water to make water fluoridation effective.

Milk and water are the two tooth-friendly drinks recommended to help prevent tooth decay, and tap water is a free resource available to everybody living on the Isle of Man.

### **Is fluoride an ingredient in Prozac?**

**Answer:** The active ingredient in Prozac (otherwise known as Fluoxetine) which is used to treat depression and other mental health conditions is fluoxetine hydrochloride. This is not the same as fluoride—its chemical structure is made up of a variety of elements, and fluoride is just part of this.

The other ingredients in Prozac are:

- Pregelatinised maize starch
- Capsule shell components – Gelatin, yellow iron oxide (E172), titanium dioxide (E171) and brilliant blue (E133)
- Printing ink components – Ethyl Alcohol, Propylene Glycol, Isopropyl Alcohol, n-Butyl Alcohol, Potassium Hydroxide and Ammonium Hydroxide

### **Does fluoride cause skeletal fluorosis and joint pain?**

**Answer:** Prolonged exposure to high concentrations of fluoride can cause skeletal fluorosis, which can eventually result in joint stiffness and pain. Excessive fluoride intake usually occurs through the consumption of groundwater naturally rich in fluoride, particularly in warm climates where water consumption is greater, or where high-fluoride water is used in food preparation or irrigation of crops such as rice. In these areas, means should be sought to manage intake by providing drinking-water with a moderate (i.e. safe) fluoride level or using alternative sources of water for drinking, cooking or irrigation. The preparation of food using fluoride-rich coal also contributes to excess fluoride intake via ingestion and inhalation.

Water fluoridation has been adopted by several countries as a cost-effective public health measure for the prevention of dental caries. The World Health Organization recommends a maximum level of 1.5 mg/L of water. This value is intended to maximise the oral health benefits, and be protective of public health, including fluorosis.

### **Does water fluoridation cause health impacts such as on IQ, neurological impairment, cancer, fractures etc?**

**Answer:** Water fluoridation schemes have been in operation since the 1940s and the health impacts have been studied consistently since their introduction. The literature on fluoride has explored many possible health effects, both positive and negative, and it is recognised that there is risk associated with most health related interventions. It is well recognised in the literature that both too little, and too much, fluoride causes adverse health effects. In recognition of this, levels of fluoride within water have to be continually monitored to ensure that a balance is achieved between providing the oral health benefits of decreased dental caries, whilst also not exposing the population to an unacceptable level of risk which could lead to adverse health impacts. Overall there is no evidence of health related harms for any age-group following water fluoridation, when water is fluoridated within the recommended levels.

The continued exploration of fluoride safety and possible health effects is an essential element of the health monitoring systems that countries with water fluoridation have in place. Ongoing research helps to ensure that if there are any queries regarding potential health impacts, that this can be picked up and explored thoroughly.

### **Will fluoride in the water affect livestock?**

**Answer:** As long as levels do not exceed 2 mg/L there should be little risk of harmful effects on animal health. The European Union Scientific Committee on Health and Environmental Risks (SCHER) (see references) conducted research into the environmental impact of water fluoridation and found that fluoridation within the recommended levels does not cause negative impacts for the environment, including for animals.

In the UK, the maximum permitted value of fluoride in drinking water is 1.5 mg/L.

### **Can fluoride exposure cause dental fluorosis?**

**Answer:** Dental fluorosis can sometimes occur if a child's teeth are exposed to too much fluoride when they're developing.

Mild dental fluorosis can be seen as very fine, pearly white lines or flecking on the surface of the teeth. Severe fluorosis can cause the tooth's enamel to become pitted or discoloured. It is a cosmetic condition, not a disease.

Most cases result from young children taking fluoride supplements or swallowing fluoride toothpaste when the water they drink is already fluoridated.

The correct amount of toothpaste should always be used (a smear for children under 3 years of age, and a pea-sized amount for children and adults aged 3 and over) and spat out after brushing.

It is uncommon in the UK for fluorosis to be severe enough to seriously affect the appearance of teeth. This is because fluoride levels in water are carefully monitored and adjusted if necessary.

## **References**

[Better Oral Health European Platform: Fluoridation in water](#)

[UK Parliament: Water Fluoridation and Dental Health](#)

[Scientific Committee on Health and Environmental Risks. Critical Review of Any New Evidence on the Hazard Profile, Health Effects, and Human Exposure to Fluoride and the Fluoridating Agents of Drinking Water.; 2010](#)

[Package leaflet for Fluoxetine](#)

[American Cancer Society: Water fluoridation and cancer risk](#)

[World Health Organization: Inadequate or excess fluoride: A major public health concern](#)

[Water Quality Australia: Livestock drinking water guideline](#)

[Drinking Water Inspectorate: Fluoridation of drinking water](#)

[Columbia University College of Dental Medicine: Fluorosis](#)

[UK Department of Health and Social Care, Office for Health Improvement & Disparities: Evidence Based Toolkit for Better Oral Health – Chapter 9: Fluoride](#)

[UK Department of Health & Social Care: Statement on water fluoridation from the UK Chief Medical Officers](#)

[UK Office for Health Improvement and Disparities – Water Fluoridation: health monitoring report for England 2022](#)