

Position Statement from the Irish Expert Body on Fluorides and Health regarding Water Fluoridation in the Republic of Ireland.

Background

Water Fluoridation and the use of appropriate fluorides is a major plank of public health policy in Ireland in the prevention and management of tooth decay. Fluoridation began in Ireland in 1964 on foot of the Health (Fluoridation of Water Supplies) Act 1960. The Act provides that health authorities arrange for the fluoridation of public piped-water supplies, and that local (sanitary) authorities act as their agents for doing this. Currently, approximately 68.5% of the population receives fluoridated public water supplies.

This policy was the subject of a major review in 2000. The Forum on Fluoridation, established by the Minister for Health and Children in 2000, reviewed the fluoridation of public piped water supplies. The Forum was comprised largely of persons with expert knowledge, spanning the areas of public health, dental health, food safety, environmental protection, law and ethics, water quality and health promotion, and included consumer representatives. The main conclusion of the Report of the Forum on Fluoridation 2002 was that the fluoridation of public piped water supplies should continue as a public health measure.

Approximately 400 million people around the world reside in areas served by optimally fluoridated water supplies (British Fluoridation Society 2012). In addition, recent years have seen a renewed interest in using water fluoridation as a public health strategy in a number of countries. For example, in February 2008, Britain's then Health Secretary, Alan Johnson called for fluoride to be added to his country's water supplies as a key means of tackling tooth decay there and set aside £42m to help carry out this implementation process. About 10% of the United Kingdom is fluoridated, mainly in the midlands and north-east of England. It is planned that Southampton will be the next city to begin fluoridation. In Queensland, Australia, the Water Fluoridation Act was introduced in 2008 and requires that a public potable water supplier must add fluoride to the supply in a form prescribed under a regulation and comply with the requirements prescribed under the regulation.

It is worth noting that three EU member states (Ireland, UK and Spain) have water fluoridation policies at the national or regional level. Major fluoridating jurisdictions include the USA, Canada, Australia, New Zealand, Malaysia, South Africa, Israel, Singapore, Hong Kong, Columbia, Chile and several others. Other forms of fluoridation are also practiced, including salt fluoridation in many South and Central American countries. For some European countries water fluoridation is impracticable due to the large number of separate water sources; many of these countries choose salt fluoridation or milk fluoridation as an alternative to give the health benefits of fluoride exposure to their citizens.

The World Health Organisation supports the use of water fluoridation as an efficient and equitable public health measure.

Legal Basis for Water Fluoridation

Water fluoridation is compatible with Irish, European and International law. The Health (Fluoridation of Water) Act 1960 and subsequent Statutory Instruments provide the statutory basis for the fluoridation of water in Ireland.

The EU Commission has determined that there are no European legal impediments to water fluoridation in any member state (EU Petitions 0210/2007 and 0211/2007). The Commission also noted that there are no international treaties which impinge on the right of a member state to avail of water fluoridation programmes. EU law defines a maximum permitted concentration of 1.5ppm for public water supplies through its drinking water directives. The maximum permitted level for water fluoridation schemes in Ireland is 0.8ppm.

The Code of Practice on the Fluoridation of Drinking Water 2007 was prepared by the Expert Body to implement Recommendation 2 of the Forum on Fluoridation 2002 the purpose of which is to ensure safe, efficient and effective implementation of the technical aspects on the procedure for the fluoridation of drinking water, by all personnel involved and hence to ensure that:

The fluoride concentration of fluoridated water supplied to the consumer will be within limits set by Irish and European legislation.

The Expert Body will continuously review this Code of Practice.

Health Issues

A number of claims have been made for many years in various media in relation to water fluoridation and potential health issues.

The Forum on Fluoridation Report (2002) considered these issues and found there was no valid evidence at that time of any negative health effects. "The best available and most reliable scientific evidence indicates, that at the maximum permitted level of fluoride in drinking water at 1 part per million, human health is not adversely affected" (Forum on Fluoridation, 2002)

Similar reviews have been conducted in many countries including the United Kingdom (York Review 2000, MRC 2002), Australia (2008), Canada (2010), and United States (2006). None of these reports have established any basis for considering that artificially fluoridated water poses any systemic health risks.

The EU Scientific Committee on Health and Environmental Risks (SCHER), published its 'Opinion on critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water' – 16 May 2011. The SCHER report concluded that there are no known health implications from fluoridating water at levels used in the EU. It also considered the possibility of wider environmental damage and concluded that the evidence did not demonstrate any untoward effects from fluoridation.

Fluoride which is not excreted by the body tends to be retained primarily by calcified tissue, much of the research has focused on potential effects on bone, particularly regarding skeletal fluorosis, bone fractures and bone cancer. As the SCHER report notes *'the occurrence of endemic skeletal fluorosis has not been reported in the EU general population'*.

On the basis of the best available evidence to date regarding fluoride levels in drinking water at levels aimed at controlling dental decay, SCHER further states '*there is not sufficient evidence linking fluoride in the drinking water to the development of osteosarcoma*'. Similarly the York Review states that no evidence is associated with increased risk of any other kind of bone cancer in humans or of an increased bone fracture risk for people consuming optimally fluoridated water.

Some claims have been made concerning other potential health effects, largely on the basis of laboratory experiments rather than human epidemiological studies. The Expert Body notes the view of the American Council on Science and Health (ACSH) which stated 'The arguments that tie water fluoridation to a whole host of health risks have little substance. Most of the studies that these arguments are based on involve either human exposure to much higher levels of fluoride than the U.S. standards, or animal studies in which the lab animals received extremely high doses of fluoride – neither of which is representative of the how the U.S. population will respond to our low levels of fluoride in water' Similarly, the York Review team stated "*Exposure in vitro (laboratory studies) is very different to those in vivo (real life situations)*."

The New and Emerging Issues Committee of the Expert Body reviews new studies concerning fluoride as they are published. The Committee has found no studies which cast serious doubt on the safety of water fluoridation.

Dental Fluorosis

There are no known side effects of water fluoridation other than dental fluorosis. Dental fluorosis is a cosmetic or aesthetic condition which refers to the way teeth look; it is a superficial staining of the tooth surface and is not considered to be an adverse health effect. Where such staining occurs it can be removed easily and painlessly in a matter of minutes (at the levels seen in the Republic of Ireland).

This is in contrast to the treatment of tooth decay which may on occasion involve the use of general anaesthesia and hospitalisation. Furthermore, non-treatment of dental fluorosis has no health consequences, whereas non-treatment of dental decay can lead to pain, trauma, disfigurement, loss of teeth and function, problems with nutrition and growth, school absenteeism and significant financial and social cost (Do and Spencer, 2005, Williams et al 2006, Meneghim et al 2007, Ardu et al 2009).

Regularly conducted studies on dental health in Ireland, carried out when the upper limit for fluoridation was 1.0ppm, confirm the low level of dental fluorosis in Ireland (Whelton et al, 2002)

Much of the dental fluorosis occurs from sources other than fluoridated water, such as inappropriate use of fluoride toothpaste (Ketley, O'Mullane and Halbrook, 2004). and is thought to be connected to inappropriate ingestion of fluoride toothpastes, which are generally 1,500 times more concentrated with fluoride than is fluoridated water.

In order to reduce the level of dental fluorosis the Expert Body now recommends that fluoridated toothpaste should not be given to children under 2 years of age. For children aged 2 to 7 years, adults should supervise tooth brushing with fluoridated toothpaste (not less than 1000ppm) and ensure only a small, pea-sized amount of fluoride toothpaste is used and that the toothpaste is spat out and not swallowed.

Effectiveness

The effectiveness of water fluoridation in preventing tooth decay continues to be endorsed by a comprehensive range of authoritative international bodies including the World Health Organization, the Center for Disease Control and Prevention, the United States Public Health Service, the United States Surgeon General, the Federation Dentaire Internationale/World Dental Federation, the International Association for Dental Research, the Royal College of Physicians of England, and by major international scientifically validated reviews in many countries. Peer reviewed reports of studies which outline these benefits are widely available in the public domain.

Surveys have been conducted on a regular basis to measure the effectiveness of water fluoridation in the Republic of Ireland including:

National Survey of Children's Dental Survey 1984
National Survey of Adult's Oral Health 1990
Regional Surveys of Children's Oral Health 1990-1999
National Survey of Adult's Oral Health 2001
All-Island Survey of Children's Oral Health 2002 (which included a comparison with caries levels in Northern Ireland)
Cross-Border Study of impact of water fluoridation in 16 year olds, 2006

All of these studies showed a substantial benefit in terms of the reduction in tooth decay experience.

The Expert Body is unaware of any evidence to the contrary in Ireland.

Ireland has a very high dental decay risk profile compared to most other European countries. For example Children in the Republic of Ireland (RoI) have amongst the highest frequency of consumption of foods and drinks sweetened with sugar when compared with 34 other countries (WHO). The Irish Health Behaviour in School aged Children (HBSC) Study (2010) showed that overall, 21% reported drinking soft drinks on a daily basis.

The most recent national survey of children's oral health in Ireland found that of those living in areas with fluoridated water 37% of children has dental decay by the age of 5. In areas where there is no fluoride in the water, 55% of all 5 year olds have experienced dental decay.

Water fluoridation is the most cost-effective method of preventing dental decay and thus overcoming the poor risk profile in Ireland.

There is some evidence that water fluoridation may have particular advantages for persons on lower income. The percentage of children under 18 experiencing consistent poverty has increased significantly from 6.3% in 2008 to 8.7% in 2009 (State of the Nations Health – Ireland, 2010). Reducing health inequalities is a matter of fairness and social justice. Creating a fairer society is fundamental to improving the health of the whole population and ensuring a fairer distribution of good health (The Marmot Review 2010).

Fluoridation has been described by the US Center for Disease Control as one of the top 10 public health successes of the 20th century.

Conclusion

The Expert Body is of the opinion that there continues to be overwhelming evidence that water fluoridation significantly benefits dental health. The Expert Body is satisfied, having studied current peer reviewed scientific evidence worldwide, that water fluoridation, at the optimal level, does not cause any ill effects and continues to be safe and effective in protecting the oral health of all age groups. These views are supported by reputable international agencies and valid scientific articles and reviews.

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