

## NEWS ITEM

### WATER FLUORIDATION IN ELEVEN COUNTRIES

In several countries, there is an official policy supporting fluoridation of drinking water, but it is left to each city to decide whether to implement this policy. The decision is frequently made through a referendum. Sapolsky [1] and Arcus-Ting *et al.* [2] among others have analyzed and discussed these referenda. Sapolsky [1] and Head [3] have discussed the arguments typically used by the pro-fluoridation and anti-fluoridation forces during the campaigns.

There is an argument which might be termed the 'peer-pressure' argument. Crain [4] has discussed the effect on a given referendum of fluoridation decisions in nearby cities. But more generally both the pro- and anti-fluoridation forces refer to the status of fluoridation in other countries during the campaigns.

Referenda are still occurring. For example, there was a fluoridation referendum in the City of Waterloo, located in the Province of Ontario, in Canada, in June 1981. Waterloo is a city of about 52,000 people. Out of 10,000 votes cast, fluoridation was retained by a margin of about 300 votes. During the campaign, in order to influence Waterloo voters to retain fluoridation, the pro-fluoridation forces claimed that there was widespread support for fluoridation in other countries. For example, the former Medical Officer of Health of the City of Waterloo stated that "every reputable scientific authority throughout the entire world strongly advocates the addition of fluoride to the water supply..." [5].

Similarly, in order to influence voters against fluoridation, the anti-fluoridation forces claimed that fluoridation was being discredited and defeated in many other countries.

The present paper summarizes the results of a study made to resolve these conflicting claims. The study method was to contact directly the appropriate national government ministry in each of eleven countries outside North America. Each ministry was asked to provide information on the following points:

1. Results or conclusions of the most recent official inquiry into the fluoridation question.
2. Current official government policy on fluoridation.
3. Current extent of use of fluoridation and recent trend in extent of adoption.

The United States and Canada were not contacted as their official positions are well-known and fluoridation use is rather widespread in these two countries. Also, in what follows, reasoning used by the various governments in support of fluoridation is not reviewed as this reasoning is amply documented in the literature.

The responses of each government are summarized below in alphabetical order. It should be noted that Boettcher [6] made a similar study and the present results can be regarded as adding further details.

#### *Australia*

The Department of Health states that "the Commonwealth Government strongly supports the fluoridation of water and encourages communities to adopt this measure". Possibilities of adverse health effects have been examined carefully "and it is considered that there is no evidence to support" these possibilities [7].

In 1976, 47% of the population received fluoridation. Then Melbourne commenced fluoridation and the percentage increased to 67% as a result. "The figure has since dropped to 66.3% because two communities have discontinued the fluoridation of their water supplies".

"It is expected that fluoridation in... Victoria will move ahead in the next few years... (as a result of)... the Inquiry into the Fluoridation of Water Supplies in Victoria, which was requested by the Government of Victoria. This Inquiry strongly supported fluoridation...".

There is a "low level of fluoridation in Queensland, where only some 6 to 7% of the people are receiving fluoridated water..." [7].

#### *Austria*

The Bundesministerium für Gesundheit und Umweltschutz states that water fluoridation is not in use. Supply of fluoride is carried out by tablets exclusively [8].

#### *Denmark*

The Ministry of the Environment states that "fluoridation is not allowed in Denmark" [9]. On 3 January, 1977, the National Agency of Environmental Protection recommended to the Minister for the Environment "not to permit fluoridation of drinking water in Denmark. The recommendation of the Agency is among other things based upon the fact that a number of questions on human health and environment are not and hardly can be clarified" [10].

Following upon receipt of this recommendation, the Minister for the Environment issued on 5 January, 1977, a statement concluding that "the power warranted by section 48 of the Water Supply Act should not be applied to allow fluoridation of drinking water". Some of the reasons included in the statement as the basis for this conclusion are:

1. "It must be ensured that industrial enterprises within a water supply district do not produce goods that might be affected by an increased content of fluoride in the water supply".
2. "The greater part of the fluoride is not consumed... but is carried into the soil through irrigation or into water-courses, lakes, and the sea as wastewater. Knowledge about the consequences of an increased discharge of fluoride into marine and fresh waters is very limited". There is "a possibility that fluoride may be accumulated via food chains".
3. While there is "extensive documentation of the prophylactic effect on dental caries, ... adequate studies have not been carried out of the long-term effect on other human organosystems".

4. "It is impossible to exempt the following critical groups from being supplied with fluoridated drinking water:

- (a) persons with very large consumption of liquid
- (b) persons suffering from kidney diseases with reduced kidney function,
- (c) persons under prolonged dialysis,
- (d) babies fed on foods made from dried milk.

It must be emphasized that this enumeration is not exhaustive" [10].

The Danish Dental Association states that "the Association has for many years advocated water fluoridation in Denmark. The authorities have refused this approach because of some unsolved problems concerning (the critical groups in the population). Danish dentists therefore have been forced to utilize the topical effect of fluoride. This in connection with compulsory public dental health service to children... has caused such a progress in dental health that only a few areas will benefit particularly from water fluoridation today" [11].

#### Finland

The National Board of Health states [12] that the "fluoridation issue has been vigorously discussed also in Finland... The National Plan for Primary Health Work in 1981-1985 approved by the Government of Finland includes a requirement to the communes to provide the entire population with sufficient (optimum) intake of fluorides. The recommended methods are fluoridation of household waters or distribution of fluoride tablets and a comprehensive utilization of topical applications of fluorides".

"Water fluoridation has also in Finland become an object of bitter controversy and as a result no progress has been achieved since 1959 when Kuopio town started with water fluoridation. The use of fluoridated dentifrice, however, has increased significantly during the last few decades" [12].

The population of Kuopio is 55,000. A number of water supplies in Finland contain substantial natural levels of fluoride (1 ppm or above). The largest supply in this category is that of Hamina, population 11,000 [13].

#### Netherlands

The Ministerie van Volksgezondheid en Milieuhygiëne states [14] that "in the past the Dutch Government has promoted several thorough studies to investigate and evaluate data on the benefits and disadvantages of fluoridation. These studies, held with the supervision of the National Health Council, led unanimously to the conclusion that adjusted fluoridation of public water supplies prevents to a high degree tooth decay and—with a correct dosage—has no detrimental effect on public health. Fluoridation of public water supplies, which amounted to about 20% of the drinking water, came to an end by a Royal Decree of 31 August 1976, which cancelled another Royal Decree (1960) opening the possibility of fluoridation. In 1973 the High Court declared in a case in that matter that fluoridation was illegal, i.e. not based on a formal law. In the High Court's opinion, the above mentioned Royal Decree of 1960 was not sufficient as a basis for such an important measure as fluoridation of public water supplies" [14].

The Government then tried to change the law in order to make fluoridation legally possible. After lengthy formal and informal discussions, "objections remained, and the bill was withdrawn from Parliament in early 1976 when it became evident it would be rejected by the majority".

The major objection in Parliament was "that no alternative provisions for those who objected against fluoridated drinking water were available or acceptable" [14].

#### New Zealand

The Ministry of Health states [15] that "successive Ministers of Health have, since the early 1950's, when fluoridation was introduced on an experimental basis in Hastings, supported fluoridation. The Government does not decree that all public water supplies shall be fluoridated, but it encourages, both by advice and subsidy, local authorities which administer public water supplies to fluoridate them".

In 1970, 57% of the public received fluoridated water. In 1980, the proportion was 64.9%.

"Although the proportion of the population that receives fluoridated water has increased, there is a vigorous anti-fluoridation lobby in New Zealand which has succeeded to the extent that some large centres (notably Christchurch City) regrettably remain unfluoridated" [15].

#### Norway

The Helsedirektoratet of the Ministry of Social Affairs states [16] that "in 1968 a committee on fluoridation reported to the Ministry making recommendations for adding fluoride to drinking water in Norway... Water fluoridation will, according to a court decision of 1959, require positive legislation to permit the municipalities to add fluoride to their water supplies. Up to the present time, no such legislation has been presented to, or voted on, by the Norwegian Assembly. Accordingly, no municipality has added fluoride to its water supply to far".

"However other methods of taking advantage of the caries-preventive properties of fluoride are in general use". Sales statistics indicate that fluoride tablets are purchased for approx. 30% of Norwegian children up to 11 years of age. "Close to 90% of children 7 to 15 years of age participate at organized preventive programs in the Public Dental Service" which include topical applications. Fluoride-containing dentifrices make up nearly 70% of total toothpaste sales [16].

#### Sweden

The Social departementet states [17] that in August 1977 a Fluoride Commission was appointed by the Swedish Government. The result of the work of the Commission was presented to the Minister of Health in June 1981. The Minister sent copies of the report of the Commission to 38 authorities, county councils, municipalities, and labour unions. These bodies were asked to comment in June 1982. These comments are likely to have great influence on the government's decision regarding fluoridation. The Commission concluded that "the basic cause of caries is the consumption above all of sweet foods... habits of this kind are the first matter that must be dealt with in the prevention of caries. Good oral hygiene also has its allotted part to play. The preventive effect of fluoride comes after these considerations..." [18].

"The Commission is opposed to the addition of fluoride to foodstuffs. The addition of fluoride to salt is rejected for both practical and medical reasons".

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As regards the fluoridation of drinking water, the Commission is opposed to legislation making it possible for municipal authorities to add fluoride to drinking water supplies. The various measures taken so far have led to a steep decline in the incidence of caries in recent years, and the Commission feels that further preventive effects can be obtained on a voluntary basis... by means of... improved popular dietary habits and oral hygiene and also by means of efficient individual fluoride treatment".

"... The combined and long-term environmental effects of fluoride are insufficiently known, which is yet another reason for rejecting fluoridation of water. The Commission has also found that no adequate survey report exists concerning the possible effects of fluoride administration via breast milk substitutes". Two of the seven members of the Commission filed a dissenting opinion. "The dissentients... propose that each of Sweden's 279 municipalities be free to decide independently whether or not to increase the fluoride content of the drinking water. They feel that the administration of fluoride via drinking water is particularly valuable to socially and medically underprivileged groups in society... The dissentients feel that the adoption of a standpoint against water fluoridation ought logically to imply a standpoint in favour of defluoridation of water" naturally containing substantial amounts of fluoride, and yet "the majority has not recommended defluoridation" [18].

#### Switzerland

The Département fédéral de l'intérieur states [19] that "the City of Basle with a population of some 250,000 is the only town practising water fluoridation".

"All other cantons have decided against the addition of fluoride to water supplies, mainly for economical reasons. Water supplies are extremely decentralized in our country. An additional point against water fluoridation is the fact that only a small part of the water is actually used for human consumption. The desirable amount of fluoride is therefore administered to the population by means of cooking salt. Up to now our salt has been fluoridated to 90 ppm F. The Cantonal Public Health Departments have, however, just decided that the fluoride rate in cooking salt be increased to 250 ppm F, which will provide a level of daily fluoride intake similar to water at 1 ppm" [19].

#### United Kingdom

The Department of Health and Social Security states [20] that "since 1962... successive Governments have encouraged health authorities to seek introduction of fluoridation in their areas. Local Health Authorities are at present responsible for such preventive health measures. Water authorities have also been encouraged to comply with the requests of health authorities. The Government are convinced of the safety and efficiency of fluoridation but prefer to proceed with the consent of those concerned and to leave the decision to area health authorities locally".

"Water Authorities cannot be compelled to fluoridate and there are no plans at present to introduce legislation which would place on them a duty to do so. Although the Government regard their legal powers to add fluoride to water supplies as adequate, doubts have arisen and at this writing the Government are awaiting the outcome of two legal cases (one in Scotland and one in England) which may clarify the question of powers. Proceedings on the Strathelyde case in Scotland continue but no judgement has yet been made. The English case (Calderdale) has not yet been scheduled for hearing".

"Throughout the United Kingdom nearly 9% of the population (about 4.8 million people) is now receiving fluoridated water, mainly from schemes introduced before reorganization of health services and water supplies in April 1974. There is a new fluoridation scheme which is projected for Wolverhampton. This should mean a further 1.9 million people receiving artificially fluoridated water in due course" [20].

#### West Germany

The Bundesminister für Jugend, Familie und Gesundheit states [21] that only one city had used fluoridation but has ceased doing so. A 1974 federal law advocates fluoridation but provides for exceptions through negotiations with the provinces. The negotiations became complex and the Minister asked the Federal Health Authority to take up the problem. The Authority found deliberations on the problem very difficult and could not reach a final decision. Some of the reasons which the Authority found against fluoridation were:

1. Water is a necessary commodity for which there is no replacement. This means that in fluoridated areas everyone must ingest fluoride whether he wants to or not.
2. Because of the nature of the distribution system, the fluoride dose at the faucet can vary. This problem is further aggravated due to variable use of drinking water by individuals [21].

Greece and Ireland were not contacted in the present study. Boettcher states [6] that fluoridation is not used in Greece. He states that Ireland is the only country in Europe in which fluoridation in all water supply systems is obligatory. As of 1977 the extent of coverage had reached 30%. Boettcher estimates that with the cessation of fluoridation in the Netherlands, the proportion of the population of Europe receiving fluoridated water dropped from 2 to 1%.

As already stated, Canadian health authorities were not contacted in this study. It is of interest to note that a 1977 report [22] issued under the imprimatur of the Associate Committee on Scientific Criteria for Environmental Quality of the National Research Council of Canada listed the following areas in which research is needed or where caution is needed in connection with ingestion of fluorides:

- 1 "There is evidence that chronic intake of fluoride increases the long-term metabolic requirement for both calcium and magnesium. ... There is no doubt that inadequate nutrition increases the severity of fluoride toxicosis".
2. "Long-term ingestion, with accumulation of fluoride in animals and man, induces metabolic and biochemical changes, the significance of which has not yet been fully assessed. It cannot be assumed that such changes are of no significance to human health".
3. "Fluoride is a persistent bioaccumulator, and is entering into human food and beverage chains in increasing amounts" [22].

In a recent document [23], the Associate Committee listed areas in which there are 'gaps in knowledge' and invited proposals for research in these areas. Among the areas listed are:

"Epidemiological studies to:

1. Assess the extent of nephropathic diabetes in relation to total fluoride intake/exposure in humans.
2. Correlate effects of dietary nutritional inadequacies with fluoride intoxication.

Studies of effects of fluoride, for example:

1. As a potential cocarcinogen or comutagen.
2. In early subtle changes in fluoride intoxication, especially as related to blood plasma ionic fluoride concentrations" [23].

#### CONCLUSION

This study has shown the actual position to be somewhere between that stated by the pro-fluoridation forces and that stated by the anti-fluoridation forces. Referring again to the statement of the former Waterloo Medical officer of Health [5], it is *not* true that "every reputable scientific authority throughout the entire world strongly supports the addition of fluoride to the water supply". On the other hand, those authorities not supporting water fluoridation frequently support alternate means of administering fluoride.

Varying interpretations can be placed on the situation seen in several countries in which the official government position is in favour of water fluoridation but water fluoridation is not actually practised.

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